UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

A COMPARATIVE STUDY OF THE MUSICAL CHARACTERISTICS OF CHILDREN AS OBSERVED IN THE SPONTANEOUS CHANT OF NATIVE AMERICAN AND ANGLO AMERICAN CHILDREN

A Dissertation

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

By

ERIC JON NICHOLS
Norman, Oklahoma
2003

UMI Number: 3078946

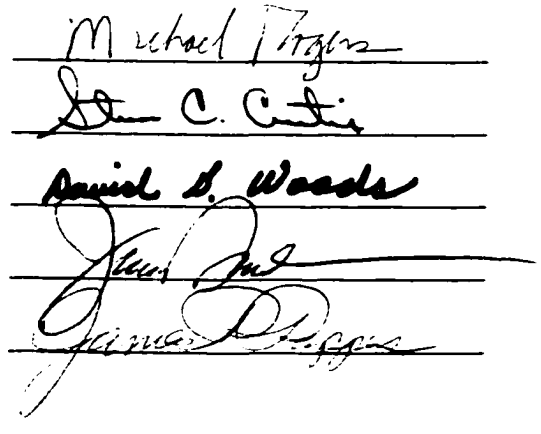
UMI Microform 3078946

ProQuest Information and Learning Company
300 North Zeeb Road
P.O. Box 1346
Ann Arbor, MI 48106-1346

A COMPARATIVE STUDY OF THE MUSICAL CHARACTERISTICS OF CHILDREN AS OBSERVED IN THE SPONTANEOUS CHANT OF NATIVE AMERICAN AND ANGLO AMERICAN CHILDREN

A Dissertation APPROVED FOR THE
SCHOOL OF MUSIC

BY



ACKNOWLEDGEMENTS

Among the many individuals who participated in, and contributed to the development and completion of this study, I especially wish to thank the following:

Dr. David G. Woods (committee co-chair), for his advice, guidance, and constant encouragement throughout this project.

Committee members, Dr. Michael Rogers (committee co-chair), Dr. Steven Curtis, Dr. James Faulconer, and Dr. James Pappas.

Dr. Robert Rhodes, for his advice, assistance with the Hopi Tribe, and identifying possible participants on the Hopi Reservation.

The parents who allowed their children to participate and the children who were subjects in the study.

Ted Masur and Kimberly Carballo, for transcribing the recorded spontaneous chants into musical notation.

Dr. Sara Stevens and Dr. Robert Tamborrino, for serving as judges as they reviewed the accuracy between the recordings and musical transcriptions.

Erick Carballo, for his assistance with some of the logistics in formatting the appendixes and for programming the musical notation into Finale.

Dr. Laura Plummer and Dr. Elizabeth Kurz, for reviewing and editing the final document.

My parents Charles W. and Ann Lee Nichols, for their prayers, support, and encouragement.

My wife, Tammy, and children Levi and Paige, for their love, understanding, and support in allowing me to see this project to completion.

TABLE OF CONTENTS

LIST OF FIGURES

ABSTRACT

During the past fifty years, researchers and scholars have studied the musical development of young children, identifying not only the musical characteristics of young children, but also the developmental stages of their musical growth. These studies have specifically defined what children can and cannot do at various ages of musical development. Methodologies and approaches to music teaching and learning based on this body of research have emerged and have permeated preschool and elementary school music curricula throughout the United States.

The Comparative Study of the Musical Characteristics as Observed in the Spontaneous Chant of Native American and Anglo American Children was designed to create a concise and definitive research environment that would provide optimum reliability and validity of the responses observed in the spontaneous chant of Native American and Anglo American children. Ten Native American subjects and 11 Anglo American subjects were randomly identified. Recordings were made of the spontaneous chants of 21 Native American and Anglo American children. The recordings were transcribed into musical notation and were reviewed by two independent judges for accuracy. A comparative analysis matrix instrument was used for comparing the spontaneous chant of Native American and Anglo American children. Metric frequencies, intervallic frequencies, pitch centers, intervallic directionality, and the frequency of rhythmic patterns were analyzed and compared using this matrix instrument. The analysis supports the hypothesis that significant differences can be identified in the spontaneous chant of children in the two distinct cultures.

This study concludes that there are significant differences in the musical characteristics and the musical responses of children in the two groups arbitrarily selected by the primary investigator. In the 17 recorded examples of the spontaneous chant of Native American children, the chants were most dominantly multimetric, the most frequently sung interval was the major second, and the most frequently sung pitch center was c#/db. The most frequently sung intervals were descending, and the most frequently sung rhythmic pattern was the double eighth-note pattern. In comparison, the recorded examples of the spontaneous chant of Anglo American children, duple meter was dominant; the most frequently sung interval was the minor third; and the most frequently sung pitch centers were b, bb, f#, e, and d. The most frequently sung intervals were descending; and the most frequently sung rhythmic pattern was the double eighth-note pattern. Significant differences were identified in meters, intervals, and pitch centers between the Native American and Anglo American cultures. The directionality of intervals and the frequency of rhythmic patterns were similar. However, some differences were identified in the lesser-sung rhythmic patterns.

The differences in the musical responses identified in the spontaneous chant of Native American and Anglo American children have clear implications for the development of music teaching materials, approaches, and environments.

A COMPARATIVE STUDY OF THE MUSICAL CHARACTERISTICS OF CHILDREN AS OBSERVED IN THE SPONTANEOUS CHANT OF NATIVE AMERICAN AND ANGLO AMERICAN CHILDREN

CHAPTER I

INTRODUCTION

Background

The early years of children are an important period of musical aptitude growth and development. Gordon (1990) states that what children learn during the first five years of life forms the foundation for all subsequent educational development, which traditionally begins when they enter kindergarten or first grade and receive formal instruction. Researchers, including, Andress, Hermann, Rinehart, and Talbert (1973) are concerned that educators are neglecting young children's intellectual growth at the most critical stage of their development – the years from age three to five.

From the moment children are born, they begin using their voices. Certain aspects of music are a natural part of the lives of young children (Andress, 1980; Harrison, 1983). Creating and producing sound is a pleasurable and natural activity for young children (Andress, 1973; Fredrickson, 1994).

Art has its inception in those activities in infancy and early childhood generally identified as play (Wendrich, 1980). Self-initiated activities of young children may be

described as the beginnings of music. Children explore many ways to manipulate sound, and they take great delight in their product. Much of the sound making of children includes "delightful" improvisations (Harrison, 1983). By utilizing a playful approach, they discover a variety of sounds that represent many of the elements of music (Andress, 1980). These playful experiences, thus, start children down the path toward song making. These early songs are spontaneous sound experiments (Fredrickson, 1994).

These playful activities lead to a more structured pedagogical environment. In the past, as a result of emphasizing selected aspects of Western European and American classical and folk music, American teachers have often led students to believe there was only one general musical system in the world, the Euro-American system (Anderson & Campbell, 1989). Navarro (1989) observes strong Austro-German influences in this system since the inception of public school music education in the United States in 1838 and suggests that these influences are still evident in current music teacher training curricula. Navarro further suggests that the profession should be much more sensitive to the changes in culture and should rethink the suitability of imposing Austro-Germanic values in a multicultural American society.

Curricular programs have received criticism, particularly on the reservations, as being ineffective for Native Americans (Gilliland, 1988; Reyhner, 1988). Rhodes (1994) believes that a curriculum should be designed to meet students' needs and that within the current use of standardized curricula and state textbook lists, there is little room for individual or cultural differences in students.

Rhodes (1994) states that some Native Americans, and some who teach Native Americans, are very reluctant to identify Native American or specific tribal "traits"

fearing that it will lead to stereotyping, categorizing, and labeling. These people insist the Native American students are "the same" as any other student. In some senses they are correct, but in other ways they are ignoring significant differences that could greatly influence the educational process.

Research indicates that Navajos, Hopis (and likely other tribes) are primarily holistic in their worldview and their perception of ideas (Rhodes, 1988, 1990; Wallis, 1984). This would support a holistic educational process that presents the physical and social elements of knowledge simultaneously. New ideas and the responsible use of those ideas should be linked. Rhodes (1994) observed that the learning styles of the students tested were quite different from the model of schooling that insists on scope and sequence, building each step of the learning process on full understanding of the previous step. Rather, students would be more comfortable with a model that allowed understanding of the end goals while developing the processes along the way.

Rhodes (1994) concludes that ethnic minorities, specifically Native Americans, have different genetic and cultural backgrounds that can, and should, allow for differences in approach. These culturally based differences exhibit themselves in the thinking and value processes used. These differences are present even for families that have been away from direct contact with the main elements of their culture for a generation or two. Rhodes believes that the studying, observing, and utilizing of differences and strengths to help give access to education and aid the educational process is appropriate.

Child song/chant can be identified in all cultures and societies (Moorehead & Pond, 1978) and can be seen as a genre of music (Bjorkvold, 1990; Campbell, 1991;

Nettl, 1983). When dealing with the vocal development of the very young child, music teachers have traditionally employed the technique of song making through imitation. Little consideration has been given to the child's own world of music, which is rich in improvisation and does not require a preset response (Andress, 1980). Of all age groups, young children are our most persistent music makers. They create more music, explore music more conscientiously, use music more consistently and spontaneously, and are more strongly motivated toward music than any other age group (McDonald, 1979). Studying child song/chant as music in culture means apprehending it as a part of the communication between a child and his/her environment (Bjorkvold, 1990). Singing models by adults and other agencies are included in the enculturation process in children – a lifelong process where human beings gradually learn their own culture (Merriam, 1964).

Song/chant as observed by Moorehead and Pond (1978) is ordered after its own manner, exists for its own purpose, and is subject to its own rules. Chant seems to appear under conditions of freedom and good environmental adjustment, when the life of the child is flowing freely and naturally into pursuits of his/her own choosing. Its emotion is not that which is "recollected in tranquility"; it is immediate and compelling. It is not deliberately constructed; it bursts forth, is repeated until some kind of climax is reached, and stops.

Moorehead and Pond (1978) state that chant is the most primitive music art-form and that it is individual and unique and can be found amongst children, and, indeed, amongst humans in general. In the studies of Moorehead and Pond concerning music and the young child, there appeared to be two varieties of chant. One variety is unfettered

and free rhythmically, like plainsong. The voice wanders over a large vocal compass, the singer sings to himself/herself alone, quietly, of everyday things, as though the melody, not the words, is important. Another variety is rhythmic, like a ritual chant. The voice is pitched around one note and weaves a melodic pattern limited in scope and insistent in form; it is sung most often in the group, usually loudly, repeated over and over again, rising often to a high emotional pitch. Moorehead and Pond define this type of sing-song vocal production as "chant."

Moorehead and Pond (1978) found that there are certain situations that set up the occurrence of chant. First, considering the very strong rhythmic character of all of the chants, it seems likely that the physical rhythmic activity involved is directly related to, if not a cause of, the rhythmic chant. Second, play of strongly social character, whether it is play with materials that set up a social conversation or the frequent occasions in all play that produces social intercourse by replacing the interest in the play is manifested in rhythmic chant. Dramatic play is developed into rhythmic chant in many cases.

Moorehead and Pond (1978) observed that there is a need for simple, meaningful, unfettered creativeness. To satisfy this need, individuals must have opportunities to create for themselves out of their own indigenous musical language, their own music, which is uniquely appropriate to their own society and culture and integral to it. This is the root from which all later musicality can grow and flourish.

Need for the Study

There are two significant aspects of this study. First, knowledge in the area of children's spontaneous chant is greatly lacking. Literature that discusses children's

spontaneous chant contains a very limited number of written musical examples of actual children's spontaneous chant. Additional chants as a result of this study have significantly contributed to the understanding of the complexities of young children's chant. By making an analysis of these additional spontaneous chants, music educators now have access to additional knowledge concerning the musical characteristics of young children and their music. Second, the discovery of significant differences in musical characteristics of the children from Native American and Anglo American cultures has direct implication for curriculum and program development. Currently, curricular planning focuses on a monolithic structure in preschool and kindergarten music that assumes that Native American and Anglo American cultures both sing, hear, and respond to the same basic elements of music. Recommendations are found in Chapter V regarding the results of this study.

Purpose

The purpose of this study was to collect and compare the spontaneous chant of children, ages three to five. The children involved in the study came from two different cultural backgrounds, Native American and Anglo American. A comparison of the chants was made to determine if there were differences or similarities of inherent musical characteristics of the children involved in the study, based upon culture.

The Study

The research formats of the study included the following stages for assembling and analyzing the data:

1. Small research groups of children, ages three to five, were randomly selected from the Native American and Anglo American cultures to serve as subjects in the study.

2. The appropriate institutions were contacted and permission was obtained to conduct the study (see Appendixes C, D, and E).

3. The *Informed Parental Consent* and *Demographic Data Forms* were developed and sent out in order to obtain consent from parents for their children to participate in the study and to obtain information about the subjects (see Appendix F).

4. Observation times were scheduled at the participating institutions and with the individual family units.

5. The spontaneous chant of children was recorded on audiocassette tape during observations by the principal investigator.

6. The chants that were recorded were transcribed by a professional music theorist into musical transcription and then programmed into Finale.

7. Two judges, recognized as experts in the field of music education, were selected to verify the accuracy of the chant transcriptions. The judges verified the transcriptions by listening to audio recordings of the chants as they compared them to the written transcriptions.

8. A taxonomy of musical characteristics, that are generally accepted by the music profession and by the cultures, was developed after the chants had been recorded and then transcribed into musical notation.

9. An analysis of the chants, using the taxonomies, was completed in order to identify metric frequencies, intervallic frequencies, pitch centers, intervallic directionality, and the frequency of rhythmic patterns that are used by the children.

10. Comparisons and observations were made regarding the chants, based upon accepted musical characteristics.

11. The similarities and differences of the chants collected from the Native American and Anglo American cultures were noted and the implications for curricular reform were recommended.

12. The null hypothesis was tested as a part of the procedure.

Definition of Terms

Anglo American. A person living in the United States who is of the white race and of European ancestry.

Child song/chant. Melodies and rhythms chanted or sung by children, usually exhibited during times of free play, also called "spontaneous chant."

Duple. A type of meter in music that has a multiple of two beats per measure.

Enactive. Having the power to enact or establish.

Enharmonic. Notes that are written differently, such as c# and db, but sound the same in the tempered scale.

Finale. A computer software program that is utilized to produce musical notation.

Iconic. Of, relating to, or having the character of an icon.

Matrix. A chart resembling a mathematical matrix especially in terms of its rectangular arrangement of elements into rows and columns.

Melograph. A form of musical notation that indicates contour as a melodic band which is represented on a graph, but which does not indicate discrete pitches.

Musical characteristics. Characteristic features based upon the basic elements of music, primarily dealing with melody and rhythm.

Multimetric. A type of meter in music in which a song consists of more than a single type of meter.

Native American. An American Indian of North American.

Pitch center. The pitch most frequently sung within a song or chant, as defined by Gordon: "A child in the tonal babble stage tends to favor one pitch in song and chant, although he will perform minute as well as extreme deviations from that pitch. Moreover, he is consistent in favoring the same pitch from day to day. The pitch that the child favors is not representative of a keyality or of a tonality. It is simply a pitch center" (Gordon, 1984, p. 24).

Spontaneous chant. Melodies and rhythms chanted or sung by children, usually exhibited during times of free play. The term is interchangeable with "Child song/chant."

Strophic. A song that uses the same music for successive stanzas.

Taxonomy. A classification system broken down into ordered groups or categories.

Triple. A type of meter in music that has a multiple of three beats per measure.

CHAPTER II

RELATED LITERATURE

Introduction

During the last half of the twentieth century, numerous studies have been conducted that produced significant results regarding the musical characteristics of children and the characteristics related to the child's chant. This review of literature will focus on nine major areas related to and supportive of this comparative study of the musical characteristics of children as observed in the spontaneous chant of Native American and Anglo American children. Recent literature regarding child's play, the child's chant, and children's composition will be reviewed. In addition, the musical characteristics of children, developmental influences on children, cultural influences, cultural characteristics, curriculum, and implications for research and teaching will also be reviewed. Although this review of related literature is specific to the chant of Native American and Anglo American children, it is comprehensive in its depth of study regarding the factors contributing to the young child's growth and development in the musical arts.

Researchers have found that play significantly influences various growth factors in the young child. Pertinent to this study is the concept of play as it relates to spontaneous chant and sing-song like compositions created by young children.

Play

Music education often begins in playgroups, preschools, informal settings, or at home, long before the young child commences formal schooling (Hoermann & Bridges, 1984).

> Young children are natural explorers. They can be encouraged to play with sound and to make sound. ... Since children do not separate the purpose of music from the medium itself, their interaction with music is play, and they are pleased to have music permeate many of their activities (Fox, Huffaker, Sims, & Tarnowski, 1994, p. 35).

One particular activity of play is movement. Play seems to be a very important factor involved in the initiation of the singing of songs, whether that play is because of a child's own body movement or the moving of a toy in a play situation. Fredrickson (1994) states that the singing of small children is strongly directed by environmental and play situations.

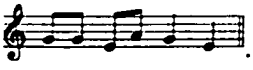
> As the child continues to grow and experiment with his voice, his sounds many times take on the form of singing. Usually, with some guidance, he will be able to reproduce sounds of animals, jets, machines, names of people, and the like. At this stage of the child's development, he is in almost constant motion and frequently will make sounds to accompany his play and motion. Very rarely are these beginnings of musical and bodily movement absent from the young child (Bayless & Ramsey, 1982, p. 5).

> The child's own body response to excitement, fear, and pain as contrasted with happiness and contentment result in the natural use of highs and lows. The child plays with sound, he changes the shape of his sound and pitch, he exaggerates. He may do this as he plays with words or when just making sounds. These sound plays are shaped into longer ideas in which he makes up patterns based upon his own ideas or other sounds that he has heard (Andress et al., 1973, p. 42).

