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With Taiwanese Students in Grades Four to Twelve

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**AN INVESTIGATION OF THE USE OF MUSIC APTITUDE PROFILE
WITH TAIWANESE STUDENTS IN GRADES FOUR TO TWELVE**

By

Wuei-Chun Jane Chuang

A DISSERTATION

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ABSTRACT

AN INVESTIGATION OF THE USE OF MUSIC APTITUDE PROFILE WITH TAIWANESE STUDENTS IN GRADES FOUR TO TWELVE

By

Wuei-Chun Jane Chuang

Musical Aptitude Profile (MAP) is a standardized music aptitude test for use with American students. However, no research has been conducted using MAP with Taiwanese students. This study focused on the use of the MAP with Taiwanese students, and the relationships of Taiwanese students' music aptitudes, music environments, and level of musical abilities as estimated by the students, their parents, and their teachers.

The subjects (N=1723) in this study included students from fourth grade to twelfth grade in Central Taiwan. Two of the three divisions of MAP, Tonal Imagery and Rhythm Imagery, were used in this study to measure students' tonal and rhythmic aptitudes. Three questionnaires were administered to selected students (N=1066), parents, and music teachers.

The subtests of MAP were found to be valid music aptitude measurements with high reliabilities and concurrent validities for Taiwanese students. Taiwanese students scored significantly higher than American students as reported in the MAP Manual.

Scores on MAP and students' musical backgrounds and their parents' support of and attitudes toward their music learning differed according to genders. Females scored higher than males.

Students' musical backgrounds and parents' support of and attitudes toward children's music learning are most related to students' performances on MAP. Families' musical experiences and family members' musical background, in addition to parents' attitude toward music, have less relationship to their children's music aptitude. Teachers are not able to separate their evaluations of students' tonal from their rhythm abilities.

Students in higher grades were more capable of evaluating their music abilities, but students' willingness to pursue music as a future career is not related to their performance on MAP. Parents' concepts of their children's music abilities related to their children's scores on MAP, however, there were less so in grades seven to nine. Therefore, there is a need for a standardized music aptitude test for use in Taiwan.

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1997

**To my parents and my grandparents
who continually inspire and educate their children**

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CHAPTER ONE

NATURE OF THE STUDY

Introduction

The term "aptitude," in relation to psychological testing, came out of the "nature-nurture" controversy in the 1920's (and later in the 1940's and 1960's) when scientists began to divide into hereditarian and environmental camps. In the process of trying to discriminate which characteristics of intelligence are innate and which are acquired, aptitude came to denote "innate" intelligence, over a period of time, as opposed to achievement, which denoted "acquired" intelligence (Rothe, 1991).

Music aptitude is the potential for music achievement. Music achievement is the level of skill that one has acquired based on her/his aptitude and music experiences. One's music aptitude is not necessarily represented by his/her music achievement. It is possible that a low music achiever may have high music aptitude. For example, many students who have high potential to achieve in music are never encouraged to participate in music, and thus, achieve at a lower level than their aptitude would allow. Forty percent of children with high music aptitude are never identified by the school and by teachers (Gordon, 1987, p. 98-99).

Each person is born with some level of intelligence as well as some level of music aptitude. As with IQ, music aptitude is distributed normally throughout the population at birth (Gordon, 1990, p. 9). Although music aptitude is innate, it is not hereditary (Taggart, 1989, p. 46). That is, the level of music aptitude that

one is born with cannot be predicted on the basis of the level of music aptitude of her/his parents. However, Scheinfeld (1956) supported the belief that the sources of music aptitude are innate and hereditary by investigating the backgrounds of 36 well-known instrumental musicians and 36 renowned vocalists. When studying the group of 36 famous instrumental musicians, she found that 17 mothers, 29 fathers, and about one-third of the siblings had attained high levels of music achievement. When studying the group of vocalists, she found that 34 mothers, 13 fathers, and more than half of the siblings were found to have attained high levels of music achievement. However, she also found that there is some evidence to suggest that music aptitude may be environmentally based. For example, Toscanini, Rubinstein, and Schnabel, whose parents were found to be untalented by definition in Scheinfeld's study, all had outstanding music environments. These results seem to bear out the nurture theory.

Gordon (1971) defined music aptitude as a product of both innate potential and early environmental experiences. He suggested that favorable environmental influences are necessary for a child to maintain the level of music aptitude with which she/he is born. The higher the level of music aptitude with which a child is born, the more and more varied early informal and formal experiences are required for her/him to maintain that level. The lower the level of music aptitude with which a child is born, the fewer early informal and formal experiences are required for her/him to maintain that level.

According to Gordon (1987), the music aptitude of children up to approximately 9 years of age is developmental; the music aptitude of children approximately 9 years of age and older is stabilized. That means that music

aptitude does not continue to develop, either positively or negatively, after a child is approximately 9 years old. The level of music aptitude with which a person is born is affected by the quality of her/his environment until she/he is approximately 9 years of age. Unless a person's music environment is rich and varied, the level of his music aptitude will continually decrease until age 9, at which time it stabilizes (Gordon, 1987, p. 9). After age 9, a person will be able to achieve in music only to the level that her/his stabilized aptitude will allow. However, since to this point, no one has developed a valid way to measure what the exact level of aptitude is at birth, much of this is speculation.

Gordon (1987) has identified more than 20 dimensions of stabilized music aptitude (p. 36). The two dimensions of music aptitude that have the greatest bearing on music learning, according to Gordon, are the tonal dimension and the rhythm dimension. Those two dimensions are not significantly related to one another. Therefore, it is possible for a person to have a high tonal aptitude and average or low rhythm aptitude, or a low tonal aptitude and an average or high rhythm aptitude. Rarely will a person have a high level or a low level of both tonal aptitude and rhythm aptitude. Moreover, a majority of persons have average music aptitude, fewer persons have above or below average music aptitude, and only very few persons have very low or exceptionally high musical aptitude (Gordon, 1971).

Terms Related to Music Aptitude

In this century, there exist many different terms related to aptitude, such as ability, capacity, talent, and intelligence. Those words can mean both aptitude

or achievement. Researchers and psychologists have defined the terms differently and similarly to certain degrees.

Music Ability

Ability refers to the quality or state of being able, especially the physical or mental power to perform, and it is the natural talent or acquired proficiency equal to "aptitude" (Webster's, 1991). Boyle and Radocy (1987) believe that musical ability is the result of genetic endowment and maturation plus what ever musical skills may develop with formal music education. A person who is musically able can apply diverse skills to a particular musical situation.

Lundin (1953) indicated that ability refers to acquired skills to discriminate between different pitches, intensities, and intervals, or ability to harmonize melodies, sing at sight, or perform on an instrument. According to Lundin's interbehavioral view (1953), musical ability consists of a number of acquired interrelated behaviors built up through a process of interaction of individual organisms with musical stimuli throughout the life history. It appears that "ability" is a broad term that combines most elements of music achievement and music aptitude.

Musical Capacity

Seashore (1938) described musical capacity as an attribute of the mind, and musicality as a part of musical capacity. Lundin (1953) more broadly defined capacity. He said that "It is a biological potential serving as a framework within which we develop musical actions." (p. 176). His use of "biological" rather than "inborn" was intended to allow for maturational variables that might

have an effect on musical capacity. One's capacity includes, among other things, a sound nervous system, two hands, normal hearing structures, and other mental structures necessary for musical behavior. This interpretation bears a close resemblance to aptitude. Boyle and Radocy (1987) referred to "superior auditory discrimination ability" as a matter of capacity and further stated that "musical capacity increases regardless of environmental influence." (p.296) However, aptitude is a more complete term, as capacity is interpreted more as "biological" and lacks the "psychological" aspects of aptitude.

Musical Talent

Seashore (1938) stated that musical talent includes six related areas involving sensory discrimination: pitch, loudness, rhythm, time, consonance, and tonal memory. Each is independent of the other. Seashore described that there are four main components of musical talent: the tonal, the dynamic, the temporal, and the qualitative. Lundin (1953) believed that musical talent consists of musical feeling, musical understanding, musical sensitivity, and musical virtuosity. Virtuosity here implies achievement rather than aptitude. Again, aptitude is coupled with achievement.

Musical Intelligence

Gardner defined an "intelligence" as an ability to solve problems or to fashion a product, that is valued in at least one culture (Gardner, 1990, p.16). Gardner advocated that only if educators expand and reformulate their views of human intellect will teachers be able to devise more appropriate ways of assessing it and more effective ways of educating it.

In brain research, there are the "localizer" researchers, who believe that different portions of the nervous system mediate diverse intellectual capacities, and the "holists," who deem major intellectual functions to be the property of the brain as a whole (Gardner, 1983). Similarly, two attitudes toward mind that have competed and alternated across the centuries are discussed by Gardner (1983). Some may classify these as Gestalism and Elementalism. Gardner labels them as follows: a) hedgehogs (Gestaltists): viewing all intellect as a piece, and b) foxes (Elementatists): considering intellect as fragmentation into several components. The hedgehogs believed that each individual is born with a certain God-given intellect or I. Q.; while foxes believe in the altering effects of environment and training. For instance, British educational psychologist Spearman, a "hedgehog" in Gardner's terms, believes a general overriding factor of intelligence is measured by every task in an intelligence test. On the other side, Thurstone, a "fox" in Gardner's terms, believes in the existence of a small set of primary mental faculties that are relatively independent of one another and are measured by different tasks.

However, Gardner believes that there are several relatively autonomous human intellectual competencies that exist as "frames of mind." These intelligences, as Gardner calls them, are relatively independent of one another, and they can be fashioned and combined in a multiplicity of adaptive ways by individuals and cultures. In Gardner's theory of multiple intelligences, musical intelligence is among seven different isolated human intelligences, including linguistic intelligence, logical-mathematical intelligence, musical intelligence, spatial intelligence, bodily kinesthetic intelligence, interpersonal intelligence, and intrapersonal intelligence.

Gardner lists eight characteristics of an intelligence: a) potential isolation by brain damage, b) the existence of idiots savants, prodigies, and other exceptional individuals, c) an identifiable core operation or set of operations, d) a distinctive development history, along with a definable set of expert "End-State" performances, f) an evolutionary history and evolutionary plausibility, g) support from experimental psychological tasks, and h) susceptibility to encoding in a symbol system. (Gardner, 1983, p. 63)

Music is represented with some localization in an individual. Gardner (1983) mentions that many studies converge on the right anterior portions of the brain with such predictability as to suggest that this region may assume for music the same centrality as the left temporal lobe occupies in the linguistic sphere. Gardner believes that it is irrelevant that the localization of one individual is not identical to another's.

After working with youngsters in Project Zero at Harvard, Gardner (1982) stated that children may be very strong in one area, but their strength in one area simply did not predict whether they would be strong in other areas. This supports the theory of music aptitude, in which music aptitude is considered to be separate from other intelligences.

The Development and Philosophical Foundations of Musical Aptitude Tests

Measurement of traits and abilities began to appear during the latter part of the nineteenth century. The earliest test of musical talent was Carl E. Seashore's *Measures of Musical Talent*, published in 1919 (Seashore, 1960). After the 1939 revision of Seashore's test, other music aptitude tests began to be

written. There was little activity in the designing of new measures during the 1950s, and in 1965 Edwin Gordon published the *Musical Aptitude Profile*. (Gordon, 1995)

Every music aptitude test is based upon certain psychological assumptions and implies a certain view of the nature and function of the musical mind. For example, early researchers of music aptitude were influenced by the primary psychology views of Elementarism and Gestaltism. By 1960, research inspired by cognitive and developmental theories re-stimulated interest in music perception and aptitude.

Measures of Musical Talents (MMT)

In 1919, Carl E. Seashore published a standardized music aptitude test battery, *Measures of Musical Talents* (MMT). It was later revised in 1939, 1956, and 1960. Seashore's atomistic point of view was clearly reflected in the development of his test. This point of view was known as elementarism, which is a "bottom-up" approach (Gardner, 1985) or, as Seashore (1937) put it, a theory of specifics. Wing (1948) described "atomists" as ".....those who attempted to analyze music into its most elementary basic constituents and then to build up tests of a sensory type that aim at assessing these elementary constituents in their most exact form." (p. 8) In 1937, Seashore stated that musical talent was not a single talent, but a hierarchy of talents, many of which were entirely independent of one another.

Seashore's test contains six subtests: Pitch discrimination, Loudness, Rhythm, Time, Tonal memory, and Timbre. In the Pitch test of MMT, 50 pairs of individual tones are presented. The subject is asked to judge whether the second

tone sounds higher or lower than the first. In the Loudness test, the subject is asked whether the second of two tones is stronger or weaker than the first. In the Rhythm test, the subject is to indicate whether the two patterns presented in each test pair are the same or different. The test of the sense of time consists of 50 pairs of tones of different durations, and the subject is asked to decide whether the second tone of the pair is longer or shorter than the first. There are 50 pairs of tones in the Timbre test, and the subject is to judge whether the tones are the same or different in timbre or tone quality. The test for tonal memory consists of 30 pairs of tonal sequences. The second tonal sequence of each pair has one note that is different from the first sequence. The subject is to indicate which note is different by number.

Seashore (1937) believed that his six measures represented a theory of specific measurements, and that the design of these six measures was based on two universal scientific sanctions: 1) the factor under consideration must be isolated in order to know exactly what it is that one is measuring, and 2) the conclusion must be limited to the factors under control.

Seashore distinguished the psychological aspects of sound, (which he called pitch, loudness, time, and timbre) from the corresponding physical aspects of sound (which he called frequency, amplitude, duration, and form.) He reasoned that the physical aspects are the bases of the psychological aspects, and unless one had the acuity to deal with the physical, he/she could not deal with the psychological.

Thus, for Seashore, music aptitude is best described by what can be observed objectively in the sound wave. He also stated that the four physical sensory capacities and their psychological counterparts are more significant

musically when they function in the complex forms of the sense of tone quality, the sense of consonance, the sense of volume, and the sense of rhythm. The complex forms must be dealt with by themselves, and from this, Seashore derived ultimately what he believed to be a comprehensive description of music aptitude.

The aim of elementalism or structuralism as reflected in MMT was the analysis of conscious experience into atoms or molecules of feelings and sensations (Lundin, 1953, p.207). This is in contrast to a view in which mind is considered to be an integrated unanalyzable whole, a Gestaltism.

Gestalt psychology (1924) is the study of perception and behavior from the standpoint of an organism's response to configurational wholes with stress on the uniformity of psychological and physiological events and rejection of analysis into discrete events of stimulus, precept, and response (Webster's, 1991). Gestaltists believed that psychological behavior involves purpose and intelligence; hence it is not correlated with physical movement/phenomena. From a Gestalt-field point of view, psychological behavior is not directly observable; it must be inferred. A change in physiological behavior does not necessarily mean that learning has occurred.

Gestalt field psychologists believe that "transfer" of learning occurs because of perceptual similarities between two situations. The "transfer of learning" is in the form of generalization, concepts, or insights that are developed in one learning situation and are usable in others. Learning is a change or reorganization of insight or cognitive structure. One does not "learn by doing" except insofar as one's doing contributes to one's change in cognitive structure.

Learning, then, involves the getting and generalization of insights. Gestaltism permeates Gordon's learning theory and the design of his music aptitude tests.

Gestaltism came to be associated with the critics of Seashore's tests, particularly Mursell, Revesz, and Wing. They believed in the primacy of wholes over parts. The Gestalt psychologists eschewed the sensory approach to music aptitude. Mursell (1947) stated the following:

The individual mind is precisely not a composite of unitary traits or abilities, but a functioning unit. Intelligence, for instance, can not be separated from interest. What is called musical talent, or artistic talent, or mechanical aptitude is not a sort of special faculty, but is essentially the mind or personality as a whole operating in a particular way. (p. 22)

Mursell indicated that musicality does not depend directly on sensory abilities, as Seashore had emphasized. He believed that the psychological capacities upon which musical behavior depends are found in various degrees and in widely differing combinations. The most foundational of these would appear to be a general emotional responsiveness to tone, which can manifest itself without any clear apprehension of structural elements. Therefore, he believed that musicality is more than a sum of special sensory abilities.

Seashore believed that his tests tapped basic physiological capacities that were inborn and could not be influenced by training. He also admitted that his test battery was limited, and that there were other capacities that he was not measuring. In the later version of the Manual of Instructions (1960), he stated that not all of the facets of music aptitude are known, but that there are several fundamental capacities that can be assessed through MMT. The description of the test as measuring "fundamental capacities" had not changed. This is

particularly striking in light of the recent work of Gardner and his theory of "multiple intelligences," in which he talks about the reemergence of interest in the nineteenth century "faculty psychology" from which Seashore's theories came.

Historically, MMT was the most used and written about test of music aptitude, but it was seen as too limited in scope as time went on, when Gestalt-influenced theories came more into prominence. During World War II, candidates for training in submarine detection were tested with the pitch and intensity subparts of MMT. MMT has been criticized, however, because each subtest deals with only one dimension of music. Followers of "the Gestalt theory of musical aptitude test construction" maintain that most music is made up of the interaction of rhythmic, tonal, and expressive qualities (Gordon, 1971, p.14).

Kwalwasser-Dykema Music Tests (K-D Tests)

Jacob Kwalwasser and Peter W. Dykema published the Kwalwasser-Dykema test in 1930. This test was designed along the same general lines as Seashore's MMT. Most parts of K-D Tests represent an atomistic design philosophy. Only a few subtests of the K-D Tests, which require the subject to judge which music ending is better, are built on Gestalt theory.

The K-D tests consist the measures of Tonal Memory, Pitch Discrimination, Intensity (loudness) Discrimination, Time Discrimination, Rhythm Discrimination, Quality (timbre) Discrimination, taste for Tonal Movement, Melodic Tastes, Pitch Imagery, and Rhythm Imagery. In the Tonal Memory subtest, the subjects have to judge whether two melodies are the same or different. A single tone is heard for three seconds in the Pitch subtest. If the tone rises or falls in pitch and then returns to the original pitch, the subjects are to

identify the tone as "different." In the Intensity subtest, the subjects are asked to judge whether the second of two tones is stronger or weaker than the first. In the Time Discrimination test, the subjects are asked to determine if two tones have the same duration. In the Rhythm Discrimination test, the subjects are to judge whether a pair of rhythms are the same or different. In the Timbre Discrimination subtest, the subjects are asked to judge whether the paired musical patterns are played on the same or different instruments.

In the tonal Movement, Melodic Taste, Pitch Imagery, and Rhythmic Imagery subtests, the subjects have to judge which of two endings, consisting of different pitches, melodies, or rhythms, is better. Unlike most parts of the tests, these subtests are Gestaltist in nature, because the judgment is based on a whole musical idea. However, as a part of the Pitch Imagery and Rhythm Imagery subtests, subjects must compare the tones notated on a printed page to what he/she is hearing and judge whether they are the same or different. In order to do this, subjects need to know how to read music notation. As a result, those subtests are more of an achievement test than an aptitude test.

K-D Tests have been used quite extensively by music teachers in some areas of the United States. Many teachers feel that the attention of subjects is held somewhat more successfully by K-D Tests than by the Seashore measures because of the brevity of the separate tests and the use of actual musical sounds from a Duo-Art piano (William, 1971).

The K-D tests were found to have low reliability by Taylor (1941), Whitley (1932), and Beinstock (1942). In 1954, Homes published a revised version of the K-D Tests. Unfortunately, the tests still were reported as having reliabilities too low to be used for measuring success in music (Lehman, 1968). With reliabilities

being as low as they were, the validity of the test comes into question. Also, critics have pointed out that most of the tests are too short and that they do not include a sufficient number of items at acceptable discriminative levels. This test is out of print (Rothe, 1991).

Test of Musicality (TM)

The *Test of Musicality* by E. Thayer Gaston was published in 1942 and revised in 1950, 1956, and 1957. The first seventeen items on Gaston's test consist of a personal-interest inventory with self-rating questions concerning, for example, the use of music in the home and attitude of the subject's other family members toward music. Item 18 requires the students to list, in order, the instruments he or she would like to play.

All musical test items on the test's recording were produced using a piano and consist of chord construction, aural-visual melody completion, and tonal memory tests. The difficulties of the items increase progressively. Subjects are asked to determine whether a given tone is in a following chord, whether a notated melody differs from a melody heard, whether the final note of a notated melody is higher or lower than the last tone heard, and whether notes or rhythms are altered in a subsequent playing of a melody. Since the music items are built on melodic patterns or chords, this test design is based to some extent on Gestaltism. This test, again, is related to musical achievement, because it requires the ability to read music notation. It, too, is out of print.

Wing Standardized Tests of Musical Intelligence (WMI)

The *Wing Standardized Tests of Musical Intelligence* was designed in 1939 by Herbert Wing, an English educator. WMI consisted of seven tests that focus on Pitch Change, Memory, Rhythmic Accent, Harmony, Intensity, Phrasing, and Chord Analysis. This battery appeared on records after World War II, and in 1958 a revised edition was issued on reel to reel tape.

In the Pitch Change test, the subjects are asked to determine if two notes or two chords are the same or different. In the Memory test, the subjects are asked to indicate the number of the note that is altered in the second of each melodic paired patterns. In the tests of Rhythmic Accent, Harmony, Intensity, and Phrasing tests, the subjects are asked to indicate whether two melodies are the same or different. If the two are different, the subjects should indicate their preference for one of the two by writing in either "A" or "B." The Chord Analysis subtest requires subjects to count the number of pitches present in a given chord.

Wing (1948) stated that music ability and music appreciation are qualities of the whole mind; though they involve auditory discrimination, they do not depend solely on the ear. Almost all of WMI test are items paired of melodies instead of tones, and this reflects Wing's more Gestaltist approach. He believed that melodies rather than isolated pitches or rhythms are the fundamental unit for perception of and understanding in music.

Drake Musical Aptitude Test (DMAT)

Drake Musical Aptitude Test was designed by Raleigh M. Drake in 1954 and revised in 1957. This test was based upon Gestaltist theory, since the test items are always presented in the whole musical form. The test consists of Musical Memory and Rhythm Tests. The Musical Memory portion of DMAT

involves determining whether the key, duration, or pitches are changed in a subsequent playing of a melody. As one part of the Rhythm test, subjects are asked to listen to an established tempo and then count silently after the metronome that is establishing the tempo quits sounding. The subjects continue counting until they are asked to stop. As another part of Rhythm test, subjects are asked to continue to count against a distracting beat. For both parts of the Rhythm test, the number a subject is counting at the moment the voice says "stop" is his or her answer.

Based on the reliability and validity report issued by Drake, only Musical Memory subtests were found to be useful (Drake, 1933). Lundin (1949) found the validity figures to be lower than Drake had determined. Gordon (1961) studied the effects on training and practice on DMAT scores and concluded: "... the obtained difference, while not significant, was consistent with the hypothesized effect of training. Also, the informal tests built and used by the instructor during the training period gave some indicating of growth in skill....." Ferrell (1961) did a follow up study in which he found that the test successfully discriminated between students with a high level of music aptitude and those without a high level of aptitude. Conflict clearly exists regarding the quality of this test. It, too, is out of print.

Measures of Musical Ability (MMA)

Bentley published his *Measures of Musical Ability* (MMA) in 1966. It contains four separate tests: Pitch Discrimination, Tonal Memory, Chord Analysis, and Rhythm Memory. In the Pitch Discrimination test, the subjects are asked to determine whether the second of two successive pitches moves up or

down. In the Tonal Memory test, the subjects are asked which tone in the second playing of a melody was changed. In the Chord Analysis test, subjects are asked to determine the number of tones in a chord. The Rhythm Memory test involves determining which of four beats in the second rhythmic pattern is altered.

The reliability was determined by the test author through the re-test method with a group of 90 children ranging in age from 9 years 10 months to 11 years 9 months. The co-efficient derived was .84. Since this battery is intended for use with children of ages seven through fourteen, there is a need for further study of the reliability with children of these ages. Bentley conducted no validity research when designing this test.

All the test items in Bentley's test are presented as musical patterns, which is Gestaltist in design and is similar in design to WMI. Gestaltist theory is reflected in Bentley's rationale while designing the test: "The most elemental form of music is the melodic phrase, or figure, which comprises tonal configurations within a rhythmic framework." Elementarists would have identified the most elemental form of music as that which could be observed in a given wave.

Musical Aptitude Profile (MAP)

Gordon's *Musical Aptitude Profile* (MAP) was first published in 1965. MAP contains three separate divisions: a) Tonal Imagery, which includes Melody and Harmony subtests, b) Rhythm Imagery, which includes Tempo and Meter subtests, and c) Musical Sensitivity, which includes Phrasing, Balance, and Style subtests.

The Melody and Harmony tests involve determining if a second musical phrase (musical answer) of each pair is an embellishment of the first (musical statement) or is fundamentally a different phrase. In the Tempo subtest, subjects are asked to determine if the musical answer has a different or the same ending as the musical statement. If the answer is different, it is because the tempo of the musical answer is different from the tempo of the musical statement. In the Meter subtest, subjects are asked to determine if the "accents" in a musical answer are the same or different from musical statement. In the Phrasing subtest, the same selection is played twice with different musical expression, and the subject is asked to indicate which version is "better." The Balance and Style subtests are also based on musical preference. The Balance test requires the subjects to judge whether the first or second member of each pair has the "better" ending. In the Style test, the paired excerpts differ in tempi, but all other aspects of the melody are the same. The subjects are asked to indicate preference for the first or second version of the melody (Gordon, 1995).

Gordon (1987) stated that the Gestaltists held that music aptitude is a unitary trait of which general intelligence is a substantial part; the atomistic group contended that music aptitude is multidimensional, that it has various parts. During the development of the *Musical Aptitude Profile*, Gordon stated that over 20 dimensions of music aptitude were discovered. He believes that music aptitudes are inter-related, but that a substantial part of each music aptitude is unique. MAP is an eclectic test battery, drawing from both atomistic and Gestalt omnibus theories. Although both preference and non-preference tests constitute the battery, and the test items consist of especially composed music performed by professional musicians, the battery, nevertheless, is designed to measure

seven separate dimensions of stabilized music aptitude. Moreover, the test items in all subtests, whether they are the tonal, rhythm, or aesthetic/expressive, include both tonal and rhythm aspects.

The subtests of MAP go beyond measuring aural discrimination of isolated abilities. In Tonal Imagery, the test is primarily concerned with melodic contour as it interacts with tonality and rhythmic elements. The Rhythm Imagery also embodies unique psychological constructs. That is, rather than dealing with nonmelodic rhythm patterns or isolated metronomic clicks, the Tempo subtest allows for tempo to be influenced by and interact with melodic rhythm as well as with expressive elements typically found in music. Similarly, meter must be perceived as it influences melodic rhythm. In this sense, tempo and meter perception are presented as basic functions of rhythm aptitude. The battery, unlike the Seashore measure, does not contain any type of "time" discrimination test or rhythm "memory" test.

Some of the most commonly used music aptitude tests are the Seashore's *Measures of Musical Talents*, the *Drake Music Tests*, the *Wing Standardized Tests of Musical Intelligence*, and the *Musical Aptitude Profile*. Unfortunately, reliabilities and validities of all the music aptitude tests except MAP are either low or unverified. Gordon developed *Advanced Measures of Music Audiation* for college students, *Primary Measures of Music Audiation* for grades K through 3, *Intermediate Measures of Music Audiation* for grades 1 through 6, and *Audie* for child ages 3 and 4. However, these tests are all for use with different aged populations than MAP.

MAP was standardized using over 10,000 students from diverse geographical locations, school sizes, urban and rural environments, and socio-economic statuses. Although the standardization of MAP was conducted three

decades ago, all indications are that the norms remain current. Therefore, there is no need to establish new norms for MAP (Gordon, 1995, p. 66).

When Gordon was standardizing MAP, the answer sheets were scored by the Measurement Research Center. Raw score frequency distributions were prepared and standard scores derived. Reliability coefficients, standard errors of measurement, and intercorrelations among tests were computed using split-halves procedures for the entire standardization sample. MAP has a reliability ranging from a low composite reliability of .90 for the fourth grade to a high of .96 for the eleventh grade (Gordon, 1995). Concurrent (criterion-related) validity coefficients for composite MAP scores, based upon teacher's estimate of musical talent, range from .64 to .97 (Gordon, 1995). The three-year longitudinal predictive validity coefficients for composite MAP scores, based upon music achievement test (Iowa Tests of Music Literacy), range from .44 to .71 (Gordon, 1967). MAP is the only test of its kind to receive extensive longitudinal study supporting its validity (Buros, 1992).

The percentile norms of specific grade levels are included so that the teacher or researcher can compare students' test performances with other students at the same grade in school. The battery is well-organized, with clear and concise instructions, both printed and oral, that are easy to read. The manual is one of the strengths of the test, as it contains more than an adequate amount of information for the interested reader, including relevant studies, documentation, supportive material, explanations, and normative and statistical data (Kramer & Conoley, 1992).

Gordon's MAP has frequently been described as superior to other available aptitude batteries (Lehman, 1968; George, 1980). McLeish (Buros, 1972)

described MAP as undoubtedly the best test of its kind on the market, conforming to all the criteria of excellence in musicality as well as in test construction and validation. Therefore, MAP is arguably the most appropriate tool for measuring the musical aptitude of students in fourth through twelfth grades.

Standardized Tests and Authentic Assessment

The search for more objective assessment tools gave rise to the "scientific testing movement" early in this century. However, recently many educators have sharply criticized the use of standardized tests for assessing student learning or characteristics. Some educators have advocated authentic assessment, which focuses on involving students in tasks that are worthwhile, significant, and meaningful rather than examining students only by multiple choice tests. This authentic type of assessment may involve varied activities such as oral interviews, group problem-solving tasks, or the creation of writing portfolios.

The standardized test, which was usually in a multiple-choice format, was developed to be administered to large numbers of people with consistent results. Some critics have spoken and written against standardized testing. Some of the concerns are as follows: 1) schools and districts are not accurately reporting data, because they are more concerned about the reputation of school than real information about their students, 2) tests do not provided clear insight into student application of knowledge, due to the doubts about the construct validity of the test, 3) teachers often are pressured to spend excessive amounts of time preparing students to take tests. Therefore, the test may reduce time spent on

meaningful teaching and learning, 4) schools have felt intensive pressure to outscore and be better than other schools in their local geographical area, 5) students and teachers alike are politically pressured to produce outstanding test results, 6) test-construction bias exists when the test items are not related to what students have learned, and 7) testing is very costly considering limited school budgets (Fischer, 1995; Hart, 1994).