> To carry on the parallel in musical development, it might be assumed that in order for pitched intoning to become music, it, too, must have the essentials of function and exchange. In music, the function would be found through satisfaction in the playful interaction with musical materials, analogous to word play and playful construction with sand, water, blocks and other physical

materials. The exchange would come from interaction with appreciative and musical adults (Wendrich, 1980, 173).

Chant

Agnes Moorhead and Donald Pond, in their landmark Pillsbury Foundation study of "Music and Young Children," 1938-1941, found that chant is the natural spontaneous self-expression of the young child. It is the process of chant that leads significantly to the development of a child's later musical expression. According to Shelley's research (1976), a child sings before he/she talks; he/she labels the sounds that are uttered during infancy as lulling. Observations of young children at play reveal a spontaneous, nonsensical sing-song like chant prevalent in child's play in many cultures. It is often claimed that all children sing a universal song: "ssmlsm",  . According to Davidson (1985a) the melodic structures that may have preceded this universal song are obscure, and very little is known about how the child makes the transition from this song to the songs of adults. Observation and research indicate that children make their own music through chant. They spontaneously improvise and create chants in their own world of music. At ages two to four, children start creating their own music, improvising songs to accompany their play, and doing on the spot accompaniment to dramas and stories they invent or hear (Fox et al., 1994). Zimmerman (1993) reported that children's spontaneous songs can indicate what rhythms and motives from the musical environment are salient for them and provide insight into emerging musical thought. The child uses language and song to reflect how he or she feels about the world. Thus egocentric songs about himself or herself, parents, pets, toys at home, color, and numbers become his or her way of knowing. These songs may be his or her own

improvisation or songs modeled by a mother, other children, television, or recordings (Andress et al., 1973).

Fredrickson (1994) cited that developmentally, several musical patterns were found among examples of spontaneous songs of children:

1) pattern song, where children repeat a single contour pattern without any tonal relation to the standard song
2) scheme song, in which children outline certain melodic/rhythmic figures
3) fragment song, where children arrange melodic/rhythmic contour patterns successively as parts of a large whole
4) preset song, in which children are able to make melodic/rhythmic variations in their spontaneous songs so that the result will be acceptable (p. 181-182)

> The complexity of the songs and chants become a matter of growth. The highness or lowness of individual words becomes the melodies of the child's song. The pleasurable repetition of individual sounds evolves into repeated patterns in the framework of the song. The joy of repeating the same song many times becomes a part of the growth process. The intensity of a cry of the softness of a coo eventually evolves into an expressive quality of the song. The eventual shape of his music will flow from the length of his breath, his need for a feeling for rest, and his language pattern (Andress et al., 1973).

Observation of chant reveals that most chant and song like patterns are fragmented. Fredrickson (1994) states that children process melodic features in fragments:

- Tonality is not stable between those fragments, but in some successive organized melodic contour patterns the relations between single notes stay the same.
- Deep structure processing can be one explanation for the phenomenon according to which children connect several different song patterns fragmentally in their variants in spontaneous singing.
- When the melodic scheme is activated as melodic contours, different melodies can be represented in children's minds at the same time.
- Children could process all the contour patterns in standard song except the closing form at the cadenza. Presumably, the feeling of tonal structure and form has not developed yet in infants (p. 181).

Observation of children in chant clearly shows that children often engage in chant while they are in groups and while they are at play. A few chants, especially those of a

few particular children, arose from individuals who were not socially engaged, but temporarily were unrelated to the group around them. The greatest number, however, were composed by individuals playing within the group, by the group itself, or as a sort of serial repartee by the group chanting successively as individuals (Moorhead & Pond, 1978).

Children's Composition

As an extension of the chant, children often combine fragments into a hierarchy that can be labeled as composition. In their early songs, children gradually begin to sing some melodic fragments of standard songs according to their own mental representations. Different melodic fragments are constructed in the child's mind as hierarchic schemes (Dowling, 1984).

Observations of children indicate that there is not a standard procedure for composition or for the combining of fragments into hierarchical schemes.

> There is no single process of composition; there are many. If you listen to sounds a child produces while composing on an instrument, you can hear a variety of compositional processes. Sometimes the sounds appear random without structure or focus. Sometimes a child will hit upon an idea, which may be a melodic pattern or a rhythm, and repeat it many times over. Sometimes a child will grab an idea, change it in some ways and then discard it. Sometime she is simply trying to figure out which combination of movements on an instrument will produce a particular sound or pattern. Sometimes a child will stare at the instrument as if silently rehearsing the sounds inwardly (Kratus, 1994, p. 130).

It is clear that children can arrange melodic fragments and information into more sophisticated compositional structures.

> Producing a song is an activity in which cognitive processes like assimilation, accommodation, and equilibration have an important role. Melodic – rhythmic schemes are tools for the children to arrange melodic information in the songs she/he is/has been listening to. Schemes are organized in mental

> representations that are constructed by former experiences of sound and their expectation in children (Fredrickson, 1994, p. 178).

The fragment combination and construction with children does not follow a set process.

> But in composing there are no points of reference, no commonalities, no models of correctness. Each sound a child makes while composing is the result of a unique decision. Every child makes different decisions while composing, resulting in different sound being produced. A single child makes different sounds when composing today as compared to yesterday, and even while composing a single piece, the sounds of the process change from second to second. The process of composition is, by its very nature, fluid and always changing (Kratus, 1994, p. 131).

Performance of chant is spontaneous and the performance of connected chant fragments is also spontaneous and improvisatory. The process of composition as something separated in time from the performance of the product is one of the primary distinctions between composition and improvisation (Kratus, 1994).

Kratus (1994) has developed an approach for describing compositional processes. The three main compositional processes are exploration, development, and repetition. Exploration is a searching process, development is a reworking process, and repetition is a testing and verifying process.

Musical Characteristics of Children

During the past 25 years, numerous studies have identified specific musical characteristics of the young child. These characteristics, as found in the literature, help define musical learning and teaching programs and assist in the understanding of musical growth and development.

The young child's use of his or her imagination in free response is explained by Almy (1961): "Not yet understanding which aspects of his environment are likely to remain constant and which will change momentarily, the young child lives, at least for the time, in a world of many possibilities. Thus, he is often much more inclined to experiment and try than is the older youngster." The young child's imagination is rich. His need to develop control over his body, himself, and his environment is enormous. Under conditions that recognize personal and social characteristics of the individual child, these unite to express themselves in highly creative ways. The music experience can capitalize on this natural propensity toward self-assertion and self-expression (Andress et al., 1973).

There is standard agreement among researchers that children have a limited range of d' - a'. Woods (1985, 1990, 1992, 1999) in his research, has identified five characteristics including the tonal range of the child. Children have general musical characteristics that come from their own worlds. These help us understand better the musical child:

1. The child naturally chants the descending minor third.
2. The tonal range of the young child is five tones, centering around f' or f#'.
3. The half step is somewhat difficult for young children to sing or even to play.
4. Children seem to sing descending intervals more easily than ascending intervals.
5. Duple meters are very natural for the young child. The child's world is in twos. It is duple.

Observed early behaviors of children squealing, crying, and laughing indicate that young voices have a wide range of pitch. When singing formally, however, girls and boys tend to stay within a limited range of d' - a' (Andress, 1980). Chang and Trehub (1977a, 1977b) determined that infants as young as 5 months can process melodic and rhythmic information.

As with research on chant, scholars have found that the voice in speech and in song is closely related. The uses of the voice in speech and in song were very closely alike and that much speech approached music both in rhythmic and in tonal patterns (Moorhead & Pond, 1978).

Melodic construction has been found to be holistic within the chant framework of young children. Trehub, Bull and Thorpe (1984) found that infants' perceptions of melodies are holistic or structural, with the global properties of contour and range perceived across transformation of specific properties such as interval size and absolute frequency.

Gordon, Gardner, and others have defined a babble stage of development which includes chants. Singing during the babble stage is essentially experimentation with vocal inflection and sing song chant. There is not a tonality or definite pitch to this exploratory singing (Burnsed, 1993).

The chants that have been researched by scholars in the fields of music education and musical learning are direct representations of the child's environment. The young child's intuition and imagery and his direct representations of his world through action and manipulation seem to be the very ingredients of aesthetic expression. Both the child and the artist find spontaneous excitement in the dynamic, or expressive qualities - the most powerful and immediate qualities of the percept (Rudolf, 1961). Kenney (1995) cites examples of children spontaneously creating music. Each of the children was doing what comes naturally to preschool children: they were expressing themselves musically. They were improvising!

Every person has the potential capacity to respond directly with enactive and iconic representations, independent of verbal symbols. Taylor (1964) suggests, however, that at its brightest and most responsive, the young child's capacity to respond to life has not been dulled or tarnished by a set of customarily imposed verbal symbols. Thus in the young child we find a natural poet, a natural musician, a person who is accustomed to responding to aesthetic values by his very nature.

Observations of children's chant indicate that children sing with a range of success.

> Some of the children sing with a pure, clear sound, having few overtones. Others carry the quality of the speaking voices into song. Some have wide ranges and sing accurately. Some sing close to the pitch, with occasional variations. Others seem to have limited ranges, perhaps of only four or five notes. Still others drone along seeming to be still speaking rather than singing (Harrison, 1983, p. 70).

At first, pre-school children fail to return to established pitches or reference points in their songs as they generate only the individual contours that form the specific child's repertory of melodic schemes (Davidson, 1988). In Werner's (1961) study of the spontaneous melodies of children ages 2 to 5, the melodies of the younger children had tones strung together in a global and diffuse manner while those of the older children were more differentiated and integrated into phrase-like structures.

When listening to music rather than chanting music, young children seem to focus their attention on one musical characteristic. There is evidence that 3- to 5-year-old children tend to "center" their attention when listening to music, that they are not successful when asked to respond to more than one musical characteristic simultaneously in listening and singing activities, and that instruction seems not to improve these responses (Hargreaves, 1986; Petzold, 1966, Sims, 1988, 1990, 1991; Young, 1982;

Zimmerman, 1986). The age at which decentration in response to music becomes a reasonable expectation for children is not known.

Chant responses have been studied by Davidson, Menins, McDonald and Simons. Between the ages of one year and five years and six months, the intervals that children control gradually widen, yielding tonal frames which they use as templates for both their performances of standard songs and their invention of novel songs (Davidson, 1985a). According to Menins (1994) the children's creative responses were linked to the vividness, consistency, and unselfconscious manner of the models given. As long as teachers sang, moved, played, and acted with the children, so did the children similarly respond as individuals. As long as the children were given the freedom to respond in different ways, they were surprisingly inventive.

During the Project Zero research, a model emerged suggesting that there are five specific levels of pitch development in young children's singing between the ages of one and six years. According to Davidson (1988) these levels characterize children's structural knowledge as expressed through *contour schemes*: a third, fourth, fifth, sixth, and then later an octave. McDonald and Simons (1989) have synthesized the research findings by child developmentalists in the following age referenced singing characteristics. These characteristics are observed from the sensorimotor stage through the preoperational. They also follow the pattern of what Gordon (1990) has called singing "babble."

Age	Characteristics
12-18 months	Vocal play experimentation with sound
19 months	Melodic and rhythm patterns appearing in vocalizations
19-24 months	Free experimentation with songs: short spontaneous songs, often consisting of a small melodic interval with flexible rhythm patterns

2 years	Use of melodic pattern from learned songs in spontaneous singing. Ability to sing parts of songs.
2 ½ -3 years	Imitation of songs, though rarely with total accuracy.
4 years	Sequence followed in learning songs: words, rhythm, phrases, melodic "contour"
5-5 ½ years	Sense of "key" stabilized; can sing most songs when learned fairly accurately (p. 57).

Developmental Influences

The child's musical growth, closely aligned to the production of chant, is related to numerous developmental and environmental influences. The first musical experiences of the young child often emerge from the child's world.

> Children's first musical experiences begin in babyhood as soon as they respond to sounds they hear. Their responses are usually expressed by physical movement.
>
> They:
> - turn in the direction of sound
> - bounce up and down
> - indicate pleasurable recognition
>
> They also begin to make sounds.
>
> They imitate and experiment:
> - with voice
> - by manipulating objects
>
> Thus:
> - aural perception and attentive listening habits
> - physical response – movement
> - vocalization – singing
> - experimenting with sounds
> - imitating and recognizing sounds and sound patterns
>
> form the basis of early music learning, in association with an informal input of music and speech patterns which can be stored in the mind and later retrieved (Hoermann & Bridges, 1984, p. 7).

> Developmental psychologists tell us that during the first five years of life the child learns more about his world than he will at any other time. ... During these formative years (birth – age 5) bases for maturity in the physical, social, emotional, intellectual, and musical aspects of life are being laid (Zimmerman, 1993, p. 1).

The child's musical development often follows a pattern. There are various paths that might describe the individual's development. For example, tonal structures might appear in familiar songs first and be used later in invented songs, or no pattern whatsoever might be discernible in the early development of tonal structures. But it appears that neither of these simple patterns conveys what the children actually do. Davidson (1985a) lists three patterns that describe the children's development. These patterns are a *cross pattern* in which one song type is used for the development of one scale, and the other song type is used for the development of the other scale; a *parallel pattern* in which a single song type is the cutting edge of development; and finally, a *zigzag pattern* in which one song type is used for all the levels. Children (and others) learn music best through a developmental process of perceiving and comprehending what music is. The development of basic music concepts together with the ability to recall, imagine, and produce organized patterns of sound is the basis of music education (Hoermann & Bridges, 1984). Children's concepts at first are very vague and the process of education and language development expands their grasp of the world around them (Hoermann & Bridges, 1984).

Current research has produced evidence that tonal and rhythmic development occurs at an earlier age than previously defined.

> The research seems to indicate that the requisite structures for tonal and rhythmic perceptions are available to infants much earlier than our present educational practices indicate. Research on various traits at least over the last decade has strongly indicated that, in the perennial nature – nurture debate, we have been underestimating nature. Indications are that perceptual and cognitive structures and capacities are available to infants at least from birth. These genetic predispositions must be matched to vibrant and vital environmental incentives and opportunities (Zimmerman, 1993, p. 11).

Linguistic development and music development have often been compared and parallels have been identified.

> Writing on musical behavior in early childhood, Rosamund Shuter (1968) has suggested that there is a parallel between the development of language and pitch imitation. She points out that the early vocalizations of the child – babbling and cooings that are characteristic of the one-month-old – are spontaneous and do not reflect the speech around him. It is noted that such babbling is important in establishing circuits in the infant's brain and nervous system, so that he learns that certain movements of his vocal organs will produce certain sounds. Shuter suggests that the development from babbling all possible sounds to speaking one's native language is paralleled in music by the development from the earliest vocalizations to singing the notes of a specific musical scale (Wendrich, 1980, p. 172-173).

Gordon, Burnsed, and others have described "babble" as an exploration into sound for the young child and the basis for a later musical vocabulary.

> Music "babble" is characterized by an exploratory response to music. The child experiments with vocal sounds, pitch gliding, and spontaneous song. The child moves to music, but in an unstructured manner. Gordon emphasizes that informal, not structured, musical experiences are the preferred mode of music experience during the "musical babble" stage. Children emerge from the "babble" stage when they can sing phrases on pitch and echo chant rhythms. Then they are ready for more structured experiences with music (Burnsed, 1993, p. 57).

Language development and musical development, as mentioned above, emerges in the babbling environment.

> The parallel between language development and musical development is an attractive one. Certainly the observations reported in our earlier study would seem to indicate that infant capacity to perceive and imitate pitched sound is general and similar to infant's propensity to babble speech-like sounds. In this sense both pre-speech and pre-musical sounds are part of the general vocal behavior in infants. The difference comes in the development from babbling to language as compared to the development of intoning music. For language, after all, is culturally obligatory. That is, social interaction of the infant with the human surround demands the development of language. Language learning has two essential components: 1) a functional impact for the infant – it helps him represent his world, and 2) an opportunity for active exchange with adults (Wendrich, 1980, p. 173).

Spontaneous chant, after a time, becomes deliberate and takes on a very specific music shape. Spontaneous music making gives way to more deliberate and rehearsed musical expression as the child shapes and measures his or her own musical performance against that of his or her peers (Wolf & Gardner, 1980). Children's grasp of tonal relationships undergoes systematic development in two ways: first as they expand their repertory of contour schemes, and second as they more often return to individual referent notes of the model song. However, this development does not proceed neatly from steps to leaps, nor does it follow a direct sequence from simple to more complex intervals (Davidson, 1988).

A musical vocabulary can be built through the spontaneous chant process. Davidson has proposed a developmental theory of tonal knowledge based on an analysis of the singing of learned and spontaneous songs by preschool children. They first grasped the words, followed by the song's rhythmic shaping. This was followed by the contour and finally interval and pitch relationships (Zimmerman, 1993). Systematic observation of nearly 80 children over a seven-year period at Harvard's Project Zero, suggests that "contour schemes," rather than gradual refinements in the overall contour or interval matching, account for the route of emerging tonal knowledge (Davidson, 1985a). Contour schemes do not develop in ways one might logically predict from interval learning, for example, proceeding from smaller to larger fixed intervals (Davidson, 1988). Stepwise motion within a contour scheme occurs only after the next larger contour scheme using leaps is in use. Only then does the child fill in the gap between the top and bottom of the previous contour scheme with stepwise motion. This "backing-and

filling" process continues until finally the contour scheme of a sixth has been achieved (Davidson, 1988).

Wendrich (1980) has defined four constructs and approaches to musical understanding and learning of the young child:

1. Psycho-acoustic: This approach focuses on the properties of tonal and temporal sensation. It is based on the premise that musical intelligence is a function of sensory perception, the mechanisms for which may be genetically fixed and which may be measured in terms of discriminatory ability. In this approach, variation between individuals is seen in terms of genetic equipment. Change is a function of cognitive development. The pioneer work in this field was done by Seashore et al.

2. Psycho-motor: This approach maintains that musical understanding is based on musical action – singing, dance movement, playing, etc. It is one adopted by a number educational pedagogues (Suzuki, Dalcroze, and Kodaly) and by the majority of instrumental teachers in American Schools. Research in this approach tends to focus on techniques and systems for accomplishing certain behavioral outcomes. Variations between individuals and change over time are seen as a function of experience and practice which is affected by instruction and motivation.

3. Developmental: This is a relatively recent approach which attempts to draw a parallel between stages of cognitive development and the development of musical intelligence. Research in this area has attempted to define characteristic musical behavior and understanding for various developmental periods: sensory-motor, pre-operational, concrete operations, and logical operations. This approach is less concerned with identifying variations of ability between individuals than with identifying the abilities common to one stage of development and different from the preceding and succeeding stages. Change is seen as a general condition which happens in spite of specific training.

4. Constructivist: This approach suggests that musical intelligence is a construct which is dependent upon sensory-motor activity in infancy and early childhood. Research in this area focuses on observations of sensory-motor behavior as it is affected by interaction with the human and physical surround (p. 169 – 170).

The developmental psychology of Piaget purports that a child collects information in her/his environment with her/his cognitive processes. Although Piaget is not normally

associated with music education, it is widely seen that the theory is suitable in music education as well (Zimmermann, 1986). The theory of schemes (Bartlett, 1932; Rumelhart, 1980) provides a theoretical framework for processing and learning a melody/song. The possible ways in which melody/song is mentally represented in children, how melodic schemes are constructed and what kind of proposals can be seen in their spontaneous songs has also been examined by information processing theory (Fredrickson, 1994).

Swanwick and Tillman (1986) outlined a mode of musical development based on an analysis of 745 children's original compositions, across age levels from 3-15 years. From their analysis, a spiral model emerged that indicated four levels of organizing principles: mastery, imitation, imaginative play, and metacognition (Zimmerman, 1993). Growth of musical concepts and perception in children is recognized at various stages. Campbell (1992) states that what is important for understanding the musical development of children is that children at different levels of mastery possess differently organized ideas of their musical world and possess developmentally different skills (both cognitive and technical) in expressing their thoughts.

There is not yet a large body of research on the musical development of young children upon which to draw, however. Whether children's thinking about music is comparable to their thinking about other subject matters or develops in a similar manner is still open to inquiry. This information is necessary for planning experiences that match the child's musical as well as cognitive abilities (Sims, 1995).

Cultural Influences

Multiculturalism has been a major focal point in music education for the past several decades (Jordan, 1992).

> At one time it was fashionable to speak of America's cultural diversity in terms of a "melting pot," with each ethnic group absorbed into some part of a national American community, but the acceptance of this myth is clearly waning. The civil rights movements of the 1950's and 1960's stimulated ethnic revitalization: Groups that had previously denied their cultures now proclaim their unique identities. Thus, today the United States is best described as a country composed of a mosaic of various ethnic communities that contribute to the national culture as they maintain distinct identities (Anderson & Campbell, 1989, p. 2).

This trend is reflected in an increase in the multiethnic material content of music textbooks and the amount of multicultural music materials currently on the market from publishers. Klinger (1994) believes that while most music educators claim to have some 'multicultural' content in their curriculum, they continue to struggle with very basic issues, such as the problems posed by the perceived necessity for teachers to develop competence in the musical cultures they choose to teach.

> The inclusion of world musics in music education programs in the United States has become increasing important since the middle of the twentieth century. Since that time, American Society has undergone major social changes, which are reflected in its attitudes toward various ethnic groups and their civil rights. Events related to these changes include the civil rights movement, the desegregation of schools, and an upswing in the melting-pot ideology. In recent decades, there has been greater recognition of the value of maintaining various cultural traditions in America and of encouraging, rather than neglecting, a culturally diverse society (Fung, 1995, p. 36).

> A multicultural approach to learning centers around organizing educational experiences for students that encourage and develop understanding and sensitivity to peoples from a broad spectrum of ethnic backgrounds. If students are to learn from a multicultural perspective, teachers need to develop an educational philosophy that recognizes the inherent worth of endeavors by different cultural groups. Multicultural education develops the understanding that there are many different but equally valid forms of musical and artistic expression and encourages students to develop a broad perspective based on understanding,

> tolerance, and respect for a variety of opinions and approaches (Anderson & Campbell, 1989, p. 1).

Hookey (1994) puts forth the argument that we should recast our approach to multicultural music education as teaching within diverse cultures instead of teaching about them.

In language development, it has been noted that while infants possess the capacity to perceive and produce all elements of various spoken languages, over time and through practice in the real world, the speech sounds most often used become "native language." Wendrich (1980) states that the practice and use of linguistic combinations peculiar to the native language so overshadow the other possibilities that these are lost from the perceptual/behavioral repertory.

> If two or more languages are learned, either sequentially or simultaneously, but one is the language of play and the other the language of discipline; if one is taught within the intimate environment of the home and the other in the more demanding and impersonal environment of school; ...then the learning of the two patterns will be affectively weighted, and the learning will be of a different sort. (Mead, 1966, p. 78).

Mead (1966) feels that comparisons can be made about the ways that children progress in learning a standard language that is not their mother tongue in these different settings. Real speech is how we speak at home; they speak and insist that I learn to speak in another way that has less reality.

Preschool children are interactive. Environmental encounters determine their cultural, educational and social accouterments. Their immediate social environment and general social-cultural environment are extremely potent factors in learning. Learning and teaching do not occur in isolation but in social and cultural contexts that influence their course and outcomes (Zimmerman, 1993). Sloboda (1988) suggests that a cognitive

representation of tonality and meter is developed in children through the process of enculturation. Enculturation refers to musical development that takes place without self-conscious effort as a result of a child's spontaneous interaction with a shared set of musical experiences provided by the culture (Wilson & Wales, 1995). Hargreaves and Zimmerman (1992) point out that we need to remember the distinction between changes that are a product of *enculturation* and those that are a product of *training*. The former occur spontaneously in a given culture, without any conscious effort or direction, and the latter are the result of self-conscious, directed efforts (Zimmerman, 1993).

It is important to recognize that preschool children may be learning ways of dealing with life that are radically opposed to the expectations on which the school system is built (Mead, 1966). Non-Native American schools are generally oriented around activities which are appropriate for left brained learners (McCarthy, 1987); these types of activities are generally linear, sequential, and involve organizing, listing, and reporting with little concern of the relationship of the specific activity with a larger whole.

However, studies have concluded that most Navajo and Hopi students tested as right brained learners. This would imply a mismatch between the teaching style of the school and the leaning style of the students (Rhodes, 1994). Rhodes goes on to say that there are differences in ways of thinking between Native Americans and non-Natives which makes some ways of asking questions inappropriate in one culture. Linguistic and cultural anomalies tend to give misleading results to tests designed for one culture but used on another.

Rhodes (1994) compares the difference between Navajo students and Anglo students with regard to how they process learning, and goes on to state that Hopi students also appear to have much the same mismatch with schools as do Navajo students. There are distinctive differences in Navajo learning processes as compared with Anglo learning processes.

Navajo Learning Process

Observe - - - - Think -

- Understand/Feel - - - - Act

Anglo Learning Process

Act -

- Observe/Think/Clarify - - - - Understand (p. 85-86)

The failure of many curricula development projects of the 1970's taught educators that new plans and curriculum ideas were not enough; curricular change must be accompanied by ongoing attention to the issues and concerns associated with teacher planning, classroom practice, and organizational support for this work. Now that ethnomusicologists have provided music educators with access to a variety of musics and musical practices, curriculum developers and teachers must turn their attention to the design and implementation of multicultural music curricula. This attention to the context for music education is particularly important, since music educators disagree on the nature and value of 'multicultural' or 'world music' education. For example, Walker (1990a, 1990b) argues that, to avoid the divisiveness of confronting the worldviews that are inherent in different music, a program of world music should start with the one common feature of all musics, sound itself. Other researchers argue that the multicultural

nature of our student populations demand that music education must accommodate alternative musical expressions (Reimer, 1993).

We need ways to work with the interpersonal challenges that we face as we attempt to make musical connections within our bicultural and multicultural settings. Hookey (1994) believes that the challenges often point to conflicting understandings about the role and function of music and music-making in different cultures. Walker (1990a) states that a new understanding of the role and function of music in society is emerging.

> Music is seen ... more and more as possessing unique information about the culture which nurtured it. For education this trend is particularly important. For music to be understood, in these terms, implies knowledge of the ways in which music can embody, signify, and represent cultural values, belief systems, traditions, and the deeply felt emotions which are peculiar to each cultural system (p. 78).

Standard songs for and with children (Campbell, 1991) have usually been collected by adults as appropriate for children. The singing material a mother or caregiver chooses to perform to a little child will be the most important basis for the child's own singing practice. Standard songs can therefore be seen as cognitive song/singing models for the child. Culturally, those songs provide the main material for learning about traditional tonality (Anderson, 1991). In the contour-copying model, the child starts with a salient feature of song, its contour, and with development, becomes able to control various contours until there is a rich vocabulary of shapes from which to produce songs of the culture (Davidson, 1985a). Parthun (1976) states that because American Indian music is functional, it therefore is understood best in terms of the culture as a whole. It is this cultural factor that we are just beginning to appreciate and allow for; it is this deep block to achievement with which programs such as Head Start

are attempting to deal (Mead, 1966). What is needed in America, as has always been needed, is an awakening and re-orienting of our total spiritual and cultural perspective to embrace, understand and learn from the aboriginal American what motivates his/her musical and artistic impulses (Parthun, 1976).

Students discover that musics from other cultures often have principles that differ significantly from those principles contained in music of their own and that one should learn the distinctive, inherent logic of each type (Anderson & Campbell, 1989).

The arts of any people in the history of mankind have often been the only element to survive and it is a curious fact that the surviving art forms are mainly those with a richly heterogeneous influence wherein intrinsic differences are allowed freedom of expression (Parthun, 1976).

Cultural Characteristics

Cultural factors and traditional tonal patterning can influence auditory perception. Intervallic relationships that have developed over time as a part of songs and chants of a society greatly influence the tonal development of children in the society. Western scaler forms are not found in the traditional Hopi chants and songs. However, there are common intervallic relationships.

Many scales in the world's major non-Western musical systems are also founded on octaves, fifths, and, to a lesser extent, fourths. One cannot help wondering if our partiality to these simple frequency ratios is based in our biology or if they are learned cultural preferences that just happen to be ancient and ubiquitous (Shreeve, 1996). Rhodes (1977) mentions one Hopi adult, who has a large record collection and who

performs "western" music instrumentally, stated that he has to listen to music in different ways depending on whether it is "western" or Hopi music. At the turn of the century, Benjamin Ives Gilman (1891, 1908) made an intensive study of Zuni and Hopi song melodies. After employing various methods of transcription, including an attempt to notate microtones, he came to the conclusion that Pueblo music was without a scale (List, 1985).

As a result of his of work with the Hopi Indians, Rhodes (1977) identified specific cultural characteristics:

> 1. In ensemble performance, the unison or octave is of utmost importance. ... Singers will try to match pitch with the lead or strongest singer for the song or section. When the experimenter would sing with either students or adults, they would match his pitch as nearly as possible, even on wrong notes. This was true on both English and Hopi songs.
>
> 2. According to several (Hopi) adults, however, if a singer in Hopi music cannot reach a certain pitch, he will simply get as close as he can until the song returns to his range. This happens mostly with young performers whose voices have not matured. The notes sung off pitch because they are out of range are not regarded as wrong notes by that performer, but are accepted as adequate. However, it is recognized that the unison has not been kept.
>
> 3. Volume is more important than pitch. When a song is low, the group follows the singer whose voice is strongest in that range. When the pitch rises, they follow the singer in that range who is strongest. Another man worded the same idea in a different way in stating that the important aspect is maximum group projection. Any departure from unison or octave, then, reduces the group projection.
>
> 4. A rather wide variation of pitch was acceptable. This concerns the internal interval structure of the song. The amount of variation tolerated was greater in Hopi songs than in English songs (p. 4 – 5).

Parthum (1976) identifies the following cultural characteristics found in Native American society:

1. Free melodic rhythm is typical of most tribal songs.

2. The Native American singer is not concerned with such artificial bar-line stresses.

3. Syncopation occurs stylistically in tribal songs.

4. In many tribal songs, there are strong glottal attacks, blowing and whistling, pitch pulsations, wide vibrato (or none), yells, portamento, and timbre, and other elements that can be heard but not seen.

5. The tonal center in most cases is clear and is frequently determined by the occurrence and duration of a given pitch. Tribal melodies employ modes that vary from three tones to seven or more.

6. In Native American songs, three main types of melodic contours occur – terraced, undulating, and arced.

7. The most common form is the strophic.

8. All native singers do not sing in the same way. The style depends on the tribe and the area the singer represents (p. 35 – 45).

George List (1985) received a letter in 1962, along with melographs, from Charles Seeger in which Seeger stated: "American Indian singing is about as ill-defined in notable pitches as any we have run into except for some Chinese and Japanese art singing." Further, List found it impossible to translate melographs that he had received from Charles Seeger into the discrete pitches of our Western notation system. From this he drew the inference that the Hopis must conceive their melody as a series of contours rather than a series of discrete pitches.

It would appear that the concept of pitch or interval is different in this (Hopi) culture (Rhodes, 1977). List (1985) does not believe that the Hopis conceive melody as a series of discrete pitches or holds the concepts of scale and tonality common to European or European derived music. Rather, he believes the Hopis conceive melody as a series of contours that are differentiated by their combination of rising and falling pitch lines.

Parthun (1976) believes that any consideration of melody in the songs of native America needs to be divorced from European concepts of major and minor tonality. Rhodes (1977) states that it appears from the limited data that there are indeed some differences in the way Hopi Indians hear and perceive musical pitch when compared with the way those who are reared listening to "western" music hear and perceive pitch. Pitch instability in Hopi song is contributed to the breath accent (List, 1985).

Native American Curriculum

Understanding the tonal and melodic basis of the Native American culture can provide the foundation for programmatic and curricular development in the musical arts in Native American schools and preschool programs. The musical perception of children within a society should be the basis for curriculum development.

> Today, through greater attention to and more research on non-Western musics, many have come to understand that the musics, like the societies, are based on different systems and philosophies. Musics from all cultures have begun to emerge in music programs as part of the ongoing debate on the inclusion of underrepresented groups in the musical canon and the curriculum of the nation's schools (Fung, 1995, p. 36).

However, Littleton (1991) suggests that because of a paucity of research in which children's musical play behaviors are observed in truly naturalistic settings, the practitioner has had little help in devising appropriate curricula and practice in music for use with young children.

> Studies investigating different types of musical response modes, such as moving or instrument playing, also will be crucial to developing a clearer understanding of conceptual development. This information should have implications for structuring and evaluating musical activities and curricula, particularly in the preschool and primary grades, to ensure that musical activities, learning sequences, and curricula are based on developmentally appropriate expectations and practices (Sims, 1995, p. 220).

The National Association for the Education of Young Children (NAEYC) has taken the position that a major determinant of program quality is the extent to which knowledge of child development is applied in program practices (Bredekamp, 1987). A primary reason for determining patterns of children's thinking at any given point in their development is to assist in determining "developmentally appropriate" curricula (Sims, 1995). Rhodes (1994) states that schools are generally concerned with linear presentation of materials in a passive rather than active format and in "scope and sequence" as an important concept in curriculum development. In contrast, Navajo and Hopi students are right brain dominant and would need a more global and intuitive approach to subject material. Rhodes (1994) points out that based on studies done by Platero, Brandt, Witherspoon, & Wong, (1986); TCI, Inc. & Educational Data Systems, Inc. (1987); Arizona Department of Education (n.d.) the schools are not doing well at educating Native American students.

A "developmentally and individually appropriate" curriculum is sequential and matched to the naturally emerging developmental sequences of the child. It is extremely important that childhood music experiences take advantage of the natural development (Zimmerman, 1993). Bredekamp (1987) states that a developmentally appropriate curriculum for young children should address the age span of the children within the group and implemented with attention to the different needs, interests, and developmental levels of those individual children.

> The structured song approach has succeeded insofar as we have in many instances wisely used children's folk literature that has been passed down from generation to generation. This literature has survived because children through the ages have felt it to be right, but with the more structured approach to singing, children often labor long to perform even simple folk material. They finally find

> varying degrees of performance success in the late fourth or fifth year. This leaves the song world of the Threes and early Fours at a stage where a single focus on the structured song may not be the most appropriate (Andress, 1980, p. 50).

Andress (1980) goes on to state that isolating three- and four-year-olds from composed (structured) songs is neither possible nor desirable. Children's performance of structured songs, however, can be coupled with more attention to their own improvisations, thus creating a program that better meets their needs.

According to Sloboda (1988), enculturation is the dominant process in Western culture until the child is approximately ten years old. With regard to Sloboda's (1988) work, the results of this study support the notion of enculturation, (Wilson & Wales, 1995). Because of multicultural diversity, curricula in all subject areas are being designed to encourage the broadest world perspectives (Anderson & Campbell, 1989).