Gardner (1990) conveys his view that psychologists spend too much time ranking children and not enough time helping them. He advocated that teachers should assess students in an "intelligence fair way" by creating environments in which students can actually show where they have strength and where they do not. Naturalistic assessment has been advocated by these critics because they believe that it can be done in a way that recognizes multiple intelligences through the introduction of a portfolio. They believe that this kind of assessment becomes developmental, placing the teacher in a supportive and coaching role rather than in "the teacher-examiner-student-examinee" model that has traditionally characterized teaching" (Moody, 1990).

Elliott (1990) described the child-centered view as based upon the premise that no two children are alike and that the curriculum should reflect those individual differences. He suggested that reliance on a single test score, regardless of the test, is not advisable, and that the most effective procedures seem to employ a profile or a portfolio of some kind. Wolf (1987) defined a portfolio as a "chronologically sequenced collection of work that records the long-term evolution of artistic thinking." Portfolios enable students and teachers to see "the processes that underlie long-term development" (p. 27). Reflective

interview as an extension of the portfolio process invites students to judge themselves.

Robinson (1995) listed four types of portfolios for assessing students' performance: 1) "Presentation/product portfolio": it represents students' best finished work, and this type of portfolio is useful in formulation a summative or final grade. 2) "Product/performance portfolio": the teacher collects the same product from all students at the same time and makes judgments regarding overall students' progress. 3) "Program portfolio": it shows the best work of a group of a students from a particular program. This is meant to serve as a representation of exemplars of student work over time. 4) "Process portfolio": it includes early and any attempts at production. Students are encouraged not only to create, but also to revise, reevaluate, and refine. This enables all students to take ownership of their work.

Gardner (1990) states that a process folio creates histories of children's efforts in a specific learning domain. When Project Zero began, the initial idea was that various interim drafts, sketches, things that are rejected, and things that are valued were all documented and assessed along the way by students as well as the teacher. ARTS PROPEL (Gardner, 1989) is a project in middle school and high school being carried out in Pittsburgh with collaboration of the Educational Testing Service (ETS). In this project, there are three ways through which students learn about music: production, perception, and reflection. In a PROPEL activity, assessment takes place regularly by the child himself or herself, as well as by others throughout the carrying out of the project.

The concept of an organized collection is the key to portfolio development. Two characteristics of portfolios are advocated in assessment. First, portfolios

provide an ongoing means of monitoring students' progress. Second, portfolios may be controlled to a significant degree by the students. That is, the students decide what to include in the portfolio that best represents their ability, interests, and achievement. This enables teachers to assemble and organize materials representing students' progress and achievement.

Portfolios in music education usually contain not only examples of the students' best work, but also beginning efforts and various revisions of work, updated to previous reflections of students' progression. However, the grading of portfolios needs special consideration. It is especially appropriate that teachers and students cooperatively decide on the expectations and develop a check list for students' self evaluation as well as for the teacher evaluation. Teachers need to communicate to students what it means to do their work well by making explicit the standards by which that work will be judged.

Gordon (1997) stated that portfolio assessment is a marvelous teaching technique but that it can not offer as much useful information in a short period of time as a valid multilevel music test. He stated that although objective test results have not always been what teachers, administrators, and boards of education prefer, there is a need to test students, not to compare students to one another but to improve instruction. "The enthusiasm for assessment and standards has contributed to a lack of regard for music aptitude tests.....unless the results from a valid music aptitude test are used to determine each student's capacity to learn music, students' potential to learn music will continue to be based on their music achievement" (Gordon, 1997, p. 8). This is particularly harmful to those students with high levels of aptitude and low levels of achievement.

Criticisms of standardized tests focus on evaluating students' musical achievement without considering the measurement of the students' musical aptitude. The evaluation of students' performance on music in the schools should be based on more than one test result, but information about a students' music aptitude compared with the population has been shown to be useful in improving instruction. (Gordon, 1995, p. 56) Therefore, music aptitude should be measured using a valid, objective tool, that is a standardized musical aptitude test, because that is the only known means through which to measure music aptitude.

The Importance of Music Aptitude Tests

Both subjective evaluation from music teachers and the objective results of music aptitude tests are important if music education is to be effective. The results of a valid music aptitude test can be used positively to encourage children who have potential for musical accomplishment to participate in music activities. In schools, all students who have the desire to learn music should be encouraged to participate in music activities. However, some students who have high music aptitudes but choose not to participate in music classes could be especially encouraged to participate, based on their music aptitude test scores.

Music aptitude tests can help teachers to provide appropriate instruction to remedy students' specific deficiencies and to enhance students' special musical strengths. From the theories of music aptitude previously discussed, it is understood that there are many dimensions of music aptitude. Teachers need an effective tools to help diagnose individual students' strengths and weaknesses in each dimension of music aptitude. For instance, a student may have higher tonal

music aptitude and lower rhythm aptitude. The student's separate performances on tonal and rhythm dimensions of a valid music aptitude test would help music teacher to adapt music teaching by emphasizing more rhythm instruction and increasing the difficulty levels of tonal practice for this specific student.

Music aptitude tests can help students view their potentials for learning music more objectively. Most students evaluate their music abilities and decide their future educational plans in music according to their present music achievement. However, not every school has effective music instruction that can reveal every student's music potential through his/her music achievement. Therefore, students may not realize their hidden music potential and may not formulate their education plans correctly without the use of a valid music aptitude test.

Students' self-concept of their music aptitude is usually mixed with factors outside of music aptitude, such as their attitudes toward music or their music achievement. This "incomplete" self-concept of music aptitude can result in less interest and in a student underachieving in music. Some students, who have high music aptitude but have low musical achievement, may perceive themselves as unmusical. Therefore, a valid music aptitude test can be useful.

Moreover, to have a more complete understanding of their children's musicianship, parents should obtain objective information from a music aptitude test along with a teacher's judgment concerning their children's musical abilities. It is possible that parents overestimate or underestimate their children's music potentials and do not offer the proper environment or pressure to their children to too great an extent. A music aptitude test is a tool for parents to use in evaluating and understanding their children better.

Attitude and Self-Concept toward Music

Students' self-esteem in music is mostly related to their present music achievement, because students can not always correctly evaluate their true music aptitudes. Research has indicated that self-esteem has much to do with learning, therefore, educators should introduce students, particularly those with high aptitude levels, to the concepts of music aptitude and make students aware of their potentials, even if they may not be achieving at a high level. In this way, students may have a more positive self-concept and attitude toward music learning even though they may not have a high music achievement at the time.

VanderArk, Nolin, and Newmann (1980) showed that music self-esteem scores of junior-high-aged students accounted for a significant amount of variance in predicting attitudes toward classroom music experience beyond what could be accounted for by social status, gender, or age. Positive measures of music self-concept have been linked to higher levels of motivation in music (Chandler, Chiarella, & Auria, 1986), higher scores on music achievement measures (Austin, 1988), and enhanced music attitude, interest, and involvement (Schmitt 1979; Svengalis 1978).

Svengalis (1978) studied music attitude and tried to provide possible reasons for a decline in positive attitude as grade level increased. She also tried to identify why this decline was more prevalent in males than females. She found a significant negative relationship between self-concept in music and increased grade level. She also found a significant positive relationship between background in music and self-concept in music. These studies linked high self-

concept to higher motivation, higher musical achievement, and enhanced involvement in music.

Pogonowski (1985) found that among fourth, fifth, and sixth grade students, classroom music attitudes and music aptitude were unrelated to each other. However, grade level, gender, and socio-economic status were found to be related to classroom attitude. Low positive relationships between both measures of attitude, private instrumental study, and type of performing group suggest that musical background was not related to students' music learning attitudes.

Hedden (1982) researched the relative magnitudes of academic achievement, attitude toward and self-concept in music, musical background, and gender as predictors of music achievement among fifth and sixth grade students. Hedden found that attitude and self-concept were significant predictors of music achievement, although the effects of academic achievement and self-concept in music on music achievement were mixed.

Kehrberg (1984) examined the relationship between selected out-of-school factors and five musical characteristics: aptitude, general music achievement, attitude towards music, level of music participation, and school music achievement. He found the following: 1) self-appraisal of overall music ability was predictive of general music achievement among high school students; 2) school music participants had a more positive attitude toward school music activities than did non-participants; 3) the self-appraisals of music skills and abilities were strongly related to the level of school music participation in musical activities; and 4) aptitude and musical experience of any kind were

highly predictive of general music achievement in high school students, while self-concept and achievement were positively correlated, but to a lesser degree.

The comparison of students' music aptitudes and their self-concepts in music further clarifies the need for a valid music aptitude test. The difference between students' self-concepts in music and their performances on a valid music aptitude test may indicate an inaccuracy in the students' self-awareness of their music potential. Therefore, the results of a music aptitude test could be used to encourage select students who have low self-concepts in music to have a more positive attitude toward music learning, and thus study comparing students' self-concepts in music and their music aptitudes is needed to enable us better to motivate students to learn music.

The Use of MAP in Other Cultures

Musical Aptitude Profile (MAP) was intended for students from occidental cultures and was standardized using an American sample. Several researchers have investigated the use of MAP with students from other countries. Those researchers focused on determining if MAP is a valid test for students from other countries and if the published norms of MAP are appropriate for these students.

Schoenoff (1972) tested 2,021 German students in grades four through twelve from three different sections of Germany using MAP. The results indicated that 1) MAP is a valid test with a German population, 2) German students scored a bit higher than but statistically comparable to the American students, and 3) published norms are appropriate for use with native German students in grades four through ten and for musically select German students in grades four through twelve.

Sell (1976) investigated the use of the MAP in Finland. The Finnish 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 differences in the reliability of the Finnish version and the American version of MAP. A significant difference between the standard and raw scores among two populations showed that the published American norms were not adequate for use with the Finnish population. Finnish students scored higher than American students. Girls scored higher than boys in Finland, especially in eighth and ninth grades.

Jung (1990) investigated the music aptitude and intelligence of 94 Korean students in grade 10. Her study showed that MAP is a valid measure of music aptitude among Korean students to the extent that it does not measure IQ. The similarity between Korean and American students regarding the IQ/MAP relationship and the knowledge that Western music dominates the Korean musical culture, led Jung to believe that MAP is a valid measure of music aptitude for Korean students.

Later, using the same sample, Jung (1992) compared MAP scores to a) the scores of the *Aural Dictation Music Achievement Test* (ADMAT), which was constructed by Jung as a measure of Western music achievement, and b) Korean traditional music achievement scores on instrumental performance as measured by the students' teachers. The predictive validity for using MAP with Korean students, found using the MAP scores and ADMAT scores, ranged from .33 to .66. The predictive validity correlations found between the MAP and Korean traditional music performance scores ranged from -.01 to .28. These results

indicated that MAP measures music aptitude among Korean students for Western music but not for Korean traditional music.

The above researchers concluded the following: 1) MAP is a valid music aptitude test for the students from other countries except for predicting their performance on Korean traditional music, and 2) national normative data for MAP should be generated for countries in which that students performed significantly different from American students. There are few music aptitude measurement tools available to music educators for use in other countries. Both Sell (1972) and Schoenoff (1976) have claimed that music educators who use measuring tools that lack proper normative data for the specific countries are neglecting the impact on a child's development as conditioned by a given country. Therefore, they believed that national normative data should be generated before foreign tests are used. However, this advocacy and the research associated with it began 20 years ago when countries were very separate and different from each other. Unfortunately, little research has been done regarding the use of MAP with other cultures in the past 20 years.

Teacher Rating as a Means of Determining Validity of MAP

Establishing validity is essential in determining whether a music aptitude test is appropriate for use with a given population. Teacher rating as a measure of music achievement can be used in determining validity of a music aptitude test. In an attempt to identify the constructs of music aptitude and provide a basis for establishing construct validity for future music aptitude tests, Rainbow (1965) investigated the relationship of 14 predictive variables to teacher ratings of musical "talent" and "awareness." The predictor variables included a) pitch

discrimination, b) tonal memory, c) rhythm, d) musical memory, e) academic intelligence, f) school achievement, g) sex, h) age, i) music achievement, j) participation in musical activities, and m) socio-economic background. Subjects included 291 students in grades four through twelve.

Three aptitude groups (high, middle, low) were identified using teacher ratings of potential talent in music, and the mean scores of the groups were compared for each variable. Results indicated that in addition to pitch discrimination, tonal memory, rhythmic sensitivity and musical memory, the extra-musical variables of interest in music, home enrichment, and socio-economic background are significant predictors of music aptitude as measured by teacher rating.

Researchers (Bailey, 1975; Gordon, 1967a, 1968; Young, 1976) have used teacher ratings as a criterion variable. In all cases, rating scales were used either to evaluate specific aspects of performance or to make a global assessment of students' progress. Two of the studies (Gordon, 1967a, 1968) used rating scales to make both types of assessments.

Gordon (1967a, 1968) and Young (1971) used teacher ratings to evaluate the music achievement of beginning instrumental music students. Three 5 -point rating scales were used by Gordon to assess the melodic accuracy, rhythmic accuracy, and musical expression of tape recorded students performance. In a similar manner, Young used three judges to evaluate the performance of 91 fifth grade instrumentalists. All teacher ratings were found to be significantly related to students' scores on MAP. This information has been used to confirm the concurrent validity of MAP.

In examining the validity of MAP for use with different populations, a comparison of teachers' ratings of students' music achievement with students' scores on MAP is helpful. MAP has been recognized as a music aptitude test with high concurrent validity for an American population; there should be further research to identify the concurrent validity of MAP to use with people from other cultures.

Environmental Factors and Music Aptitude

Individuals differ in their music aptitude. For many years, music teachers have wondered and researchers have investigated what factors result in the variety of levels of music aptitude within a group. Researchers have considered the roles of heredity, personality traits, socio-economic levels, maturational levels, or other environmental influences on musical aptitude.

One of the earliest studies examining parental involvement in music was conducted by Vance and Grandprey (1938). Home environment was found to be related to musical responsiveness, although no significance levels were reported. Later, Shull (1953) examined musicality among kindergarten children. Her purpose was to determine the importance of the home environment as an element in determining a child's musicality and to validate the literature that considered preschool musical experience important. From the study, Shull supported a) parental encouragement and proper attitudes, b) singing in the home, c) imitating environmental sounds, and d) use of the record player as musical source at home. Recommendations called for more emphasis on music in the home, help for parents in guiding pre-school children musically, and more

encouragement of the child by the parent with less criticism and demands for skills.

Many believe that the quality of the music environment may determine who will be most successful in music. Even Suzuki (1983), on the basis of his experience, stated that "...the only superior quality a child can have at birth is the ability to adapt itself with more speed and sensitivity to its environment." (p. 24) Suzuki explained that neither a child's personality nor potential is at fault if he/she can not demonstrate the very best in music achievement. Rather, the child's musical environment is lacking in quality. Gordon (1971) indicated that the level of music aptitude a child has at birth will change according to the quality of the early informal and formal musical experiences she/he receives. Therefore, he believes that music aptitude is a product of innate potential and early environmental influences.

Socio-economic status has been considered as one of the possible environmental factors influencing students' music aptitudes. Gordon (1967a) analyzed MAP results of 658 seventh-grade students enrolled in two junior high schools in a large north central city. The two schools were selected for the study because they were comprised of students who are technically classified as "educationally deprived" under the provisions of the Elementary and Secondary School Act of 1965. The eleven MAP mean standard scores of these socio-economically disadvantaged students were compared with those of culturally heterogeneous students (participants in the MAP national standardization program). Gordon found that only two of the mean differences for the musically unselect groups favored the students with lower socio-economic status: "Meter" in Rhythm Imagery, and "Balance" in Musical Sensitivity. For the musically

select groups, only the mean differences for "Harmony" and "Tonal" favored the group of the students with lower socioeconomic status. The largest standard score difference found was "Style" in the Musical Sensitivity division which favored the culturally heterogeneous group in the musically select group. Gordon concluded that differences indicated by the MAP composite mean standard scores between two groups were negligible and had no practical significance. Although students with lower socioeconomic status can be objectively identified as musical according to their similar performances to those of the music selected students in two groups, Gordon stated that it was possible that general environmental factors could preclude a student with lower socioeconomic status from achieving his/her music potential.

Gordon (1967b) found that several environmental factors have a low but positive association with music aptitudes. The environmental factors he found that related to aptitudes included whether the students a) "like" to practice, b) played an instrument in an extra school activity, c) took summer music lessons, d) played a second instrument, e) had a piano at home, and f) attended concerts. Occupational status of the head of the household was also significantly related. However, Gordon (1967b) also found that the lack of favorable musical background (being a member in a school music performance group, or having private or group lessons on a musical instrument) was not a factor in attaining higher scores on MAP. In fact, consistent and systematic extensive instrumental music training over a period of 3 years for children whose aptitudes had already stabilized did not significantly improve their performances on MAP.

More recently, several studies have been conducted by Brand (1982, 1985, 1986) examining parental involvement among elementary student populations in

music learning. Brand (1982) examined the relationship between music aptitude and music environment. He found that playing an instrument significantly correlated with the performance on the Rhythmic Imagery, subtest of MAP. He also found that most students with a high music aptitude on the overall test tended to have played a musical instrument. However, as a result of his research, Brand (1986) stated that beyond age 9, music environment may enhance music achievement and response, but not necessarily music aptitude. The results of his studies also reinforced the importance of music in the child's early life. From birth to age 9, parents and educators can expect to influence music aptitude through providing a rich musical environment. These statements are closely related to Gordon's belief that music aptitude stabilizes at approximately age nine.

First grade subjects (N=30) were examined by Shelton (1965) in a study of musical home environment and musical responses. He identified that some home environments were influential in developing musical abilities in first grade children. The "musical" children were provided with more records and other types of music listening and had access to a piano. Also, the parents of those children had previous music study and had attended concerts frequently. In addition, Moore (1982) examined 100 children entering kindergarten. Correlations between home environment and pitch response were higher than for home environment and rhythm responses.

Mitchell (1985) examined relationships between tonal music aptitude and aspects of home musical environment among third graders (N=121). Tonal music aptitude was found to be significantly related to the presence of musical siblings. However, no significant relationships were found between students' tonal music

aptitudes and having musical parents, informal musical education in the home, or musical instruments in the home.

Rainbow (1963) also included home music enrichment as a factor when examining the constructs of music aptitude. Significant differences in music home enrichment were found among students with high, average and low aptitude ratings. Higher amounts of enrichment were found for higher degrees of music aptitude. He also revealed differences in the strength of relationship according to age.

Age differences were also reflected in the relationships obtained between interest in music and music home enrichment. Wermuth (1972) examined associations between parental involvement and music aptitude and investigated relationships with family activities in music, student activities in music, and student interest in music. Parental involvement was found to be significantly related to music aptitude, as were student activity in music and student interest in music.

Kehrberg (1984) examined relationships of home environment, music aptitude, music achievement, attitude toward music, and degree of musical participation among students in grades four through twelve (N=169) in a small Kansas farming community. Home music activities, which were measured in grades nine through twelve only, were significantly related to student music aptitude, music participation, music achievement, choir rating, band rating, and attitudes towards music. In addition, music aptitude and music attitude were both found to be related to music achievement.

Lenz (1978) investigated the extent to which children who come from a rich musical background perform differently from those with less musical

background. She reported that children with a rich musical background performed better on musical discrimination tasks, which is indicative of aptitude, than those with less musical background.

Research findings generally indicate that early musical experiences in the home and in the environment as a whole, are valuable for children in developing their music aptitudes. However, research has been done with American populations only, and cultural factors have not been discussed in relation to music aptitude. The cultural factors, such as music education systems, parental involvement in the child's music learning, and home environment in other countries should be further investigated and compared with students' performance music aptitude tests. It is possible that the differences between Western and Oriental cultures might affect the development of children's music aptitude in those cultures.

Gender Differences

"Many behavioral differences between men and women are based on differences in brain functioning" (Restak, 1979, p. 75). Restak consistently states that girls speak earlier, have larger vocabularies, and sing in tune earlier; boys however, demonstrate earlier visual superiority and excel at total body coordination. In fact, some researchers have wondered if there is difference in music aptitude between genders.

In the process of establishing the norms of MAP, Gordon (1965) found that female students perform slightly better than males, but the difference is too small to be of any practical significance. (p. 91) However, in Finland, Sell (1976) found that girls scored higher than boys in the eighth and ninth grade. Therefore, along

with the cultural differences research on MAP, there is a need to investigate gender differences.

Need for the Study

Music aptitude scores are valuable as a tool in adapting instruction to meet the needs of individual students, to provide parents another objective information about their children's music aptitude, and to help students to formulate their educational plans in music. However, no research exists concerning the use of MAP, which is widely accepted as the best test of music aptitude for students from ages 9 to 18, with a Taiwanese population. Information generated by such a study could be used to promote a more positive musical environment for Taiwanese students and to provide a more objective evaluation of Taiwanese students' musical potential.

Purpose

The purpose of this research is to gather more information about the use of the "Music Aptitude Profile" with Taiwanese students and about the relationship of Taiwanese students' music aptitudes, musical environments, and levels of musical performance.

Problems

The problems of this study are as follows:

- 1) To determine whether Taiwanese students' performance is significantly different from that of American students on MAP according to genders and grade levels.

- 2) To investigate whether Taiwanese students' musical environments and backgrounds are related to their performances on MAP.
- 3) To compare music teachers' evaluations of individual student's musical abilities with each student's performance on MAP.
- 4) To compare Taiwanese students' self-concepts of their own musical abilities with their scores on MAP.
- 5) To investigate relationships between Taiwanese parents' awareness of and attitudes toward their child's musical potential and their child's scores on MAP.

If Taiwanese students' performance is significantly different from that of American students on MAP, then cultural differences could be considered as a factor that relates to the development of students' music aptitude. If there is no significant difference between these two groups, then the norms in the MAP manual can be used with the Taiwanese population.

If there is a significant difference on the results of MAP according to genders, then gender differences should be studied more in the future. If there is no significant difference between genders, then the development of children's music aptitude should be considered equal between girls and boys in Taiwan and separate norms do not need to be developed for Taiwanese males and Taiwanese females.

If there is significant difference between Taiwanese students' self-concepts of their own musical abilities and their scores on MAP, then using MAP becomes even more important with a Taiwanese population, assuming that other measures point to MAP being a valid music aptitude test for the Taiwanese population. It may also point to the need for providing more effective music instruction in the schools, which allows and encourages students to achieve to

their full musical potential. If there are no significant differences between students' self-concepts and their scores on MAP, then Taiwanese students have an accurate self-concept of their musical abilities.

Similarly, if Taiwanese parents' assessment of their children's music aptitude is not correlated with their children's performance on MAP, then it may be concluded that music aptitude tests may be an appropriate tool for parents in determining how to guide their child's education. If there is no significant difference between parents' awareness and their children's results on MAP, then Taiwanese parents are aware of their child's music aptitudes.

If music teachers' evaluation of individual student's musical abilities is valid and is found to be highly correlated with students' performances on MAP, then MAP is a music aptitude test with a concurrent validity for Taiwanese students. If teachers' rating are found not correlated with students' performance on MAP, then either the concurrent validity of MAP for Taiwanese students is still in question or teachers in Taiwan may be unable to diagnose their students' musical strengths and weaknesses.

CHAPTER TWO

REVIEW OF LITERATURE

Since 1919, when Carl Seashore published his *Measures of Musical Talents*, comparative studies of the music aptitudes of different ethnic groups, races, or countries has become a research focus. However few researchers have investigated the use of MAP in different countries, and no one has studied the use of MAP with a Taiwanese population.

This chapter will review literature and research related to the use of *Musical Aptitude Profile* (MAP) in Germany, which was one of the earliest studies on the use of MAP in a different country; Finland, in which the researcher investigated some environmental factors that might relate to students' performance on MAP in addition to the use of MAP in Finland; and Korea, which was the most recent study on the use of MAP and the only one in an Asian country.

MAP in Germany

Schoenoff (1972) administered MAP to 2,021 German students in grades four through twelve from three different sections of the Federal Republic of Germany. The number of students in each grade ranged from 77 to 312, with an average of 225. The majority of the sample was considered representative of the population of each grade in a given school, except for the eleventh and twelfth grade students who were all currently enrolled in music.

Schoenoff was interested in testing the use of MAP with a musically select as well as with a general German population. The schools or the classes were not selected on the basis of the proportion of musically select students. For this study, the musically select students were members of performing music groups or students who had received private music instruction for at least one year. In the German public schools, only the Gymnasium included classes beyond the tenth grade. Gymnasium students were academically select. Therefore, the eleventh and twelfth-grade sample in this study were not a representation of the whole population; they were both musically and academically select.

MAP was administered during regular class periods. Before the study began, the testing program, the purpose of the study, and the procedure for administering MAP were explained to each school administrator and teacher who would assist in the testing program. The researcher observed and assisted in the initial administration of the test battery in most classes.

MAP directions were translated into German and recorded on the test tape, but the English numbers on the answer sheet were not translated. The answer sheets were the un-translated American edition supplied by the publisher. The English numerals and the meaning of the answer sheet designations of "L," "S," and "D" for "like," "same," and "different" were explained in German to insure that they were understood by all subjects before the test began.

All answer sheets were scored manually using the MAP scoring masks supplied by the publisher. The split-halves reliability coefficients were determined and corrected through the use of the Spearman-Brown Prophecy Formula, and the raw scores were converted to standard score equivalents

through the use of the table provided in the MAP manual. Means, standard deviations, standard errors of measurement, and intercorrelations were computed based on the standard score equivalents using all subtests scores of MAP in the total sample. The percentile ranks were calculated for both the total sample and the musically select sample for all eleven subtests. The standard score-percentile rank equivalents were compared with those of the published norms of MAP.

Shoenoff found that two-thirds of the reliability coefficients for German students were equal to or higher than those of the American students. The three lowest coefficients were for sixth and tenth graders on the Phrasing (.58; .53) and Balance (.59) subtests of Musical Sensitivity division. The means for German students were all higher than those of the American students. Intercorrelation coefficients among the subtest scores of the German students were similar to those of the scores of the American students.

The standard score point differences of the standard score-percentile ranks between German students and American students were small. More than eighty percent of the total comparisons reflected either no difference, or only 1.0 to 2.0 points, except for the twelfth grade. All differences between the standard score-percentile ranks favored German students except the Balance subtest in the fourth grade, and the Balance and Phrasing subtests in the eleventh grade.

Differences of at least 3.0 points were found in the percentile ranks with the subtests or division in the following grades: a) Grade 4: Tempo, Rhythm, Balance, Style, and Musical Sensitivity, b) Grade 5: Tempo, and Rhythm, c) Grade 6: Harmony, Tonal, Tempo, Meter, Rhythm, Phrasing, Style, and Musical Sensitivity, d) Grade 7: Melody, and Tonal, f) Grade 9: Tonal, g) Grade 10:

Melody, Harmony, Tonal, and Musical Sensitivity, h) Grade 11: Melody, Harmony, Tonal, Tempo, Meter, Rhythm, Balance, Style and Musical Sensitivity, and i) Grade 12: Melody, Harmony, Tonal, Tempo, Meter, Rhythm, Balance, and Musical Sensitivity.

Schoenoff concluded 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 believed that the American MAP norms were appropriate for native German students with the exception of students in the eleventh and twelfth grades who should use the musically select norms since the students were more select in nature.

The testing procedures and the preparation of the materials in Schoenoff's study generally were well-designed and applied. However, the reasons for not translating the answer sheet into German were not clearly explained, leading to concerns about the process validity of MAP in this study, especially at the lower grade levels.

Moreover, there was no statistical test used to determine whether the differences between German and American students were significant, so the reader was forced to make judgments based on mean trends. The lower reliability coefficients found with the Music Sensitivity subtests were not explained either according to the grade-levels or the nature of the subtests.

Also, the research would have been more meaningful if the researcher had identified possible factors causing the differences and had addressed the implication of the study for music education in either the United States or Germany. A discussion of the music instruction or education system in Germany would have been helpful in interpreting the results of the study.

Although norms developed using an American population may be appropriate for use with German students according to this research, other studies investigating different types of validity (i.e., predictive, diagnostic, concurrent, concurrent validities) of MAP with German students would be necessary before using MAP with the German population with confidence. Last, this research was conducted more than twenty years ago, and some school systems in Germany may have been changed since then, especially considering the reunification of Germany since that time. Therefore, there remains a need to investigate further the use of MAP with German students.

MAP in Finland

Sell (1976) administered MAP to 5,083 Finnish students, ages 9 through 18, from 252 classes in 57 schools. The subjects were from ten of Finland's twelve provinces and from twenty-one different villages, towns, or cities. This study was similar to Schoenoff's study in 1972. In addition to the use of MAP in Finland, this study investigated the results of questionnaires regarding student's gender, personal information, participation in music, private music lessons, music grades, parents' occupation, and parental participation in music. It should be noticed that the children in Finland begin school at the age of seven. Therefore, the Finnish students are one grade number behind the equivalent American students of the same age. (i.e., students in the third grade in Finland would be in the fourth grade in America).

MAP and the questionnaire were translated into Finnish. Then, the materials were delivered to the Finnish national test coordinator. The coordinator and the provincial music supervisors generated a sampling that was

believed to be representative of the Finnish population. To yield a valid representation of the ratio of urban to rural students and boys to girls, specific schools and classes were selected as clusters.

The provincial supervisor of music supervised the testing process, which was conducted by the classroom teacher or music teacher. The completed test materials were sent back to the researcher for the correcting of all tests and coding of information manually.

The answer sheets were corrected twice by hand. Raw scores were converted to the standard scores using the tables in the MAP Manual. Split-halves reliabilities, and the standard error of measurement for all subtests in each grade were calculated using the raw data. The raw scores were compared with the norms of the United States and were used to generate graphs and percentile ranks.

Percentile rank comparisons of Finnish students and American students were made for each subtest at each grade level. T-tests were used to compare and investigate the differences between means.