Joyce Jordan (1992) outlines three issues of curriculum development: the problem of divergent pitch systems, the needs for source books about various world musics, and the need for a databank for music specialists. Materials that respond to the issues and concerns that Hookey has identified could be part of that data bank. To date, we have many prescriptions for practice but few descriptions or analyses of the responses that music teachers make when teaching to a diverse student population (Hookey, 1994). To provide these insights, teachers need education in research approaches beyond the experimental methodology that Harold Fiske (1992) recommends. Case studies and action research offer appropriate approaches to the questions raised above, since they encourage "deep reflection on the significance, meaning and relationships of phenomena" (Adelman & Kemp, 1992). This is one area where teacher educators might redesign courses and assignments to both educate teachers in the rigors of qualitative research and

prepare them to share their work in settings, such as, local, national, and international music education conferences (Hookey, 1994).

The results of this study would indicate that a modification of school curricula would be appropriate for Navajo and Hopi students, not from the stand point of content, but rather from the methodologies to be used and the awareness of the larger concepts being developed in students' minds (Rhodes, 1994).

Implications for Research and Teaching

The review of tonal perception differences and the use of non-western scaler forms have significant implications for curricular development as well as for teaching and research. Because the western paradigm does not apply to the musical development of the Hopi children, teaching techniques, approaches, and materials should relate to the cultural differences identified. That is, teaching strategy should follow a sequence of musical understanding.

In preparing a base from which to develop a program for any level of education, it is assumed that one knows the child and knows the nature of what is to be learned. From this information it is possible to determine how and what should be included in the learning process (Andress et al.,1973).

> The role that music plays in the life of a child and what impact his or her early experiences have in shaping his or her lifetime musical behaviors have become primary concerns of the music educator. Currently there are more questions being raised than there are answers available regarding early childhood education. The excitement producing the questions, however, indicates the need for action research dealing with these young children (Andress et al., 1973, p. 1).

Zimmerman (1993) cites a bibliography of research abstracts from 1960-1975 that was compiled by Simons and published by the Music Educators National Conference in

1978. Two developmental areas where more research was indicated were infant music responses and the spontaneous music making of young children. Fredrickson (1994) states that the methodology for analyzing young children's music has been missing in the field of music education research.

> Developmental research presents us with a dilemma of either working elegantly on the trivial or inelegantly on the great issues. Researchers are urged to be flexible and to be descriptive or experimental in relation to the problem studied. There is a need for narrative, verbal description to complement objective, numerical data and other scaled measures of behavior. In music research we need to study the sequential changes in the psychological, cognitive, and affective structures of an individual as he interacts with music (Zimmerman, 1980, p. 193).

> Approaches to studying compositional processes, both qualitative and quantitative, can provide valuable information about children's composing. The approaches complement each other. It is his personal view that the qualitative studies with small numbers of subjects are useful in uncovering possible relationships, procedures, and problems for further research. Quantitative studies can investigate these problems in a narrower field of inquiry but with more subjects and greater controls. The results of quantitative research can then be verified through additional qualitative studies that have a broader scope and naturalistic settings (Kratus, 1994, p. 133).

Zimmerman (1993) states that with regard to naturalistic studies, the Pillsbury Foundation Studies of 1937-48 have become the prototype for the qualitative, naturalistic research favored today.

> The music educator's contact with the child generally does not commence until he is of school age, beyond the crucial three to five years. It is possible that the teacher does not have this very basic information for dealing effectively with the child. To know the child – how he or she grows through language and movement and how he or she thinks – must be a prerequisite for any attempt to sequence those musical understandings with which the child will be interacting (Andress et al., 1973, p. 1).

Babies need singing models so they can learn to sing just as they need good speaking models to imitate for talking. When they hear others sing, they discover an alternate way of expressing themselves (Bayless & Ramsey, 1982). Fredrickson (1994)

cautions that we should not try to put pressure on music educational trends too early but that we should let children find their cultural context naturally in an environment that surrounds them with artistic stimuli.

> Young children need to be helped to find their singing voices. At first they can be encouraged to use their voices by imitating familiar sounds – a fire engine, train guard's whistle, sound of a train or car, animal sounds. Repetitive rhymes and jingles are important too. Gradually children can be encouraged to sing their names, imitating the teacher, but first they need to have opportunities to respond to their own names (Hoermann & Bridges, 1984, p. 10).

> In helping children to find their voices, techniques other than singing may be most effective. Include attention to environmental sounds. Encourage the students to listen to what they hear around them. Ask them to imitate these sounds. A child who is nervous about singing may relax when imitating specified sounds in the environment. A child who doesn't pay attention may begin to listen with discrimination. A child who is careless about the sound of his or her voice may be more particular when striving to imitate an environmental sound (Harrison, 1983, p. 72).

> The teacher should be prepared to create an environment on the spot for the moment. While children are busy at play he or she should be alert and constantly observing them for cues to determine their readiness for appropriate musical experiences. The teacher should seize the moment when their play, questions, or random investigations indicate this readiness (Andress et al., 1973, p. 24).

Research in music and early education today defines the musical child as one who is involved in movement and play and a child who spontaneously chants. This spontaneous sing-song like chant can be found in almost every culture. Melodic and rhythmic fragments of this chant can be developed into compositional structures for the young child and can represent the child's world of music and sounds.

Over the past fifty years, a number of researchers have defined the musical characteristics of young children. These characteristics give us an opportunity to specifically define what a child can and cannot do at various ages of development. Edwin Gordon and Howard Gardner have defined the "babble" stage as an exploratory

stage for young children to discover sounds, movements, and rhythms. This is also a stage where children are able to discover their own sound centers.

It is important to note in the literature that ways of learning and expectations of learning are many times different for Native American children. The differences are primarily in regard to the process of learning. Curricular changes and programmatic changes must reflect an understanding of the Native American culture as well. The musical characteristics of Navajo children and Hopi children do not conform with the standards that have been defined in related studies of Anglo children.

This review of literature establishes a foundation on which to continue the research process of analyzing Hopi children's chant and songs as compared with Anglo children's chant and songs. This study will provide the field of music education with an understanding of curricular and programmatic approaches for Native American schools.

CHAPTER III

THE STUDY

Development of the Method of Study

Introduction

The development of the methodology for this comparative study of spontaneous chant was designed to create a concise and definitive research environment that would provide optimum reliability and validity. Although the subject sampling of both Native American and Anglo American children was small, the methodology created provides a clear and exemplary model for future comparative studies of children's music between distinct cultural groups. Children, ages three to five, on the Hopi Reservation in northern Arizona and in Bloomington, Indiana were identified as subjects in this study. Appropriate consent forms and approval mechanisms were employed before the initiation of the observations. The spontaneous chant of children was recorded on audio cassette tape during observations by the principal investigator on the Hopi Reservation in northern Arizona and in Bloomington, Indiana. The recorded chants were then transcribed into musical notation. Two music educators, recognized by the field, served as judges to verify the accuracy of the chant transcriptions.

The methodology of the comparative study included the development of a taxonomy of musical characteristics as identified in the transcribed musical notation of the chants. An analysis of the chants using the taxonomy was then completed in order to identify metric frequencies, intervallic frequencies, pitch centers, intervallic

directionality, and the frequency of rhythmic patterns. The similarities and differences of the chants collected from the Native American and Anglo American cultures were identified from the data. The null hypothesis was tested as a part of the procedure.

The Sample

Research environments were identified for both the Native American and Anglo American samplings. Because of its isolation and dedication to a cultural heritage, the Hopi Reservation was selected for the Native American sampling. The Hopis are a complex and vital Native American tribe located in the northern mesas of Arizona. The original Indian name *Hopituh* actually means "peaceful ones." The Hopis are the westernmost of the Pueblo people, and are a small, peaceful, and gentle group that have farmed their arid, but fertile valleys for centuries. In the twenty-first century, the Hopis are still among the lesser known and isolated Indian peoples living within the continental United States. The spiritual life of the Hopis centers on the Kachina ceremonies. These ceremonies provide a rich musical environment for children at an early age, and influence tonal and rhythmic aptitude of the Hopi children. Prior to the arrival of the Spanish almost five hundred years ago, the Hopi villages were considered urban centers in the southwest. Facets of the early urban living can be identified in today's Hopi society. The Hopi are bound together by their religion, a multi-stranded cord, uniting them to withstand the hazards of the harsh environment on the mesas. It was within this environment that the principal investigator observed 13 Hopi children, ages 3 to 5 and recorded their spontaneous chants.

A Midwest environment was selected for the Anglo American sampling. Bloomington, Indiana is located in the southern part of the state of Indiana. It is the

eighth largest city in the state, with a population estimated at sixty-five thousand. Because of the Indiana University School of Music, the cultural environment is rich in musical performances, opera productions, and Broadway musicals. The area around Bloomington, Indiana is agrarian. Most of the farmland is dedicated to corn, hay, and soybeans. Livestock includes cattle, hogs, and sheep. More than ninety percent of the work force has at least a high school degree and sixty percent has a college degree. It was within this Midwest environment that the principal investigator observed 21 Anglo American children ages 3 to 5 and recorded their spontaneous chants.

Thirteen Native American children and 21 Anglo American children were selected as subjects in the original sampling. Technical factors and the hesitancy of some children reduced the number of total subjects in the sampling. Ten Native American subjects and 11 Anglo American subjects were included in the final comparative analysis of the data gathered.

Native American Subject Information

Subject	Age	Gender	Tribal Affiliation
1	3 years 5 months	Female	Yavapai/Apache
2	2 years 9 months	Male	Hopi
3	2 years 9 months	Female	Navajo/Hopi
4	3 years 11 months	Male	Hopi
5	5 years 3 months	Male	Hopi
6	4 years 3 months	Male	Hopi
7	5 years 5 months	Male	Hopi
8	5 years 1 month	Male	Hopi
9	5 years 11 months	Female	Hopi
10	4 years 10 months	Male	Hopi

Distribution of Sampling

7	Male
3	Female
8	Hopi
1	Navajo/Hopi
1	Yavapai/Apache

Average Age - 4 years 3 months

Figure 1: Native American Subject Information

As indicated in Figure 1, 7 subjects were male and 3 subjects were female. Eight of the subjects were Hopi, 1 was Yavapai/Apache, and 1 was Navajo/Hopi. The average age of the 10 Native American subjects was 4 years and 3 months.

Anglo American Subject Information

Subject	Age	Gender	Cultural Background
11	4 years 6 months	Male	Anglo
12	4 years 5 months	Male	Anglo
13	3 years 11 months	Male	Anglo
14	3 years 10 months	Female	Anglo
15	3 years 11 months	Female	Anglo
16	4 years 9 months	Male	Anglo
17	5 years 6 months	Male	Anglo
18	5 years 11 months	Male	Anglo
19	5 years 6 months	Male	Anglo
20	5 years 7 months	Female	Anglo
21	5 years 6 months	Female	Anglo

Distribution of Sampling

7	Male
4	Female
11	Anglo

Average Age - 5 years 1 month

Figure 2: Anglo American Subject Information

As indicated in Figure 2, 7 subjects were male and 4 were female. All subjects were Anglo American. The average age of the 11 Anglo American subjects was 5 years and 1 month.

The Method of Study

The method of study selected for this comparative study of spontaneous chant included the random selection of subjects from two experimental groups. One group was randomly selected on the Hopi Reservation in northern Arizona and recorded in individual homes. The second group was randomly selected in a preschool environment in Bloomington, Indiana and recorded on site. Recordings were made of the spontaneous chant of the 21 Native American and Anglo American children. The method of study

included the transcription of the recordings to musical notation and included an analysis of metric frequencies, intervallic frequencies, pitch centers, intervallic directionality, and the frequency of rhythmic patterns.

Conducting the Study

Preliminary Steps

The primary investigator arbitrarily decided on the identification of subjects on the Second and Third Mesas of the Hopi Reservation in northern Arizona. In addition, the Bloomington Developmental Learning Center in Bloomington, Indiana was arbitrarily selected as the location for the Anglo American subjects. The primary investigator received a letter of approval to conduct the study with the Native American subjects from The Hopi Tribe Office of Education (see Appendix D). The primary investigator also received a letter of approval to conduct the study with the Anglo American subjects from the Bloomington Developmental Learning Center (see Appendix E). Both letters were submitted to The University of Oklahoma Office of Research Administration. Final consent for the study with the Native American subjects and the Anglo American subjects was granted by the Institutional Review Board at The University of Oklahoma Office of Research Administration (see Appendix C). *Informed Parental Consent* and *Demographic Data Forms* (see Appendix F), were distributed to parents of the Native American and Anglo American children. Final permissions were received for each subject before the data gathering began.

The principal investigator acquired a Marantz cassette tape recorder, model PMD201 and used Maxell XLII High Bias audiocassette tapes for recording the subjects in the study.

The parents of the Native American subjects were notified of the time and date of the observations and the subsequent recording of the spontaneous chants. The Bloomington Developmental Learning Center was notified of the time and date of the observations and subsequent recording of the Anglo American subjects.

Time Schedule

The recordings of the Native American subjects were made over a period of six days in May 2001. The recordings of the Anglo American subjects were made on seven separate days during the months of April and May 2002. Following the collection of the recordings, transcriptions were made into musical notation for analytic purposes (see Appendixes G and H). After the transcriptions were completed, they were reviewed for accuracy by two judges selected from the field of music education. This process took fourteen days for each judge to complete. After receiving verification, appropriate corrections were made to the transcribed musical notation and the analysis process began.

Procedures

In the recording environments on both the Hopi Reservation in northern Arizona and at the Bloomington Developmental Learning Center in Bloomington, Indiana, the primary investigator conducted pre-recording information sessions with parents or classroom teachers.

On the Hopi Reservation in northern Arizona, the primary investigator met with the Native American parents before the recording sessions to discuss the purpose of the

study and the procedures used to collect data related to spontaneous chant in Native American and Anglo American children. The primary investigator then met the subject or subjects to be observed and recorded. The parent explained to the subject or subjects what the primary investigator was doing and helped to encourage an environment of play that would generate spontaneous chant. Some parents developed a climate of musical exploration by playing recordings of Hopi ceremonial music. In addition, some Native American parents created an environment of play by using drums and rattles. The subjects would often explore rhythmic patterns on the drums and rattles and would move during the exploration process. The Native American parents were quite involved in the creation of an environment of play during the recording sessions.

At the Bloomington Developmental Learning Center in Bloomington, Indiana, the primary investigator met with individual classroom teachers regarding the purpose of the study and the procedures used to collect the comparative data related to a comparison of spontaneous chant in Native American and Anglo American children. The primary investigator then went into individual classrooms unannounced. Classes were always in session when the primary investigator arrived and the children were always involved in playtime. Some children would ask the primary investigator what he was doing in the classroom. However, the children were not formally informed of the purpose of the primary investigator's visit. The primary investigator would observe the children at play and would identify the subjects from the other children in the classroom by gender and clothing descriptors provided by the classroom teachers. The primary investigator had a listing of pre-approved subjects before entering the classroom. The primary investigator would observe the subjects and would follow them around the classroom or on the

playground during the play period. When the primary investigator observed spontaneous chant from any of the subjects, recording would begin.

The primary investigator observed both in the Native American environment and in the Anglo American environment that some subjects were shy and withdrawn during the recording sessions; other subjects were gregarious, outspoken and acutely spontaneous. The primary investigator did not interact, speak to, or play with the subjects in the Native American or the Anglo American recording environments. The primary investigator experienced non-participation at times from both the Native American and Anglo American subjects. Some recording sessions with the Anglo American subjects were particularly non-productive in the late afternoon.

In some situations, actual recording of spontaneous chant from the Native American and Anglo American subjects began immediately during a session, at other times the actual recording was delayed up to 45 minutes. It was observed by the primary investigator that in most sessions with the Anglo American subjects the recordings began immediately because of the play modality of the free time environment.

The primary investigator did play the recorded spontaneous chant back to the subjects if asked to do so. This occurred only with some Native American subjects and never with the Anglo American subjects.

After each recording session, the primary investigator completed a log of the observations of the subjects and the meter readings of the recordings of the spontaneous chants. The primary investigator then created a master of discreet tape findings, eliminating the names of children and labeling samples by subject number. The discreet tape findings were then transcribed into musical notation. The tape recordings and the

transcriptions of the musical notation were given to judges to review for errors. The judges were told by the primary investigator to listen to the discreet tapes, while reviewing the transcribed notation and to identify changes needed for accuracy. After reviewing the changes, the primary investigator revised the transcriptions (see Appendixes G and H).

Collecting the Data

Collection of the recordings occurred in sessions scheduled by the primary investigator on the Hopi Reservation in northern Arizona and at the Bloomington Developmental Learning Center in Bloomington, Indiana. The recordings of the spontaneous chant occurred in environments of play. The primary investigator was a neutral observer in these environments and had little, if any, interaction with the subjects.

The recording length of the spontaneous chants ranged from 4 to 5 seconds to 4 to 5 minutes. Subjects were often recorded more than once during a recording session. The primary investigator had a directional microphone as a part of the Marantz PMD201 recording unit.

In the Native American recording environments the primary investigator often placed the Marantz PMD201 recording unit in an inconspicuous location on the floor or on a table but always close to the subject. The subjects were aware that the recording unit was there. In the Native American recording environment, the primary investigator would often record for long periods of time without pausing. This captured the spontaneous chant of the subjects but also resulted in long periods of non-productive and non-useable recording. With the Native American subject samplings, the names were not recorded on the tape but rather meter readings and names were written in a log. The

recording sessions with the Native American subjects were concluded by the principal investigator, after spontaneous chant had been recorded or when it was apparent that spontaneous chant was not going to occur.

In the Anglo American recording sessions, the primary investigator carried the unit over his shoulder with the unit resting by his side. The recording unit was inconspicuous. The primary investigator had the recording unit on pause mode until a spontaneous chant occurred. Without interrupting the play environment or the spontaneous chant, the primary investigator switched the unit to the on mode and recorded the chant. When the subject had finished chanting or had moved into another area of play the primary investigator would identify the subject by speaking the name of the subject softly into the microphone and would return the unit to the pause mode. The primary investigator would then move away from the subject and would observe all of the subjects by wandering throughout the classroom or playground. The primary investigator would then identify other subjects who were beginning to chant spontaneously. At times more than one subject was involved in spontaneous chant. Also, at times, the subjects interacted with each other in spontaneous chant. These episodes were recorded by the primary investigator. The recording sessions concluded after spontaneous chant had been recorded or when the primary investigator observed that spontaneous chant was not occurring in the environment or if the playtime had ended and the subjects had moved into more structured environments.

Analysis of Data

After collecting the recordings of the spontaneous chant of Native American and Anglo American children, and after the judges' review of the discreet tape findings and

the transcriptions, the primary investigator developed a comparative analysis matrix instrument. This instrument incorporated the taxonomical characteristics identified in the spontaneous chants of the Native American and Anglo American subjects. The matrix included a composite analysis of metric frequencies, intervallic frequencies, pitch centers, intervallic directionality, and the frequency of rhythmic patterns. The results can be found in the composite matrixes of musical characteristics (see Appendixes I and J).

In addition to the composite matrix analysis, *Individual Analysis Worksheets* (see Appendixes K and L) were developed for each of the 21 subjects in the study. These individual analytic worksheets included the specific identification of metric frequencies, intervallic frequencies, pitch centers, intervallic directionality, and the frequency of rhythmic patterns for each of the 21 subjects. The individual analysis worksheets were the basis for developing the composite matrix (see Appendixes K and L).

The results of the composite matrix analysis and the individual analysis worksheets are discussed in Chapter IV.

Summary of Chapter III

The methodological process for developing this comparative study of spontaneous chant began with the identification of specific research environments. The primary investigator identified the Hopi Reservation located in northern Arizona for the Native American sampling. The primary investigator also identified the Bloomington Developmental Learning Center in Bloomington, Indiana for the Anglo American sampling. Ten Native American subjects and 11 Anglo American subjects were randomly identified for participation in the comparative study. The average age of the 10

Native American subjects was 4 years and 3 months. The average age of the 11 Anglo American subjects was 5 years and 1 month. Recordings were made of the spontaneous chants of 21 Native American and Anglo American children. The recordings were transcribed into musical notation and were reviewed by two independent judges for accuracy. A comparative analysis matrix instrument was used for comparing the spontaneous chant of Native American and Anglo American children. This instrument was based on a taxonomy of the musical characteristics of the chants as identified in the transcribed musical notation. Metric frequencies, intervallic frequencies, pitch centers, intervallic directionality, and the frequency of rhythmic patterns were analyzed and compared using this matrix instrument.

CHAPTER IV

RESULTS OF THE DATA ANALYSIS

The Hypothesis

The hypothesis of this comparative study of spontaneous chant is that significant differences can be identified in the spontaneous chant of the two distinct cultures. Five areas of comparison were used in the methodology of the comparative study: metric frequencies, intervallic frequencies, pitch centers, intervallic directionality, and the frequency of rhythmic patterns. Differences as well as similarities were identified in the study in Native American and Anglo American children's spontaneous chant in all areas. Although the following comparisons show some similarities, the differences in the musical characteristics of children from both cultures are obvious. The analysis supports the hypothesis and provides significant conclusions and implications, as discussed in Chapter V. Each of the five areas was analyzed and compared and conclusions drawn for each. Each area is analyzed below.

Analysis of the Data

Metric Frequencies

During the study, 10 Native American subjects singing spontaneous chant were recorded. The recordings resulted in 17 distinct examples of Native American children's spontaneous chant (see Appendix G). Twelve of these examples were multimetric and five were analyzed as being in duple meter (see Appendix I). The number of meter

changes in the multimetric examples varied from three to twenty-six. The multimetric examples in the Native American children's spontaneous chant included 3/8, 5/8, 9/8, 12/8, 6/8, 7/8, 2/4, 3/4, 5/4, 4/4, 8/8, and 6/4 meters (see Appendix K). The multimetric examples were varied in their combination of the specific meters. Seventy-one percent of the recorded examples of Native American children's spontaneous chant were multimetric. Twenty-nine percent of the examples were duple. In the five duple meter examples recorded in this study, the major second and minor second were the dominant intervals. This intervallic reoccurrence can be identified also in the multimetric examples. Although different in meter, the intervallic relationships remained constant.

During the study, 11 Anglo American subjects singing spontaneous chant were recorded. The recordings resulted in 23 distinct examples of Anglo American children's spontaneous chant (see Appendix H). Twenty-one of these examples were in duple meter and two were analyzed as being multimetric (see Appendix J). One multimetric example had three changing meters and one multimetric example had two changing meters (see Appendix L). In one example, the changes were from triple to duple meter and in the other example, the changes were from duple to triple meter. Ninety-one percent of the examples recorded of Anglo American spontaneous children's chant were duple. Nine percent of the examples were multimetric.

In the examples recorded of Native American spontaneous children's chant and Anglo American spontaneous children's chant, multimetric meter was dominate in the Native American examples and duple meter was dominant in the Anglo American examples. It is clear that in this study there is a distinct difference in the use of meters in the spontaneous chant of Native American and Anglo American subjects.

Intervallic Frequencies

In the 17 recorded examples of Native American children's spontaneous chant, the major second was the most frequently sung interval. One hundred eighty-seven recorded intervals were ascending and 219 were descending. Fifty-four (29%) of the 187 ascending intervals were major seconds. Thirty-seven (20%) of the 187 ascending intervals were minor thirds and 32 (17%) of the 187 ascending intervals were minor seconds (see Appendix I). Sixty-eight (31%) of the 219 descending intervals were major seconds. Fifty-three (24%) of the 219 descending intervals were minor thirds and forty-one (19%) of the 219 descending intervals were minor seconds (see Appendix I).

In the 23 recorded examples of Anglo American children's spontaneous chant, the minor third was the most frequently sung interval. One hundred sixty-three recorded intervals were ascending and 203 were descending. Fifty-two (32%) of the 163 ascending intervals were minor thirds. Forty-four (27%) of the 163 ascending intervals were major seconds and 23 (14%) of the 163 ascending intervals were minor seconds (see Appendix J). Eighty-two (40%) of the 203 descending intervals were minor thirds. Sixty (30%) of the 203 descending intervals were major seconds and 23 (11%) of the 203 descending intervals were minor seconds (see Appendix J).

The minor second, major second, and minor third ascending and descending intervals were the most frequently sung intervals by the Native American and Anglo American subjects. The most frequently sung interval by the Native American subjects was the descending major second and the most frequently sung interval by the Anglo American subjects was the descending minor third (see Appendixes I and J). The descending intervals were the most frequently sung intervals in the recorded examples of

Native American and Anglo American children's spontaneous chant. Although Native American and Anglo American children most frequently sang ascending and descending minor seconds, major seconds, and minor thirds, the dominant interval sung by the Native American subjects was the descending major second and the dominant interval sung by the Anglo American subjects was the descending minor third. There is a distinct difference in this study of the intervallic dominance found in the spontaneous chant of Native American subjects as compared to the Anglo American subjects.

Pitch Centers

In the 17 recorded examples of Native American children's spontaneous chant, 19 pitch centers were identified in the recorded examples. In those 19 pitch centers the principal investigator identified 8 distinct pitches. Several subjects sang with the same pitch center. Two of the 17 chants recorded had multiple pitch centers resulting in a total of nineteen pitch centers identified in the seventeen recordings. The most frequent pitch center sung by Native American subjects was c#/db. Seven (37%) of the identified pitch centers were c#/db. The next most frequent pitch centers identified in the 17 recordings of the spontaneous chants of Native American subjects were eb/d# and f. Three (16%) of the identified pitch centers were eb/d# and three (16%) were f (see Appendix I).

In the 23 recorded examples of Anglo American children's spontaneous chant, 27 pitch centers were identified in the recorded examples. In those 27 pitch centers the principal investigator identified 16 distinct pitches. As with the Native American subjects, some of the pitch centers were repeated among the Anglo American subjects. Two of the 23 chants recorded had two pitch centers and 1 of the 23 chants recorded had three pitch centers resulting in a total of 27 pitch centers identified in the 23 recordings.

The most frequent pitch centers sung by Anglo American subjects were b, bb, f#, e, and d. Fifty-five percent of the identified pitch centers were b, bb, f#, e, and d. The next most frequent pitch center identified in the 23 recordings of the spontaneous chants of Anglo American subjects was f. The remainder of the identified pitch centers were all different (see Appendix J).

The most frequent pitch center for Native American subjects was c#/db. The most frequent pitch centers for Anglo American subjects were b, bb, f#, e, and d. Not one Anglo American subject sang c#/db as the pitch center. However, this was the most frequent pitch center identified in the Native American examples. Anglo American subjects sang 16 total distinct pitch centers as compared to 8 total distinct pitch centers sung by Native American subjects.

Intervallic Directionality

In the 17 recorded examples of Native American children's spontaneous chant, descending intervals were more frequently sung than ascending intervals. Of the 406 total intervals sung by Native American subjects, 219 (54%) were descending and 187 (46%) were ascending (see Appendix I).

In the 23 recorded examples of Anglo American children's spontaneous chant, descending intervals were more frequently sung than ascending intervals. Of the 366 total intervals sung by Anglo American subjects, 203 (55%) were descending and 163 (45%) were ascending (see Appendix J).

Native American subjects as well as Anglo American subjects in the study sang descending intervals more frequently than ascending intervals. This conforms to research previously reported in this study (page 15).

Frequency of Rhythmic Patterns

In the seventeen recorded examples of Native American children's spontaneous chant, 211 rhythmic patterns were sung. Thirty-one of these patterns were distinct. The most frequently sung rhythmic pattern was  . This double eighth-note rhythmic pattern was identified 104 times in the 17 recorded examples. This represents 49% of the total rhythmic patterns sung by Native American subjects. The second most frequently identified rhythmic pattern sung by Native American subjects was  . This double eighth-note and quarter-note pattern was identified 11 times in the recorded examples. This represents 5% of the total rhythmic patterns sung by Native American subjects. The third most identified rhythmic pattern sung by Native American subjects was  . This double eighth-note tied to a quarter-note pattern was identified 9 times in the recorded examples. This represents 4% of the total rhythmic patterns sung by Native American subjects.

In the 23 recorded examples of Anglo American children's spontaneous chant, 175 rhythmic patterns were sung. Twenty-seven of these patterns were distinct. The most frequently sung rhythmic pattern was  . This double eighth-note rhythmic pattern was identified 45 times in the 23 examples. This represents 26% of the total rhythmic patterns sung by Anglo American subjects. The second most frequently identified rhythmic pattern sung by Anglo American subjects was  . This dotted eighth-note followed by a sixteenth-note pattern was identified 28 times in the 23 recorded examples. This represents 16% of the total rhythmic patterns sung by Anglo American subjects. The third most identified rhythmic pattern sung by Anglo American

subjects was ♩ ♩. This double quarter-note pattern was identified 27 times in the 23 recorded examples. This represents 15% of the total rhythmic patterns sung by Anglo American subjects.

The most frequently sung rhythmic pattern by Native American and Anglo American subjects was ♫. This double eighth-note pattern appears to be characteristic of both cultures. The double eighth-note followed by a quarter-note pattern and the double eighth-note tied to a quarter-note pattern also appeared to be sung frequently in the Native American examples. The double quarter-note pattern and the dotted eighth-note followed by a sixteenth-note pattern also appeared to be sung frequently in the Anglo American examples. Similarities of the frequency of rhythmic patterns occurred most often with the double eighth-note pattern. Additional rhythmic patterns were distinctively different in the examples from the two cultures (see Appendixes I and J).

Summary of Chapter IV

The analysis of the data collected in this study revealed significant differences in the spontaneous chant of the two distinct cultures.

In the 17 recorded examples of Native American children's spontaneous chant, multimetric examples were the most dominant in the recordings. Duple meter was dominant in the Anglo American examples. In this study there is a significant difference in the use of meters in the spontaneous chant of Native American compared to Anglo American subjects.

The minor second, major second, and minor third ascending and descending intervals were the most frequently sung intervals by the Native American and Anglo

American subjects. The most frequently sung interval by the Native American subjects was the descending major second and the most frequently sung interval by the Anglo American subjects was the descending minor third.

The most frequently sung pitch center by Native American subjects was c#/db. The most frequently sung pitch centers by Anglo American subjects were b, bb, f#, e, and d. It is significant to note that not one Anglo American subject sang c#/db as the pitch center.

In an analysis of intervallic directionality descending intervals were more frequently sung in the recorded examples of Native American and Anglo American children's spontaneous chant.

The double eighth-note rhythmic pattern was identified as the most frequently sung pattern by the Native American subjects and the double eighth-note rhythmic pattern was identified as the most frequently sung pattern by the Anglo American subjects.

The analysis of the data in this study identifies significant differences in Native American and Anglo American children's spontaneous chant in the areas of metric frequencies, intervallic frequencies, and pitch centers. Although intervallic directionality and the frequency of rhythmic patterns had commonalties and similarities, distinct differences in these two areas were also identified.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of the Study

During the past fifty years, researchers and scholars have studied the musical characteristics of young children and have explored the developmental stages of musical growth in young children. Researchers such as, Gordon, Pond, Moorehead, Rinehart, Andress, Talbert, Hoerman, Bridges, Gardner, Simons, Fredrickson, Davidson, Sims, Werner, Zimmerman, Wendrich, and Woods are but a few in music education who have contributed to the body of scholarly literature regarding the musical characteristics of children. These characteristics provide an opportunity to specifically define what a child can and cannot do at various ages of development. Methodologies and approaches to music teaching and learning based on this research have emerged and have permeated preschool and elementary school music curricula throughout the United States.

Edwin Gordon and Howard Gardner have defined a "babble" stage as an exploratory period of development for young children to discover sounds, movements, and rhythms. This is also a stage where children are able to discover their own sound centers. Research in music and early education today defines the musical child as one who is involved in movement and play and a child who spontaneously chants. The research shows that spontaneous sing-song like chant can be observed in almost every culture. This chant emerges from environments of movement and play. Melodic and rhythmic fragments of this chant can represent the fundamental elements of the child's

world of music and sounds. This world of music and sound is influenced by the general social-cultural environment. Exploration in the babble stage, chant, and play do not occur in isolation, but in social and cultural contexts. Differences in these social contexts have an impact on the observable and identifiable musical characteristics of children. This study focuses on the differences of the musical characteristics of Native American and Anglo American children.

The development of the methodology for this study of spontaneous chant was designed to create a concise and definitive research environment that would provide optimum reliability and validity. Although the subject sampling of Native American and Anglo American children was small, the methodology used in this study provides a clear and exemplary model for future comparative studies of children's music between distinct cultural groups. Children, ages 3 to5, on the Hopi reservation in northern Arizona and in Bloomington, Indiana, were identified as subjects of this comparative study. Ten Native American subjects and 11 Anglo American subjects were randomly identified. The average age of the 10 Native American subjects was 4 years and 3 months. The average age of the 11 Anglo American subjects was 5 years and 1 month. Recordings were made of the spontaneous chants of 21 Native American and Anglo American children. The recordings were transcribed into musical notation and were reviewed by two independent judges for accuracy. A comparative analysis matrix instrument was used for comparing the spontaneous chant of Native American and Anglo American children. This instrument was based on a taxonomy of the musical characteristics of the chants as identified in the transcribed musical notation. Metric frequencies, intervallic frequencies, pitch centers, intervallic directionality, and the frequency of rhythmic patterns were

analyzed and compared using this matrix instrument. The analysis supports the hypothesis that significant differences can be identified in the spontaneous chant of children in the two distinct cultures.

The analysis of the data collected in this study revealed significant differences in the spontaneous chant of the two distinct cultures.

The analysis and interpretation of the data in this study identifies significant differences in Native American and Anglo American children's spontaneous chant in the areas of metric frequencies, intervallic frequencies, and pitch centers. Although intervallic directionality and the frequency of rhythmic patterns had commonalties and similarities, distinct differences in these two areas were also identified.

This study contributes to the understanding of the differences in environmental influences of Native American and Anglo American cultures and how these influences impact the musical responses of children in both cultures.

Conclusions of the Study

The primary investigator of this study concludes that there are significant differences in the musical characteristics of children in arbitrarily selected groups of Native American and Anglo American children. An analysis of the chant reveals the following differences and similarities: in metric frequencies, intervallic frequencies, pitch centers, intervallic directionality, and the frequency of rhythmic patterns.

In the 17 recorded examples of Native American children's spontaneous chant, multimetric examples were the most dominant in the recordings. The analysis of the data shows that 71% of the examples recorded of the Native American children's chant were

multimetric. Duple meter was dominant in the Anglo American examples. The analysis of the data shows that 91% of the examples recorded of the Anglo American children's chant were duple. In this study, there is a significant difference in the use of meters in the spontaneous chant of Native American compared to Anglo American subjects.

The minor second, major second, and minor third ascending and descending intervals were the most frequently sung intervals by the Native American and Anglo American subjects. The most frequently sung interval by the Native American subjects was the major second. Thirty-one percent (the highest percentage for descending intervals) of the intervallic examples recorded and identified in the Native American children's chant were descending major seconds. Twenty-nine percent (the highest percentage for ascending intervals) were ascending major seconds. The most frequently sung interval by the Anglo American subjects was the minor third. Forty percent (the highest percentage for descending intervals) of the intervallic examples recorded and identified in the Anglo American children's chant were descending minor thirds. Thirty-two percent (the highest percentage for ascending intervals) were ascending minor thirds. In this study, a significant difference was identified in the use of intervals in the spontaneous chant of Native American compared to Anglo American subjects.