The norms for the Finnish students were developed for each grade from three through eleven and for the musically select students in three grade ranges, grade three through five, six to eight, and nine to eleven. Using information from the questionnaire, the researcher investigated factors that may be related to the performance of MAP.

The Finnish Split-halves reliabilities, corrected using the Spearman-Brown Prophecy Formula, compared favorably with those reported in the MAP Manual. Fifty-one of the 99 favored the Finnish, 37 favored the American, and eleven reliabilities were identical. Most reliabilities ranged from .80 to .99. The lower

reliabilities, .70 to .79 and .50 to .69 were mainly in the subtests of the Musical Sensitivity division. The overall high reliability coefficients in this study supported that MAP can be used with confidence with Finnish students.

The majority of the differences found between the standard percentile ranks favored the Finnish students with the range of difference from zero to nine percentage points. The greatest number of score differences in favor of the American students were found with students in the Finnish grade eight and nine. These results suggest a strong interaction according to grade-level. The Finnish students' scores on Rhythm Imagery were consistently higher than the American students with the difference ranging from four to five points.

Finnish students scored higher than the American standardization sample on MAP. The majority of the comparisons of the standard scores favored the Finnish students. In 99 comparisons of standard scores means, only eight favored American students, 90 favored Finnish students, and one showed no difference. Again, at each grade level, the Finnish scores for the Rhythm division were consistently higher than those of the American students.

T-tests were used with the raw scores to assess the significance of the differences between means. There were 73 significant differences ($p \leq .05$), and 26 differences were not significant. All the significant differences favored Finnish students except the Melody and the Tonal in the grade nine. Therefore, there was a significant difference between the two populations, and norms developed with Finnish students would be more appropriate for use with Finnish students than the norms published in the MAP Manual.

A 2x2 comparison of composite MAP means for Finnish urban female, rural female, urban male, and rural male students indicated that male students

scored lower than the girls in all of the composite scores. The rank order of the means for the whole sample was urban female, rural female, urban male, and rural male. In the eighth and ninth grades, the males scored lower than the females in all of the composite scores. The researcher speculated that the factor causing this difference was that the male students of this age lacked interest in certain school subjects, such as music. Thus they placed less importance on their test results and scored commensurately lower.

The results of the questionnaires completed by the Finnish students indicated that the environmental factors that correlated most highly with MAP for each group were choir/band participation, private lesson participation, and music grades. The lowest correlations included socio-economic conditions and parents' participation in music. Students who participated in school music performance groups scored consistently higher than those who did not. The students taking lessons scored consistently higher than those who did not take lessons. The student who did not participate in musical groups scored lower than the students who participated but did not take lessons. This information indicated the need to develop norms for use with musically select Finnish students and the importance of students' participation in music groups in the schools.

The sampling procedures used in this study were achieved effectively through the national test coordinator and the provincial music supervisors. The score calculations insured the accuracy of the results. Also, the information describing the education system and the history of Finland in this study was helpful in interpreting the results of this study.

The reliabilities for the subtests of the Musical Sensitivity division were lower than the other subtests of the other division of MAP; this also happened in Schoenoff's study. However, again, the researcher failed to provide an interpretation of these unexpected results.

The possible factors that caused Finnish students to score consistently higher than American students on Rhythm division should be discussed further in relation to the music instruction in Finland. Moreover, the investigation of gender differences in this study was combined with the variable of urban versus rural. These differences were based on the visual comparison of means rather through the use of tests to determine statistically significant differences. Also, for a more complete investigation on genders, the interaction of other factors with genders should be considered.

The results of correlation of the responses to the questionnaire and MAP scores identified several environmental factors that may relate to the Finnish students' performances on MAP. However, more questions related to each category (i.e., students' participation in music groups, private lessons...) should be added to the questionnaire in order to gain more complete and accurate information regarding the relationships between music aptitudes as measured by MAP and home environments.

MAP in Korea

Jung's Study in 1990

Jung (1990) investigated the relationship between MAP scores and the scores of general intelligence (IQ) with Korean students. Ninety-four tenth grade students from a music high school in Seoul, Korea participated in this study.

Subjects had not received any formal music training other than in a general music class before being admitted to the school in 1990. After entering school, the students received instruction both in Western and Korean music. A weekly one-hour individual lesson on either a Korean instrument or voice was required for every student. Students were required to practice their performance medium at least two hours a day. Aural theory and general theory classes in Western and Korean music and participating in the orchestra and Korean traditional music ensemble performances were required as parts of the curriculum.

All MAP subtests were translated into Korean before the study began. At the beginning of the school year, students were administered an IQ test, and during the eighth month of the school year, the researcher's assistant administered MAP to those same students. The reliabilities of MAP with American students were slightly higher than those with Korean students except for the Tempo subtest. The means and standard deviations of the scores of Korean students were found to be comparable to those of the American students as reported in the MAP manual.

Means and standard deviations for MAP for the musically select Korean students in the sample were compared with the norms for the musically select American students as measured by Gordon in 1965 as part of the MAP standardization process. The means of the Rhythm and Musical Sensitivity tests for Korean students were similar to the results of American students. The means of the Tonal test for Korean students were higher than the means of the Tonal test for American students.

The relationship between scores on each subtest of MAP and the scores on the IQ test were computed. The correlations between IQ scores and MAP scores

on the Tonal and Rhythm for Korean students were slightly higher than those for American students. However, the Musical Sensitivity scores of the Korean students were less related to IQ scores than those of American students. The correlations of the composite scores of MAP and IQ were comparable for Korean and American students. Similar to those found in Gordon's study, the correlations between Rhythm scores and IQ scores of the Korean students were the highest, and the correlations between Musical Sensitivity and IQ scores were the lowest.

The researcher concluded that the positive but low or moderately low correlations between IQ scores and MAP scores were similar to the correlations found in using MAP with American students. This information supported that MAP is a valid measurement of music aptitude for Korean students.

However, one may question Jung's conclusions for several reasons. Her sampling procedure was flawed in that she only included musically select tenth grade students from one school in this study. This leads readers to doubt whether the sample was representative of the whole Korean population. Also, the sample size was small for this type of study. Moreover, the low correlations of IQ scores and MAP scores can only indicate that MAP does not measure students' IQ. This inverse validity information for musical selected 10th graders in Korea does not provide strong enough support that MAP is a valid measurement of "music aptitude" for the students in Korea.

Jung's Study in 1992

Jung (1992) investigated the predictive validity of MAP for Korean students in a follow-up study. For this study, she used the same students as she

used in 1990. Jung investigated the longitudinal predictive validity of MAP for Western musical achievement and for achievement on traditional Korean instruments.

As part of her first study, she administered MAP to all 94 students. Then, after two years of music training, the subjects were tested using the "Aural Dictation Music Achievement" (ADMAT), a music achievement test constructed by the researcher. ADMAT was used to measure Western music achievement. Before this study began, Jung conducted a pilot study to establish reliability for ADMAT. As a result of the pilot study, Jung made several changes to ADMAT. Students' performances on traditional Korean instruments were rated by teachers, and the resulting scores were used to represent music achievement in traditional Korean music.

All the predictive validity correlations using scores from MAP and from ADMAT ranged from .33 to .66 and were statistically significant ($p \leq .01$). The Tonal scores were more highly related than the Rhythm scores. The correlations between the MAP scores and Korean traditional music performance scores ranged from -.01 to .28. Most of these validity correlations were not statistically significant.

Jung concluded that MAP measured music aptitude for Western music among Korean students but not for Korean traditional music. However, again, in Jung's study, MAP was only administered to music select students in grade 10 from a particular school. Generalizing the results of this study to other grades levels or other schools in Korea is problematic without further research.

Also, the size of Jung's sample should have been larger in order to generalize her results to the whole population of Korea. Further sampling

procedures needed to be described in greater detail in order to allow for interpretation of Jung's research results.

Finally, the factors that may have caused the tonal scores of MAP to be correlated more highly with the ADMAT Rhythm subtest scores than the ADMAT tonal subtest scores should have been discussed and interpreted. For further evaluation of the content validity of ADMAT, the contents of theory classes that the subjects attended need to be specifically described and the choice of the tonal and rhythmic patterns in ADMAT should have been explained. A more detailed description ADMAT and more information regarding the education system and music instruction in Korea would also have been helpful in interpreting Jung's study.

Summary

The research reviewed above is focused on the standardization of MAP for use in countries other than the United States of America, the comparison of the results of MAP for different populations, the investigation of the validity of MAP in different countries, and the investigation of the factors related to different performances on MAP in different countries. These foci form the foundation of research and the primary impetus for investigating the use of MAP in Taiwan.

The above researchers concluded that MAP is a valid music aptitude test for students from other countries and suggested that national normative data for MAP should be generated for countries in which students performed significantly different from American students. According to the above research, the comparison of students' performances on MAP in different countries has shown that the scores of MAP in most of the subtests tended to

favor the students outside of the United States. Because of these differences, there is a need to compare MAP scores of Taiwanese students with those of the American students used in the standardization sample before the published MAP norms can be used with confidence in Taiwan.

Unfortunately, little research has been done regarding the use of MAP with other cultures in the past twenty years. More studies should be conducted to investigate the different types of validity for the use of MAP in other countries. Therefore, as a part of the current study, the concurrent validity of MAP as established through teacher ratings, parents' concepts of their children's music aptitudes, and student's self-concept of their music aptitudes will be investigated. Also, the home environment of Taiwanese students will be investigated to allow for meaningful interpretations of the results of MAP.

CHAPTER THREE

DESIGN AND ANALYSIS

Sample

The subjects (N=1723) of this study were selected from grades four through twelve in nine schools in Central Taiwan. There were one Elementary School (grades four through six), three Junior High Schools (grades seven through nine), and five Senior High Schools (grades ten through twelve) involved in this study. First, the researcher asked the administrator of each school about his or her willingness to allow students to participate in the study. Then, after the administrator agreed, the classroom music teachers from that school selected students enrolled in each grade level to participate in the study. The students were chosen by the teachers according to class availability, rather than their musical or academic performance. The class availability depended primarily on class. The result approximated a random sampling of each classroom.

In Taiwan, there is a national standard music curriculum for all schools. In every elementary school, each student in grades four to six receives two 40-minute periods of music instruction per week. In the junior high schools, each students receives one fifty-minute period of music instruction per week. Students in grades ten and eleven in all senior high schools receive one 50-minute period of music instruction per week. However, students in grade twelve do not have any music instruction.

The music instruction in the schools involved in this study was taught by music specialists. Although none of the musically selected classes (classes mainly involved in musical activities, such as choir or band) or special education classes participated in this study, some subjects might have had some experiences in choral or instrumental groups, in addition to the required music classes.

Procedures

Before conducting this study, it was approved by the University Committee on Research Involving Human Subjects (UCRIHS). As required, all subjects consented to participate before any portion of the study was administered (see Appendix A). The subjects who chose to participate were told that they could refuse to answer any question or refuse to return the questionnaires.

Two of the three divisions of *Musical Aptitude Profile* (MAP), Tonal Imagery and Rhythm Imagery, were used in this study to measure students' tonal and rhythmic aptitudes. To limit the amount of time that each student served as a participant in the study, most of the students took only one division of MAP, Tonal Imagery or Rhythm Imagery. Only two classes of seventh and eighth grade students took both Tonal and Rhythm divisions. Students were randomly assigned to the "Tonal" or "Rhythm" group by the researcher. The total numbers of subjects in each group were similar.

Before the study began, the answer sheets and directions of the tape for Tonal Imagery and Rhythm Imagery were translated into Chinese by the researcher and two other Taiwanese graduate students at the Michigan State

University School of Music (see Appendix B). All three translators agreed on the translation. The test was administered to all subjects by the researcher and classroom music teachers within one of each class's scheduled music class periods.

Before the tape of MAP was played, students provided personal data including name, school, and grade, on the answer sheet, and the researcher briefly answered students' questions regarding the purpose of the testing. The students, then, listened to the recorded directions and practice examples of MAP. Next, the appropriate division of MAP, both of which include two separate subtests (Melody and Harmony, or Tempo and Meter), was administered. Students who took both divisions of MAP took the second portion of the test during another class period within one week of the administration of the first division.

After returning their MAP answer sheets, students in some classes were asked to complete a questionnaire (see Appendix C). Due to the limited research time and large sample size, only some students (N=1066) were selected to answer the questionnaires. These students were representative of the whole group of subjects. The researcher answered students' questions to make sure that all questions were clear to every student. The students took approximately 15 to 20 minutes to complete the questionnaire. Finally, the students who returned their questionnaires to the researcher were asked to take another questionnaire to their parents when they returned home (see Appendix D). Parents were asked to complete and return their questionnaires to the classroom teachers within two weeks.

The teachers of classes that participated in the questionnaire (see Appendix E) were asked to complete a questionnaire to evaluate each student's musical performance in their classes that participated in the study. Teachers were asked to complete their questionnaires and return them along with the collected parents' questionnaires to the researcher within two weeks.

Design

Musical Aptitude Profile (MAP) (Gordon, 1965) is an American nationally standardized musical aptitude test designed for students in fourth through twelfth grades. MAP has three divisions: Tonal Imagery, Rhythm Imagery, and Musical Sensitivity. These divisions include a total of seven separate subtests: a) Melody and Harmony for Tonal Imagery, b) Tempo and Meter for Rhythm Imagery, and c) Phrasing, Balance and Style for Musical Sensitivity. The administration time required for MAP is 50 minutes for each of the three divisions of the test.

Each subtest of MAP includes practice songs and directions that are recorded on tape. The tests consist of original short selections composed for violin and cello by Gordon.

The Melody and Harmony tests involved determining whether the second musical phrase (musical answer) of each of 40 pairs was an embellishment of the first (musical statement) or was fundamentally a different phrase. Students had to decide whether the musical answer was "like or different" from the musical statement. The phrases included major and minor keys, mixed meter, various tempi, and syncopation. Gordon stressed that the meter remained unchanged

within each pair and that any rhythmic alterations were in melodic rhythm. The violin was the stimulus for Melody subtest.

In the Harmony subtest, the upper part was performed on the violin and the lower part was performed on the cello. The upper part of the musical statement and of the musical answer were always exactly the same in every test item. Extra notes or different phrases were added only to the lower parts. Again, the students were asked to determine if the musical answer was "like or different" from the musical statement.

There are 40 items in the Tempo subtest. The musical phrases were played on violin. Students were asked to determine whether two musical phrases were the same or different. One was supposed to respond "different" if the musical answer had an ending in which the tempo increased or decreased. If the tempo did not change, one should respond "same." When the musical answer was the same as the musical statement, the music answer was a re-recording of the musical statement. In this way, it insured that the two musical phrases were the same.

In the 40 item Meter subtest, students were required to determine whether the musical answer sounded the same or different from the musical statement. Differences were a result of different "accents," which created meter changes. Changes in melodic rhythm occurred only as necessitated by meter changes. Violin, again, was the performance medium.

In designing the test, Gordon discovered that to listen to and respond to 40 different musical statements, each followed by a musical answer, was too demanding. Therefore, in the Tonal and Rhythm Imagery, the test items were in pairs, and they were numbered 1A and 1B, 2A and 2B, and so on. The musical

statement was the same for 1A and 1B. This design prevented students from experiencing too many different musical phrases in rapid succession, resulting in an emphasis on the memory and not audiation. Gordon considered audiation as the basis of music aptitude and he defined audition is "to hear and comprehend the music that is not physically appear" (Gordon, 1990, p. 18)

The difficulty of the test items was distributed randomly within each of the subtests. If students were uncertain about their answers, they were asked not to guess. Rather, they were asked to mark the question-mark (?) column, which indicated that they were "in doubt."

Several questionnaires were used in this study to gather information about students' musical environments, students' attitude and self-concepts toward music, parents' concepts of their children's music aptitudes, and teachers' estimations of their students' music abilities. The questionnaires were initially designed by the researcher in English and translated into Chinese for the purpose of this study. Most of the items in the questionnaire were designed as a Likert scale, while others were yes-or-no questions or short answers.

The students' and parents' questionnaires both contained items designed to gather information about each student's family members' musical background/experiences, parents' support and attitudes toward their children's music learning, and students' musical background and experiences.

The questions concerning students' family member's musical background/experiences contained the following items that focused on whether and how much students' parents and siblings : a) listen to music, b) play a musical instrument, c) sing or whistle, d) participate in musical activities, f) sing

with the student, g) sing with Karaoke, h) own records/tapes/CD, and i) practice a musical instrument.

Parents' support and attitudes toward children's music learning were investigated using questions on the parent survey regarding whether or not parents : a) talk with their children about music , b) ask about their children's progress in music learning, c) listen to their children's music practice, d) encourage their children to learn or practice music, e) take children to concerts or other musical activities, f) provide records/tapes/CD, g) provide musical instruments or toys, h) purchase music books/scores, and i) encourage their children to learn music.

The questions concerning the students' musical background and experiences were included on both the student and the parent questionnaires. These focused on whether the student: a) sings at home, b) watches music programs on TV, c) listens to music programs on radio, d) has music records/tapes/CD, e) has private music lessons, f) plays or practices a musical instrument, g) attends music activities, and h) spends time singing with Karaoke.

The students' questionnaire also included questions about students' self-concept of their musical abilities and students' attitudes about and willingness for musical involvement. The questions concerning the students' self-concept of their musical abilities focused on how the students: a) rated their overall music abilities, b) rated their singing abilities, c) distinguished slow-fast, and followed the tempo of the music, d) compared their music abilities with the classmates, e) rated the possibility of his or her pursuing music as a future career, and f) identified the contours of the music.

Students' attitudes about and willingness for musical involvement were investigated through the questions about how much students : a) liked the present music class, b) liked to create/compose music, c) would liked to learn music after graduation, d) liked to attend concerts, e) would like to learn to play a musical instrument, f) like music, g) like to listen to music, and h) would like to have more music classes in school.

Most of the questions in the questionnaire for the parents were similar to those included on the student questionnaire. Some questions were used to compare parents' responses to their child's responses. The remaining questions were designed to investigate parents' attitudes toward their children's musical potential and learning.

Therefore, in addition to the information included on the students' questionnaire, parents' questionnaires had the additional sections of parents' attitudes toward music and parents' concepts of their children's music aptitudes. Parents' attitudes toward music included the questions concerning how much parents: a) liked to listen to music, b) would like to learn music some day, c) liked to attend a concerts, d) would like to learn to play a music instrument, and e) liked music .

The questions concerning parents' concepts of their children's music aptitude focused on: a) how parents rated their child's overall music ability, b) how parents rated their child's singing ability, c) whether parents believed that it is possible for their children to pursue music as his/her future career, and d) whether parents believed that the school should have more music classes.

The teachers' questionnaire, which included five items for each student, was used to gather information about each teacher's evaluation of their students'

musical performance and potential. These questions focused on: a) how teachers rated their students' overall music abilities, b) how teachers rated their students' abilities on pitch perception, c) how teachers rated their students' rhythm abilities, d) whether teachers believed that it was possible for each student to pursue music as a future career, and e) what the teacher would award each student as his or her final music grade for the semester.

Data Analysis

Means, standard deviations, and standard errors of measurement were calculated for the raw scores on MAP. In addition, the reliabilities of MAP (Cronbach's alpha) subtests were computed for each grade level. All results were compared to those reported in the MAP Manual. T-tests were used to investigate differences between Taiwanese and American students.

To obtain the reliability of each family's information, parents' responses to the questionnaire were compared with their child's questionnaire responses to the same questions using Spearman correlation. Then, raw scores on MAP and teacher's ratings of students were compared to investigate the concurrent validity of MAP using Pearson Product-moment correlation. Students' performance on MAP and their responses to the questionnaires were calculated using Spearman correlation to gather information about the relationship between students' music aptitudes and their family members' musical backgrounds/experiences, their musical backgrounds, parents' support and attitudes toward their children's music learning, the children's self-concepts and attitudes toward music, and parents' attitudes toward music.

The questions in the students' and parents' questionnaires were classified into seven categories: a) Families Members' Musical Background/Experiences, b) Parents' Support of and Attitudes toward Their Children's Music Learning, c) Students' Musical Backgrounds and Experiences, d) Students' Self-concepts of Their Musical Abilities, e) Students' Attitudes about and Willingness for Musical Involvement, f) Parents' Attitudes toward Music, and g) Parents' Concepts of their Children's Music Aptitudes. The sum of the responses for the individual questions within each category were considered as the total response for that category. Each student's category totals were correlated with their performance on MAP according to grade levels and for the total group (grade 4 to 12) using the Pearson Product-moment correlation.

Three questions in the parents' questionnaire related to the parents' concept of their children's musical abilities. Using Spearman correlation, the responses of the parents to these questions were correlated with their child's performance on MAP. This gave the information about whether parents have accurate concepts of their children's music aptitudes.

Mann-Whitney U tests, a non-parametric alternative to the t-test, were used to investigate whether responses differed according to gender on each question of the questionnaire. Also, the Mann-Whitney U test was used to investigate gender differences in the responses of each category of questions as previously defined.

CHAPTER FOUR

RESULTS AND INTERPRETATIONS

The Reliability of MAP Subtests for Different Grades in Taiwanese Population

Results

Some portion of MAP was administered to all students in the study. The reliability coefficients (the values of Cronbach's alpha) for the Taiwanese students in each grade who participated in each subtest are reported in Table 1. Also, reported in Table 1 are the split-halves reliability coefficients, corrected for length using the Spearman-Brown Prophecy Formula, that are reported in the MAP manual. Those were developed using a sample of American students who participated in the test standardization program. For Taiwanese students, the reliabilities of all tests in all grades ranged from .60 to .94; these are similar to the reliabilities established using American students, which range from .66 to .92. The biggest differences between the reliabilities of the Taiwanese students and those reported in the MAP Manual were found in the Tempo subtest with eighth grade students. Generally, the reliabilities of MAP with Taiwanese eighth grade students were lower than those of the other grade students.

Among reliabilities estimated for using MAP for Taiwanese students, the two lowest are the Harmony subtest (.60) when used with fourth grade students, and the Tempo subtest (.60) when used with eighth grade students. In this study, the reliabilities for the Tonal dimension range from .74 to .88 and the reliabilities for Rhythm range from .75 to .94, depending upon grade level.

Table 1 - Reliability of MAP Subtests for Different Grades

<u>Grade</u>	<u>(N=)</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>(N=)</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:								
<u>Taiwanese</u>	(41)	.73	.60	.75	(42)	.65	.71	.75
<u>American</u>	(1765)	.73	.66	.80	(1765)	.72	.66	.82
Gr. 5:								
<u>Taiwanese</u>	(43)	.65	.64	.78	(41)	.90	.86	.94
<u>American</u>	(1627)	.75	.68	.81	(1627)	.76	.70	.83
Gr. 6:								
<u>Taiwanese</u>	(44)	.81	.66	.83	(44)	.83	.84	.89
<u>American</u>	(1681)	.76	.70	.83	(1681)	.77	.75	.84
Gr. 7:								
<u>Taiwanese</u>	(206)	.77	.74	.84	(116)	.75	.72	.83
<u>American</u>	(1543)	.78	.74	.86	(1543)	.81	.77	.87
Gr. 8:								
<u>Taiwanese</u>	(139)	.63	.63	.74	(136)	.60	.67	.75
<u>American</u>	(1494)	.79	.75	.87	(1494)	.82	.79	.87
Gr. 9:								
<u>Taiwanese</u>	(91)	.82	.74	.86	(94)	.75	.74	.82
<u>American</u>	(1312)	.80	.79	.88	(1312)	.83	.82	.90
Gr. 10:								
<u>Taiwanese</u>	(240)	.74	.76	.84	(183)	.81	.81	.88
<u>American</u>	(1223)	.82	.82	.90	(1223)	.84	.83	.90
Gr. 11:								
<u>Taiwanese</u>	(153)	.74	.84	.88	(96)	.81	.88	.91
<u>American</u>	(1077)	.85	.85	.92	(1077)	.85	.85	.91
Gr. 12:								
<u>Taiwanese</u>	(52)	.78	.84	.88	(52)	.65	.68	.78
<u>American</u>	(1083)	.84	.84	.90	(1083)	.84	.84	.90

Interpretation

The reliabilities of MAP with Taiwanese students and the similarities between the reliabilities of MAP with the Taiwanese sample and those reported in the MAP manual support that MAP is a reliable measurement for Taiwanese population.

Means, Standard Deviations, Standard Errors of Measurement, and the
Comparison between Taiwanese Students and American Students

Results

The means, standard deviations, and standard errors of measurement are presented in Table 2. The values of the standard error of measurement in this study are similar to those presented in MAP manual. All the means were higher and most of the standard deviations were smaller in the Taiwanese sample's scores than in the American sample's scores as reported in the MAP manual.

Table 2 - Means, Standard Deviations, and Standard Errors of Measurement

Grade 4:

	Taiwanese (N=41)		American (N=1765)		Taiwanese	American
	Mean	SD	Mean	SD	S.E.M.	S.E.M.
<u>Melody</u>	25.54	5.55	23.3	5.51	2.90	2.9
<u>Harmony</u>	21.56	4.75	21.5	4.64	2.99	2.7
<u>Tonal</u>	47.10	8.35	44.8	8.74	4.20	3.9
	Taiwanese (N=42)		American (N=1765)		Taiwanese	American
	Mean	SD	Mean	SD	S.E.M.	S.E.M.
<u>Tempo</u>	30.12	4.29	26.4	6.17	2.53	3.3
<u>Meter</u>	26.55	5.24	23.1	5.65	2.81	3.3
<u>Rhythm</u>	56.67	7.58	49.5	10.73	3.81	4.5

Grade 5:

	Taiwanese (N=43)		American (N=1627)		Taiwanese	American
	Mean	SD	Mean	SD	S.E.M.	S.E.M.
<u>Melody</u>	29.07	4.51	25.0	5.67	2.67	2.8
<u>Harmony</u>	23.77	4.96	23.0	5.12	2.97	2.9
<u>Tonal</u>	52.84	8.45	48.0	9.56	4.00	4.2
	Taiwanese (N=41)		American (N=1627)		Taiwanese	American
	Mean	SD	Mean	SD	S.E.M.	S.E.M.
<u>Tempo</u>	31.24	7.27	28.5	6.01	2.29	2.9
<u>Meter</u>	29.00	6.60	24.8	5.85	2.49	3.2
<u>Rhythm</u>	60.24	13.46	53.3	10.80	3.39	4.4

Table 2 (cont'd).

Grade 6:

	Taiwanese (N=44)		American (N=1681)		Taiwanese	American
	Mean	SD	Mean	SD	S.E.M.	S.E.M.
<u>Melody</u>	29.36	5.87	25.7	5.69	2.59	2.8
<u>Harmony</u>	26.05	4.94	23.3	5.24	2.89	2.9
<u>Tonal</u>	55.41	9.53	49.1	9.81	3.90	4.0
	Taiwanese (N=44)		American (N=1681)		Taiwanese	American
<u>Tempo</u>	32.48	5.59	29.8	6.06	2.29	2.9
<u>Meter</u>	28.71	6.46	26.5	6.15	2.61	3.1
<u>Rhythm</u>	61.18	10.72	56.2	11.24	3.51	4.5

Grade 7:

	Taiwanese (N=206)		American (N=1543)		Taiwanese	American
	Mean	SD	Mean	SD	S.E.M.	S.E.M.
<u>Melody</u>	29.45	5.14	26.3	5.97	2.48	2.8
<u>Harmony</u>	26.47	5.57	23.8	5.97	2.83	3.0
<u>Tonal</u>	55.92	9.65	50.3	11.00	3.87	4.1
	Taiwanese (N=116)		American (N=1543)		Taiwanese	American
<u>Tempo</u>	33.63	4.35	30.7	6.07	2.17	2.6
<u>Meter</u>	30.22	4.89	26.9	6.25	2.61	3.0
<u>Rhythm</u>	63.85	8.06	57.6	11.42	3.34	4.1

Grade 8:

	Taiwanese (N=139)		American (N=1494)		Taiwanese	American
	Mean	SD	Mean	SD	S.E.M.	S.E.M.
<u>Melody</u>	32.34	3.88	26.8	5.50	2.36	2.5
<u>Harmony</u>	28.78	4.38	24.6	5.51	2.68	2.7
<u>Tonal</u>	61.12	6.95	51.8	9.89	3.57	3.6
	Taiwanese (N=136)		American (N=1494)		Taiwanese	American
<u>Tempo</u>	34.63	3.36	31.6	5.86	2.13	2.5
<u>Meter</u>	31.32	4.25	28.4	5.92	2.46	2.7
<u>Rhythm</u>	65.94	6.53	60.0	10.67	3.25	3.8

Grade 9:

	Taiwanese (N=91)		American (N=1312)		Taiwanese	American
	Mean	SD	Mean	SD	S.E.M.	S.E.M.
<u>Melody</u>	31.13	5.60	27.3	5.71	2.37	2.6
<u>Harmony</u>	28.22	5.26	25.1	6.04	2.69	2.8
<u>Tonal</u>	59.35	9.57	52.4	10.73	3.61	3.7
	Taiwanese (N=94)		American (N=1312)		Taiwanese	American
<u>Tempo</u>	35.26	3.70	32.2	6.12	1.86	2.5
<u>Meter</u>	32.44	4.43	29.2	6.57	2.26	2.8
<u>Rhythm</u>	67.69	7.06	61.4	11.77	2.97	3.7

Table 2 (cont'd).