The most frequently sung pitch center by Native American subjects was c#/db. Thirty-seven percent of the examples recorded and identified in the Native American children's chant had c#/db as the pitch center. The most frequently sung pitch centers by Anglo American subjects were b, bb, f#, e, and d. Fifty-five percent of the examples recorded and identified in the Anglo American children's chant had b, bb, f#, e, and d as the equally identified pitch centers. It is significant to note that not one Anglo American

subject sang c#/db as the pitch center. In this study there is a significant difference in the identified pitch centers in the spontaneous chant of Native American compared to Anglo American subjects.

In an analysis of intervallic directionality, descending intervals were more frequently sung in the recorded examples of Native American and Anglo American children's spontaneous chant. Fifty-four percent of the intervals identified and analyzed in the examples recorded in the Native American children's chant were descending. Fifty-five percent of the intervals identified and analyzed in the examples recorded in the Anglo American children's chant were descending. The primary investigator concludes that the directionality of intervals recorded and identified in Native American and Anglo American children was not affected by cultural differences.

The double eighth-note rhythmic pattern was identified as the most frequently sung pattern by the Native American and Anglo American subjects. Forty-nine percent of the rhythmic patterns identified and analyzed in the Native American children's chant were the double eighth-note rhythmic pattern. Twenty-six percent of the rhythmic patterns identified and analyzed in the Anglo American children's chant were the double eighth-note rhythmic pattern. Although the double eighth-note rhythmic pattern was identified as the most frequently sung rhythmic pattern by both the Native American and Anglo American subjects, rhythmic patterns less frequently sung were analyzed and identified as different. The primary investigator concludes that a similarity was identified in the predominant rhythmic pattern, but differences existed in other rhythmic patterns.

This study concludes that there are significant differences in meters, intervals, and pitch centers between the Native American and Anglo American cultures. The study also

concludes that the directionality of intervals sung and the frequency of rhythmic patterns sung were similar with some differences in lesser-sung rhythmic patterns. The principal investigator interprets this conclusion as significant in defining specific musical characteristics of Native American and Anglo American children. The review of the related literature pertinent to this study strongly emphasized characteristics common to Anglo American children with little evidence of differences in children of other cultures, particularly Native American.

The study of the spontaneous chant identified the following musical characteristics for Native American children:

1. Native American children most often chanted in multimeter.
2. Native American children most often sang c#/db as the pitch center in chant.
3. Native American children most often sang the major second in chant.
4. Native American children most often sang descending intervals in chant.
5. Native American children most often sang the double eighth-note pattern in chant, but also sang the double eighth-note followed by a quarter-note pattern, double eighth-note tied to a quarter-note pattern, and a double sixteenth-note pattern, as well as other patterns.

The study of the spontaneous chant identified the following musical characteristics for Anglo American children:

1. Anglo American children most often chanted in duple meter.
2. Anglo American children most often sang b, bb, f#, e, and d as the pitch centers in chant.
3. Anglo American children most often sang the minor third in chant.

4. Anglo American children most often sang descending intervals in chant.
5. Anglo American children most often sang the double eighth-note pattern in chant, but also sang the dotted eighth-note followed by a sixteenth-note pattern, a pattern of two quarter-notes, and an eighth-note followed by a quarter-note followed by an eighth-note pattern, as well as other patterns.

Because of the research by Davidson, Pond, Moorehead, Andress, Rinehart, Gordon, and others regarding the musical characteristics of children as reported in Chapter II of this study, the field of music education has generally assumed that all children in all cultures respond the same. However, the research by Rhodes questions the validity of imposing monolithic structures of musical characteristics of children on Native American cultures. The questions raised by Rhodes have been explored and confirmed by this study. The conclusion can be made that there are major differences in the musical characteristics of children, major differences in the sequence of musical elements, and major differences in the role of music in the lives of children in Native American and Anglo American cultures.

Implications for Music Education

The conclusion of this study identified distinct differences between the musical responses in the spontaneous chant of Native American children and the musical responses in spontaneous chant of Anglo American children. This conclusion has significant implications for the field of music education.

This study provides information related to cultural differences in the musical responses in the spontaneous chant of young children. This information should be

considered as curricular programs are developed within different cultural environments and in multicultural environments. The selection of song materials for curricular purposes must be made with an understanding of how children in distinct cultures respond to musical elements. For example, multimetric songs would be more appropriate for Native American children than Anglo American children and duple meter songs would be more appropriate for Anglo American children. Song materials emphasizing major second intervals are appropriate for Native American curricular programs and song materials emphasizing the minor third are appropriate for Anglo American curricular programs. Song materials with pitch centers around c#/db are appropriate for Native American children and song materials with pitch centers around b, bb, f#, e, and d are appropriate for Anglo American children. Song materials with a predominance of descending intervals are appropriate for both Native American and Anglo American curricular programs. Song materials with a repetition of a double eighth-note pattern are also appropriate for both Native American and Anglo American curricular programs. The knowledge of the elements of music most commonly sung in spontaneous chant by the different cultures assists in providing appropriate curricular environments. Without this knowledge, curricular development follows the assumption that children of all cultures respond in similar ways. This study concludes that there are cultural differences that should be considered in curricular construction.

The differences identified in this study should also be considered when materials are developed for music methods textbooks and teacher training courses. In the past, textbooks and teacher training classes and workshops often assumed that the musical characteristics of children are the same for all cultures. Again, this study clearly shows

that teaching approaches, sequences, and classroom strategies should be adapted to cultural differences. Teacher training should also adapt structures and approaches that include the cultural differences identified in the study.

The implication of this study is that more adaptation of cultural differences should be made in teaching tactics, teaching materials, song materials, and textbooks.

Recommendations for Music Education and for Future Research

Because of the conclusion that there are differences in the responses in spontaneous chant in both Native American and Anglo American children, the following recommendations are made.

First, there has to be a rejection of the monolithic notion that children in all cultures learn music and respond to music the same way. There are cultural differences in the musical characteristics of children.

Second, it is recommended that music teaching materials, curricular programs, teacher training programs, song collections, and pedagogical environments in preschool music reflect cultural differences of children. This study has identified distinct differences in meter, pitch center, and in the intervals spontaneously chanted by young children. Therefore, the corresponding meters, pitch centers, and common intervals identified for the specific culture should be incorporated in music curricula, music books, and musical environments for young children.

Third, it is recommended that musical aptitude tests currently being used for young children be examined and modified according to the differences found in different

cultural settings and in multicultural settings. The results of this study of spontaneous chant could imply that current aptitude tests are skewed to Anglo American children.

In addition to these recommendations relevant to the field of music education, the following recommendations are made regarding future research of cultural differences in the musical responses and musical characteristics of young children.

First, it is recommended that studies be further developed for other Native American tribes using the same research model constructed for this study of Hopi children. The studies of other Native American tribes should also include comparisons to Anglo American control groups, as well as comparisons among the different tribes.

Second, it is recommended that this study be enlarged to create a more extensive subject pool of both Native American and Anglo American children.

Third, it is recommended that the scope of this study be expanded from the babble and spontaneous chant stages of musical response and development to more formulated and conceptually oriented processes. This would involve older children in more highly structured musical environments in both cultures.

These recommendations could have a significant impact on how children respond to music and learn music in different cultures. The environment in the United States today has been described as a mosaic of various ethnic communities that contribute to the national culture as they maintain distinct identities. These distinct identities must be recognized and embraced by all who teach music to young children.

BIBLIOGRAPHY

Adelman, C., & Kemp, A. E. ((1992). Case study and action research. In A. Kemp (Ed.), *Some approaches to research in music education*. Reading, England: International Society for Music Education.

Anderson, J. D. (1991). Children's song acquisition: An examination of current research and theories. *The Quarterly Journal of Music Teaching and Learning, 2* (4), 42-49.

Anderson, W. M., & Campbell, P. S. (Eds.). (1989). *Multicultural perspectives in music education*. Reston, Virginia: Music Educators National Conference.

Almy, M. (1961). Wishful thinking about children's thinking? *Teachers College Record, 62*, 405.

Andress, B. L. (1980). *Music experiences in early childhood*. New York: Holt, Rinehart, and Winston.

Andress, B. L., Hermann, H. M., Rinehart, C. A., & Talbert, E. G. (1973). *Music in early childhood*. Reston, Virginia: Music Educators National Conference.

Arizona Department of Education (n.d.). *1986-87 Dropout Rates*. Phoenix, Arizona.

Aronoff, F. W. (1969). *Music and young children*. New York: Holt, Rinehart, and Winston, Inc.

Bartlett, F. C. (1932). *Remembering. A study in experimental and social psychology*. Cambridge: CUP.

Bateson, G. (1955). A theory of play and fantasy. *Psychiatric Research Reports, 2*, 39-51.

Bayless, K. M., & Ramsey, M. E. (1982). *Music: A way of life for the young child*. St. Louis, Missouri: The C. V. Mosby Company.

Bedsole, E. A. (1987). A descriptive study of the musical abilities of three- and four-year old children. (Doctoral dissertation, University of Illinois at Urbana-Champaign, 1987). *Dissertation Abstracts International, 47*.

Bentley, A. (1966). *Musical ability in children*. New York: October House, Inc.

Bjorkvold, J. R. (1990). Canto – ergo sum: Musical child cultures in the United States, the Soviet Union and Norway. In F. R. Wilson & F. L. Roehmann (Eds.), *Music and child development* (pp. 117-135).

Bloom, B., et al. (1965). *Compensatory education for cultural deprivation*. New York: Holt, Rinehart, and Winston, Inc.

Bredekamp, S. (Ed.). (1987). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8*. Washington, DC: National Association for the Education of Young Children.

Burnsed, C. V. (1993). *The classroom teacher's guide to music education*. Springfield, Illinois: Charles C. Thomas Publisher.

Campbell, M. R. (1991). Musical learning and the development of psychological processes in perception and cognition. *Bulletin of the Council for Research in Music Education, 107*, 35-48.

Campbell, M. R. (1992). *Overview of developmental theories: Implications for music*. Unpublished manuscript.

Campbell, P. S. (1991). The childsong genre: A comparison of songs by and for children. *International Journal of Music Education, 17*, 14-23.

Chang, H., & Trehub, S. E. (1977a). Auditory processing of relational information by young infants. *Journal of Experimental Child Psychology, 24*, 324-333.

Chang, H., & Trehub, S. E. (1977b). Infants' perception of temporal grouping in auditory patterns. *Child Development, 48*, 1666-1670.

Davidson, L. (1985a). Tonal structures of children's early songs. *Music Perception, 2* (3), 361-373.

Davidson, L. (1985b). Tonal structure in the songs of preschool children. In J. Boswell (Ed.), *The young child and music: Contemporary principles in child development and music education*. Reston, VA: Music Educators National Conference.

Davidson, L. (1988). Tonal structure in the songs of preschool children. *Journal of Music Theory Pedagogy, 2* (1), 12 – 23.

Davidson, L., McKernon, P., & Gardner, H. (1981). The acquisition of song: A developmental approach. In *Documentary report of the Ann Arbor symposium: Applications of psychology to the teaching and learning of music*. Reston, VA: Music Educators National Conference.

Davies, C. (1994). The listening teacher: An approach to the collection and study of invented songs of children aged 5 to 7. In H. Lees (Ed.), *Musical connections: Tradition and change.* ISME, Tampa, 1994. Auckland, New Zealand: Uniprint.

Dowling, W. J. (1988). Tonal structure and children's early learning of music. In J. A. Sloboda (Ed.), *Generative processes in music: The psychology of performance, improvisation, and composition* (pp. 113-128). Oxford, England: Clarendon Press.

Dowling, W. J. (1984). Development of musical schemata in children's spontaneous singing. In W. R. Crozier & A. J. Chapman (Eds.), *Cognitive processes in the perception of art.* Amsterdam: Elsevier.

Drexler, E. A. (1938). A study of the development of the ability to carry a melody at the preschool level. *Child Development, 9,* 19-32.

Fiske, H. E. (1992). Research-based music education. In H. Lees (Ed.), *Sharing music of the world.* Proceedings of the XX ISME Conference (pp. 111-119). Christchurch, NZ.

Fox, D. B., Huffaker, J., Sims, W. L., & Tarnowski, S. M. (1994). Jam it up! Creating music in preschool. *Teaching Music, 2* (3), 34-46.

Fredrickson, M. (1994). Variants in spontaneous songs and the enculturation process in infants. In H. Lees (Ed.), *Musical connections: Tradition and change.* ISME, Tampa, 1994. Auckland, New Zealand: Uniprint.

Fung, C. V. (1995). Rationales for teaching world musics. *Music Educators Journal, 82* (1), 36-40.

Gardner, H. (1973). *The arts and human development: A psychological study of the artistic process.* New York: Wiley.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences.* New York: Basic Books.

Gilliland, H. (1988). *Teaching the Native American.* Billings, MT: Council for Indian Education.

Gilman, B. I. (1891). Zuni Melodies. *Journal of American Ethnology and Archaeology, 1,* 63-91.

Gilman, B. I. (1908). Hopi songs. *Journal of American Ethnology and Archaeology, 5,* 1-126.

Gordon, E. E. (1984). *Learning sequences in music: Skill, content, and patterns.* Chicago, IL: G.I.A. Publications, Inc.

Gordon, E. E. (1989). *Learning sequences in music: Skill, content, and patterns.* Chicago, IL: G.I.A. Publications, Inc.

Gordon, E. E. (1990). *A music learning theory for newborn and young children.* Chicago, IL: G.I.A. Publications, Inc.

Hargreaves, D. J. (1986). *The developmental psychology of music.* Cambridge, England: Cambridge University Press.

Hargreaves, D. J., & Zimmerman, M. P. (1992). Developmental theories of music learning. In R. Colwell (Ed.), *Handbook of research in music teaching and learning.* New York: Macmillan.

Harrison, L. N. (1983). *Getting started in elementary music education.* Englewood Cliffs, N. J.: Prentice-Hall, Inc.

Harwood, E. (1994). Miss Lucy meets Dr. Pepper: Mass media and children's traditional playground song and chant. In H. Lees (Ed.), *Musical connections: Traditions and change.* ISME, Tampa, 1994. Auckland, New Zealand: Uniprint.

Hildebrandt, C. (1987). Structural-developmental research in music: Conservation and representation. In J. C. Peery, I. W. Peery, & T. W. Draper, (Eds.), *Music and child development* (pp. 80-95). New York: Springer-Verlag.

Hoermann, D., & Bridges, D. (1984). *A developmental music program: Stage one.* Victoria, Australia: Educational Supplies Pty. Ltd., The Book Printer.

Hookey, M. (1994). Culturally responsive music education: Implications for curriculum development and implementation. In H. Lees (Ed.), *Musical connections: Tradition and change.* ISME, Tampa, 1994. Auckland, New Zealand: Uniprint.

Jones, R. L. (1976). The development of the child's conception of meter in music. *Journal of Research in Music Education, 24,* 142-154.

Jordan, J. (1992). Multicultural music education in a pluralistic society. In R. Colwell (Ed.), *Handbook of research on music teaching and learning.* New York: Schirmer Books.

Kenney, S. H. (1995). The voice within. *Teaching Music, 2* (5), 36-37.

Kessen, W., Levine, J., & Wendrick, K. A. (1979). The imitation of pitch in infants. *Infant Behavior and Development, 2,* 93-99.

King, N. (1986). Play and the culture of childhood. In G. Fein & M. Rivkin (Eds.), *The young child at play: Reviews of research* (Vol. 4, pp. 29-41). Washington, DC: National Association for the Education of Young Children.

Klinger, R. (1994). Multiculturalism in music education: Authenticity versus practicality. In H. Lees (Ed.), *Musical connections: Tradition and change.* ISME, Tampa, 1994. Auckland, New Zealand: Uniprint.

Kratus, J. (1989). A time analysis of the compositional processes used by children ages 7 to 11. *Journal of Research in Music Education, 37,* 5-20.

Kratus, J. (1994). The ways children compose. In H. Lees (Ed.), *Musical connections: Tradition and change.* ISME, Tampa, 1994. Auckland, New Zealand: Uniprint.

Lee-Ries, N. L. (1982). An analysis of the characteristics of infant-child singing expressions. (Doctoral dissertation, Arizona State University, 1982). *Dissertation Abstracts International, 42.*

List, G. (1985). Hopi melodic concepts. *Journal of the American Musicological Society,* (Spring, pp. 143-152). Indiana: Indiana University Press.

Littleton, J. D. (1991). Influence of play settings on preschool children's music and play behaviors. *Dissertation Abstracts International, 52.*

McCarthy, B. (1987). *The 4-MAT System: Teaching to Learning Styles with Right/Left Mode Techniques.* Barrington, IL: Excel, Inc.

McDonald, D. T. (1979). *Music in our lives: The early years.* Washington, D. C.: National Association for the Education of Young Children.

McDonald, D. T., & Simons, G. M. (1989). *Musical growth and development birth through six.* New York: Schirmer.

McKernon, P. (1979). The development of first songs in young children. *New Directions for Child Development,* 3, 43-58.

Mead, M. (1947). The implications of culture change for personality development. *Journal of Orthopsychiatry, 17,* 633-646.

Mead, M. (1951). *The school in American culture.* Cambridge: Harvard University Press.

Mead, M. (1966). Early childhood experience and later education in complex cultures. *The changing culture of an Indian tribe* (pp. 67-90). New York: G. P. Putnam's Sons, Inc. (Original work published 1932).

Menins, S. (1994). Music and language developed through stories. In H. Lees (Ed.), *Musical connections: Tradition and change.* ISME. Tampa, 1994. Auckland, New Zealand: Uniprint.

Merriam, A. P. (1964). *The anthropology of music.* Northwestern University Press.

Moog, H. (1976). The development of musical experience in children of pre-school age. *Psychology of Music, 4*, 38-45.

Moorehead, G. E., & Pond, D. (1941). *Music of young children*. Santa Barbara, CA: Pillsbury Foundation for the Advancement of Music Education.

Moorehead, G. E., & Pond, D. (1978). *Music of young children*. Santa Barbara, CA: Pillsbury Foundation for the Advancement of Music Education.

Navarro, M. L. (1989). The relationship between culture, society, and music teacher education in 1838 and 1988. (Doctoral dissertation, Kent State University, 1989), *Dissertation Abstracts International, 50*.

Nettl, B. (1983). *The study of ethnomusicology: Twenty-nine issues and concepts*. Chicago and Urbana: University of Illinois Press.

Parthun, P. (1976). Tribal music in North America. *Music Educators Journal, January*, 32-45.

Petzold, R. G. (1966). *Auditory perception of musical sounds by children in the first six grades*. (Cooperative Research Project No. 1051). Madison, WI: University of Wisconsin.

Platero, P. R., Brandt, E. A., Witherspoon, G., & Wong, P. (1986). *Navajo Students at Risk*. Window Rock, AZ: Platero Paperworks, Inc.

Rainbow, E. L., & Owen, D. (1979). A progress report on a three year investigation of the rhythmic ability of pre-school aged children. *Bulletin of the Council for Research in Music Education, 59*, 84-86.

Reyhner, J. (1988). *Teaching the Indian child: A bilingual/multicultural approach (2nd Ed.)*. Billings, MT: Eastern Montana College.

Reimer, B. (1993). Music education in our multimusical culture. *Music Educators Journal, 79* (7), 21-26.

Rhodes, R. W. (1977, November 4). *Hopi Indian pitch perception an hypothesis*. Paper presented at the annual meeting for the Society for Ethnomusicology, Austin, TX.

Rhodes, R. W. (1988). Holistic teaching/learning for Native American students. *Journal of American Indian Education, 27* (2), 21-29.

Rhodes, R. W. (1990). Measurement of Navajo and Hopi brain dominance and learning styles. *Journal of American Indian Education, 9* (1), 13-18.

Rhodes, R. W. (1994). *Nurturing learning in Native American students.* Hotevilla, Arizona: Sonwai Books.

Rudolf, a. (1961). Gestalt psychology and artistic form. In L. L. Whyte (Ed.), *Aspects of form.* Bloomington, IN: Indiana Press.

Rumelhart, D. (1980). Schemata: The building blocks of cognition. In R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension* (pp. 33-57). Hillsdale, NJ: Lawrence Erlbaum Associates.

Seeger, C. (1962, January 3). Discussion of problems concerning notation of American Indian singing. [Letter to George List].

Shelley, S. J. (1976). Music. In C. Seefeldt (Ed.), *Curriculum for the preschool-primary child – a review of the research.* Columbus, OH: Charles e. Merrill Publishing Co.

Shelley, S. J. (1981). Investigating the musical capabilities of young children. *Bulletin of the Council for Research in Music Education, 68,* 26-34.

Sherman, R. W. (1971). Creativity and the condition of knowing in music, part 2. *Music Educators Journal, 58* (3), 59-61.

Shreeve, J. (1996). Music of the hemispheres. *Discover, October,* 90-100.

Sims, W. L. (1988). Movement responses of pre-school children, primary grade children, and pre-service teachers to characteristics of musical phrases. *Psychology of Music, 16,* 110-127.

Sims, W. L. (1990). Characteristics of young children's music concept discrimination. *Psychomusicology, 9,* 79-88.

Sims, W. L. (1991). Effects of instruction and task format on preschool children's music concept discrimination. *Journal of Research in Music Education, 39,* 298-310.

Sims, W. L. (1995). Children's ability to demonstrate music concept discriminations in listening and singing. *Journal of Research in Music Education, 43* (3), 204-221.

Sinor, E. (1984). The singing of selected tonal patterns by preschool children. (Doctoral dissertation, Indiana University, 1984). *Dissertation Abstracts International, 44.*

Sloboda, J. A. (1988). *The musical mind: The cognitive psychology of music.* New York: Oxford University Press.

Swanwick, K., & Tillman, J. (1986). The sequence of musical development: A study of children's composition. *British Journal of Music Education, 3* (3), 305-339.

Tarnowski, S. M. (1994). [Review of *Influence of play settings on preschool children's music and play behaviors*]. *Bulletin of the Concil for Research in Music Education, 120,* 73-76.

Taylor, H. (1964). Music as a source of knowledge. *Music Educators Journal, 51,* September-October.

TCI, Inc. and Educational Data Systems, Inc. (1987). *Chinle Area Demographic Study, 1987.* Washington, DC & Campbell, CA: Author.

Trehub, S. E., Bull, D., & Thorpe, L. A. (1984). Infants' perception of melodies: The role of melodic contour. *Child Development, 55,* 821-830.

Updegraff, R., Heiliger, L., & Learned, J. (1938). The effect of training upon the singing ability and musical interest of three-, four-, and five-year-old children. *University of Iowa Studies in Child Welfare, 14,* 83-131.

Walker, R. (1990a). Multiculturalism in the teaching of music. In V. D'Oyley & S. M. Shapson (Ed.), *Innovative multicultural teaching.* Toronto: Kagan and Woo, Ltd.

Walker, R. (1990b). *Musical beliefs: Psychoacoustic, mythical and educational perspectives.* New York: Teachers College Press.

Wallis, P. (1984). Holistic learning – A must with American Indian students. *Momentum, 14* (1).

Webster, P. R. (1987). Conceptual bases for creative thinking in music. In J. C. Peery, I. W. Peery, & T. W. Draper (Eds.), *Music and child development* (pp. 158-174). New York: Springer-Verlag.

Webster, P. R. (1994). Thinking in sound: Studying children's improvisation. In H. Lees (Ed.), *Musical connections: Tradition and change.* ISME, Tampa, 1994. Auckland, New Zealand: Uniprint.

Wendrich, K. (1980). Pitch imitation in infancy and early childhood observations and implications. In P. T. Tallarico (Ed.), *Contributions to Symposium/80 the Bowling Green State University Symposium on Music Teaching and Research.* Bowling Green, OH.

Werner, H. (1961). *Comparative psychology of mental development.* New York: Science Editions.

Wilson, S. J., & Wales, R. J. (1995). An exploration of children's musical compositions. *Journal of Research in Music Education, 43* (2), 94-111.

Wolf, D., & Gardner, H. (1980). Beyond playing or polishing: A developmental view of artistry. In J. Hausman (Ed.), *Arts and the schools*. New York: McGraw-Hill.

Woods, D. G. (1985, June 15). *The musical characteristics of children*. Paper presented at the American Symphony Orchestra League Conference, San Francisco, CA.

Woods, D. G. (1990, July 1). *Applications of music learning theory*. Paper presented at the Australian Society for Music Education Conference, Alice Springs, Australia.

Woods, D. G. (1992, April 11). *Building a musical vocabulary*. Paper presented at the Music Educators National Conference, New Orleans, LA.

Woods, D. G. (1999, June 24). *Children as music makers*. Paper presented at Indiana University, Bloomington, IN.

Young, L. P. (1982). An investigation of young children's music concept development using nonverbal and manipulative techniques. *Dissertation Abstracts International*, 43, 1345A. (University Microfilms No. DA 8222205).

Zimmerman, M. P. (1980). Development research and the music curriculum. In P. T. Tallarico (Ed.), *Contributions to Symposium/80 the Bowling Green State University Symposium on Music Teaching and Research*. Bowling Green, OH.

Zimmerman, M. P. (1986). Musical development in middle childhood: A summary of selected research studies. *Bulletin of the Council for Research in Music Education, 86*, 18-35.

Zimmerman, M. P. (1993). An overview of developmental research in music. *Bulletin of the Council for Research in Music Education, 116*, 1-21.

APPENDIX A

Institutional Review Board: Application and Description of Study

February 1, 2000

Ms. Paula Wolfe
Office of Research Administration
The University of Oklahoma
1000 Asp Avenue, Room 314
Norman, Oklahoma, 73019-0430

Dear Paula:

I spoke with you in October regarding the research that I need to undertake to complete my doctoral dissertation. The project had previously been approved but the time period ran out before I was able to complete my research. You said that I should send my application to you and that you would help see that this was processed quickly, since it had already been approved once. I have been delayed in getting this material sent to you, due to the fact that other matters at Indiana University required my attention.

As you requested, I have enclosed two copies of the Discription of the Study and the Subject's Informed Consent Form. I have enclosed only one copy of the Application Form because it needs a signature from Dr. Steve Curtis in the School of Music, one of the Co-Chairs of my committee. You told me that if I sent this to you, you would be able to get his signature.

I appreciate you assistance in processing this application as soon as possible, so that I can hopefully complete my research in the next couple of months. Please let me know when I have received approval for the use of human subjects in my research so that I can proceed.

Sincerely,

Eric Jon Nichols
3610 Tamarron Drive
Bloomington, IN 47404
812-335-8516

INSTITUTIONAL REVIEW BOARD APPLICATION
FOR APPROVAL OF THE USE OF HUMAN SUBJECTS IN AN INVESTIGATION CONDUCTED ON THE NORMAN CAMPUS AND/OR BY UNIVERSITY OF OKLAHOMA FACULTY, STAFF OR STUDENTS

Your application for approval of the use of human subjects should consist of eleven (11) copies* of three parts:

PART I - A COMPLETED APPLICATION FORM
PART II - A DESCRIPTION OF YOUR RESEARCH STUDY
PART III - SUBJECT'S INFORMED CONSENT FORM FOR PARTICIPATION IN YOUR STUDY

You should attach supplementary information pertinent to this study that will help the board members in their review of your application, i.e., questionnaires, test instruments, letters of approval from cooperating institutions or/and organizations. Failure to submit these items will only delay your review.

Applications are due not later than the 5th day of the month in which you wish the proposed project reviewed

Please return completed proposals to:

Campus Mail:
Office of Research Administration
Buchanan Hall, Room 314

U.S. Mail:
Office of Research Administration
1000 Asp Avenue, Room 314
Norman, Oklahoma 73019-0430

Please call the ORA at 325-4757 and ask for the IRB if you have any questions. Please type your responses.

PART I - APPLICATION FORM

1. Principal Investigator:
Name Eric Jon Nichols
Department Music Education
Campus Phone No._____ E-mail Address erinicho@indiana.edu

If you are a student, provide the following information:
Daytime Phone No. (if different from above) 812-335-8578
Mailing Address 3610 Tamarron Drive
Bloomington, IN 47408

Faculty Sponsor Dr. Steve Curtis
Department School of Music Sponsor's Phone No. 405-325-5390

Co-Principal Investigator(s) (Please include name, department, and campus phone number)

Signatures:
Principal Investigator Eric Jon Nichols
Co-Principal Investigator(s)

_____ Faculty Sponsor (if student research project)

* If you believe your use of human subjects would be considered exempt from review or qualifies for expedited review as defined in Sections 4 and 12 of the University of Oklahoma Norman Campus Policy and Procedures for the Protection of Human Subjects in Research Activities, you may submit two (2) copies of

this application for initial review. If full Board review is required, you will be required to submit nine (9) additional copies.

2. Project Title: A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children

3. Project Time Period: From _____ October 1999 to October 2000

4. Previous Institutional Review Board-Norman Campus Approval for this project?
   Yes __X__ No
   If yes, please give date of the action May 1997

5. Are you requesting funding support for this project?
   Yes ____ No X
   If yes, please give sponsor's name

6. Description of Human Subjects:
   Age Range __3 - 5 years old_____ Gender (please check one): ___Males: ___Females; __XBoth
   Number of Subjects 50 - 300
   Special Qualifications: Native American Children, Anglo American Children, Age range 3 - 5 years old
   Source of Subjects and Selection Criteria: Randomly selected at day care centers, Head Start programs and individual homes

Please check any protected groups included in this study.

___ Pregnant Women	___ Mentally Retarded	___ Elderly	__X__ Children
___ Mentally Disabled	___ Fetuses	___ Prisoners	

PART II - DESCRIPTION OF THE STUDY

To assist Institutional Review Board members in conducting their review of your application, please prepare a brief (1-3 page) description of the study you plan to conduct, including the following information:

A. Purpose/Objectives

Explain the overall purpose of your study and its primary objectives, including the importance of the knowledge expected to result.

B. Research Protocol

Describe the study and procedures you will use, including a step-by-step description of the procedures you plan to use with your subjects.

C. Confidentiality

Briefly describe the procedures you will use to assure confidentiality of the data you collect from your subjects, specifically address whether subjects will be identifiable from raw and/or refined data, how data will be protected from non-project personnel (e.g., stored in locked cabinets), whether the identifiable data will be destroyed when no longer needed, and whether project publications (theses, papers, videotapes, etc.) will allow identification of individual subjects.

D. Subject Benefit/Risk

INSTITUTIONAL REVIEW BOARD APPLICATION
FOR APPROVAL OF THE USE OF HUMAN SUBJECTS IN AN INVESTIGATION CONDUCTED ON THE NORMAN CAMPUS AND/OR BY UNIVERSITY OF OKLAHOMA FACULTY, STAFF OR STUDENTS

Your application for approval of the use of human subjects should consist of eleven (11) copies* of three parts:

PART I - A COMPLETED APPLICATION FORM
PART II - A DESCRIPTION OF YOUR RESEARCH STUDY
PART III - SUBJECT'S INFORMED CONSENT FORM FOR PARTICIPATION IN YOUR STUDY

Attach supplementary information pertinent to this study that will help the board members in their review of your application, i.e., questionnaires, test instruments, letters of approval from cooperating institutions/organizations.

APPLICATIONS ARE DUE NOT LATER THAN THE 5TH DAY OF THE MONTH IN WHICH YOU WISH THE PROPOSED PROJECT REVIEWED

PLEASE TYPE YOUR RESPONSES

PART I - APPLICATION FORM

1. Principal Investigator:
   Name Eric Jon Nichols
   Department Music Education
   Campus Phone No.

   If you are a student, provide the following information:
   Daytime Phone No. (if different from above) (405) 364-9903
   Mailing Address 4725 Marston Ct.
   Norman, OK 73072
   Faculty Sponsor Dr. David G. Woods, Dean Dept. College of Fine Arts
   Sponsor's Phone No. 325-7370

   Co-Principal Investigator(s) (Please include name, department, and campus phone number)

   Signatures:
   Principal Investigator Eric Jon Nichols
   Co-Principal Investigator(s)

   Faculty Sponsor (if student research project) David G. Woods

*If you believe your use of human subjects would be considered exempt from review or qualifies for expedited review as defined in Sections 4 and 12 of the University of Oklahoma Norman Campus Policy and Procedures for the Protection of Human Subjects in Research Activities, you may submit two (2) copies of this application for initial review. If full Board review is required, you will be required to submit nine (9) additional copies.

2. Project Title A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children

3. Project Time Period: From April 1997 to June 1997

4. Previous Institutional Review Board-Norman Campus Approval for this project?
Yes_____ No_X_____
If yes, please give date of the action_____

5. Are you requesting funding support for this project?
Yes_____ No_X_____
If yes, please give sponsor's name_____

6. Description of Human Subjects
Age Range 3 - 5 years old
Gender (please check one): ___Males; ___Females; _x_Both
Number of Subjects 100 - 300
Special Qualifications Native American children, Anglo American Children, Age range 3 - 5 years old
Source of Subjects and Selection Criteria Randomly selected at day care centers and Head Start programs
Please check any protected groups included in this study.
_____Pregnant Women
_____Fetuses
_____Mentally Disabled
_____Mentally Retarded
_____Elderly
_____Prisoners
__X__Children

A COMPARATIVE STUDY OF THE MUSICAL CHARACTERISTICS OF CHILDREN AS OBSERVED IN THE SPONTANEOUS CHANT OF NATIVE AMERICAN AND ANGLO AMERICAN CHILDREN

BY
ERIC JON NICHOLS

A. PURPOSE/OBJECTIVES

This study will focus on the collecting of a repertoire of spontaneous chants from children. The children involved in the study will come from two different cultural backgrounds, Native American and Anglo American. A comparison of the chants will be made to determine if there are differences or similarities of inherent musical characteristics of the children involved in the study, based upon the culture.

The importance of this study is two pronged. First, knowledge in the area of children's spontaneous chant is greatly lacking. The collection of a repertoire of children's spontaneous chant would significantly add to the knowledge that we currently have about young children and music. Second, the discovery of significant differences in musical characteristics of the children from these two different cultures, would have implications for and assist in the development of curriculum that could be used to teach these children.

B. RESEARCH PROTOCOL

In order to complete this study, the following will be accomplished:

1. Randomly select children from both cultures to serve as subjects in the study.
2. Contact institutions, such as daycare centers, preschools, and Head Start programs, where children can be observed and obtain their willingness to participate in the study.
3. Develop an Informed Consent Form in order to obtain consent from parents for their children to participate in the study.

4. Set up observation times at the participating institutions.
5. During observations, record on audio tape, the spontaneous chant of children.
6. Transcribe, into musical notation, the chants that have been recorded.
7. Selected judges to verify the accuracy of the chant transcriptions.
8. Develop a taxonomy of musical characteristics, that are generally accepted by the music profession and by the cultures.
9. Make an analysis of the chants using the taxonomies.
10. Make comparisons and observations regarding the chants, based upon accepted musical characteristics.
11. Note the similarities and differences of the chants collected from the two different cultures.

C. CONFIDENTIALITY

In order to provide confidentiality for the subjects of this study the following steps will be taken by the principal investigator:

Raw Data

1. All audio recordings and letters of consent will be stored in the home office of the principal investigator, to ensure that access is not gained by non-project personnel.
2. Recordings and letters of consent may be retained by the principal investigator for later use in longitudinal studies or for comparisons in subsequent new studies.