Grade 10:

	Taiwanese (N=240)		American (N=1223)		Taiwanese	American
	Mean	SD	Mean	SD	S.E.M.	S.E.M.
<u>Melody</u>	32.92	4.50	27.8	5.56	2.31	2.4
<u>Harmony</u>	30.42	5.20	25.6	5.66	2.54	2.4
<u>Tonal</u>	63.35	8.56	53.4	10.18	3.42	3.2
	Taiwanese (N=183)		American (N=1223)		Taiwanese	American
<u>Tempo</u>	35.02	4.49	32.8	5.36	1.98	2.1
<u>Meter</u>	31.91	5.19	30.0	5.99	2.27	2.5
<u>Rhythm</u>	66.93	8.72	62.8	10.42	3.04	3.3

Grade 11:

	Taiwanese (N=153)		American (N=1077)		Taiwanese	American
	Mean	SD	Mean	SD	S.E.M.	S.E.M.
<u>Melody</u>	35.03	3.77	28.2	5.92	1.94	2.3
<u>Harmony</u>	31.56	5.97	26.2	6.03	2.40	2.3
<u>Tonal</u>	66.59	9.08	54.4	10.97	3.12	3.1
	Taiwanese (N=96)		American (N=1077)		Taiwanese	American
<u>Tempo</u>	35.07	4.40	33.4	5.43	1.90	2.1
<u>Meter</u>	32.63	6.30	30.4	6.14	2.22	2.4
<u>Rhythm</u>	67.70	9.82	63.8	10.43	2.95	3.1

Grade 12:

	Taiwanese (N=52)		American (N=1083)		Taiwanese	American
	Mean	SD	Mean	SD	S.E.M.	S.E.M.
<u>Melody</u>	29.73	5.42	28.7	5.84	2.57	2.3
<u>Harmony</u>	28.71	6.47	26.7	6.13	2.59	2.4
<u>Tonal</u>	58.44	10.45	55.4	11.10	3.68	3.5
	Taiwanese (N=52)		American (N=1083)		Taiwanese	American
<u>Tempo</u>	35.29	3.18	33.8	5.20	1.88	2.1
<u>Meter</u>	33.79	3.72	30.9	6.28	2.12	2.5
<u>Rhythm</u>	69.08	6.05	64.7	10.46	2.84	3.3

There were significant differences between the Taiwanese sample and the American sample ($p \leq .05$) in the means of every subtest for every grade, except for "Harmony" and "Tonal" in Grade 4, "Harmony" in Grade 5, and "Melody" in Grade 12. The results of those t-tests are reported in Table 3.

Table 3 - The t test between Taiwanese and American students on MAP

Grade 4:	Taiwanese (N=41)		American (N=1765)		t value
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
<u>Melody</u>	25.54	5.55	23.30	5.51	2.55*
<u>Harmony</u>	21.56	4.75	21.50	4.64	.08
<u>Tonal</u>	47.10	8.35	44.80	8.74	1.74
	Taiwanese (N=42)		American (N=1765)		
<u>Tempo</u>	30.12	4.29	26.40	6.17	5.49***
<u>Meter</u>	26.55	5.24	23.10	5.65	4.21***
<u>Rhythm</u>	56.67	7.58	49.50	10.73	5.99***
Grade 5:	Taiwanese (N=43)		American (N=1627)		t value
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
<u>Melody</u>	29.07	4.51	25.00	5.67	5.80***
<u>Harmony</u>	23.77	4.96	23.00	5.12	1.00
<u>Tonal</u>	52.84	8.45	48.00	9.56	3.69***
	Taiwanese (N=41)		American (N=1627)		
<u>Tempo</u>	31.24	7.27	28.50	6.01	2.40*
<u>Meter</u>	29.00	6.60	24.80	5.85	4.03***
<u>Rhythm</u>	60.24	13.46	53.30	10.80	3.28**
Grade 6:	Taiwanese (N=44)		American (N=1681)		t value
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
<u>Melody</u>	29.36	5.87	25.70	5.69	4.09***
<u>Harmony</u>	26.05	4.94	23.30	5.24	3.63***
<u>Tonal</u>	55.41	9.53	49.10	9.81	4.33***
	Taiwanese (N=44)		American (N=1681)		
<u>Tempo</u>	32.48	5.59	29.80	6.06	3.13**
<u>Meter</u>	28.71	6.46	26.50	6.15	2.24*
<u>Rhythm</u>	61.18	10.72	56.20	11.24	3.04**
Grade 7:	Taiwanese (N=206)		American (N=1543)		t value
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
<u>Melody</u>	29.45	5.14	26.30	5.97	8.09***
<u>Harmony</u>	26.47	5.57	23.80	5.97	6.41***
<u>Tonal</u>	55.92	9.65	50.30	11.00	7.71***
	Taiwanese (N=116)		American (N=1543)		
<u>Tempo</u>	33.63	4.35	30.70	6.07	6.77***
<u>Meter</u>	30.22	4.89	26.90	6.25	6.90***
<u>Rhythm</u>	63.85	8.06	57.60	11.42	7.77***

Table 3 (cont'd).

Grade 8:	Taiwanese (N=139)		American (N=1494)		t value
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
<u>Melody</u>	32.34	3.88	26.80	5.50	15.45***
<u>Harmony</u>	28.78	4.38	24.60	5.51	10.50***
<u>Tonal</u>	61.12	6.95	51.80	9.89	14.49***
	Taiwanese (N=136)		American (N=1494)		
<u>Tempo</u>	34.63	3.36	31.6	5.86	9.29***
<u>Meter</u>	31.32	4.25	28.4	5.92	7.38***
<u>Rhythm</u>	65.94	6.53	60.0	10.67	9.52***
Grade 9:	Taiwanese (N=91)		American (N=1312)		t value
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
<u>Melody</u>	31.13	5.60	27.3	5.71	6.30***
<u>Harmony</u>	28.22	5.26	25.1	6.04	5.41***
<u>Tonal</u>	59.35	9.57	52.4	10.73	6.64***
	Taiwanese (N=94)		American (N=1312)		
<u>Tempo</u>	35.26	3.70	32.2	6.12	7.31***
<u>Meter</u>	32.44	4.43	29.2	6.57	6.58***
<u>Rhythm</u>	67.69	7.06	61.4	11.77	7.89***
Grade 10:	Taiwanese (N=240)		American (N=1223)		t value
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
<u>Melody</u>	32.92	4.50	27.8	5.56	15.48***
<u>Harmony</u>	30.42	5.20	25.6	5.66	12.93***
<u>Tonal</u>	63.35	8.56	53.4	10.18	15.92***
	Taiwanese (N=183)		American (N=1223)		
<u>Tempo</u>	35.02	4.49	32.8	5.36	6.06***
<u>Meter</u>	31.91	5.19	30.0	5.99	4.55***
<u>Rhythm</u>	66.93	8.72	62.8	10.42	5.82***
Grade 11:	Taiwanese (N=153)		American (N=1077)		t value
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
<u>Melody</u>	35.03	3.77	28.2	5.92	19.29***
<u>Harmony</u>	31.56	5.97	26.2	6.03	10.38***
<u>Tonal</u>	66.59	9.08	54.4	10.97	15.10***
	Taiwanese (N=96)		American (N=1077)		
<u>Tempo</u>	35.07	4.40	33.40	5.43	3.49***
<u>Meter</u>	32.63	6.30	30.40	6.14	3.32***
<u>Rhythm</u>	67.70	9.82	63.80	10.43	3.71***

Table 3 (cont'd).

Grade 12:	Taiwanese (N=52)		American (N=1083)		t value
	Mean	SD	Mean	SD	
<u>Melody</u>	29.73	5.42	28.70	5.84	1.33
<u>Harmony</u>	28.71	6.47	26.70	6.13	2.20*
<u>Tonal</u>	58.44	10.45	55.40	11.10	2.04*
	Taiwanese (N=52)		American (N=1083)		
<u>Tempo</u>	35.29	3.18	33.80	5.20	3.18**
<u>Meter</u>	33.79	3.72	30.90	6.28	5.25***
<u>Rhythm</u>	69.08	6.05	64.70	10.46	4.88***

(* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

Interpretation

The similar values of standard error of measurement for Taiwanese and American population support that the stability of MAP test scores in Taiwan is similar to the stability of test scores when using MAP with an American population.

Most of the standard deviations were smaller within the Taiwanese sample, meaning the scores among the Taiwanese students were less varied than those of the American students. The size of Taiwan is only 13, 896 square miles, while the size of the United States is 9,160,454 square miles. In the 16th century, Malay-Polynesian tribes and Chinese settled in Taiwan. Currently, more than 90 percent of the 21 million people living in Taiwan were born there, and there is considerable intermarriage among population groups. This results in a fairly homogenous population. However, the population in the United States comes from various cultural backgrounds, and living in America may be radically different from place to place. Since the population in Taiwan is more

homogeneous than that in America, and the size of Taiwan is much smaller than that of the United States, the smaller standard deviations would be expected with a Taiwanese sample. Moreover, the students in Taiwan may have more similar music learning experiences in the schools than the students in the United States, because there is a national standard education curriculum in Taiwan. Taiwanese students' similar music learning experiences might have resulted in less variance in their performances on MAP.

Taiwanese students scored significantly higher than American students on most of the subtests. Some cultural differences may be contributing to the significantly higher means of Taiwanese students. First, students' learning environments when they were young could be a factor that caused the differences in students' performances on MAP. Music aptitude is developmental; it is affected by the environment until a child is nine. In Taiwanese schools, students spend 120 to 160 minutes per week in singing activities from first grade through third grade. In fourth grade to sixth grade, students are required to take two 40-minute general music classes per week. In addition, interested students may attend choir or band activities after school in elementary or high school. However, in the United States, the music curricula in the elementary schools vary according to school district policies. Few American districts include as much music instruction as in Taiwanese schools. Therefore, fewer music classes in the United States may have limited students' development of their music aptitude and lowered their scores on MAP.

Second, compared with parents in the United States, parents in Taiwan may emphasize children's learning of skills at an early age. This is especially true of skills in music. In Taiwan's education system, students from grade seven to

high school focus on entrance exams in academic subjects. Prior to grade seven, many parents want their children to learn music or other arts. Students who have had private lessons before they were eight years old would have at least one year to develop their music aptitude through private music instruction before their music aptitude was stabilized at the age of nine . According to the questionnaire responses, more than half of the students in Taiwan begin private music lessons before the age of 8 in every grade (Table 4). This will be discussed further when discussing the results of the questionnaire.

Table 4 - Percentage of the students beginning music lessons before/after 8 years old

	<u>Before 8 years old</u>	<u>After 8 years old</u>
<u>Gr. 4 (N=27)</u>	66.7	33.3
<u>Gr. 5 (N=26)</u>	50.1	49.9
<u>Gr. 6 (N=27)</u>	51.9	48.1
<u>Gr. 7 (N=46)</u>	65.4	34.6
<u>Gr. 8 (N=22)</u>	59.3	40.7
<u>Gr. 9 (N=41)</u>	17.1	82.9
<u>Gr. 10 (N=39)</u>	43.4	56.6
<u>Gr. 11 (N=56)</u>	69.5	30.5
<u>Gr. 12 (N=22)</u>	68.4	31.6

Third, the educational system in Taiwan includes many weekly exams. As a result, Taiwanese students may be better at taking tests, such as MAP, than are American students, because they have more practice at test-taking.

Finally, the varieties of stress, duration, pitch, and intonation in the Chinese languages also may help to develop students' tonal and rhythmic

abilities. All Taiwanese people are bilingual in Taiwanese and Mandarin, two types of Chinese languages. Mandarin is the medium of instruction in the school system in Taiwan. Chinese languages are the "tone languages"; English is one of the non-tone languages. A tone language is a language in which its speakers attach phonological significance to certain small changes in a syllable's frequency contour (Miller, 1981). Wang (1976) found that Mandarin speakers could identify and discriminate the tone phonemes easier than could speakers of English, because the pitch changes in tone language (i.e., Chinese languages) could strengthen the speakers' perceptions of pitch changes. In Chinese languages, the pitches at which the syllables in words are pronounced can make differences in the words' meanings. Children must distinguish differences between words at a very early age when learning Mandarin or Taiwanese. Therefore, learning the native languages of Taiwan may help Taiwanese children's development of pitch discrimination.

Comparison of Parents' and Student's Responses on the Questionnaire Results

Subjects and their parents were asked to complete surveys regarding students' home music environments and musical backgrounds. Then, their responses were compared. If the responses of the students were highly related to those of their parents, the responses to the surveys could be considered reliable and representative. All the values of Spearman correlation between parents' response and students' response to the same questions were larger than the critical value at the .001 level. The values of the correlations ranged from .43 to .90. The values of the correlation are presented in Table 5.

Table 5 - Correlations of Students' and Parents' Responses on Questionnaires

<u>Question</u>	<u>Value of Correlation</u>
<u>Families Member's Music Background/Experiences</u>	
Do you have Karaoke at home?	<u>.88***</u>
How many days do (your parents/you) listen to music at home per week?	<u>.51***</u>
How many days do (your parents/you) play any musical instrument at home per week?	<u>.50***</u>
How many days do (your parents/you) sing or whistle some music at home per week?	<u>.50***</u>
How much time do (your parents/you) spend participating in musical activities per week?	<u>.43***</u>
How often do (your parents/you) sing with (you/your child)?	<u>.56***</u>
How much time do (your parents/you) spend singing with Karaoke per week?	<u>.66***</u>
How many music records/tapes/CD do (your parents/you) have?	<u>.62***</u>
How many days do (your siblings/your other children) play or practice a musical instrument per week?	<u>.58***</u>
How often do (your siblings/your other children) sing or practice music with (you/your other children)?	<u>.54***</u>
How many music records/tapes/CD do (your siblings/your other children) have?	<u>.58***</u>
<u>Students' Music Background</u>	
How many days (do/does) (you/your child) sing at home per week?	<u>.46***</u>
How many days (do/does) (you/your child) watch music programs on TV per week?	<u>.51***</u>
How many days (do/does) (you/your child) listen to music programs on radio per week?	<u>.57***</u>
How many music records/tapes/CD (do/does) (you/your child) have?	<u>.58***</u>
How many private music lessons (have/has) (you/your child) had?	<u>.77***</u>
When (at what ages) did (you/your child) have these private music lessons?	<u>.90***</u>
How many days(do/does) (you/your child) play or practice a musical instrument per week?	<u>.66***</u>
How often (do/does) (you/your child) attend music activities?	<u>.65***</u>
How much time (do/does) (you/your child) spend singing with Karaoke per week?	<u>.62***</u>

Table 5 (cont'd).

Parents' Attitudes toward Child's Music Learning

How often do (your parents/you) talk about music with (you/your child)?	<u>.57***</u>
How often do (your parents/you) ask about (your/your child's) progress in music learning?	<u>.61***</u>
How often do (your parents/you) listen to (your/your child) music practice?	<u>.60***</u>
How often do (your parents/you) encourage (you/your child) to learn or practice music?	<u>.63***</u>
How often do (your parents/you) take (you/your child) to concerts or other musical activities?	<u>.59***</u>
How many music records/tapes/CD did (your parents/you) provide (you/your child)?	<u>.53***</u>
How many musical instruments or toys have (your parents/you) provided for (you/your child)?	<u>.56***</u>
How many music books/scores have (your parents/you) purchased for (you/child)?	<u>.69***</u>
How much do you think (your parents/you) encourage (you/your child) to learn music?	<u>.66***</u>

(Number of participants in the questionnaire: Student-- 985; Parents--813)
 (* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

Interpretation

The values of the correlations here are considered low to moderate when considered as "interjudge reliabilities." However, these correlations represent the reliability of individual questions, and it is expected that the reliability of the whole set of questions would be higher. These correlations indicate that parents' responses were highly related with those of their children. As a result, one can assume that the overall information regarding students' family environment and background is reliable and can be used with confidence for the rest of this study.

Correlation of Teachers' Ratings and MAP Results:

Results

The relationship between teachers' ratings of students' musical abilities and students' scores on the "Tonal" and "Rhythm" divisions of MAP were calculated using a Pearson Product-moment correlation. These correlations represent an indication of the concurrent validity of MAP for the Taiwanese population. Teachers' ratings and MAP are considered to be two different means of measuring students' music abilities. If teachers' ratings are significantly correlated to the students' scores on MAP, then this will indicate that MAP has a high concurrent validity for the Taiwanese population. Since music is not studied in grade 12 in Taiwan, students in grade 12 could not be included in this portion of study.

The results of the teachers ratings' are based on the rating of: a) the final grade given to the student at the end of this semester, b) student's overall music abilities, c) student's ability on pitch perception, d) student's rhythmic ability, and e) the possibility of the student pursuing music as his/her future career.

The teacher of the ninth grade students who took only the tonal division of MAP responded only to the first question of the questionnaire. The results of the correlation for each grade on each question are presented in Table 6.

According to the correlation results of students' final grades, which can range from zero to 100, and MAP scores, which can range from zero to 80, most of the correlations were larger than the critical value at .05 level except for the following tests at certain grades: a) Grade 4: Meter, b) Grade 7: Melody and Meter, c) Grade 8: Tempo, d) Grade 9: Tempo, e) Grade 10: Tempo and Rhythm, and f) Grade 11: Melody, Tempo, Meter, and Rhythm.

Teacher ratings of student's overall music ability were found to be significantly correlated with the scores of MAP except for: a) Grade 4: Melody, Harmony, and Meter, b) Grade 5: Meter, c) Grade 6: Melody, d) Grade 7: Melody, and Tonal, e) Grade 8: Melody, Tempo, and Rhythm, f) Grade 10: Harmony, and Tempo, and g) Grade 11: Melody, Tonal, Tempo, Meter, and Rhythm.

The ratings of student's pitch perception ability was significantly correlated with MAP scores except for the following tests for certain grades: a) Grade 4: Harmony, Tempo, Meter, and Rhythm, b) Grade 5: Meter, c) Grade 7: Melody, Harmony, Tonal, Tempo, and Meter, d) Grade 8: Harmony, Tempo, Meter, and Rhythm, e) Grade 9: Meter, f) Grade 10: Melody, Harmony, Tonal Tempo, Meter, and Rhythm, and g) Grade 11: Melody, Harmony, and Tonal.

Students' MAP scores and their rhythmic abilities were significantly correlated except for certain subtests at certain grade levels: a) Grade 4: Melody, Harmony, b) Grade 7: Melody, Tonal, Tempo, and Meter, c) Grade 8: Melody, Tempo, Meter, and Rhythm, d) Grade 9: Meter, and Rhythm, e) Grade 10: Tempo, and f) Grade 11: Tempo and Rhythm.

There was no significant correlation between MAP scores and the ratings of the possibility of students pursuing music as the future career for the Harmony and Meter subtests for Grade 4, the Melody and Tempo subtests for Grade 7, and all the subtests for grades 8, 9, and 10.

Table 6 - Correlations of Teachers' Ratings and MAP Results

1. What is the final grade you are going to give this student at the end of this semester?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.54***	.34*	.55***	.47**	.21	.41**
Gr. 5:	.50***	.41**	.51***	.56***	.49***	.54***
Gr. 6:	.40**	.38**	.44**	.68***	.55***	.69***
Gr. 7:	.19	.26*	.26*	.27*	.22	.30*
Gr. 8:	.34*	.49***	.49***	.15	.42**	.34*
Gr. 9:	.41**	.42**	.49***	.27	.44**	.42**
Gr. 10:	.36***	.29**	.36***	.19	.36*	.31
Gr. 11:	.13	.23*	.20*	-.04	-.12	-.09

2. This student's overall music ability is:

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.28	.28	.34*	.37*	.24	.37*
Gr. 5:	.49***	.45**	.53***	.35*	.28	.33*
Gr. 6:	.30	.40**	.39**	.56***	.47***	.58***
Gr. 7:	.13	.22*	.21	.24*	.25*	.29*
Gr. 8:	.28	.41**	.41**	.12	.36**	.29
Gr. 9:	---	---	---	.33*	.32*	.36*
Gr. 10:	.25*	.20	.25*	.21	.35*	.32*
Gr. 11:	.11	.21*	.18	.02	.06	.05

3. This student's ability on pitch perception is:

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.37*	.13	.32*	.26	.14	.25
Gr. 5:	.46**	.43**	.50***	.34**	.29	.33*
Gr. 6:	.34*	.36*	.39**	.59***	.54***	.64***
Gr. 7:	.02	.02	.02	.22	.22	.26*
Gr. 8:	.38**	.21	.33*	.03	.08	.07
Gr. 9:	---	---	---	.36*	.27	.35*
Gr. 10:	.37	.28	.26	.33	.26	.40
Gr. 11:	.06	.13	.11	.21*	.32**	.30**

Table 6 (cont'd).

4. This student's rhythmic ability is:

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.26	.28	.34*	.37*	.40**	.49***
Gr. 5:	.40**	.40**	.45**	.44**	.40**	.43**
Gr. 6:	.39**	.35*	.42**	.72***	.64***	.76***
Gr. 7:	.01	.24*	.15	.21	.18	.24*
Gr. 8:	.22	.31*	.31*	.14	.19	.18
Gr. 9:	---	---	---	.32*	.19	.29
Gr. 10:	.33**	.23*	.31**	.27	.35*	.35*
Gr. 11:	.28**	.37***	.36***	.10	.23*	.20

5. How possible do you think it is that this student could pursue music as his/her future career?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.33*	.28	.38*	.41**	.15	.33*
Gr. 5:	.46**	.45**	.51***	.35*	.33*	.35*
Gr. 6:	.34*	.39**	.41**	.48***	.47***	.53***
Gr. 7:	.19	.35***	.32**	.21	.28*	.30***
Gr. 8:	.27	.18	.26	.11	.05	.09
Gr. 9:	---	---	---	.28	.09	.20
Gr. 10:	.18	.13	.17	.13	.26	.23
Gr. 11:	.40***	.49***	.48***	.35***	.43***	.43***

(* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

(Numbers of students participated in the teacher's rating on Tonal (T) and Rhythm (R): Gr. 4 T=41, R=42; Gr. 5 T=43, R=41; Gr. 6 T=43, R=44; Gr. 7 T=88, R=74; Gr. 8 T=47, R=43; Gr. 9 T=47, R=46; Gr. 10 T=87, R=38; Gr. 11 T=96, R=96)

Interpretation

The considerably low intercorrelation of MAP subtests reported in MAP Manual has indicated the multidimensional nature of music aptitude (Gordon, 1995, p. 79). The diagnostic validity reported in MAP Manual has shown that the scores on the Tonal Imagery correlated significantly higher with singing abilities than with either rhythmic or creative expressive ability. Scores on the Rhythm

Imagery correlated significantly higher with rhythmic abilities than with singing abilities. The concurrent validity was reported as .53 (Gordon, 1995, p.113). However, many Taiwanese teachers' ratings of their students' pitch perceptions have high correlations with students' performances on the Rhythm division of MAP. This may indicate that teachers do not differentiate students' tonal abilities from their rhythmic abilities with accuracy. Similarly, many teachers' ratings of their students' rhythmic abilities are also found to be highly correlated with students' performances on the Tonal division of MAP. Thus, the results, again, show that music teachers in Taiwan may not be aware of the different dimensions of musical abilities and are unable to effectively diagnose students' tonal and rhythmic abilities.

Although the correlations between teachers' ratings of students' overall musical abilities and students' performances on the Rhythm dimension of MAP are strong, teachers' ratings are more strongly related to the Tonal dimension than to Rhythm dimension of MAP. This supports that music teachers in Taiwan may tend to judge students' musical abilities based on their tonal achievement. This may be because music teachers are not aware of students' rhythmic ability, since rhythmic activities are used less frequently in music classes than tonal activities in Taiwan and are rarely isolated from tonal activities.

Generally, teachers' ratings for the students in Grades 4, 5, and 6 are more strongly correlated to the scores of MAP than the ratings for other grades. The music teachers for Grade 4 to Grade 6 may identify students' musical abilities better than those in upper grade levels because there are two 40- minutes music sessions per week in Grades 4 to 6 rather than only one music class for Grades 7

to 11. Moreover, 6th grades teachers may have had students for several years and know them better, resulting in higher correlations with their ratings for grade 6 than their ratings for grades 4 and 5. The music class in Grades 7 to Grade 11 is only one 50-minute session per week. The correlations for Grades 7, 8, and 10 are weaker, and this suggests that music teachers in these grades are less aware of the musical abilities of their students.

The responses from the teacher who only answered the first question of the questionnaire for ninth graders were all significantly correlated at the .01 level. This indicates that this teacher was aware of the students' abilities but may have been very cautious about evaluating students.

The answers to the question regarding rating students' potentials for a future career in music were significantly correlated ($p \leq .001$) with the results of MAP for Grade 11. The reason could be that students in Grade 11 are closer to making career decisions, and their musical potentials and personalities at this time enable their teachers to better assess their career viability in music. The music teachers for the upper grade levels may have more confidence and feel more comfortable in rating students' potentials for future careers than the teachers of the lower grade students.

The reasons for some of the weak correlations of the teachers' ratings with the results of MAP may be the size of classes and the overloaded school schedule for music teachers. The sizes of the music classes in Taiwan usually range from 40 to 50 students per class. Therefore, a teacher does not have sufficient time to diagnose students' musical strengths and weakness. Also, a music teacher in Taiwan usually has 24 teaching hours per week. Therefore, the

sizes of the classes and the busy school teaching schedule in Taiwan may not allow teachers time to accurately identify individual students' abilities.

Generally, the final grades given to the students, teachers' ratings of student's overall musical abilities, and the ratings of students' potential for future careers in music were found to be significantly correlated with the results of MAP in most of the grades and subtests. This information supports that MAP is a valid music aptitude test with high concurrent validity for use with Taiwanese students.

Correlation of Responses to Individual Questions and MAP

The relationship between the responses to individual questions of the questionnaires and students' performance on MAP are reported in Tables 7 to 11. These were calculated using Spearman Correlations. The responses of the questions were significantly but randomly correlated with the subtests of MAP at different grade levels. Therefore, in order to focus on issues of practical significance, the results and interpretation will be based on considering all participants as one group (Gr. 4-12) regardless of grade level.

The questions from the student's questionnaires were classified into seven categories: a) Families Member's Musical Background/Experiences, b) Parents' Support and Attitudes toward Their Children's Music Learning, c) Students' Musical Background and Experiences, d) Students' Self-concepts of Their Musical Abilities, e) Students' Attitudes about and Willingness for Musical Involvement, f) Parents' Attitudes toward Music, and g) Parents' Concepts of Their Children's

Music Aptitudes. In addition, questions regarding "Parents' Attitudes toward Music" were included in the parents' questionnaire.

Family Member's Musical Background/Experiences

Results. Some questions had fewer meaningful correlations to students' performance on MAP. "How much time do your parents sing with Karaoke per week?" had little and the weakest relationship to scores on MAP. Also, in the group of Gr. 4 through 12, MAP scores had no correlation with the answers to the question No. 4 "How much time do your parents spend participating in musical activities per week?", No. 5 "How often do your parents sing with you?" and No. 7 "How many music records/tapes/CD do your parents have." Parents' listening to music (question No. 1) or playing music instruments at home (question No. 2), and siblings' playing music instruments (question No. 8) had some but few correlations with MAP scores.

The answers to question No. 3 "How many days do your parents sing or whistle music at home per week?", No. 9 "How often do your siblings sing or practice music with you?", and No. 10 "How many music records/tapes/CD do your siblings have?" more significantly correlated with MAP scores, since these individual questions at least had five significant correlations among the six tests for Grades 4 through 12. Overall, there were somewhat more rhythmic than tonal correlations found.

Table 7 - Correlation of Family Members' Music Background and MAP

1. How many days do your parents listen to music at home per week?

<u>Grade</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:	.31*	.45**	.48**	.21	.04	.07
Gr. 5:	.11	.32*	.26	.21	.22	.22
Gr. 6:	-.07	-.08	-.07	.05	.12	.10
Gr. 7:	-.07	-.08	-.11	-.06	.09	.02
Gr. 8:	-.30*	-.21	-.29*	-.03	-.22	-.13
Gr. 9:	.35*	-.11	.18	.00	.06	.01
Gr. 10:	.15	-.10	-.00	.29**	.21	.25*
Gr. 11:	.10	.11	.11	.44***	.35***	.43***
Gr. 12:	.18	.35*	.27*	.10	.01	.04
Gr. 4-12:	.02	.00	.01	.11*	.06	.11*

2. How many days do your parents play any musical instrument at home per week? (such as harmonica, guitar, recorder, piano.....etc.)

<u>Grade</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:	.06	.05	.08	.25	.00	.14
Gr. 5:	.34*	.12	.20	.09	.05	.03
Gr. 6:	-.14	.05	-.04	.03	.22	.19
Gr. 7:	.08	.01	.04	-.06	.09	.02
Gr. 8:	-.03	-.30*	-.19	-.07	-.13	-.01
Gr. 9:	.10	-.00	.04	-.12	-.07	-.13
Gr. 10:	.05	.04	.06	-.05	.21	.12
Gr. 11:	.00	.15	.10	.20*	.23*	.22*
Gr. 12:	.15	.13	.14	-.15	-.02	-.07
Gr. 4-12:	-.06	-.09*	-.08*	.00	.11*	.07

Table 7 (cont'd).

3. How many days do your parents sing or whistle some music at home per week?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.43**	.16	.38*	-.08	.01	.02
Gr. 5:	.04	.20	.09	.09	.19	.12
Gr. 6:	.07	.05	-.01	-.01	.26	.16
Gr. 7:	.08	.13	.10	-.00	.06	.02
Gr. 8:	.10	.29*	.25	-.09	-.05	-.03
Gr. 9:	.09	-.12	.02	-.12	.18	.07
Gr. 10:	.25*	.29**	.32**	-.02	.17	.09
Gr. 11:	.20*	.16	.19	.27**	.28**	.30**
Gr. 12:	.13	.26	.20	.11	.08	.07
Gr. 4-12:	.10*	.13**	.13**	.04	.16***	.12**

4. How much time do your parents spend participating in musical activities per week? (such as choir, band, concerts..... etc.)

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.31**	.40**	.43**	.33*	-.17	.09
Gr. 5:	.00	.23	.13	.17	.11	.10
Gr. 6:	-.05	-.07	-.12	-.21	-.16	-.18
Gr. 7:	.04	.20	.10	-.08	.15	.07
Gr. 8:	.22	.09	.16	-.03	-.10	-.07
Gr. 9:	-.18	-.41**	-.32*	-.13	-.25	-.30
Gr. 10:	.11	.13	.14	.05	.09	.08
Gr. 11:	.19	.30**	.27**	.35***	.30**	.36***
Gr. 12:	.16	.17	.21	-.01	.12	.05
Gr. 4-12:	-.03	-.02	-.03	.00	-.01	-.00

5. How often do your parents sing with you?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.17	.17	.20	.09	.10	.07
Gr. 5:	.23	.26	.24	.39.*	.24	.29
Gr. 6:	-.04	-.02	-.05	.02	.11	.10
Gr. 7:	.10	-.01	.02	-.04	.09	.12
Gr. 8:	-.07	.06	.03	.12	.10	.14
Gr. 9:	.40**	.02	.23	.20	.05	.17
Gr. 10:	.03	.05	.06	.30**	.31**	.30**
Gr. 11:	.20*	.30**	.28**	.19	.10	.15
Gr. 12:	.07	.23	.16	.23	.10	.16
Gr. 4-12:	.03	.03	.03	.04	.05	.05

Table 7 (cont'd).

6. How much time do your parents sing with Karaoke per week?

<u>Grade</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:	.16	.21	.19	-.13	.01	-.09
Gr. 5:	-.14	.14	-.00	-.07	-.11	-.13
Gr. 6:	-.05	.20	.06	.11	.19	.21
Gr. 7:	-.01	.01	-.01	-.06	-.13	-.09
Gr. 8:	-.13	-.14	-.17	.16	.11	.16
Gr. 9:	.08	-.01	.05	.15	.07	.12
Gr. 10:	-.05	-.04	-.07	.06	.04	.03
Gr. 11:	-.14	-.19	-.18	.04	.05	.04
Gr. 12:	.26	.25	.29*	.09	-.01	.02
Gr. 4-12:	-.03	-.02	-.03	.00	-.01	-.00

7. How many music records/tapes/CD do your parents have?

<u>Grade</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:	.33**	.30*	.12**	.37*	-.10	.06
Gr. 5:	.03	.08	.08	.15	.05	.07
Gr. 6:	-.14	.17	-.01	-.10	.13	.06
Gr. 7:	.09	-.06	.00	-.13	.04	-.05
Gr. 8:	-.02	-.02	-.01	.03	.04	.06
Gr. 9:	.21	-.17	.06	.32*	.01	.15
Gr. 10:	.18	.10	.13	.07	.06	.06
Gr. 11:	.01	.02	.01	.18	.21*	.22*
Gr. 12:	.10	.27	.20	-.11	-.06	-.10
Gr. 4-12:	-.00	-.01	-.01	.02	.02	.02

8. How many days do your siblings play or practice a musical instrument per week?

<u>Grade</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:	.25	.32*	.36*	.35*	.23	.39*
Gr. 5:	.13	-.05	.03	.23	.07	.17
Gr. 6:	-.06	-.06	-.08	.24	.40**	.38*
Gr. 7:	.35***	.17	.27**	-.08	.17	.07
Gr. 8:	.24	.20	.27	.02	.15	.12
Gr. 9:	.08	.11	.09	.08	-.12	-.01
Gr. 10:	.07	.23*	.40	.19	.15	.18
Gr. 11:	.11	.13	.13	.20	.21*	.23*
Gr. 12:	.04	.28*	.19	.13	.31*	.23
Gr. 4-12:	.08	.07	.08	.09*	.17***	.15***

Table 7 (cont'd).

9. How often do your siblings sing or practice music with you?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.29	.17	.29	.12	.06	.09
Gr. 5:	-.02	-.11	-.08	.44**	.36*	.43**
Gr. 6:	.04	.03	.04	.26	.42**	.40**
Gr. 7:	.18	.12	.13	.09	.13	.11
Gr. 8:	.07	.17	.17	.11	.29	.22
Gr. 9:	.22	.13	.20	.14	-.03	-.03
Gr. 10:	-.01	.10	.06	.21	.27*	.27*
Gr. 11:	.19	.18	.20*	.27**	.14	.23*
Gr. 12:	.01	.22	.15	-.02	.06	-.00
Gr. 4-12:	.09*	.10*	.11*	.16***	.18***	.18***

10. How many music records/tapes/CD do your siblings have?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.23	.20	.27	.16	.01	.11
Gr. 5:	-.19	.05	-.06	.13	.08	.11
Gr. 6:	.12	.09	.12	.20	.11	.21
Gr. 7:	-.06	-.00	-.05	-.00	.01	-.02
Gr. 8:	-.01	.04	-.03	-.09	-.13	-.11
Gr. 9:	.01	.07	.04	-.03	-.09	-.06
Gr. 10:	-.09	.04	-.01	.08	.02	.04
Gr. 11:	-.05	-.05	-.05	.23*	.05	.16
Gr. 12:	.17	-.06	.16	-.09	.07	-.01
Gr. 4-12:	.09*	.12**	.11**	.11*	.10*	.11*

(* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

Interpretation. Parental involvement in Karaoke appears not to be related to their child's musical aptitude, although nearly half of the families in Taiwan have Karaoke at home (see Table 8). On the other hand, parents' and siblings' whistling or singing, and practicing musical instruments seem to be the most related to the students music aptitudes. Karaoke is considered to be for entertainment rather than for music learning. As a result, children may not focus

on the musical aspects of Karaoke, and as a result, may not benefit much musically. However, it is possible that children may focus on and comprehend musical elements more while their parents or siblings are listening to music or practicing music instruments, resulting in the development of aptitude.

Moreover, parents' musical activities or ownership of recorded music are not related to their children's musical aptitudes, although the amount of recorded music that siblings owned was significantly correlated with MAP scores. Students may often listen to the tapes or CDs belonged to their siblings rather than their parents, so siblings' ownership of recorded music may be more related to students' music aptitude.

Parent's singing with a child is not as highly related as singing/whistling as a model. This may be because when a parents sings with child, the child is not as able to hear his/her own sing voice and therefore, benefits less from the activity.

Table 8 - Percentage of Families with Karaoke at Home

	<u>Yes</u>	<u>No</u>
<u>Gr. 4 (N=82)</u>	46.3	53.7
<u>Gr. 5 (N=80)</u>	40.0	60.0
<u>Gr. 6 (N=88)</u>	46.6	53.4
<u>Gr. 7 (N=110)</u>	52.7	47.3
<u>Gr. 8 (N=89)</u>	53.9	46.1
<u>Gr. 9 (N=81)</u>	50.6	49.4
<u>Gr. 10 (N=170)</u>	40.6	59.4
<u>Gr. 11 (N=193)</u>	40.4	59.6
<u>Gr. 12 (N=104)</u>	51.0	49.0

Student's Musical Background

Results. The correlation of the responses of students' music background and MAP scores were presented in Table 9. The answers to the question "How much time do you spend singing with Karaoke per week?" were not significantly related to students' scores on MAP. Except for the question regarding Karaoke, the results of all other questions are significantly correlated with children's music aptitudes for the group of Grades 4 through 12 in every subtest except for the following questions for certain subtests: a) "How many days do you watch music program on TV per week?" was not significantly related to scores on the Tempo subtest, b) "How many music records/tapes/CDs do you have?" was not significantly related to the score on the Melody and Tempo subtests, and c) "How many days do you play or practice a musical instrument per week?" was not significantly related to scores on the Tempo subtest.

Table 9 - Correlation of Students' Music Background and MAP

1. How many days do you sing at home per week?						
Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.42**	.24	.40**	.27	.04	.11
Gr. 5:	-.10	.08	.06	.37*	.20	.30
Gr. 6:	.14	.17	.19	.31*	.54***	.47***
Gr. 7:	.08	.05	.07	.13	.05	.16
Gr. 8:	.24	.07	.20	.01	.18	.11
Gr. 9:	.27	.01	.20	.10	.16	.12
Gr. 10:	.20	.30**	.30**	.09	.27*	.24*
Gr. 11:	.17	.23*	.22*	.39***	.31**	.38***
Gr. 12:	-.06	.24	.07	.11	.22	.14
Gr. 4-12:	.23***	.26***	.28***	.22***	.27***	.27***

Table 9 (cont'd).

2. How many days do you watch music programs on TV per week?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.20	.14	.18	.03	.01	.05
Gr. 5:	-.07	.23	.10	.36*	.21	.30
Gr. 6:	.01	-.07	.02	-.06	.08	.04
Gr. 7:	.06	.14	.11	.17	.17	.18
Gr. 8:	-.07	.07	.03	-.05	.14	.06
Gr. 9:	.21	-.01	.14	-.16	.01	-.07
Gr. 10:	.04	.06	.06	-.03	.03	.02
Gr. 11:	.06	-.06	-.01	.21*	.17	.21*
Gr. 12:	.07	.13	.12	.21	.32*	.26
Gr. 4-12:	.11*	.11**	.12**	.08	.14***	.13**

3. How many days do you listen to music programs on radio per week?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.32*	.10	.27	.04	.08	.01
Gr. 5:	.30*	.25	.30*	.19	.35*	.29
Gr. 6:	.10	.20	.22	.09	.17	.19
Gr. 7:	.09	.07	.10	.06	.04	.04
Gr. 8:	-.03	-.01	-.04	-.19	-.19	-.20
Gr. 9:	.31*	.00	.22	-.08	-.12	-.12
Gr. 10:	.13	.08	.12	.10	.06	.09
Gr. 11:	.16	.07	.11	.26*	.11	.21*
Gr. 12:	.01	.13	.06	-.15	-.05	-.12
Gr. 4-12:	.20***	.16***	.19***	.10*	.11*	.12**

4. How many music records/tapes/CD do you have?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.13	.05	.00	.08	.16	.00
Gr. 5:	-.05	.05	.01	.27	.13	.19
Gr. 6:	-.06	-.08	-.09	-.43**	-.30*	-.37*
Gr. 7:	-.09	-.00	-.06	-.05	.14	.07
Gr. 8:	-.10	-.01	-.08	-.27	-.19	-.24
Gr. 9:	.27	.08	.23	.09	-.07	-.04
Gr. 10:	.06	.21*	.17	-.10	-.07	-.10
Gr. 11:	.01	-.08	-.05	.28**	.18	.25*
Gr. 12:	-.19	.05	-.02	-.02	-.04	-.03
Gr. 4-12:	.08	.14**	.12**	.08	.11**	.12**

Table 9 (cont'd).

5. In addition to the music classes in school, how many private music lessons have you had?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.14	.24	.23	.34	.14	.31*
Gr. 5:	.25	.44**	.39*	.43**	.39*	.42**
Gr. 6:	.26	.34*	.34*	.07	.24	.21
Gr. 7:	.18	.18	.19	.24*	.00	-.09
Gr. 8:	.16	.22	.26	.33*	.24	.30*
Gr. 9:	.40**	.15	.31*	.25	.10	.19
Gr. 10:	.21*	.32**	.33**	.12	.11	.14
Gr. 11:	.28**	.42***	.39***	.42***	.54***	.52***
Gr. 12:	.22	.27	.30*	.03	.27*	.17
Gr. 4-12:	.19***	.27***	.26***	.15***	.27***	.24***

6. How many days do you play or practice a musical instrument per week? (such as harmonica, guitar, recorder, piano, violin, trumpet....etc.)

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.45**	.40**	.55***	.18	.08	.18
Gr. 5:	.40**	.19	.31*	.08	-.15	-.04
Gr. 6:	.06	.15	.13	.07	.32*	.25
Gr. 7:	.03	.04	.02	-.05	.06	.02
Gr. 8:	.01	.02	.05	.09	.08	.09
Gr. 9:	-.03	.09	.02	.32	.51***	.54***
Gr. 10:	.16	.18	.22	.14	.22**	.22**
Gr. 11:	.32**	.47***	.43***	.39***	.37***	.42***
Gr. 12:	.15	.33*	.28*	.09	.23	.16
Gr. 4-12:	.13**	.13**	.14***	.05	.12**	.10**

7. How often do you attend music activities? (such as choir, band, concerts, music competitions...etc.)

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.24	.31*	.36*	.15	.01	.16
Gr. 5:	.39**	.39**	.42**	.47**	.45**	.48**
Gr. 6:	.12	-.00	.01	.24	.43**	.41**
Gr. 7:	.02	-.04	-.03	-.22	-.00	-.10
Gr. 8:	.23	.19	.25	.03	-.03	.01
Gr. 9:	-.02	.03	-.04	-.29	-.13	-.20
Gr. 10:	.13	.08	.11	.13	.17	.18
Gr. 11:	.25*	.40***	.36***	.40***	.39***	.42***
Gr. 12:	.08	.11	.16	.02	.08	.02
Gr. 4-12:	.20***	.24***	.25***	.13**	.22***	.20***

Table 9 (cont'd).

8. How much time do you spend singing with Karaoke per week?						
Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.18	.07	.14	-.15	.05	-.08
Gr. 5:	.12	.27	.23	-.04	-.15	-.10
Gr. 6:	-.23	-.05	-.18	-.09	-.02	-.01
Gr. 7:	-.10	-.01	-.08	.07	.07	.09
Gr. 8:	-.00	.03	.02	.20	.10	.18
Gr. 9:	.20	.04	.18	.02	-.03	-.02
Gr. 10:	-.15	-.06	-.11	.14	.02	.06
Gr. 11:	-.16	-.11	-.13	-.03	-.01	-.02
Gr. 12:	.08	-.06	.05	-.19	-.17	-.22
Gr. 4-12:	-.08	-.02	-.05	.02	.04	.03

(* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

Interpretation. This result, again, supports that Karaoke has no relationship to the development of child's musical aptitude. However, it is possible that because Karaoke was not in existence when the subjects were very young children, it did not have an opportunity to impact the development of the subjects' music aptitudes as they developed.

Listening to music recordings has a slightly stronger relationship to MAP scores than watching music programs on TV. Perhaps the music programs on TV may distract students more from music itself because of its visual factors. The Tempo subtest scores had fewest significant correlations with MAP scores. It is possible that students' repertoires from private music lessons, musical groups, and the radio may focus on changes of pitches or on melodic elements of music rather than on the rhythmic aspects. This could result in less-developed rhythm aptitudes.

Other questions regarding students' music experiences, participation in musical groups, participation in private music lessons, practice on music instruments, singing at home, watching or listening to TV or radio music programs, and the ownership of recorded music were all highly related to students' music aptitudes, so students' music background should be considered as an important factor that is related to children's music aptitudes.

Parents' Support for and Attitudes toward Their Children's Music Learning

Results. The correlations of the answers to the questions focusing on parents' support for and attitudes toward their children's music learning and the scores on MAP are reported in Table 10. The questions concerning parents' support for and attitudes toward their children's music learning that were strongly related to students' music aptitude were as follows : a) How many musical instruments or toys have your parents provided for you? b) How many music books/scores have your parents purchased for you? and c) How much do you think your parents encourage you to learn music? No significant relationship was found in the question regarding "How many music records/tapes/CDs did your parents provide you?"

There were some significant correlations between MAP scores and answers to the following questions: a) How often do your parents talk about music with you? b) How often do your parents ask about your progress in music learning? c) How often do your parents listen to your music practice? d) How often do your parents encourage you to learn or practice music? and e) How often do your parents take you to concerts or other musical activities?

Table 10 - Correlations between Parental Support and MAP Scores

1. How often do your parents talk about music with you?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.30	.32*	.36*	.11	.13	.02
Gr. 5:	.37*	.18	.26	.35*	.20	.27
Gr. 6:	.10	.06	.08	.12	.36*	.30
Gr. 7:	.06	.05	.05	-.14	.11	-.00
Gr. 8:	.09	.01	.06	.04	.09	.08
Gr. 9:	.08	-.08	.04	.01	-.01	.07
Gr. 10:	.22*	.14	.20	.14	.35***	.29**
Gr. 11:	.19	.31**	.27**	.35***	.27**	.34***
Gr. 12:	.20	.27	.24	.09	.27*	.17
Gr. 4-12:	.09*	.07	.09*	.05	.15***	.12**

2. How often do your parents ask about your progress in music learning?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.28	.38**	.40**	.05	.13	.06
Gr. 5:	.37*	.18	.25	.15	.10	-.09
Gr. 6:	-.11	.04	-.05	-.12	.22	.09
Gr. 7:	.05	-.04	-.01	-.06	.07	-.03
Gr. 8:	.21	.14	.22	.09	.08	.11
Gr. 9:	.36*	.09	.29	.10	.11	.17
Gr. 10:	.23*	.15	.23*	.14	.36***	.32**
Gr. 11:	.19	.31**	.28**	.30**	.38***	.37***
Gr. 12:	.24	.23	.24	-.03	.14	.04
Gr. 4-12:	.10*	.06	.09*	-.01	.12*	.06

3. How often do your parents listen to your music practice?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.14	.22	.24	-.14	.09	-.02
Gr. 5:	.34*	.30*	.32*	.26	.25	.26
Gr. 6:	.02	.12	.07	.09	.39**	.31*
Gr. 7:	.08	.13	.09	-.04	.16	.11
Gr. 8:	.13	.15	.18	.09	.22	.19
Gr. 9:	.28	.12	.25	.23	.19	.28
Gr. 10:	.15	.13	.16	.17	.30**	.30**
Gr. 11:	.22**	.35***	.31**	.30**	.32**	.35***
Gr. 12:	.22	.30*	.27*	.03	.18	.10
Gr. 4-12:	.06	.08	.08	.01	.15***	.10*

Table 10 (cont'd).

4. How often do your parents encourage you to learn or practice music?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.24	.39**	.40**	.21	.06	.12
Gr. 5:	.34*	.29	.33*	.37*	.19	.26
Gr. 6:	-.04	-.01	-.04	-.08	.24	.14
Gr. 7:	.12	.12	.11	-.19	-.06	-.14
Gr. 8:	.22	.09	.18	.13	.19	.20
Gr. 9:	.07	.10	.12	.17	.12	.21
Gr. 10:	.23*	.31**	.32**	.16	.28*	.26*
Gr. 11:	.09	.23*	.19	.34***	.39***	.40***
Gr. 12:	.31*	.25	.30*	.11	.25	.18
Gr. 4-12:	.08	.10*	.10*	.05	.14**	.10*

5. How often do your parents take you to concerts or other musical activities?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.49***	.45**	.56***	-.10	.05	.08
Gr. 5:	.19	.19	.17	.27	.35*	.29
Gr. 6:	.00	-.34*	-.20	-.10	.07	.03
Gr. 7:	.00	.15	.06	-.09	.13	-.01
Gr. 8:	.24	.13	.21	-.04	.03	.00
Gr. 9:	.07	.10	.12	.17	.12	.21
Gr. 9:	.23	.18	.23	.23	.18	.26
Gr. 10:	.06	.20	.17	.16	.20	.21*
Gr. 11:	.09	.26**	.20**	.37***	.22**	.31**
Gr. 12:	.20	.32*	.29*	-.14	.06	-.03
Gr. 4-12:	.09*	.11**	.12**	.03	.10*	.08

6. How many music records/tapes/CD did your parents provide you?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.15	.23	.28	-.02	.10	.00
Gr. 5:	-.02	.06	.03	.27	.20	.21
Gr. 6:	-.00	-.04	-.05	-.25	-.12	-.17
Gr. 7:	.08	.06	.08	-.01	-.11	-.07
Gr. 8:	.07	-.03	.03	-.39**	-.11	-.23
Gr. 9:	.24	.11	.18	.31	.09	.18
Gr. 10:	.12	.32**	.27**	.08	.08	.09
Gr. 11:	.07	.14	.12	.17	.21*	.20*
Gr. 12:	.06	.23	.21	.02	.19	.09
Gr. 4-12:	-.02	.02	.01	-.04	.00	-.02

Table 10 (cont'd).

7. How many musical instruments or toys have your parents provided for you?						
Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.22	.04	.23	-.17	-.25	-.22
Gr. 5:	.31*	.23	.33*	.13	.08	.09
Gr. 6:	-.11	-.01	-.11	.16	.31*	.30*
Gr. 7:	.15	.15	.17	.11	.07	.08
Gr. 8:	.51***	.29*	.48***	-.08	.00	-.00
Gr. 9:	.12	-.07	.07	.39*	.19	.34*
Gr. 10:	.08	.21*	.18	.16	.11	.13
Gr. 11:	.19	.29***	.28***	.32***	.25**	.29***
Gr. 12:	.40**	.30*	.42**	.17	.17	.17
Gr. 4-12:	.13**	.11*	.14**	.13**	.14**	.14**

8. How many music books/scores have your parents purchased for you?						
Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.38*	.39*	.47**	-.12	-.24	-.19
Gr. 5:	.20	.28	.29	.35*	.40*	.39*
Gr. 6:	-.11	-.09	.15	.02	.26	.18
Gr. 7:	.22*	.33**	.32**	-.08	.17	.09
Gr. 8:	.36*	.25	.39**	-.09	-.21	-.17
Gr. 9:	.43**	.03	.30	.28	.17	.30
Gr. 10:	.25*	.33**	.34**	.17	.05	.11
Gr. 11:	.22*	.21*	.22*	.36***	.46***	.45***
Gr. 12:	.25	.31*	.31*	.09	.31*	.21
Gr. 4-12:	.18***	.16***	.18***	.08	.17***	.15***

9. How much do you think your parents encourage you to learn music?						
Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.14	.25	.25	.20	.00	.13
Gr. 5:	.21	.17	.18	.42**	.30	.35*
Gr. 6:	.01	.03	.01	.19	.49***	.42**
Gr. 7:	.16	.13	.15	.24*	-.09	-.08
Gr. 8:	.18	.09	.46	-.03	.04	.03
Gr. 9:	.29	.27	.37*	.23	.25	.28
Gr. 10:	.21*	.25*	.27*	.30**	.27*	.33**
Gr. 11:	.25*	.31**	.30**	.31**	.35***	.36***
Gr. 12:	.04	.17	.12	.10	.24	.16
Gr. 4-12:	.14***	.15***	.16***	.10*	.17***	.15***

(* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

Interpretation. Providing musical instruments or toys, purchasing music books/scores for children, and encouraging children to learn music are a natural outgrowth of children's private music lessons participation. Since students' private music lessons have been one of the factors most related to students' music aptitude, it is expected that these related questions will also be significantly related to students' music aptitudes.

The amount of tapes, records, or CDs that parents provided was not related to students' music aptitudes perhaps because many students purchase these items on their own. Also, these music tapes, records, or CDs were not defined clearly enough in the questionnaire; it is possible that they are not musical in nature. Rather, they might be popular songs with lots of lyrics and less focus on musical elements.

Generally, answers to most questions regarding parents' support of their children's music learning are related to the development of their children's music aptitudes and parents should be aware that their support of children's music learning may help their children develop higher levels of music aptitudes.

Student's Self-Concept and Attitude toward Music

Results. The answers to every question regarding students' self-concepts in and attitudes toward music were significantly related to every subtest in the group of Grades 4 through 12. The results are reported in the Table 11. Students in higher grade levels are more capable of evaluating their own musical abilities

than those in lower grades. Moreover, student's evaluations of their own rhythmic abilities were related to their scores on the Tonal division. Similarly, students' evaluations of their abilities on identifying the contour of the music were related to their scores on the Rhythm division of MAP.

Table 11 - Correlations of Student's Self-concept/Attitude and MAP

1. How do you rate your overall music ability?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.28	.11	.32*	.11	.00	.05
Gr. 5:	.32*	.39**	.39**	.39*	.21	.31
Gr. 6:	.04	.15	.11	.29	.47***	.46**
Gr. 7	.16	.26*	.21*	.17	.30**	.32**
Gr. 8:	.17	.35*	.32*	.07	.02	.10
Gr. 9:	.52***	.18	.41**	.35*	.22	.34*
Gr. 10:	.26*	.23*	.27*	.16	.17	.20
Gr. 11:	.34***	.41***	.10***	.36***	.34***	.39***
Gr. 12:	.17	.19	.18	.42**	.49***	.49***
Gr. 4-12:	.24***	.25***	.27***	.26***	.30***	.31***

2. How do you rate your singing ability?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.34*	.26	.36*	.08	-.13	-.03
Gr. 5:	.24	.18	.20	.49**	.25	.38*
Gr. 6:	.32**	.37**	.37**	.13	.34**	.29
Gr. 7	.08	.06	.06	.06	.09	.12
Gr. 8:	.13	.14	.17	-.01	.10	.08
Gr. 9:	.37*	.21	.35*	.11	.14	.16
Gr. 10:	.30**	.27**	.32**	.21	.15	.20
Gr. 11:	.32**	.34***	.35***	.33***	.28**	.33***
Gr. 12:	.16	.20	.18	.18	.29*	.25
Gr. 4-12:	.26***	.26***	.28***	.22***	.23***	.25***

Table 11 (cont'd).

3. When you are listening music or singing, how well do you think you can distinguish slow-fast, and follow the tempo of the music?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.35*	.19	.36*	.00	-.20	-.15
Gr. 5:	.04	.34*	.23	.37*	.27	.34*
Gr. 6:	.14	.26	.22	.22	.48***	.41**
Gr. 7:	.08	.01	.09	.03	.16	.15
Gr. 8:	.26	.10	.20	.15	.25	.27
Gr. 9:	.41**	.27	.43**	.08	.09	.10
Gr. 10:	.46***	.48***	.53***	.26*	.39***	.39***
Gr. 11:	.33***	.36***	.37***	.33**	.32**	.36***
Gr. 12:	.19	.11	.16	.28*	.17	.22
Gr. 4-12:	.29***	.28***	.31***	.23***	.29***	.30***

4. How much do you like your music class now?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.45**	.39*	.51***	.17	-.10	-.01
Gr. 5:	.17	.30*	.25	.37*	.16	.29
Gr. 6:	.14	.23	.24	.33*	.50***	.51***
Gr. 7:	.15	.21	.19	.05	.16	.14
Gr. 8:	.12	-.14	-.00	.08	.31*	.27
Gr. 9:	.38*	.20	.38*	.31	.33*	.34*
Gr. 10:	.16	.23*	.23*	.21	.24*	.24*
Gr. 11:	.04	.13	.10	.37***	.31**	.39***
Gr. 12:	.09	.32*	.25	.20	.26	.24
Gr. 4-12:	.23***	.24***	.27***	.23***	.25***	.27***

5. Compared with your classmates, you think your music ability is.....

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.25	.39*	.41**	.08	-.12	-.04
Gr. 5:	.29	.27	.30	.47**	.32*	.43**
Gr. 6:	.12	.27	.21	.28	.51***	.48***
Gr. 7:	.20	.21*	.22*	.18	.13	.20
Gr. 8:	.22	.11	.21	.06	.11	.13
Gr. 9:	.52***	.44**	.57***	.38*	.23	.36*
Gr. 10:	.40***	.29**	.38***	.21	.16	.20
Gr. 11:	.22**	.36***	.32***	.30**	.27**	.32**
Gr. 12:	.23	.25	.28*	.35*	.39**	.40**
Gr. 4-12:	.28***	.30***	.32***	.28***	.26***	.30***

Table 11 (cont'd).

6. Do you think that you can pursue music as your future career?

<u>Grade</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:	.24	.29	.34*	.16	-.25	-.03
Gr. 5:	.27	.38*	.38*	.08	.06	.10
Gr. 6:	-.03	.19	.07	.21	.35*	.35*
Gr. 7:	.06	-.01	.00	.06	.14	.13
Gr. 8:	.03	.09	.09	.17	.26	.26
Gr. 9:	.20	.24	.26	.35*	.24	.30
Gr. 10:	.14	.14	.16	.07	.31**	.25**
Gr. 11:	.16	.32**	.27**	.47***	.42***	.49***
Gr. 12:	.03	.16	.12	.11	.23	.18
Gr. 4-12:	.10**	.15***	.14***	.15***	.19***	.20***

7. How much do you like to create/compose your own music?

<u>Grade</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:	.24	.12	.22	.09	-.11	-.10
Gr. 5:	.11	.35*	.27	.26	.12	.22
Gr. 6:	.05	.11	.11	.08	.29*	.25
Gr. 7:	.06	.08	.08	.06	.13	.12
Gr. 8:	.02	.09	.08	.21	.24	.24
Gr. 9:	.21	.01	.18	.22	.14	.20
Gr. 10:	.08	.45	.45	.46	.27**	.25**
Gr. 11:	.01	.06	.03	.19	.26*	.26*
Gr. 12:	.27	.37**	.36**	.08	.33*	.22
Gr. 4-12:	.15***	.19***	.19***	.14**	.22***	.21***

8. How much do you want to learn music after graduation?

<u>Grade</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:	.28	.32*	.38*	.09	-.20	-.11
Gr. 5:	.27	.37*	.35*	.40*	.21	.33*
Gr. 6:	.11	.23	.20	.17	.45**	.39**
Gr. 7:	.13	.16	.13	-.01	.13	.17
Gr. 8:	.13	-.05	.05	.22	.33*	.29
Gr. 9:	.26	.31*	.33*	.28	.27	.27
Gr. 10:	.02	.00	.02	.16	.33**	.31**
Gr. 11:	.17	.23*	.21*	.36***	.33**	.37***
Gr. 12:	.17	.23	.23	-.03	.12	.06
Gr. 4-12:	.24***	.25***	.27***	.19***	.30***	.29***

Table 11 (cont'd).

9. How much do you like to attend concerts?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.22	.30*	.30	.24	.04	.13
Gr. 5:	-.01	.12	.00	.37*	.27	.36*
Gr. 6:	.16	.16	.18	.06	.26	.22
Gr. 7:	-.05	.03	-.04	-.09	.10	.03
Gr. 8:	-.01	.11	.05	.27	.41**	.40**
Gr. 9:	.27	.00	.20	-.04	.03	-.04
Gr. 10:	.11	-.03	.04	-.16	.11	.01
Gr. 11:	.17	.24*	.23*	.35***	.32**	.37***
Gr. 12:	.18	.13	.19	-.04	.06	.03
Gr. 4-12:	.18***	.19***	.20***	.11**	.24***	.21***

10. How much do you want to learn to play a musical instrument?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.44*	.29	.46*	.15	-.03	.03
Gr. 5:	.12	.24	.17	.14	-.06	.03
Gr. 6:	-.04	.19	.06	.27	.35*	.39**
Gr. 7:	.08	.08	.04	.00	.18	.13
Gr. 8:	.07	.13	.12	.00	.36*	.25
Gr. 9:	.16	.23	.24	.09	.11	.11
Gr. 10:	-.03	.02	-.01	-.07	.19	.11
Gr. 11:	.00	.04	.02	.37***	.25**	.34***
Gr. 12:	.23	.02	.12	.09	.06	.09
Gr. 4-12:	.19***	.19***	.20***	.16***	.26***	.25***

11. How much do you like music?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.38*	.28	.44**	.17	-.15	-.08
Gr. 5:	.30*	.26	.27	.32*	.01	.17
Gr. 6:	-.08	.13	.02	-.02	.21	.13
Gr. 7:	.09	.04	.04	.05	.12	.11
Gr. 8:	.09	-.07	.01	.24	.16	.23
Gr. 9:	.31*	.35*	.41**	.40**	.30	.33*
Gr. 10:	.07	.08	.09	.02	.12	.10
Gr. 11:	.11	.24*	.20*	.39***	.33***	.39***
Gr. 12:	.23	.14	.17	.15	.18	.17
Gr. 4-12:	.22***	.24***	.25***	.22***	.22***	.25***

Table 11 (cont'd).

12. When you are listening to music or singing, how well can you identify the contour of the music?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.38*	.41**	.49***	.11	-.21	-.09
Gr. 5:	.19	.29	.29	.38*	.24	.35*
Gr. 6:	.03	.15	.14	.23	.47***	.40**
Gr. 7:	.18	.12	.16	.18	.22	.25*
Gr. 8:	.19	.19	.22	.02	.11	.09
Gr. 9:	.38*	.19	.35*	-.01	.00	-.02
Gr. 10:	.43***	.47***	.51***	.26*	.23*	.26*
Gr. 11:	.29**	.40***	.37**	.25*	.30**	.32**
Gr. 12:	.18	.22	.21	.34*	.40**	.41**
Gr. 4-12:	.28***	.31***	.33***	.26***	.29***	.31***

13. How much do you like to listen to music?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.31*	.01	.21	.39**	.03	.22
Gr. 5:	.19	.32*	.25	.26	-.05	.11
Gr. 6:	.17	.27	.23	.13	.13	.18
Gr. 7:	.05	-.07	-.04	.01	.19	.12
Gr. 8:	.07	.00	.05	.18	.18	.21
Gr. 9:	.40**	.30*	.46**	.16	-.01	.06
Gr. 10:	.18	.20	.22*	.08	.33**	.27*
Gr. 11:	.11	.09	.10	.33***	.30**	.34***
Gr. 12:	.31*	.08	.23	.20	.19	.22
Gr. 4-12:	.24***	.22***	.25***	.23***	.25***	.27***

14. Do you agree that the school should have more music classes?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.23	.24	.30*	.31	.05	.16
Gr. 5:	.22	.31*	.27	.32*	.13	.24
Gr. 6:	-.10	.19	.06	.11	.33*	.26
Gr. 7:	.15	.08	.11	.06	.10	.11
Gr. 8:	-.01	.23	.12	.01	-.02	.02
Gr. 9:	.45**	.28	.45**	.09	.06	.04
Gr. 10:	.36***	.24*	.33**	.08	.18	.17
Gr. 11:	.10	.20*	.16	.31**	.24*	.30**
Gr. 12:	.19	.16	.23	.11	.26	.20
Gr. 4-12:	.25***	.28***	.29***	.19***	.20***	.22***

(* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

Interpretation. The reasons that students in grades 7 and 8 have the weaker self-concepts than students in other grades may be students in grades seven to nine receive only one 50-minute music lesson per week. Progressing from primary school (grades one to six) to junior high school (grades seven to nine) and from one music teacher to another might require students to re-adjust and re-evaluate their views of their own music abilities according to their performances in their new music environments. The shorter music classes and limited music activities in junior high school may not provide enough opportunities for students in grade seven and eight to evaluate their own music abilities accurately.

Students' ratings of their rhythmic abilities were related to their performances on the Tonal division of MAP and their ratings of their tonal abilities were related to their scores on the Rhythm division of MAP. This may indicate that students are not capable of differentiating between their rhythmic and tonal abilities. Also, students may not know that there is more than one dimension of music aptitude.

Because the strong correlations found between the answers to each question and scores on MAP, one might conclude that students in Taiwan are very sensitive to their overall music abilities, although they are not able to identify their abilities in relation to the specific dimensions of music aptitude.

Students' attitudes toward music were significantly related to their scores on MAP. This implies that students who have more positive attitudes toward music are often more musical, or students who are musical have more

positive attitudes toward music. This may be because students with more positive attitudes toward music may participate in music lessons and activities more aggressively. On the other hand, if they consider themselves musical, students may have more confidence about being involved in music classes or musical activities in the school. Therefore, students' attitudes and aptitudes may reinforce each other.

Parents' Attitude toward Music

Results. The answers to the questions concerning parents' attitudes toward music have fewer significant correlations with MAP than answers to the questions concerning parents' support of and attitudes toward student's music learning. Parents' willingness to attend concerts was least related to their children's scores on MAP (see Table 12). In fact, there were no significant relationships between parents' attitudes toward music and their children's music aptitudes when considering the sample as a whole.

Table 12 - Correlations of Parents' Attitude toward Music and MAP Scores

1. How much do you like to listen to music?						
<u>Grade</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:	.32	.02	.25	-.15	.18	.05
Gr. 5:	.35*	.52***	.48**	.30	.02	.15
Gr. 6:	-.08	.09	-.00	-.07	-.05	-.00
Gr. 7:	.17	.09	.14	-.09	.11	.04
Gr. 8:	-.28	-.18	-.24	.04	.05	.05
Gr. 9:	.17	.02	.14	.01	.08	.07
Gr. 10:	.13	.07	.10	.07	.17	.13
Gr. 11:	.05	.10	.04	.11	.004	.04
Gr. 12:	.32	.40*	.40*	-.11	.03	-.01
Gr. 4-12:	.08	.08	.09	.00	.08	.06

Table 12 (cont'd).

2. How much would you like to learn music some day?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.10	.11	.13	-.07	.18	.11
Gr. 5:	.34*	.29	.33*	.44**	.30	.40*
Gr. 6:	-.08	.02	-.09	.09	.07	.11
Gr. 7:	.08	.08	.09	-.08	-.13	-.11
Gr. 8:	-.46	-.45	-.46	.06	-.04	.03
Gr. 9:	.03	-.04	.02	.10	.03	.08
Gr. 10:	.02	.10	.07	.10	.37*	.30
Gr. 11:	.04	.20	.14	.13	.28*	.27*
Gr. 12:	-.01	.10	.07	-.23	.09	-.04
Gr. 4-12:	.02	.03	.01	.02	.09	.06

3. How much would you like to attend a concert ?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.15	-.00	.13	.07	.18	.11
Gr. 5:	.17	.35*	.27	.31	.13	.20
Gr. 6:	-.04	.11	-.00	.22	.07	.19
Gr. 7:	.19	.13	.17	-.13	.01	-.05
Gr. 8:	-.14	-.20	-.20	-.07	-.08	-.07
Gr. 9:	-.08	-.13	-.10	.08	.05	.09
Gr. 10:	-.06	.09	.04	.05	.25	.21
Gr. 11:	.14	.13	.14	.16	.05	.15
Gr. 12:	.28	.17	.25	-.33*	-.11	-.23
Gr. 4-12:	-.00	.02	.01	.00	.04	.03

4. How much would you want to learn to play a music instrument?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.06	.08	.09	-.09	.08	.02
Gr. 5:	.34*	.31*	.34*	.31	.16	.26
Gr. 6:	-.05	.14	-.01	.18	.13	.18
Gr. 7:	.18	.11	.17	-.11	.01	-.03
Gr. 8:	-.27	-.24	-.29*	-.14	-.07	-.11
Gr. 9:	.08	-.08	.05	-.00	-.04	-.03
Gr. 10:	.09	.11	.13	.05	.31*	.24
Gr. 11:	-.01	.18	.12	.12	.11	.15
Gr. 12:	-.10	.01	-.02	-.19	-.02	-.13
Gr. 4-12:	.02	.05	.04	-.01	.08	.04

Table 12 (cont'd).

5. How much do you like music ?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.17	-.08	.11	-.09	.07	.06
Gr. 5:	.32*	.39*	.38*	.23	.17	.19
Gr. 6:	.04	.23	.13	.26	.34*	.34*
Gr. 7:	.21	.11	.18	-.24*	.01	-.11
Gr. 8:	-.11	-.34*	-.27	-.01	.01	.02
Gr. 9:	.10	.04	.11	-.18	-.16	-.21
Gr. 10:	.09	.24*	.21	.08	.29	.23
Gr. 11:	-.00	.25	.15	.22	.18	.26*
Gr. 12:	.05	.23	.20	.07	.08	.10
Gr. 4-12:	.07	.09	.09	-.01	.09	.06

(* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

Interpretation. In direct contrast with the results from the questions of parents' support of and attitude toward their children's music learning, the results from questions concerning parents' attitude toward music were not related to their children's musical aptitudes. Therefore, it may be true that some parents who do not have positive attitudes toward music might still offer their children a positive musical environment that might influence the development of their children's music aptitudes.

Correlation between Parents' Concept of Their Children's Musical Ability and MAP Scores

Results

The questionnaire for the parents contained these questions concerning parents' concepts of their children's music abilities. Specifically, the questions asked parents to rate their children's overall musical abilities, singing ability, and possibility of pursuing music as a future career. The correlation between parents' responses to those questions and their children's performances on MAP are listed in Table 13.

Considering the whole sample as one group, there were strong correlations of parents' concepts of their children's overall music abilities and their singing abilities with MAP scores on every subtest, but there was no significant correlation found between scores on MAP and answer to the question "Do you think that it is possible that your child can pursue music as his/her future career?"

Table 13 - Correlation of Parents' Concepts of Child's Music Ability and MAP

1. How do you rate your child's overall music ability?

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.36*	.53**	.50**	.35*	.05	.18
Gr. 5:	.28	.42**	.39*	.48**	.29	.39*
Gr. 6:	.08	.20	.17	.35*	.46**	.48**
Gr. 7:	.11	.14	.11	.06	.15	.14
Gr. 8:	.21	.11	.21	.15	.15	.16
Gr. 9:	.32*	.18	.34*	.01	-.06	-.06
Gr. 10:	.20	.24*	.25*	.21	.22	.25
Gr. 11:	.23	.33**	.31*	.36**	.27*	.38**
Gr. 12:	.08	.22	.21	-.06	.14	.00
Gr. 4-12:	.19***	.22***	.23***	.20***	.24***	.25***

Table 13 (cont'd).

2. How do you rate your child's singing ability?

<u>Grade</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:	.27	.52**	.47**	.08	.15	.15
Gr. 5:	.16	.24	.25	.46**	.33*	.39*
Gr. 6:	.27	.17	.26	.05	.18	.16
Gr. 7:	.13	.09	.11	-.10	-.01	-.05
Gr. 8:	.28*	.07	.21	-.13	.10	.01
Gr. 9:	-.07	.04	.03	-.12	.07	-.03
Gr. 10:	.17	.19	.20	.18	.25	.21
Gr. 11:	.32*	.36**	.37**	.11	.16	.20
Gr. 12:	.14	.25	.25	.12	.16	.13
Gr. 4-12:	.20***	.20***	.22***	.12**	.23***	.20***

3. Do you think that it is possible that your child can pursue music as his/her future career?

<u>Grade</u>	<u>Melody</u>	<u>Harmony</u>	<u>Tonal</u>	<u>Tempo</u>	<u>Meter</u>	<u>Rhythm</u>
Gr. 4:	.01	.33	.18	.19	.16	.23
Gr. 5:	.24	.38*	.36*	.48**	.45**	.51**
Gr. 6:	-.06	.09	.01	.08	.35*	.26
Gr. 7:	.24	.22	.27	-.19	-.05	-.14
Gr. 8:	.07	.18	.14	-.25	-.13	-.19
Gr. 9:	.18	.29	.32	.08	-.00	.00
Gr. 10:	.05	.12	.10	-.05	.07	.02
Gr. 11:	.03	.21	.14	.13	.30*	.28*
Gr. 12:	-.11	-.35	-.30	-.10	.05	-.04
Gr. 4-12:	.01	.06	.03	-.02	.10	.05

(* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

Interpretation

The answer to the question "Do you think that it is possible that your child can pursue music as his/her future career?" was not as highly related to MAP as the answers to the question regarding their child's singing ability and overall musical ability. When considering whether a child will pursue music as a future career, parents may tend to include their own desires and expectation of the child in addition to that child's aptitudes and interest. Therefore, the answers to that question on the survey were not highly related to the children's music aptitudes. Overall, parents seem to be able to assess their children's' comprehensive music ability and singing ability.

Correlations between Different Categories of Questions and MAP:

The questions in the student's questionnaires were classified into six categories: a) Family Members' Musical Background/Experiences, b) Parents' Support of and Attitudes toward Their Children's Music Learning, c) Students' Musical Background and Experiences, d) Students' Self-concepts of Their Musical Abilities, e) Students' Attitudes about and Willingness for Musical Involvement, and f) Parents' Concepts of Their Children's Music Aptitudes. Other questions from parents' questionnaire form the seventh category of "Parents' attitude toward music." The questions related to each category are listed in Figure 1.

Figure 1 - Classification for Different Categories of Questions:

I. Family Members' Musical Background/Experiences:

1. How many days do your parents listen to music at home per week?
2. How many days do your parents play any musical instrument at home per week? (such as harmonica, guitar, recorder, piano.....etc.)
3. How many days do your parents sing or whistle music at home per week?
4. How much time do your parents spend participating in musical activities per week? (such as choir, band, concerts..... etc.)
5. How often do your parents sing with you?
6. How much time do your parents sing with Karaoke per week?
7. How many music records/tapes/CD do your parents have?
8. How many days do your siblings play or practice a musical instrument per week?
9. How often do your siblings sing or practice music with you?
10. How many music records/tapes/CD do your siblings have?

II. Parents' Support of and Attitudes toward Their Children's Music Learning:

1. How often do your parents talk about music with you?
2. How often do your parents ask about your progress in music learning?
3. How often do your parents listen to your music practice?
4. How often do your parents encourage you to learn or practice music?
5. How often do your parents take you to concerts or other musical activities?
6. How many music records/tapes/CD did your parents provide you?
7. How many musical instruments or toys have your parents provided for you?
8. How many music books/scores have your parents purchased for you?
9. How much do you think your parents encourage you to learn music?

III. Students' Musical Background and Experiences:

1. How many days do you sing at home per week?
2. How many days do you watch music programs on TV per week?
3. How many days do you listen to music programs on radio per week?
4. How many music records/tapes/CD do you have?
5. In addition to the music classes in school, how many private music lessons have you had?
6. How many days do you play or practice a musical instrument per week? (such as harmonica, guitar, recorder, piano, violin, trumpet....etc.)
7. How often do you attend music activities? (such as choir, band, concerts, music competitions...etc.)
8. How much time do you spend singing with Karaoke per week?

Figure 1 (cont'd).

IV. Students' Self-concepts of Their Musical Abilities:

1. How do you rate your overall music ability?
2. How do you rate your singing ability?
3. When you are listening to music or singing, how well do you think you can distinguish between slow and fast, and follow the tempos of the music?
4. Compared with your classmates, you think your music ability is.....
5. Do you think that you can pursue music as your future career?
6. When you are listening to music or singing, how well can you identify the contour of the music?

V. Students' Attitudes about and Willingness for Musical Involvement:

1. How much do you like your music class?
2. How much do you like to create/compose your own music?
3. How much would you like to learn music after graduation?
4. How much do you like to attend concerts?
5. How much would you like to learn to play a musical instrument?
6. How much do you like music?
7. How much do you like to listen to music?
8. Do you agree that the school should have more music classes?

VI. Parents' Attitudes toward Music

1. How much do you like to listen to music?
2. How much would you like to learn music some day?
3. How much would you like to attend a concert ?
4. How much would you want to learn to play a music instrument?
5. How much do you like music ?

VII. Parents' Concepts of Their Children's Music Aptitudes:

1. How do you rate your child's overall music ability?
2. How do you rate your child's singing ability?
3. Do you think that it is possible that your child can pursue music as his/her future career?
4. Do you agree that the school should have more music classes for your child?

Results

The sum of the responses for individual questions related to each category are considered to be the composite response for that category. The results of the correlations between each category's composite response and students' performances on MAP for each grade and the total group (grades 4 to 12) are reported in Table 14.

There were strong correlations between the scores of every subtest of MAP and the following categories: a) students' musical background and experiences, b) students' self-concepts of their musical abilities, c) students' attitudes about and willingness for musical involvement, and d) parents' concepts of their children's music aptitudes. "Parents' support of and attitudes toward their children's music learning" had a strong correlation with MAP scores except for with the Tempo subtest.

When considering combined grades four to twelve, the composite responses for the category, "Family members' musical background/experiences", was related only to the scores on the rhythmic subtests of MAP. "Parents' attitudes toward music" were significantly related to only the tonal subtests of MAP.

Students' self-concepts of their musical abilities in grades ten and eleven were significantly correlated with each subtest of MAP. Students' attitudes about and willingness for music learning were significantly correlated with most of the subtests of MAP for the students in grades eleven and twelve.

Table 14: Correlations between Different Categories of Questions and MAP

1. Family Members' Musical Background/Experiences:

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.37*	.21	.37*	.32*	.10	.25
Gr. 5:	.17	.19	.20	.16	.11	.14
Gr. 6:	-.16	-.03	-.12	.19	.21	.23
Gr. 7:	.08	.06	.08	-.07	.17	.18
Gr. 8:	-.01	.09	.05	.01	.10	.07
Gr. 9:	.30	-.15	.10	.10	.03	.07
Gr. 10:	.15	.12	.15	.23*	.20	.23*
Gr. 11:	.20*	.19	.21*	.38***	.26*	.34***
Gr. 12:	.18	.36**	.31*	.04	.04	.05
Gr. 4-12:	.06	.05	.06	.13**	.13**	.14**

2. Parents' Support and Attitude toward Their Children's Music Learning:

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.34*	.42**	.46**	-.02	-.04	-.04
Gr. 5:	.39**	.30*	.39**	.20	.20	.20
Gr. 6:	-.09	-.00	-.06	.08	.24	.18
Gr. 7:	.12	.17	.17	-.18	.06	-.06
Gr. 8:	.33*	.20	.30*	.05	.09	.08
Gr. 9:	.30*	.03	.21	.19	.13	.18
Gr. 10:	.27*	.32**	.34**	.19	.26*	.24*
Gr. 11:	.29**	.40***	.38***	.39***	.38***	.42***
Gr. 12:	.28	.32	.34	-.03	.28	.15
Gr. 4-12:	.12**	.13**	.14**	.04	.13**	.10*

3. Students' Musical Background and Experiences:

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.39*	.26	.41**	.11	.32	.29
Gr. 5:	.38*	.40*	.43**	.30	.27	.29
Gr. 6:	.09	.18	.15	.12	.19	.18
Gr. 7:	.04	.09	.08	-.04	.08	.03
Gr. 8:	.16	.16	.18	.01	.04	.03
Gr. 9:	.42**	-.00	.25	.05	.12	.10
Gr. 10:	.17	.20*	.21*	.15	.16	.17
Gr. 11:	.33***	.35***	.37***	.52***	.44***	.51***
Gr. 12:	.10	.27*	.22	-.10	.21	.08
Gr. 4-12:	.26***	.27***	.29***	.19***	.26***	.25***

Table 14 (cont'd).

4. Students' Self-concepts of Their Musical Abilities:

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.41**	.34*	.47**	.09	-.14	-.05
Gr. 5:	.32*	.46**	.44**	.42**	.34*	.39*
Gr. 6:	.18	.33*	.28	.32*	.52***	.48***
Gr. 7:	.17	.14	.17	.15	.24*	.24*
Gr. 8:	.15	.27	.25	.04	.16	.12
Gr. 9:	.50***	.25	.44**	.32	.28	.33
Gr. 10:	.45***	.39***	.46***	.27**	.34**	.33**
Gr. 11:	.33***	.43***	.42***	.36***	.33***	.37***
Gr. 12:	.16	.31*	.26	.29*	.41**	.41**
Gr. 4-12:	.29***	.34***	.35***	.28***	.29***	.31***

5 Students' Attitudes and Willingness for Musical Involvement:

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.37*	.21	.37*	.18	-.07	.05
Gr. 5:	.27	.39*	.37*	.31	.16	.24
Gr. 6:	.14	.30*	.24	.26	.31*	.32*
Gr. 7:	.10	.15	.14	-.02	.19	.12
Gr. 8:	.05	.05	.06	.16	.41**	.34*
Gr. 9:	.38*	.28	.38*	.19	.14	.18
Gr. 10:	.19	.20	.22*	.09	.28**	.21
Gr. 11:	.18	.28**	.26*	.45***	.46***	.49***
Gr. 12:	.30*	.34*	.36**	.04	.31*	.21
Gr. 4-12:	.33***	.34***	.37***	.24***	.30***	.30***

6. Parents' Attitude toward Music

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.24	.11	.23	-.12	.12	.03
Gr. 5:	.44**	.43**	.49**	.48**	.32	.43**
Gr. 6:	.00	.22	.12	.24	.09	.19
Gr. 7:	.24*	.13	.21	-.08	-.01	-.05
Gr. 8:	-.24	-.28	-.31*	.09	.11	.11
Gr. 9:	.12	-.04	.05	-.06	-.09	-.14
Gr. 10:	.07	.14	.12	-.07	.09	.01
Gr. 11:	.04	.24	.18	.14	.20	.20
Gr. 12:	.13	.34	.28	-.26	.02	-.13
Gr. 4-12:	.09*	.10*	.11*	.02	.08	.06

Table 14 (cont'd).

7. Parents' Concept of Their Children's Music Aptitudes:

Grade	Melody	Harmony	Tonal	Tempo	Meter	Rhythm
Gr. 4:	.32	.52**	.47**	.09	.15	.16
Gr. 5:	.28	.36*	.36*	.55***	.49**	.55***
Gr. 6:	.10	.22	.18	.31	.35*	.39*
Gr. 7:	.19	.17	.20	-.07	.03	-.02
Gr. 8:	.16	.12	.16	-.16	.08	-.03
Gr. 9:	.21	.16	.23	.05	-.16	-.06
Gr. 10:	.22*	.28**	.29**	.24	.34*	.32*
Gr. 11:	.17	.36**	.32*	.22	.32*	.34*
Gr. 12:	.05	.20	.15	-.04	.12	.05
Gr. 4-12:	.16***	.22***	.21***	.12***	.20***	.19***

(* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

Interpretation.

Parents' support of their children's music learning and students' music experiences were both strongly related to students' music aptitudes, while family members' music experiences and parents' attitudes toward music were less related to the scores on MAP. This supports that each child's music aptitudes develop according to each child's experiences and involvement in music and parental support for music, rather than according to the influence of parents' or siblings' musical experiences or parents' attitudes toward music.

The reason that tenth and eleventh grade students' self-concepts in their music aptitudes were more highly related to their scores on MAP than the self-concepts of students in other grades could be that the students at this stage were more mature and, as a result, were better able to evaluate their music aptitudes more objectively. Since there is no music instruction for students in 12th grade in

Taiwan, it is more difficult for students in this grade to evaluate themselves than it is for students in tenth and eleventh grades, although there were still some significant correlations for the twelfth grade students.

Students' attitudes about and willingness for musical involvement were most highly correlated with MAP scores of the students in the 11th and 12th grades. The reason could be that students at these grades were better aware of their musical potentials and could envision whether they would continue their music learning in the near future. Because these students were in the last stages of high school, they were more willing and felt more free to plan their learning after graduation.

The Comparison between Genders

Results

Results of two tailed t-tests of MAP between genders is reported in Table 15. The results indicated that female students in the Taiwanese sample performed significantly better ($p \leq .05$) than male students in the following subtests at certain grades: a) Grade 4: Tonal, b) Grade 5: Tempo, c) Grade 7: Harmony, Meter, and Rhythm, d) Grade 8: Harmony, Tempo, Meter, and Rhythm, e) Grade 9: Tempo, and Rhythm, f) Grade 10: Melody, Harmony, and Tonal, g) Grade 11: Melody, Harmony, Tonal, Tempo, Meter, and Rhythm. There were no significant differences in any subtest according to gender in Grade 6 and Grade 12. However, male students tended to have slightly higher scores on "Melody" in Grade 6, "Harmony" in Grade 9, and "Harmony" in Grade 12. Table 15 contains the means, standard deviations, and t-values of MAP between genders.

Table 15 - t test –Comparison between Genders in Taiwanese Students

Grade 4:	Boys (N=22)		Girls (N=19)		t value
	Mean	SD	Mean	SD	
<u>Melody</u>	24.23	5.12	27.05	5.79	1.64
<u>Harmony</u>	20.45	5.69	22.84	3.04	1.71
<u>Tonal</u>	44.68	8.67	49.89	7.20	2.10*
	Boys (N=22)		Girls (N=20)		
<u>Tempo</u>	29.14	4.06	31.20	4.37	1.58
<u>Meter</u>	25.55	4.87	27.65	5.53	1.30
<u>Rhythm</u>	54.68	6.89	58.80	8.15	1.81
Grade 5:	Boys (N=26)		Girls (N=17)		t value
	Mean	SD	Mean	SD	
<u>Melody</u>	28.42	4.96	30.06	3.63	1.25
<u>Harmony</u>	23.27	4.96	24.53	5.01	.81
<u>Tonal</u>	51.69	9.09	54.59	7.27	1.16
	Boys (N=23)		Girls (N=18)		
<u>Tempo</u>	29.17	8.61	33.89	3.89	2.15*
<u>Meter</u>	28.30	7.91	29.89	4.48	.81
<u>Rhythm</u>	57.48	16.19	63.78	7.97	1.63
Grade 6:	Boys (N=25)		Girls (N=19)		t value
	Mean	SD	Mean	SD	
<u>Melody</u>	29.48	5.55	29.21	6.42	-.15
<u>Harmony</u>	25.20	4.71	27.16	5.13	1.30
<u>Tonal</u>	54.68	8.96	56.37	10.40	.57
	Boys (N=25)		Girls (N=19)		
<u>Tempo</u>	31.92	6.45	33.21	4.25	.80
<u>Meter</u>	27.88	5.09	29.79	7.94	.97
<u>Rhythm</u>	59.80	9.81	63.00	11.83	.96
Grade 7:	Boys (N=102)		Girls (N=104)		t value
	Mean	SD	Mean	SD	
<u>Melody</u>	29.34	4.87	29.55	5.94	.27
<u>Harmony</u>	25.53	5.29	27.39	5.70	2.44*
<u>Tonal</u>	54.87	8.67	56.94	10.46	1.55
	Boys (N=54)		Girls (N=62)		
<u>Tempo</u>	33.02	4.52	34.16	4.16	1.41
<u>Meter</u>	28.69	4.97	31.55	4.44	3.25**
<u>Rhythm</u>	61.70	7.88	65.71	7.81	2.74**

Table 15 (cont'd).

Grade 8:	Boys (N=68)		Girls (N=71)		t value
	Mean	SD	Mean	SD	
<u>Melody</u>	32.32	3.59	32.35	4.16	.04
<u>Harmony</u>	27.68	3.68	29.83	4.75	3.00**
<u>Tonal</u>	60.00	6.00	62.18	7.65	1.88
	Boys (N=67)		Girls (N=69)		
<u>Tempo</u>	33.85	3.71	35.38	2.82	2.71**
<u>Meter</u>	29.85	4.44	32.74	3.54	4.18***
<u>Rhythm</u>	63.70	7.06	68.12	5.14	4.18***
Grade 9:	Boys (N=48)		Girls (N=43)		t value
	Mean	SD	Mean	SD	
<u>Melody</u>	30.98	5.98	31.30	5.22	.28
<u>Harmony</u>	28.31	5.32	28.12	5.25	-.18
<u>Tonal</u>	59.29	10.21	59.42	8.92	.06
	Boys (N=43)		Girls (N=51)		
<u>Tempo</u>	34.30	4.22	36.06	3.01	2.28*
<u>Meter</u>	31.53	5.06	33.20	3.70	1.83
<u>Rhythm</u>	65.84	8.43	69.25	5.24	2.4*
Grade 10:	Boys (N=149)		Girls (N=91)		t value
	Mean	SD	Mean	SD	
<u>Melody</u>	32.28	4.35	33.99	4.56	2.88**
<u>Harmony</u>	29.57	4.95	31.33	5.5	2.08*
<u>Tonal</u>	62.14	8.00	65.32	9.11	2.74**
	Boys (N=103)		Girls (N=80)		
<u>Tempo</u>	34.58	3.93	35.58	5.09	1.44
<u>Meter</u>	31.24	4.32	32.78	6.06	1.92
<u>Rhythm</u>	65.83	7.26	68.35	10.17	1.88
Grade 11:	Boys (N=47)		Girls (N=106)		t value
	Mean	SD	Mean	SD	
<u>Melody</u>	32.77	3.95	36.03	3.22	4.97***
<u>Harmony</u>	27.64	5.57	33.30	5.30	5.89***
<u>Tonal</u>	60.40	8.89	69.33	7.75	5.95***
	Boys (N=46)		Girls (N=50)		
<u>Tempo</u>	33.30	4.94	36.70	3.09	4.07***
<u>Meter</u>	29.61	7.16	35.40	3.68	5.04***
<u>Rhythm</u>	62.91	10.91	72.10	6.06	5.16***

Table 15 (cont'd).

Grade 12:	Boys (N=28)		Girls (N=24)		t value
	Mean	SD	Mean	SD	
<u>Melody</u>	29.46	4.34	30.04	6.55	.37
<u>Harmony</u>	28.82	6.14	28.58	6.97	-.13
<u>Tonal</u>	58.29	9.37	58.63	11.78	.11
	Boys (N=29)		Girls (N=23)		
<u>Tempo</u>	35.03	3.69	35.61	2.43	.64
<u>Meter</u>	33.69	4.02	33.91	3.40	.22
<u>Rhythm</u>	68.72	6.67	69.52	5.29	.48

(* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

Interpretation

In the MAP manual, Gordon reported musical differences between genders in the American sample, and these differences slightly favored girls (Gordon, 1965). However, Gordon stated that these differences were too small to be of practical educational significance. Gordon indicated that the differences were due to the more "conformative" attitude on the part of girls during the testing sessions. This may be true for Taiwanese students as well. However, in the Taiwanese sample some results were significantly different among genders. Therefore, the following investigation of questionnaire responses among genders is necessary to help with the interpretation of the gender differences on MAP scores for Taiwanese students.

Gender Differences on Questionnaire Responses

Results on Individual Questions Responses

While considering the students from grades 4 to 12 as a whole group, differences between genders ($p \leq .05$) for the responses to individual questions from the questionnaire were analyzed using the Mann-Whitney U test, a non-parametric alternative to the t-test. These results are reported in Table 16. All of the differences favored female students or the parents of female students.

There was no significant difference found according to gender for the questions "How many days do your parents sing or whistle some music at home per week?", "How many music records/tapes/CD do your siblings have?", "How much time do your parents sing with Karaoke per week?", "How many music records/tapes/CDs do your siblings have?", "How much time do you spend signing with Karaoke per week?", and "Do you agree that the school should have more music classes for your child?" However, there were significant difference ($p \leq .05$) according to gender for all other questions.

Table 16 - Mann-Whitney U between Gender Differences on Questions

Family Member's Music Background/Experiences

How many days do your parents listen to music at home per week?

	Boys	Girls
No. Cases	518	475
R	275080	218442
U	105391.5***	
Z	4.06	

(* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$)

Table 16 (cont'd).

How many days do your parents play any musical instrument at home per week?
(such as harmonica, guitar, recorder, piano.....etc.)

	Boys	Girls
No. Cases	520	478
R	266800	231702
U	117,220.5*	
Z	2.26	

How much time do your spend parents participating in musical activities per
week? (such as choir, band, concerts..... etc.)

	Boys	Girls
No. Cases	519	476
R	267732	227779
U	114252**	
Z	2.69	

How often do your parents sing with you?

	Boys	Girls
No. Cases	516	471
R	281627	205951
U	94795***	
Z	6.48	

How many music records/tapes/CD do your parents have?

	Boys	Girls
No. Cases	520	478
R	269309	229192
U	114711*	
Z	2.22	

Table 16 (cont'd).

How many days do your siblings play or practice a musical instrument per week?

	<u>Boys</u>	<u>Girls</u>
No. Cases	516	468
R	272967	221653
U	101907***	
Z	4.45	

How often do your siblings sing or practice music with you?

	<u>Boys</u>	<u>Girls</u>
No. Cases	512	469
R	286780	194891
U	84676***	
Z	8.61	

Students' Music Background

How many days do you sing at home per week?

	<u>Boys</u>	<u>Girls</u>
No. Cases	518	478
R	278609	217897
U	103416***	
Z	4.89	

How many days do you watch music programs on TV per week?

	<u>Boys</u>	<u>Girls</u>
No. Cases	515	474
R	270244	219312
U	106736.5***	
Z	3.56	

Table 16 (cont'd).

How many days do you listen to music programs on radio per week?

	<u>Boys</u>	<u>Girls</u>
No. Cases	514	475
R	280823	208733
U	95682.5***	
Z	6.16	

How many music records/tapes/CD do you have?

	<u>Boys</u>	<u>Girls</u>
No. Cases	516	477
R	265610	227911
U	113908*	
Z	2.14	

In addition to the music classes in school, how many private music lessons have you had?

	<u>Boys</u>	<u>Girls</u>
No. Cases	515	479
R	290785	203731
U	88770.5***	
Z	8.55	

How many days do you play or practice a musical instrument per week? (such as harmonica, guitar, recorder, piano, violin, trumpet....etc.)

	<u>Boys</u>	<u>Girls</u>
No. Cases	518	479
R	295101	202402
U	87442.0***	
Z	8.47	

Table 16 (cont'd).

How often do you attend music activities? (such as choir, band, concerts, music competitions...etc.)

	Boys	Girls
No. Cases	518	479
R	285261	212242
U	97282.0***	
Z	6.18	

Parents' Support and Attitudes toward Students' Music Learning

How often do your parents talk about music to you?

	Boys	Girls
No. Cases	516	478
R	283841	210674
U	96193***	
Z	6.48	

How often do your parents ask about your progress in music learning?

	Boys	Girls
No. Cases	517	478
R	285340	210171
U	95389.5***	
Z	7.01	

How often do your parents listen to your music practice?

	Boys	Girls
No. Cases	517	476
R	286065	207456
U	93930***	
Z	7.24	

Table 16 (cont'd).

How often do your parents encourage you to learn or practice music?

	<u>Boys</u>	<u>Girls</u>
No. Cases	513	478
R	286255	205281
U	90800***	
Z	7.72	

How often do your parents take you to concerts or other musical activities?

	<u>Boys</u>	<u>Girls</u>
No. Cases	517	479
R	270633	225873
U	110913***	
Z	3.52	

How many music records/tapes/CD did your parents provide you?

	<u>Boys</u>	<u>Girls</u>
No. Cases	517	476
R	265379	228143
U	114616.5*	
Z	1.99	

How many musical instruments or toys have your parents provided for you?

	<u>Boys</u>	<u>Girls</u>
No. Cases	508	476
R	274073	210547
U	97021***	
Z	5.61	

Table 16 (cont'd).

How many music books/scores have your parents purchased for you?

	Boys	Girls
No. Cases	505	475
R	280472	200219
U	87168.5***	
Z	8.25	

How much do you think your parents encourage you to learn music?

	Boys	Girls
No. Cases	501	474
R	275202	200598
U	88023***	
Z	7.37	

Student's Self-concept and Attitude toward Music

How do you rate your overall music ability?

	Boys	Girls
No. Cases	512	475
R	270185	217394
U	104343.5***	
Z	4.17	

How do you rate your singing ability?

	Boys	Girls
No. Cases	512	476
R	261768	226799
U	113272.5*	
Z	2.07	

Table 16 (cont'd).

When you are listening music or singing, how well do you think you can distinguish slow-fast, and follow the tempo of the music?

	<u>Boys</u>	<u>Girls</u>
No. Cases	511	476
R	261532	226047
U	112320.5*	
Z	2.24	

How much do you like your music class now?

	<u>Boys</u>	<u>Girls</u>
No. Cases	511	474
R	273938	211668
U	99092.5***	
Z	5.21	

Compared with your classmates, you think your music ability is.....

	<u>Boys</u>	<u>Girls</u>
No. Cases	510	472
R	259332	223322
U	111693.5*	
Z	2.11	

Do you think that you can pursue music as your future career?

	<u>Boys</u>	<u>Girls</u>
No. Cases	512	475
R	263286	224293
U	111242.5**	
Z	2.54	

Table 16 (cont'd).

How much do you like to create/compose your own music?

	Boys	Girls
No. Cases	509	476
R	268898	216708
U	103181.5***	
Z	4.30	

How much do you want to learn music after graduation?

	Boys	Girls
No. Cases	510	475
R	285720	199885
U	86835.0***	
Z	8.14	

How much do you like to attend concerts?

	Boys	Girls
No. Cases	512	476
R	288052	200515
U	86988.5***	
Z	8.28	

How much do you want to learn to play a musical instrument?

	Boys	Girls
No. Cases	512	477
R	289204	200352
U	86348.5***	
Z	8.48	

Table 16 (cont'd).

How much do you like music?

	Boys	Girls
No. Cases	511	477
R	281944	206622
U		92619***
Z		7.11

When you are listening to music or singing, how well can you identify the contour of the music?

	Boys	Girls
No. Cases	510	476
R	268114	218478
U		104951.5***
Z		3.97

How much do you like to listen to music?

	Boys	Girls
No. Cases	511	477
R	277318	211248
U		97245***
Z		6.43

Do you agree that the school should have more music classes?

	Boys	Girls
No. Cases	510	477
R	269559	218019
U		104016***
Z		4.17

Table 16 (cont'd).

Parents' Concept of Child's Music Aptitude:

How do you rate your child's overall music ability?

	Boys	Girls
No. Cases	373	432
R	160302	164113
U	70585***	
Z	3.41	

How do you rate your child's singing ability?

	Boys	Girls
No. Cases	347	433
R	158401	167627
U	73666**	
Z	2.50	

Do you think that it is possible that your child can pursue music as his/her future career?

	Boys	Girls
No. Cases	371	434
R	157352	167064
U	72668.5**	
Z	2.60	

(* $p < .05$, ** $p < .01$, *** $p < .001$)**Result on Different Categories of Questions:**

Differences according to gender for the different categories of questions (see Figure 1) were also investigated using the Mann-Whitney U test. Significant differences are reported in Table 17. All the significant differences favored female

students or their parents. Significant differences occurred for each category except parents' attitudes toward music.

Table 17 - Mann-Whitney U between Gender Differences on Categories

Families Member's Musical Background/Experiences

	<u>Boys</u>	<u>Girls</u>
No. Cases	492	447
R	259405	181925
U	81797***	
Z	6.80	

Parents' Support and Attitude toward Child's Music Learning

	<u>Boys</u>	<u>Girls</u>
No. Cases	493	467
R	272455	188826
U	79547.5***	
Z	8.30	

Students Musical Background and Experiences

	<u>Boys</u>	<u>Girls</u>
No. Cases	499	464
R	277127	187039
U	79159***	
Z	8.51	

Students' Self-concept of Their Own Musical Ability

	<u>Boys</u>	<u>Girls</u>
No. Cases	507	470
R	263850	213904
U	103218.5***	
Z	3.63	

Table 17 (cont'd).

Students Attitudes and Willingness for Musical Involvement

	Boys	Girls
No. Cases	503	470
R	280583	193269
U	82583.5***	
Z	8.15	

Parents' Concept of Child's Music Aptitude

	Boys	Girls
No. Cases	367	428
R	156423	159988
U	68181.5***	
Z	3.25	

(* $p < .05$, ** $p < .01$, *** $p < .001$)

Interpretation

The answers to the questions concerning students' musical background revealed significant differences between genders for almost every question. This may indicate that there was a strong difference in the musical learning experiences between female and male students in Taiwan, which might contribute to their performance on MAP.

The answers to every question concerning parents' support of and attitude toward students' music learning revealed significant gender differences. In other words, parents of girls are more likely to encourage their children to participate in music and spend time with their children on musical activities. This could result

in a better music environment for girls in Taiwan than for boys. Parents in Taiwan may encourage girls more than boys to learn music at the early ages or continue their music learning in the higher grade levels, and this may also contribute to the significant differences in music aptitudes between genders.

Gender differences in attitudes toward music learning were found for every question responses. Therefore, female students may be socialized or trained to have more positive attitudes toward music, and this may influence their music learning and their attitude toward taking MAP.

According to the responses to the different categories of questions, the results of every category were significantly different according to gender except "parents' attitude toward music." Parents like music and participate in it, regardless of the genders of their children.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A summary of this study, conclusions, implications for music education based on the findings, and recommendations for further study are included in this chapter.

Summary of the Study

Purposes and Problems

The primary purpose of this research was to gather information about the use of the "Music Aptitude Profile" with Taiwanese students and about the relationships of Taiwanese students' music aptitudes, music environments, and level of musical abilities as estimated by the subjects, their parents, and their teachers. Specifically, this study attempted to answer the following problems:

1. To determine whether Taiwanese students' performances are significantly different from that of American students on MAP according to genders and grade levels.
2. To investigate whether Taiwanese students' musical environments and backgrounds are related to their performance on MAP.
3. To compare music teachers' evaluations of individual student's musical abilities with each student's performance on MAP.
4. To compare Taiwanese students' self-concepts of their own musical abilities with their scores on MAP.

5. To investigate relationships between Taiwanese parents' awarenesses of and attitudes toward their children's musical potential and their children's scores on MAP.

Procedures

The subjects (N=1723) in this study included students from fourth grade to twelfth grade in Central Taiwan. There were one elementary school (grades four through six), three junior high schools (grades seven to nine), and five senior high schools (grades ten to twelve) involved. Two of the three divisions of *Musical Aptitude Profile* (MAP), Tonal Imagery and Rhythm Imagery, were used in this study to measure students' tonal and rhythmic aptitudes. The answer sheets and taped directions for Tonal Imagery and Rhythm Imagery were translated into Chinese before the study began. In addition, questionnaires were designed by the researcher to be completed by selected students, parents, and music teachers.

MAP was administered to all subjects by the researcher and classroom music teachers within one of each class's scheduled music class periods. Most of the students took only one division of MAP, Tonal Imagery or Rhythm Imagery. Only two classes of seventh and eighth grade students took both the Tonal and Rhythm test divisions. Students who took both divisions of MAP took the second division during another music class time within one week of the administration of the first division.

Students (N=1066) from selected classes were asked to complete questionnaires. After taking MAP, the selected students who participated in the questionnaire completed their questionnaires and returned them to the

researcher before they left the classroom. These students were asked to bring parents' questionnaires back home to their parents. The parents of the students who participated in the questionnaire were asked to complete and return their questionnaires to the students' classroom teacher within two weeks. The teachers who participated in the questionnaire were asked to evaluate each student's musical performance in their classes and return their and the parents' questionnaires to the researcher within two weeks.

The three questionnaires used in this study were initially designed by the researcher in English and translated into Chinese. The students' questionnaire was designed to gather information about each student's home environment, musical background, attitudes toward music learning, and musical self-concept. The teachers' questionnaire was used to gather the teacher's evaluation of individual students' musical performances and potentials. Most of the parents' questionnaires were similar to the student questionnaires. Some questions were used to compare parent responses with their children's responses as a means of checking the validity of those responses. The remaining questions were used to investigate the parents' attitudes toward their children's musical potential and learning.

Analysis

Means, standard deviations, standard errors of measurement, and reliabilities of MAP subtests for different grades were computed. All results were compared to those reported in the Manual of MAP. T-tests were used to investigate differences between Taiwanese and American students and between genders of Taiwanese students.

Parents' responses were compared with their children's responses to the questionnaire in order to determine the validity of the children's' responses. MAP scores and teacher's evaluations of students' performances and abilities were correlated as a means of determining the concurrent validity of MAP. Correlations between students' scores on MAP and students' responses to the questionnaires were calculated to determine the relationship between student's music aptitudes and their family member's musical background/experiences, their own musical backgrounds, their parents' support of and attitudes toward their music learning, their musical self-concepts and attitudes toward music, and their parents' attitudes toward music. The responses to the three questions in the parents' questionnaire that related to the parents' concept of their children's musical abilities were correlated with their children's performance on MAP to determine the accuracy of parents' concepts of their children's music abilities. In addition, the Mann-Whitney U test was to determine if there were any differences on the responses to individual questions based upon genders.

Discussions and the Implications for Education

The subtests of the Tonal and Rhythm divisions of *Music Aptitude Profile* are valid music aptitude measurements with a high reliability and concurrent validity for the Taiwanese students in this study. These findings are similar to the findings of Shoenoff (1972), Sell (1976), and Jung (1990). MAP, therefore, is furtherly considered a valid music aptitude test for other countries outside America.

Music teachers in Taiwan can use MAP to measure their students' music aptitudes and can use the information gained from MAP for improving teaching.

Parents also can rely on this objective information when considering the future educational plans of their children. Moreover, MAP can be considered an objective tool for research or for nation-wide assessments in Taiwan to compare the music aptitudes of students coming from different schools.

Taiwanese students and American students have significant differences on their performances on MAP. Similarly, Shoenoff (1972), Sell (1976), and Jung (1990) found that MAP scores of the students in their countries were higher than the data reported in MAP manual.

The additional music instruction in Taiwan, Taiwanese students' test taking experiences, and language learning influence in Taiwanese culture are all possible factors that may cause the differences in music aptitude in favor of the Taiwanese sample. Moreover, 62% of students in Taiwan who take private music lessons started their private music lessons before the age of eight. Therefore, Taiwanese parental support for private music lessons when children are young may have positive influences on their children's music aptitudes, since music aptitude is developmental before age nine.

Students' musical backgrounds and parents' support of and attitudes toward children's music learning are most related to students' performances on MAP. While a child is young, parents may be the only ones who can provide for and encourage opportunities to enrich their children's musical experiences. Therefore, parents should be told how important their role is in supporting the development of their children's music aptitudes. Students' taking or not taking private music lessons is also related to their scores on MAP. Students who took private lessons scored significantly higher than those who did not have music private lessons. Therefore, parents should provide support for music, a proper

musical environment, and appropriate music opportunities for their children in order to maintain or develop their music aptitudes. These conclusion are similar to those of Shull (1953), Goron(1967), and Wermuth (1972).

Families' musical experiences at home and family members' musical background, in addition to parents' attitude toward music, have less relationship to their children's music aptitude. Half of Taiwanese families own a karaoke machine at home, and singing the karaoke at home or in public has been very popular in Taiwanese social life. However, karaoke should be considered as a social entertainment rather than a tool for music learning, because karaoke use is not related to children's music aptitudes in this study. Although parents' attitudes toward music do not relate meaningfully to children's music aptitudes, one would hope that parents in the future still will have a more positive attitude toward music, in addition to encouraging their children's music learning.

Similar to the findings of Gordon (1968) and Young (1971), teachers' ratings reflect the high concurrent validity of MAP for Taiwanese students. However, teachers are not able to separate their evaluations of students' tonal from their rhythm abilities. Either they are not aware of the different dimensions of music aptitude or the sizes of their classes are so large that they can not pay much attention to individual students. Therefore, the in-service training classes, workshops, and night classes for graduate studies available for teachers should include information about music aptitude so that teachers can better assess their students' music abilities. Also, reducing the size of music classes might allow teachers to focus more on individual students needs and enable more effective instruction for individual students. In addition, teachers should use a valid music aptitude test, like MAP, to help them measure their students' aptitude.

Students in higher grades are more capable of evaluating their own music abilities. However, the students in grades seven and eight are not particularly aware of their music abilities. This may relate to the discussion of Svengalis (1978), who found that positive attitude declined as the grade level increased. Without being able to differentiate music aptitudes from music achievement or without objective information from a valid music aptitude test, students may have less motivation to learn music because some students with high aptitude and low levels of achievement may consider themselves un-musical.

Therefore, music teachers, especially of students in grades seven to nine, should help particularly high aptitude students to be more aware of their musical abilities. This may lead to their having more success in achieving their musical potential. In addition to helping students be aware of their own music aptitudes, teachers should encourage students so that they will have more positive attitudes toward music learning, regardless of the levels of their music abilities. As a results, the positive attitudes may help them to develop and maintain their music aptitudes while they are still developing.

Students' willingness to pursue music as a future career is not related to their performance on MAP in most grades. They appear to have other outside concerns preventing them from choosing music as a future career. Encouragement from music teachers may persuade students with high music aptitudes and high levels of motivation to be more positive in pursuing music as a future career for life-long learning.

Parents' concepts of their children's music abilities relate systematically to their children's scores on MAP. However, parents of students in grades seven to nine have the weaker concepts of their children's music abilities. Therefore, it

would be helpful to provide information to parents of children in those grade levels about their child's music aptitudes or abilities. In addition to music teachers' evaluations, the results from a valid music aptitude test like MAP can be used to give parents objective information about their child. This may influence parents' expectations of their child as they relate to music learning.

Scores on MAP differed according to genders. Among all the significant differences, the females scored higher than their male counterparts. These findings correspond Sell's study (1976) with Finnish students. This could be a result of environmental factors. The results of the questionnaire indicated that students' musical backgrounds and their parents' support of and attitudes toward their music learning were significantly different among genders. Those differences may be the factors causing different aptitudes among female and male students. In Taiwan, most parents may expect each child's music learning to be different according to the child's gender. It is necessary to provide a well-rounded education for every student regardless of gender. Therefore, parents should be encouraged to offer equal learning opportunities for each child.

Recommendations for Future Research

The last division of MAP, Musical Sensitivity, was not used in this study. There is a need in the future to research the use of this division with Taiwanese students. Although the Taiwanese population is more homogeneous than that of America, a sample would be more representative if participants were stratified and randomly chosen from schools in all of Taiwan.

New MAP norms for the Taiwanese population should be established, because there are significant differences between Taiwanese and American

students on their performances on MAP. Taiwanese students taking MAP could be compared to other students in Taiwan more objectively if using new norms. Again, this could require a more complete and random sampling of the Taiwanese population.

There are significant differences on MAP scores between Taiwanese students and American students, but it is not known if there is a difference in students' music achievement between these two groups. The comparison of the aptitude and achievement of these two groups would provide information about the effectiveness of the musical environments in these countries. This information would be helpful to further investigate the music education systems in different cultures.

Gender differences in MAP scores were found in this research. Due to the limited number of subjects in this study, it is still uncertain that the differences exist among the Taiwanese population as a whole. Therefore, further research with more representative samples of the population should focus on the study of gender differences on MAP scores in Taiwan.

In conclusion, this was an initial study using MAP with the Taiwanese population. It may encourage researchers to continue this field of study. Further studies in Taiwan are needed to provide more complete, comprehensive, and conclusive information about the use of MAP in Taiwan.

APPENDIX A

MAY 8 1996

Oral Presentation of Consent Procedures

Where: The selected music classes at the public schools in Taiwan

When: Before any measurement or questionnaire applied

To whom: Music Teachers and Students

Content of the Oral Presentation:

The purpose of this study is to: 1) collect students' scores on the music aptitude test, "Musical Aptitude Profile", 2) investigate students' home environment, learning attitude, and 3) investigate the role of the parents and teachers in students' music learning.

The time required for each student will be about 40 min. for the music aptitude test, and 15 min. for the questionnaire. The music aptitude test will be applied in the group setting, and administered by the researcher. The questionnaire will be completed by each subject individually at their own time.

All of you (students, teachers, and parents) volunteer will freely consent to participate. You may choose not to participate at all, may refuse to participate in certain procedures or answer certain questions, or may discontinue the test at any time without penalty or loss of benefits. You may indicate your voluntary agreement to participate by completing and returning this questionnaire.

All results will be treated with strict confidence, and you will remain anonymous in any report of research findings. On request and within these restrictions results may be made available to you.

UCRIHS APPROVAL FOR
THIS project EXPIRES:

MAY 21 1997

SUBMIT RENEWAL APPLICATION
ONE MONTH PRIOR TO
ABOVE DATE TO CONTINUE

APPENDIX B

MUSICAL APTITUDE PROFILE



GIA Publications, Inc.

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Your scores on the MUSICAL APTITUDE-
PROFILE will provide information that
will help you and your teacher.

This is a listening test. Musical selections
are on a recording. Your answers will be
marked on this answer sheet.

Wait quietly for directions.

[曲調]

姓名:

學校:

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地区:

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第一計分

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	1B 〇 〇 〇	6B 〇 〇 〇	11B 〇 〇 〇	16B 〇 〇 〇	
範例	2A 相同 ?	7A 相同 ?	12A 相同 ?	17A 相同 ?	
1 〇 〇 〇	2B 〇 〇 〇	7B 〇 〇 〇	12B 〇 〇 〇	17B 〇 〇 〇	
2 〇 〇 〇	3A 相同 ?	8A 相同 ?	13A 相同 ?	18A 相同 ?	
3 〇 〇 〇	3B 〇 〇 〇	8B 〇 〇 〇	13B 〇 〇 〇	18B 〇 〇 〇	
	4A 相同 ?	9A 相同 ?	14A 相同 ?	19A 相同 ?	
	4B 〇 〇 〇	9B 〇 〇 〇	14B 〇 〇 〇	19B 〇 〇 〇	
	5A 相同 ?	10A 相同 ?	15A 相同 ?	20A 相同 ?	
	5B 〇 〇 〇	10B 〇 〇 〇	15B 〇 〇 〇	20B 〇 〇 〇	
第二分	田此作答:	11A 相同 ?	16A 相同 ?		
指統	1B 〇 〇 〇	6B 〇 〇 〇	11B 〇 〇 〇	16B 〇 〇 〇	
範例	2A 相同 ?	7A 相同 ?	12A 相同 ?	17A 相同 ?	
1 〇 〇 〇	2B 〇 〇 〇	7B 〇 〇 〇	12B 〇 〇 〇	17B 〇 〇 〇	
2 〇 〇 〇	3A 相同 ?	8A 相同 ?	13A 相同 ?	18A 相同 ?	
3 〇 〇 〇	3B 〇 〇 〇	8B 〇 〇 〇	13B 〇 〇 〇	18B 〇 〇 〇	
	4A 相同 ?	9A 相同 ?	14A 相同 ?	19A 相同 ?	
	4B 〇 〇 〇	9B 〇 〇 〇	14B 〇 〇 〇	19B 〇 〇 〇	
	5A 相同 ?	10A 相同 ?	15A 相同 ?	20A 相同 ?	
	5B 〇 〇 〇	10B 〇 〇 〇	15B 〇 〇 〇	20B 〇 〇 〇	

APPENDIX C

Questionnaire (for Students)

Name_____ Student ID _____ Age_____
Gender_____ School_____ Grade/Class_____

Please circle a response for the following questions, or fill the answer in the blanks:

I. Family Members

1. Do you always live with your parents? _____
If not, when do or did you live with your parents? _____
2. Do you have any siblings? _____
If Yes, how many brothers do you have? _____
how many sisters do you have? _____
3. Do you always live with your siblings? _____
If not, when do or did you live with your siblings? _____
4. Do you have TV at home? _____
5. Do you have radio at home? _____
6. Do you have Karaoke at home? _____

II. Musical Background of Family Members

(please answer the questions based on the previous or present situation)

1. How many days do your parents listen to music at home per week?
5-7 days 2-4 days Less than 2 days Never
2. How many days do your parents play any musical instrument at home per week?
(such as harmonica, guitar, recorder, piano.....etc.)
5-7 days 2-4 days Less than 2 days Never

3. How many days do your parents sing or whistle some music at home per week?
5-7 days 2-4 days Less than 2 days Never
4. How much time do your spend parents participating in musical activities per week? (such as choir, band, concerts..... etc.)
At Least 5 hrs 2-4 hrs Less than 2 hrs. Never
5. How often do your parents sing with you?
At least once a month Once a year Once in many years Never
6. How much time do your parents sing with Karaoke per week?
At Least 5 hrs 2-4 hrs Less than 2 hrs. Never
7. How many music records/tapes/CD do your parents have?
More than 20 items 10-20 items Less than 10 items None
8. How many days do your siblings play or practice a musical instrument per week?
5-7 days 2-4 days Less than 2 days Never
9. How often do your siblings sing or practice music with you?
At least once a month Once a year Once in many years Never
10. How many music records/tapes/CD do your siblings have?
More than 20 items 10-20 items Less than 10 items None

III. Your Music Background

1. How many days do you sing at home per week?
5-7 days 2-4 days Less than 2 days Never
2. How many days do you watch music programs on TV per week?
5-7 days 2-4 days Less than 2 days Never
3. How many days do you listen to music programs on radio per week?
5-7 days 2-4 days Less than 2 days Never

4. How many music records/tapes/CD do you have?

More than 20 items

10-20 items

Less than 10 items None

5. In addition to the music classes in school, how many private music lessons have you had?

More than 3 lessons

3-2 lessons

1 lesson

None

When (at what ages) did you have these private music lessons? _____

What type/ subjects of music lessons have you had? _____

6. How many days do you play or practice a musical instrument per week? (such as harmonica, guitar, recorder, piano, violin, trumpet....etc.)

5-7 days

2-4 days

Less than 2 days

Never

7. How often do you attend music activities? (such as choir, band, concerts, music competitions...etc.)

At least once a month

Once a year

Once in many years

Never

8. How much time do you spend singing with Karaoke per week?

At Least 5 hrs

2-4 hrs

Less than 2 hrs.

Never

IV. Parents' Attitudes toward Your Music Learning

1. How often do your parents talk about music to you?

At least once a month

Once a year

Once in many years

Never

2. How often do your parents ask about your progress in music learning?

At least once a month

Once a year

Once in many years

Never

3. How often do your parents listen to your music practice?

At least once a month

Once a year

Once in many years

Never

4. How often do your parents encourage you to learn or practice music?

At least once a month

Once a year

Once in many years

Never

5. How often do your parents take you to concerts or other musical activities?

At least once a month

Once a year

Once in many years

Never

6. How many music records/tapes/CD did your parents provide you?
 More than 20 items 10-20 items Less than 10 items None
7. How many musical instruments or toys have your parents provided for you?
 More than 5 items 3-5 items 1 or 2 items Never
8. How many music books/scores have your parents purchased for you?
 More than 8 items 4-8 items 1-3 items Never
9. How much do you think your parents encourage you to learn music?
 Very much Average A little Not at all

V. Your and Music

1. How do you rate your overall music ability?
 Superior Good Average Poor
2. How do you rate your singing ability?
 Superior Good Average Poor
3. When you are listening music or singing, how well do you think you can distinguish slow-fast, and follow the tempo of the music?
 Superior Good Average Poor
4. How much do you like your music class now?
 Very much Average A little Not at all
5. Compared with your classmates, you think your music ability is.....
 Superior Good Average Poor
6. Do you think that you can pursue music as your future career?
 Certain Possible Probably Not Not Possible
7. How much do you like to create/compose your own music?
 Very much Average A little Not at all

8. How much do you want to learn music after graduation?

Very much Average A little Not at all

9. How much do you like to attend concerts?

Very much Average A little Not at all

10. How much do you want to learn to play a musical instrument?

Very much Average A little Not at all

11. How much do you like music?

Very much Average A little Not at all

12. When you are listening to music or singing, how well can you identify the contour of the music?

Superior Good Average Poor

13. How much do you like to listen to music?

Very much Average A little Not at all

14. Do you agree that the school should have more music classes?

Very much Average A little Not at all

問卷調查（學生的部份）

姓名：

性別：

學校：

班級：

座號（或學號）：

◎ 在以下的題目中，請在方格內打勾，選出最適當的答案，或是在填空處，寫下你的答案。

一、家庭成員與環境：

1. 你是否一直和你的父母住在一起？

☐① 是

☐② 否，你在幾歲時，或者是在什麼時候，才同你的父親或母親住在一起？_____

2. 你是否有其他兄弟姐妹？_____

如果有其他兄弟姐妹，你有幾個姐妹？_____個

你有幾個兄弟？_____個

你一直和他們住在一起嗎？ ☐① 是 ☐② 否

若不是一直住在一起，你何時和他們住在一起？_____

3. 你家裏是否有電視？ ☐① 有 ☐② 沒有

4. 你家裏是否有收音機？ ☐① 有 ☐② 沒有

5. 你家裏是否有錄音機，或是 CD 唱盤？ ☐① 有 ☐② 沒有

6. 你家裏是否有卡拉 OK？ ☐① 有 ☐② 沒有

二、家人的音樂活動與背景：

◎ 以下的問題，你可以依照以前，或現在的情況來回答。

1. 一星期中，你父親或母親通常有多少天會在家聽聽音樂？

☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有

2. 一星期中，通常你父親或母親有多少天會在家裡，練習或是彈奏一點樂器？

（例如：口琴、吉他、直笛、鋼琴...等等）

☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有

3. 一星期中，通常你父親或母親有多少天會在家裡，哼哼唱唱歌或吹吹口哨？

☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有

4. 一星期中，通常你父親或母親會花多久的時間，參加有關音樂的活動（例如：合唱、樂隊、音樂會...等等）？

☐① 超過 5 小時 ☐② 2-4 小時 ☐③ 少於 2 小時 ☐④ 從不參加

5. 通常你的父親或母親，每隔多久會教你，或和你一同哼哼唱唱歌？

☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有

6. 通常一星期中，你父親或母親花多少時間唱卡拉 OK？

☐① 超過 5 小時 ☐② 2-4 小時 ☐③ 少於 2 小時 ☐④ 從不參加

7. 你的父親或母親，大約有多少片錄音帶、CD 或唱片？

☐① 多於 20 片 ☐② 10-20 片 ☐③ 少於 10 片 ☐④ 一片也沒有

8. 如果你有兄弟姐妹的話，一星期中你的兄弟姐妹會有多少天，練習或彈奏任何樂器？

☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有

9. 通常每隔多久，你的兄弟姐妹會與你一同唱歌，或練習其它音樂？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
10. 你的兄弟姐妹，大約有多少片錄音帶、CD 或唱片？
☐① 多於 20 片 ☐② 10-20 片 ☐③ 少於 10 片 ☐④ 一個也沒有

三、你的音樂活動與背景：

1. 一星期中，有多少天，你會哼哼唱唱歌或吹吹口哨？
☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有
2. 一星期中，有多少天，你會收看與音樂有關的電視節目？
☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有
3. 一星期中，通常有多少天，你會收聽收音機中的音樂頻道？
☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有
4. 你自己大約有多少片唱片、CD 或唱片？
☐① 多於 20 片 ☐② 10-20 片 ☐③ 少於 10 片 ☐④ 一片也沒有
5. 除了學校的音樂課之外，你在課堂外，有學過多少門與音樂有關的課？
☐① 多於 3 門 ☐② 2-3 門 ☐③ 1 門 ☐④ 從來沒有
 你在幾歲時有額外學音樂？
 你學的是那些方面的課？
6. 你通常一星期中，有多少天會演奏或練習樂器（例如：口琴、吉他、直笛、鋼琴... 等等）？
☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從不練習
7. 你多久會參加有關音樂的活動（例如：合唱、樂隊、音樂會、音樂比賽... 等等）？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
8. 通常一星期中，你花多少的時間唱卡拉 OK？
☐① 多於 5 小時 ☐② 2-4 小時 ☐③ 少於 2 小時 ☐④ 從來沒有

四、你父母對你學習音樂的態度：

1. 你的父親或母親，每隔多久會和你談有關音樂方面的事？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
2. 你的父親或母親，每隔多久會問你在音樂上的進步？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
3. 你的父親或母親，每隔多久會聽你練習音樂？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
4. 你的父親或母親，通常多久會鼓勵你練習，或學習音樂？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
5. 每隔多久，你的父親或母親會帶你參加，有關音樂的活動或音樂會？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
6. 你的父親或母親，曾經買多少唱片、錄音帶或 CD 給你？
☐① 多於 20 片 ☐② 10-20 片 ☐③ 少於 10 片 ☐④ 一片也沒有

7. 你的父親或母親，曾經買了多少，會發出音樂或有關樂器的玩具給你？
☐① 多於5個 ☐② 3-5個 ☐③ 1-2個 ☐④ 從來沒有
8. 你的父親或母親，曾經買了多少，有關音樂的書或譜給你？
☐① 多於8本 ☐② 4-8本 ☐③ 1-3本 ☐④ 從來沒有
9. 你覺得你的父親或母親在你音樂方面的學習是：
☐① 非常鼓勵 ☐② 普通支持 ☐③ 很少關心 ☐④ 一點也不支持

五、你與音樂：

1. 你覺得你在音樂方面的能力是：
☐① 非常好 ☐② 好 ☐③ 不好 ☐④ 很不好
2. 你覺得你唱歌唱得：
☐① 非常好 ☐② 好 ☐③ 不好 ☐④ 很不好
3. 在你聽音樂或唱歌時，你覺得你對音樂的快慢或速度可以分辨得：
☐① 非常好 ☐② 好 ☐③ 不好 ☐④ 很不好
4. 你對現在的音樂課是：
☐① 很喜歡 ☐② 普通喜歡 ☐③ 有點喜歡 ☐④ 一點也不喜歡
5. 和你的同學比起來，你覺得你的音樂能力是：
☐① 非常好 ☐② 好 ☐③ 不好 ☐④ 很不好
6. 你覺得音樂有沒有可能，成為你未來的工作？
☐① 很有可能 ☐② 有可能 ☐③ 有一點點可能 ☐④ 根本不可能
7. 你喜不喜歡自己編寫音樂（例如：作新曲，改編舊曲...等等）？
☐① 很喜歡 ☐② 喜歡 ☐③ 不喜歡 ☐④ 很不喜歡
8. 你希望畢業以後，能繼續有機會學音樂嗎？
☐① 很希望 ☐② 希望 ☐③ 不太希望 ☐④ 很不希望
9. 你希望能有機會，去聽音樂會嗎？
☐① 很希望 ☐② 希望 ☐③ 不太希望 ☐④ 很不希望
10. 你希望有機會，能學樂器嗎？
☐① 很希望 ☐② 希望 ☐③ 不太希望 ☐④ 很不希望
11. 你喜歡音樂嗎？
☐① 很喜歡 ☐② 喜歡 ☐③ 不喜歡 ☐④ 很不喜歡
12. 在你聽音樂或唱歌時，你覺得你對音的高低可以分辨得：
☐① 非常好 ☐② 好 ☐③ 不好 ☐④ 很不好
13. 你喜歡聽音樂嗎？
☐① 很喜歡 ☐② 喜歡 ☐③ 不喜歡 ☐④ 很不喜歡
14. 你贊成學校應該有更多堂的音樂課嗎？
☐① 很贊成 ☐② 贊成 ☐③ 不贊成 ☐④ 很不贊成

APPENDIX D

Questionnaire (for Parents)

Name of your child: _____

School _____

Grade/Class: _____

Your child's student ID: _____

Please circle a response for the following questions, or fill the answer in the blanks:

I. Family Members

1. Do you always live with your child? _____

If not, when do or did you live with your child? _____

2. Does your child have any siblings? _____

If Yes, how many brothers does he/she have? _____

how many sisters does he/she have? _____

3. Does your child always live with his/her siblings? _____

If not, when does or did your child live with the siblings? _____

4. Do you have TV at home? _____

5. Do you have radio at home? _____

6. Do you have Karaoke at home? _____

II. Musical Background of Family Members

(please answer the questions based on the previous or present situation)

1. How many days do you or your spouse listen to music at home per week?

5-7 days

2-4 days

Less than 2 days

Never

2. How many days do you or your spouse play musical instruments at home per week? (such as harmonica, guitar, recorder, piano.....etc.)

5-7 days

2-4 days

Less than 2 days

Never

3. How many days do you or your spouse sing or whistle music at home per week?
5-7 days 2-4 days Less than 2 days Never
4. How much time do you or your spouse spend participating in musical activities per week?
(such as choir, band, concerts..... etc.)
At least 5 hrs 2-4 hrs Less than 2 hrs. Never
5. How often do you or your spouse teach your child to sing or sing with you?
At least once a month Once a year Once in many years Never
6. How much time do you or your spouse sing with Karaoke per week?
At least 5 hrs 2-4 hrs Less than 2 hrs. Never
7. How many music records/tapes/CD do you or your spouse have?
More than 20 items 10-20 items Less than 10 items None
8. How many days do your child's siblings play or practice a musical instrument per week?
5-7 days 2-4 days Less than 2 days Never
9. How often do your child's siblings sing or practice music with your child?
At least once a month Once a year Once in many years Never
10. How many music records/tapes/CD do your child's siblings have?
More than 20 items 10-20 items Less than 10 items None

III. Your Child's Music Background

1. How often does your child sing at home per week?
5-7 days 2-4 days Less than 2 days Never
2. How often does your child watch music programs on TV per week?
5-7 days 2-4 days Less than 2 days Never
3. How often does your child listen to music programs on radio per week?
5-7 days 2-4 days Less than 2 days Never

4. How many music records/tapes/CD does your child have?

More than 20 items 10-20 items Less than 10 items None

5. In addition to music classes in school, how many private music lessons have your child had?

More than 3 lessons 3-2 lessons 1 lesson None

When (at what ages) did your child have private music lessons? _____

What type/subjects of music lessons have your child had? _____

6. How many days does your child play or practice any musical instrument per week? (such as harmonica, guitar, recorder, piano, violin, trumpet....etc.)

5-7 days 2-4 days Less than 2 days Never

7. How often do your child attend musical activities? (such as choir, band, concerts, music competitions...etc.)

At least once a month Once a year Once in many years Never

8. How much time does your child spend on singing with Karaoke per week?

At least 5 hrs 2-4 hrs Less than 2 hrs. Never

IV. Your Attitudes toward Your Child's Music Learning

1. How often do you or your spouse talk about music to your child?

At least once a month Once a year Once in many years Never

2. How often do you or your spouse ask your child about his/her progress in music learning?

At least once a month Once a year Once in many years Never

3. How often do you or your spouse listen to your child practice music?

At least once a month Once a year Once in many years Never

4. How often do you or your spouse encourage your child to learn or practice music?

At least once a month Once a year Once in many years Never

5. How often do you or your spouse take your child to concerts or other musical activities?

At least once a month Once a year Once in many years Never

6. How many music records/tapes/CD did you or your spouse provide your child?
More than 20 items 10-20 items Less than 10 items None
7. How many musical instruments or toys have you or your spouse provided for your child?
More than 5 items 3-5 items 1 or 2 items Never
8. How many music books/scores have you or your spouse purchased for your child?
More than 8 items 4-8 items 1-3 items Never
9. How much do you think you or your spouse encourage your child to learn music?
Very much Average A little Not at all

V. The Music Ability of Your Child

1. How do you rate your child's overall music ability?
Superior Good Average Poor
2. How do you rate your child's singing ability?
Superior Good Average Poor
3. Do you think that it is possible that your child can pursue music as his/her future career?
Certain Possible Probably Not Not Possible
4. Do you agree that the school should have more music classes for your child? You agree:
Very much Average A little Not at all

VI. Your Attitude toward Music

1. How much do you like to listen to music?
Very much Average A little Not at all
2. How much would you like to learn music some day?
Very much Average A little Not at all
3. How much would you like to attend a concert ?
Very much Average A little Not at all

4. How much would you want to learn to play a music instrument?

Very much	Average	A little	Not at all
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5. How much do you like music ?

Very much	Average	A little	Not at all
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問卷調查（家長的部份）

您的子女的姓名：

學校：

班級：

座號（或學號）：

◎ 在以下的題目中，請在方格內打勾，選出最適當的答案，或是在填空處，寫下您的答案。

一、家庭成員與環境：

1. 您是否一直和您的子女住在一起？

☐① 是

☐② 否，在您的子女幾歲時，或者是在什麼時候，您才同他住在一起？_____

2. 您的子女是否有其他兄弟姐妹？_____

如果他有其他兄弟姐妹，他有幾個姐妹？_____個

有幾個兄弟？_____個

他一直和其他兄弟姐妹住在一起嗎？ ☐① 是 ☐② 否

若不是一直住在一起，他何時和他們住在一起？_____

3. 您家裏是否有電視？ ☐① 有 ☐② 沒有

4. 您家裏是否有收音機？ ☐① 有 ☐② 沒有

5. 您家裏是否有錄音機，或是 CD 唱盤？ ☐① 有 ☐② 沒有

6. 您家裏是否有卡拉 OK？ ☐① 有 ☐② 沒有

二、家人的音樂活動與背景：

◎ 以下的問題，您可以依照以前，或現在的情況來回答。

1. 一星期中，您或您的配偶通常有多少天會在家聽聽音樂？

☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有

2. 一星期中，通常您或您的配偶有多少天，會在家裡練習，或是彈奏一點樂器，

（例如：口琴、吉他、直笛、鋼琴...等等）

☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有

3. 一星期中，通常您或您的配偶有多少天，會在家裡，哼哼唱唱歌或吹吹口哨？

☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有

4. 一星期中，通常您或您的配偶會花多少的時間，參加有關音樂的活動（例如：合唱、樂隊、音樂會...等等）？

☐① 超過 5 小時 ☐② 2-4 小時 ☐③ 少於 2 小時 ☐④ 從不參加

5. 通常您或您的配偶，每隔多久會教您的子女，或和他一同哼哼唱唱歌？

☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有

6. 通常一星期中，您或您的配偶花多少時間唱卡拉 OK？

☐① 超過 5 小時 ☐② 2-4 小時 ☐③ 少於 2 小時 ☐④ 從不參加

7. 您或您的配偶，大約有多少片錄音帶、CD 或唱片？

☐① 多於 20 片 ☐② 10-20 片 ☐③ 少於 10 片 ☐④ 一片也沒有

8. 如果您的子女有兄弟姐妹的話，一星期中，他其他的兄弟姐妹有多少天，會練習或彈奏任何樂器？

☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有

9. 通常每隔多久，您子女的其他兄弟姐妹，會與他一同唱歌，或練習其它音樂？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
10. 您子女的其他兄弟姐妹，大約有多少片錄音帶、CD 或唱片？
☐① 多於 20 片 ☐② 10-20 片 ☐③ 少於 10 片 ☐④ 一個也沒有

三、您子女的音樂活動與背景：

- 一星期中，有多少天，您的子女會哼唱唱歌或吹吹口哨？
☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有
- 一星期中，有多少天，您的子女會收看與音樂有關的電視節目？
☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有
- 一星期中，通常有多少天，您的子女會收聽收音機中的音樂頻道？
☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從來沒有
- 您的子女大約有多少片唱片或 CD？
☐① 多於 20 片 ☐② 10-20 片 ☐③ 少於 10 片 ☐④ 一片也沒有
- 除了學校的音樂課之外，您的子女在課堂外，有學過多少門與音樂有關的課？
☐① 多於 3 門 ☐② 2-3 門 ☐③ 1 門 ☐④ 從來沒有
 他在幾歲時有額外學音樂？_____
 他學的是那些方面的課？_____
- 您的子女通常一星期中，演奏或練習多少天的樂器（例如：口琴、吉他、直笛、鋼琴... 等等）？
☐① 5-7 天 ☐② 2-4 天 ☐③ 少於 2 天 ☐④ 從不練習
- 您的子女多久會參加有關音樂的活動（例如：合唱、樂隊、音樂會、音樂比賽 ... 等等）？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
- 通常一星期中，您的子女花多少的時間唱卡拉 OK？
☐① 多於 5 小時 ☐② 2-4 小時 ☐③ 少於 2 小時 ☐④ 從來沒有

四、您對您的子女學習音樂的態度：

- 您或您的配偶，每隔多久會和您的子女談有關音樂方面的事？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
- 您或您的配偶，每隔多久會問您的子女在音樂上的進步？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
- 您或您的配偶，每隔多久會聽您的子女練習音樂？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
- 您或您的配偶，通常多久會鼓勵您的子女練習，或學習音樂？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
- 每隔多久，您或您的配偶會帶您的子女參加，有關音樂的活動或音樂會？
☐① 至少一個月一次 ☐② 一年一次 ☐③ 很多年才一次 ☐④ 從來沒有
- 您或您的配偶，曾經買多少唱片、錄音帶或 CD 給您的子女？
☐① 多於 20 片 ☐② 10-20 片 ☐③ 少於 10 片 ☐④ 一片也沒有

7. 您或您的配偶，曾經買了多少，會發出音樂或有關樂器的玩具給您的子女？
☐① 多於 5 個 ☐② 3-5 個 ☐③ 1-2 個 ☐④ 從來沒有
8. 您或您的配偶，曾經買了多少，有關音樂的書或譜給您的子女？
☐① 多於 8 本 ☐② 4-8 本 ☐③ 1-3 本 ☐④ 從來沒有
9. 您或您的配偶對您的子女音樂方面的學習是：
☐① 非常鼓勵 ☐② 普通支持 ☐③ 很少關心 ☐④ 一點也不支持

五、您的子女與音樂：

1. 您覺得您的子女在音樂方面的能力是：
☐① 非常好 ☐② 好 ☐③ 不好 ☐④ 很不好
2. 您覺得您的子女唱歌唱得：
☐① 非常好 ☐② 好 ☐③ 不好 ☐④ 很不好
3. 您覺得音樂有沒有可能，成為您的子女未來的工作？
☐① 很有可能 ☐② 有可能 ☐③ 有一點點可能 ☐④ 根本不可能
4. 您贊成學校應該有更多堂的音樂課嗎？
☐① 很贊成 ☐② 贊成 ☐③ 不贊成 ☐④ 很不贊成

六、您與音樂：

1. 您喜歡聽音樂嗎？
☐① 很喜歡 ☐② 喜歡 ☐③ 不喜歡 ☐④ 很不喜歡
2. 您希望有機會能學音樂嗎？
☐① 很希望 ☐② 希望 ☐③ 不太希望 ☐④ 很不希望
3. 您希望有機會，去聽音樂會嗎？
☐① 很希望 ☐② 希望 ☐③ 不太希望 ☐④ 很不希望
4. 您希望有機會，能學樂器嗎？
☐① 很希望 ☐② 希望 ☐③ 不太希望 ☐④ 很不希望
5. 您喜歡音樂嗎？
☐① 很喜歡 ☐② 喜歡 ☐③ 不喜歡 ☐④ 很不喜歡

APPENDIX E

Questionnaire (Teachers' evaluation on each student)

Student's Name: _____ Student's Gender _____

School: _____ Grade/Class _____

Student's ID: _____

1. What is the final grade you are going to give this student at the end of this semester?

2. This student's overall music ability is:

Superior Good Average Poor

3. This student's ability on pitch perception is:

Superior Good Average Poor

4. This student's rhythmic ability is:

Superior Good Average Poor

5. How possible do you think this student can pursue music as his/her future career?

Certain Possible Probably Not Not Possible

問卷調查（老師的部份）

學生的姓名：

學生的性別：

學校：

班級：

座號：

1. 您這學期評給這位學生的音樂成績是_____分
2. 您覺得這位學生總括的音樂能力是：
☐① 很好 ☐② 好 ☐③ 不太好 ☐④ 不好
3. 您覺得這位學生在音準方面：
☐① 很好 ☐② 好 ☐③ 不太好 ☐④ 不好
4. 您覺得這位學生在節奏方面：
☐① 很好 ☐② 好 ☐③ 不太好 ☐④ 不好
5. 您覺得將來這位學生，有可能有足夠的能力以音樂為職業嗎？
☐① 很有可能 ☐② 有可能 ☐③ 有點可能 ☐④ 不可能

REFERENCES

References

- Austin, J. R. (1988). The effect of music contest format on self-concept, motivation, achievement, and attitude of elementary band students. *Journal of Research in Music Education*, 36, 95-107.
- Beinstock, S. F. (1942). A predictive study of musical achievement. *Journal of Genetic Psychology*, 61, 136-45.
- Bently, A. (1966). *Measures of musical ability*. London: George G. Harrop and Company.
- Boyle, J. D., & Radocy R. E. (1987). *Measurement and evaluation of musical experiences*. (Rev. ed.). New York: Shirmer Books.
- Brand, M. (1982). Relationship between musical environment and musical aptitude among sixth grade children. *Bulletin of Research in Music Education*, 13, 13-19.
- Brand, M. (1985). Development and validation of the home musical environmental scale for use at the early elementary level. *Psychology of Music*, 13 (1), 40-48.
- Brand, M. (1986). Relationship between home musical environment and selected musical attributes of second grade children. *Journal of Research in Music Education*, 34 (2), 111-120.
- Buros, O. K. (1972). (Ed.). *The seventh mental measurements yearbook*. Highland Park, New Jersey: The Gryphon Press.
- Buros, O. K. (1974). (Ed.). *Tests in print II: an index to tests, test reviews, and the literature on specific tests*. NJ: The Gryphon Press.
- Chandler, T., Chiarella, D., & Auria. C. (1986). Performance expectancy, success, satisfaction, and attributions as variables in band challenges. *Journal of Research in Music Education*, 35, 249-158.

- Davis, A. (1941). American status systems and the socialization of the child. *American Sociological Review*, 6, 345-354.
- Doxey, C., & Wright, C. (1990). An exploratory study of children's music ability. *Early Childhood Research Quarterly*, 5, 425-440.
- Drake, R. M. (1933). The validity and reliability of tests of musical talent. *Journal of Applied Psychology*, 17, 447-458.
- Drake, R. M. (1954). *Drake musical aptitude tests*. Chicago: Science Research Associates.
- Elliott, C. (1990). *Comment on music education*. In W. J. Moody (Ed.), *Artistic Intelligences: Implication for Education*. New York: Columbia University.
- Ferrell, J.W. (1961). *A validity investigation of the Drake musical aptitude tests*. Unpublished doctoral dissertation, State University of Iowa.
- Fisher, C. F. (1995). *Authentic assessment: A guide to implementation*. Thousand Oaks, CA: Corwin Press.
- Gardner, H. (1983). *Frames of mind: The theory of multiple intelligence*. New York: Basic Books.
- Gardner, H. (1990). *Multiple intelligences: implications for art and creativity*. In W. J. Moody (Ed.), *Artistic Intelligences: Implication for Education*. New York: Columbia University.
- Gaston, T. (1942). *Test of musicality*. Kansas: Lawrence: Odell's Instrumental Service.
- George, W. E. (1980). *Measurement and evaluation of musical behaviors*. In D. A. Hodge (Ed.), *Handbook of Music Psychology*. Kansas: National Association for Music Therapy.

- Gordon, E. E. (1961). A study to determine the effects of training and practice on Drake Musical Aptitude Test Scores, *Journal of Research in Music Education*, 9, 63-74.
- Gordon, E. E. (1967a). A comparison of the performance of culturally disadvantaged students with that of culturally heterogeneous students on the Musical Aptitude Profile. *Psychology in the School*, 15, 260-268.
- Gordon, E. E. (1967b). A three-year study of the musical aptitude profile. *Studies in the Psychology of Music*, 5. Iowa: University of Iowa Press.
- Gordon, E. E. (1971). *The psychology of music teaching*. New Jersey: Prentice-Hall.
- Gordon, E. E. (1987). *The nature, description, measurement, and evaluation of music aptitudes*. Chicago: G.I.A.
- Gordon, E. E. (1990). *A music learning theory for newborn and young children*. Chicago: G.I.A.
- Gordon, E. E.. (1995). *Musical aptitude profile: Test manual*. (Rev. ed.). Chicago: G.I.A.
- Gordon, E. E.. (1997). *Music education: The forgotten past, troubled present, and unknown future*. PA: GIML.
- Hart, D. (1994). *Authentic assessment: a handbook for educators*. Menlo Park, CA: Addison-Wesley Publication.
- Hedden, S. K. (1982). Prediction of music achievement in the elementary school. *Journal of Research in Music Education*, 30, 61-68.
- Hoffer, C. R. (1990). *Artistic intelligences and music education*. In W. J. Moody (Ed.), *Artistic Intelligences: Implication for Education*. New York: Columbia University.

- Holmes, J. (1954). Increased reliabilities, new keys and norms for a modified Kwalwasser-Dykema test of musical aptitudes. *Jornal of Genetic Psychology*, 85, 65-73.
- Jung, K. H. (1990). *The relationship between music aptitude and intelligence for Korean students*. Unpublished master's thesis, Temple University, Philadelphia.
- Jung, K. H. (1992). *A two year predictive validity study of the musical aptitude profile for use in Korea*. Unpublished doctoral dissertation, Temple University, Philadelphia.
- Kehrberg, D. A. (1982). *An investigation of the relationships between musical aptitude, general music achievement, attitude toward music, school music participation, school music achievement, and students' outside-of-community*. Unpublished doctoral dissertation, University of Illinois, Urbana-Champaign.
- Kramer, J. J., & Conoley, J. C (1992). (Ed.). *The eleventh mental measurements yearbook*. Lincoln, Nebraska: The Buros Institute of Mental Measurements, University of Nebraska-Lincoln.
- Kwalwasser, J. & Dykema, P. (1930). *Kwalwasser-Dykema music tests*. Carl Fischer Inc.
- Lehman, P. R. (1968). *Tests and measurements in music*. New Jersey: Prentice-Hall.
- Lenz, S. (1978). *A case study of the musical abilities of three- and four- year-old children*. Unpublished doctoral dissertation, University of Illinois.
- Lundin, R. W. (1949). The development and validation of a set of musical ability tests. *Psychological Monographs*, 63 (305), 1-20.
- Lundin, R. W. (1953). *An objective psychology of music*. New York; The Ronald Press.

- Merriam-Webster's Collegiate Dictionary* (9th ed.). (1991). Springfield, MA: Merriam-Webster.
- Mitchell, D. H. (1985). *The influences of preschool musical experiences on the development of tonal memory*. Unpublished doctoral dissertation, University of Southern California.
- Moody, W. J. (1990). *Summary and coda*. In W. J. Moody (Ed.), *Artistic Intelligences: Implication for Education*. New York: Columbia University.
- Moore, D. L. (1982). *Musical environment: Its influence on the preschool child*. ERIC Document Reproduction Service No. ED226824.
- Mursell, J.L. (1947). *Psychological testing*, New York: Longmans, Green and Co.
- Pogonowski, L. M. (1985). Attitude assessment of upper elementary students in a process-oriented music curriculum. *Journal of Research in Music Education*, 33, 247-257.
- Rainbow, E. L. (1963). *A pilot study to investigate constructs of musical aptitude*. Unpublished doctoral dissertation, University of Iowa.
- Restak, R. M. (1979). The other difference between boys and girls. *Student Learning Styles: Diagnosing and Prescribing Program*. Reston Virginia: National Association of Secondary School Principals.
- Robinson, M. (1995). Alternative assessment techniques for teachers. *Music Educators Journal*, 81(5), 28-34.
- Rothe, P. N. (1991). *A survey of some of the theories that have developed in the field of music aptitude testing and research since 1940*. Unpublished doctoral dissertation, Harvard University.
- Schienfeld, A. (1956). *The new heredity and you*. London: Chatto and Windus.
- Schmitt, M. (1979). *Development and validation of a measure of self-esteem of music ability*. Unpublished doctoral dissertation, University of Illinois, Urbana.

- Schoenoff, A. W. (1972). *An investigation of American and German norms for the musical aptitude profile*. Unpublished doctoral dissertation, University of Iowa.
- Seashore, C. E. (1937). The psychology of music: Two types of attitude toward the evaluation of musical talent. *Music Educators Journal*, 24 (3), 25-26.
- Seashore, C. E. (1938). *Psychology of music*. New York: McGraw-Hill
- Seashore, C. E. (1960). *Measures of musical talents manual*. (Rev. Ed.). New York: The Psychological Corporation.
- Sell, V. H. (1976). *The musical aptitude of Finnish students: An investigative Study in comparative music education*. Unpublished doctoral dissertation, University of Wisconsin-Madison.
- Shelton, J. S. (1965). *The influence of home musical environment upon the musical response of first-grade children*. Unpublished doctoral dissertation, Peabody College for Teachers of Vanderbilt University.
- Shull, D. (1953). *A study of the influence of the musical environment in the home of the musicality of selected kindergarten children*. Unpublished master's thesis, Northwestern University.
- Suzuki, S. (1983). *Nurtured by love*. (W. Suzuki, Trans.). Smithtown, NY: Exposition Press.
- Svengalis, J. N. (1978). *Music attitude and the preadolescent male*. Unpublished doctoral dissertation, Unpublished doctoral dissertation, University of Iowa.
- Taggart, C. C. (1989). *The measurement and evaluation of music aptitudes and achievement*. In D. L. Walters & C.C. Taggart (Eds.), *Readings in Music Learning Theory*. Chicago: G.I.A.
- Taylor, E. M. (1941). A study of the prognosis of musical talent. *Journal of Experimental Education*, 10, 1-28.

- Vance, T. F. & Grandprey, M. (1931). Objective methods of ranking nursery school children on certain aspects of musical capacity. *Journal of Educational Psychology*, 22, 577-585.
- VanderArk, S., Nolin, W., & Newmann, I. (1980). The relationship between musical attitudes, self-esteem, social status, and grade level of elementary children. *Council for Research in Music Education*, 62, 31-41.
- Wermuth, R. F. (1971). *Relationship of musical aptitude to family and student activity in music, student interest in music, socioeconomic status, and intelligence among caucasian and negro middle school students*. Unpublished doctoral dissertation, Ohio State University, Columbus.
- Whitley, M. T. (1932). A comparison of the Seashore and K-D tests. *Teachers College Record*, 8, 731-751.
- William, E. W. (1971). *Measurement and evaluation in music*. (2nd ed.). Iowa: Wm. C. Brown.
- Wing, H. D. (1939). *Standardised tests of musical intelligence*. The Mere, Upton Park, England: National Foundation for Educational Research.
- Wing, H. (1948). *Tests of musical ability and appreciation*. Cambridge: Cambridge University Press.
- Wolf, D. (1987). Opening up assessment. *Educational Leadership*, 45 (4), 24-29.
- Young, W. T. (1971). The role of music aptitude, intelligence, and academic achievement in prediction the musical attainment of elementary instrumental students. *Journal of Research in Music Education*, 19, 385-398.
- Young, W. T. (1976). A longitudinal comparison of four music achievement and music aptitude tests. *Journal of Research in Music Education*, 24, 97-109.

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