Refined Data

1. Once the data has been refined it will no longer be identifiable by the subject's name but by a subject number and the subject will only be identifiable to the principal investigator by going back to the raw data.
2. Refined data that is used for publication will not divulge the names of any individual participating in the study.
3. Refined data will become the property of the principal investigator for use in subsequent studies and publications.

D. SUBJECT BENEFIT/RISK

The potential benefits from participation in this study include the following:

1. Increased knowledge about young children's spontaneous chant.
2. Additional repertoire of young children's spontaneous chant, an area which currently is extremely limited as to the number of examples available.

3. Increased knowledge about the musical characteristics of young children from Native American and Anglo American cultures.
4. New information gained from this study could assist music educators in developing more appropriate curriculums to implement in their classrooms to more effectively teach children.
5. Due to increased knowledge, future generations of children could benefit by being taught more appropriate material for musical skill and content development.

The principal investigator is unaware of any possible risks that might occur to the participants as a result of their participation in this study.

APPENDIX B

Institutional Review Board: 2002 Annual Review Report

The University of Oklahoma

OFFICE OF RESEARCH ADMINISTRATION

Title: A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children
Due Date: March 20, 2002
Log Number: FY2000-181

January 30, 2002

Mr. Eric Jon Nichols
3610 Tamarron Drive
Bloomington, IN 47408

Dear Mr. Nichols:

Our Institutional Assurance with the U.S. Department of Health and Human Services (DHHS) for the protection of human subjects requires annual review by the Institutional Review Board (IRB) of all studies involving human subjects at risk. The procedures for review require the principal investigator to submit a progress report to the IRB, along with a copy of each consent form currently being used in the study. If you find it necessary to extend the study, please indicate this by checking the box marked "ACTIVE-continuing to enroll subjects." You may receive up to two annual extensions of your approval in this manner. At the end of the third year, you will need to complete a new application for review and approval by the IRB before continuing with your study.

It is important that the progress report/consent form packet be received by the IRB office no later than **March 20, 2002**. Failure to provide it will prevent timely review by the Board and jeopardize your ability to continue the study.

Please complete the enclosed form, attach a copy of each currently used consent form and return the complete packet to the Office of Research Administration, 1000 Asp Avenue, Room 314. If you have any questions about these procedures or need additional information, please do not hesitate to contact us at (405) 325-4757.

Sincerely yours,

Susan Wyatt Sedwick

Susan Wyatt Sedwick, Ph.D.
Administrative Officer
Institutional Review Board - Norman Campus

SWS:lk
Enclosure

cc: E. Laurette Taylor, Chair, Institutional Review Board
Dr. Steve Curtis, Music

1000 Asp Avenue, Suite 314, Norman, Oklahoma 73019-4077 PHONE: (405) 325-4757 FAX: (405) 325-6029

2000-181

INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF OKLAHOMA - NORMAN CAMPUS
ANNUAL PROGRESS REPORT
FOR APPROVED USE OF HUMAN SUBJECTS IN AN INVESTIGATION

Project Title: A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children

Principal Investigator(s): Mr. Eric Jon Nichols, Music

Status of the Study (Please check one of the Following):

	ACTIVE continuing to enroll subjects	X	ACTIVE, but closed to new subject enrollment		COMPLETED please inactivate

APPROVED STUDY SITE(S): See attached sheet

NUMBER OF SUBJECTS ENROLLED THIS YEAR: 34

NUMBER OF SUBJECTS ENROLLED TO DATE: 34

SUMMARY OF STUDY RESULTS (Please summarize study results since your last periodic review. Use continuation pages as needed.)

see attached sheet

Please list any adverse effects to study subjects and the dates of notification to the IRB.

None

If you checked "ACTIVE, continuing to enroll subjects" above
A Copy of Each Currently Used Consent Form Must Be Included With This Progress Report

Principal Investigator Signature: [signature]
(Substitute Signatures are not allowed)

Phone: 932-335-8518 H 702-325-9849 W Date: March 6, 2002

(11/16/92)

INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF OKLAHOMA – NORMAN CAMPUS
ANNUAL PROGREES REPORT
FOR APPROVED USE OF HUMAN SUBJECTS IN AN INVESTIGATION

Project Title: A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children

Principal Investigator: Mr. Eric Jon Nichols, Music

Status of Study: Active, but closed to new subject enrollment

Approved Study Site(s): Indiana University, Campus Children's Center
The Hopi Tribe, The Office of Education
Bloomington Developmental Learning Center, Bloomington, IN

Number of Subjects Enrolled this Year: 34

Number of Subjects Enrolled to Date: 34

Summary of Study Results:

Native American Subjects

- Distributed and collected Parental Consent Forms
- Scheduled observation times
- Observed and collected audio tape recordings
- Made musical transcriptions based on audio tape recordings
- Transcriptions have been reviewed for accuracy by two external judges
- Corrections recommended by external judges have been made to the transcriptions

Anglo American Subjects

- Distributed and collected Parental Consent Forms
- Scheduled observation times

List any adverse effect to study subjects. None

The University of Oklahoma

OFFICE OF RESEARCH ADMINISTRATION

April 19, 2002

Mr. Eric Jon Nichols
3610 Tamarron Drive
Bloomington IN 47408

SUBJECT: "A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children"

Dear Mr. Nichols:

Thank you for returning your completed progress report for research conducted with human subjects under the above-referenced protocol. The Board has reviewed and approved your report. Since you indicate the study is continuing, they have extended your approval to continue this research for an additional twelve-month period ending 3/20/2003.

Please note that this approval is for the protocol and informed consent form reviewed by the Board. If you wish to make any changes, you will need to submit a request for change to this office for review.

Thirty days before the expiration of this approval you will receive notice from the IRB secretary that your approval anniversary is approaching along with information you can use to complete your progress report and request an extension of the approval date.

If you have any questions about the approval given your protocol, please contact me at 325-4757.

Sincerely yours,

Susan Wyatt Sedwick

Susan Wyatt Sedwick, PhD
Administrative Officer
Institutional Review Board-Norman Campus

SWS:lk
FY2000-181

cc: Dr. E. Laurette Taylor, Chair, IRB
Dr. Steve Curtis, Music

1000 Asp Avenue, Suite 314, Norman, Oklahoma 73019-0430 PHONE: (405) 325-4757 FAX: (405) 325-6029

APPENDIX C

Institutional Review Board: Letters of Consent to Conduct Research with Human Subjects

The University of Oklahoma

OFFICE OF RESEARCH ADMINISTRATION

May 7, 1997

Mr. Eric Jon Nichols
4725 Marston Court
Norman, Oklahoma 73072

SUBJECT: IRB-NC Review of Proposal

Dear Mr. Nichols:

The Institutional Review Board-Norman Campus, has reviewed your proposal, "A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children," under the University's expedited review procedures. The Board found that this research would not constitute a risk to participants beyond those of normal, everyday life except in the area of privacy which is adequately protected by the confidentiality procedures. Therefore, the Board has approved the use of human subjects contingent on receipt of an approval letter from each day care center, preschool, or Head Start Program participating in your project. You may conduct your research at each of the sites after we receive that particular center/preschool/program's approval letter.

After we receive all of the approval letters, I will then send you a letter of full approval for the project. If you have any questions, please call me at 325-4757.

Sincerely yours,

Karen M. Petry

Karen M. Petry
Administrative Officer
Institutional Review Board

KMP:sg
97-146

cc: Dr. Laurette Taylor, Chair, IRB
Dr. David G. Woods, Dean, Fine Arts

1000 Asp Avenue, Suite 314, Norman, Oklahoma 73019-0430 PHONE: (405) 325-4757 FAX: (405) 325-6029

The University of Oklahoma
OFFICE OF RESEARCH ADMINISTRATION

March 1, 2000

Mr. Eric Jon Nichols
3610 Tamarron Drive
Bloomington IN 47408

Dear Mr. Nichols:

The Institutional Review Board-Norman Campus has reviewed your proposal,"A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children," under the University's expedited review procedures. The Board found that this research would not constitute a risk to participants beyond those of normal, everyday life, except in the area of privacy, which is adequately protected by the confidentiality procedures. Therefore, the Board has approved the use of human subjects in this research ***contingent on*** the following:

> Provide letters from the participating institutions stating they agree to allow you to conduct your research project. Be informed that data collection can not begin until the Institutional Review Board receives the letters, approves their content and issues an approval letter free of contingencies.

Please feel free to call if you have questions. Thank you.

Sincerely yours,

Susan Wyatt Sedwick

Susan Wyatt Sedwick, Ph.D.
Administrative Officer
Institutional Review Board-Norman Campus

SWS:pw
FY00-181

Cc: Dr. E. Laurette Taylor, Chair, Institutional Review Board
Dr. Steve Curtis, Music

1000 Asp Avenue, Suite 314, Norman, Oklahoma 73019-0430 PHONE: (405) 325-4757 FAX: (405) 325-6029

The University of Oklahoma

OFFICE OF RESEARCH ADMINISTRATION

March 20, 2001

Mr. Eric Jon Nichols
3610 Tamarron Drive
Bloomington IN 47408

Dear Mr. Nichols:

The Institutional Review Board-Norman Campus has reviewed your proposal, "A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children." The Board found that this research would not constitute a risk to participants beyond those of normal, everyday life except in the area of privacy which is adequately protected by the confidentiality procedures. Therefore, the Board has approved the use of human subjects in this research.

This approval is for a period of 12 months from this date, provided that the research procedures are not changed significantly from those described in your "Summary of Research Involving Human Subjects" and attachments. Should you wish to deviate significantly from the described subject procedures, you must notify me and obtain prior approval from the Board for the changes.

At the end of the research, you must submit a short report describing your use of human subjects in the research and the results obtained. Should the research extend beyond 12 months, a progress report must be submitted with the request for re-approval, and a final report must be submitted at the end of the research.

If you have any questions, please contact me.

Sincerely yours,

Susan Wyatt Sedwick

Susan Wyatt Sedwick, Ph.D.
Administrative Officer
Institutional Review Board

SWS/pw
FY00-181

cc: Dr. E. Laurette Taylor, Chair, Institutional Review Board
Dr. Steve Curtis, Music

1000 Asp Avenue, Suite 314, Norman, Oklahoma 73019-0430 PHONE: (405) 325-4757 FAX: (405) 325-6029

The University of Oklahoma
OFFICE OF RESEARCH ADMINISTRATION

April 18, 2001

Eric Jon Nichols
3610 Tamarron Drive
Bloomington IN 47408

Dear Mr. Nichols:

The Institutional Review Board-Norman Campus, has reviewed the requested additional information you provided for your proposal, "A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children." The Board found that this research would not constitute a risk to participants beyond those of normal, everyday life except in the area of privacy which is adequately protected by the confidentiality procedures. Therefore, the Board has given full approval for the use of human subjects in this research. The approved sites are listed below:

Indiana University	The Hopi Tribe
Campus Children's Center	The Office of Education
2613 East Tenth Street	PO Box 123
Bloomington IN 74408	Kykotsmovi AZ 86039

This approval is for a period of 12 months from the original approval date of March 20, 2001, provided that the research procedures are not changed significantly from those described in your "Application for Approval of the Use of Human Subjects" and attachments. Should you wish to deviate significantly from the described subject procedures, you must notify me and obtain prior approval from the Board for the changes.

At the end of the research, you must submit a short report describing your use of human subjects in the research and the results obtained. Should the research extend beyond 12 months, a progress report must be submitted with the request for re-approval, and a final report must be submitted at the end of the research.

If you have any questions, please contact me.

Sincerely yours,

E. Laurette Taylor, Ph.D.
Chair
Institutional Review Board

ELT:pw
FY00-181

cc: Dr. Susan Wyatt Sedwick, Administrative Officer, IRB
Dr. Steve Curtis, Music

1000 Asp Avenue, Suite 314, Norman, Oklahoma 73019-0430 PHONE: (405) 325-4757 FAX: (405) 325-6029

The University of Oklahoma

OFFICE OF RESEARCH ADMINISTRATION

January 31, 2002

Mr. Eric Jon Nichols
3610 Tamarron Drive
Bloomington IN 47408

SUBJECT: "A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children"

Dear Mr. Nichols:

The Institutional Review Board has reviewed and approved the requested revision(s) to the subject protocol. This revision includes the addition of the Bloomington Developmental Learning Center in Bloomington, Indiana.

Please note that this approval is for the protocol and informed consent form initially approved by the Board on March 20, 2001, and the revision(s) included in your request dated January 30, 2002. If you wish to make other changes, you will need to submit a request for revision to this office for review.

If you have any questions, please contact me at 325-4757.

Sincerely yours,

Susan Wyatt Sedwick, PhD
Administrative Officer
Institutional Review Board-Norman Campus

SWS:lk
FY2000-181

cc: Dr. E. Laurette Taylor, Chair, IRB
Dr. Steve Curtis, Music

1000 Asp Avenue, Suite 314, Norman, Oklahoma 73019-4077 PHONE: (405) 325-4757 FAX: (405) 325-6029

APPENDIX D

Native American: Consent to Conduct Study Letters

January 15, 2001

Mr. Harvey Paymella
Education Director
Hopi Tribe
Box 123
Kykotsmovi, AZ 86039

Dear Mr. Paymella:

My name is Eric Nichols, I am a graduate student working towards my Ph.D. in Music Education. I am writing this letter in order to get permission to observe and make audio tape recordings of Hopi children, as they are involved in play situations where they might exhibit examples of spontaneous chant (songs that they make up and sing as they play). This is a research project, entitled *"A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children."* I am conducting this research as a part of my required course of study at the University of Oklahoma and under it's auspice. The faculty members who are sponsoring my research and to whom I am responsible during this study are Dr. Steven Curtis, Professor of Music Education at the University of Oklahoma and Dr. David G. Woods, Professor of Music Education and Dean of the School of Fine Arts at the University of Connecticut.

I have a great interest in and respect for the Hopi Culture as a result of the time I spent teaching music at the Hotevilla Bacavi Community School nearly twenty years ago, as well as from the many visits that I have made to the area since. I believe that this study will have positive implications for the education of Hopi children. Presently curriculum used to teach children was developed for the general population and is a "one size fits all" approach. I hope to prove through my research that Hopi children may have somewhat different areas of strength than the general population, at least in music. Therefore, curriculum which does not address and utilize those strengths would be less effective than curriculum that did. First it is important to determine if Hopi children mirror the general population or not. There is some previous research indicating differences which has not had much effect on curriculum or schools for Hopi students so far, but my research could provide more information that would give clues and provide the basis for developing teaching tools and techniques that will allow for and promote a more effective education for Hopi students and perhaps reduce the drop out rate.

My research would look at preschool children ages three to five, so I would not be involved with any institution, only with families. I would approach individual families in order to get their permission for their children to participate in this study. If my proposal is approved, I would be very willing to share the results of my study with the families that participated and the Hopi Tribe. Also, once my dissertation has been completed I would be willing to give a copy to the Hopi Tribe.

Thank you in advance for your cooperation and consideration.

Sincerely,

Eric Jon Nichols
3610 Tamarron Drive
Bloomington, IN 47408

Home: 812-335-8518
Office: 812-855-9864
Email: erinicho@indiana.edu

February 21, 2001

Ms. Phyllis Kelhoyouma
Education Department
Hopi Tribe
Box 123
Kykotsmovi, AZ 86039

Dear Ms. Kelhoyouma:

Per our phone conversation of February 20, 2001, I am writing this letter to clarify the conflict of wording that you noted between the cover letter and proposal for research that you received.

The proposal stated that I would approach Head Start Programs and Daycares to gather research. This was the original proposal approved by The University of Oklahoma (OU). Since this was submitted, I have decided to approach my research on the Hopi Reservation through individual families. I have discussed this matter with my doctoral committee and the Office of Research Administration at OU and they have approved this change of procedure.

The research that I plan to do on the Hopi Reservation will be approached and carried out by obtaining permission from individual families. I will then observe children from these families in order to make audio tape recordings of their spontaneous chants (songs that the children make up and sing, not ceremonial music).

These changes from my original proposal will be documented in my final doctoral dissertation, along with the steps and procedures that I went through to obtain these changes.

I believe that the research that I will conduct will be beneficial to children in the Hopi Tribe in the future and of course will be willing to share any information that I learn with the Hopi.

I appreciate your interest that you have expressed in this research project.

Sincerely,

Eric Jon Nichols
3610 Tamarron Drive
Bloomington, IN 47408
Home: 812-335-8518
Work: 812-855-9864
Fax: 812-335-9850
Email: erinicho@indiana.edu

Wayne Taylor, Jr.
CHAIRMAN

Phillip R. Quochytewa, Sr.
VICE-CHAIRMAN

THE OFFICE OF EDUCATION

February 28, 2001

Mr. Eric Jon Nichols
3610 Tamarron Drive
Bloomington, IN 47408

Dear Mr. Nichols:

We received your fax on February 21, 2001 clarifying your research proposal.

This was the information that we had received from Dr. Robert Rhodes and our understanding that you would be working with individual families. Our office has no problem with this.

Your research seems worthy and our office would be very much interested in the information that is gleaned from this endeavor.

Good luck in your efforts to determine the additional knowledge about children and music. If we can be of any other assistance do not hesitate to give us a call.

Sincerely,

Harvey D. Paymella, Director
The Office of Education

Cc: R. Rhodes
Chrono files

P.O. BOX 123 – KYKOTSMOVI, AZ. – 86039 – (520) 734-3000 – Fax (520) 734-2259

APPENDIX E

Anglo American: Consent to Conduct Study Letter

Bloomington
Developmental
Learning
Center

January 25,2002

Office of Research Administration
University of Oklahoma

Dear Sirs:

Mr. Eric Jon Nichols has received permission from our board for his research Project " A Comparative Study of the Musical Characteristics of Children as Observed In the Spontaneous Chant of Native American and Anglo American Children."

I was the curriculum coordinator and am very interested in his research . I have volunteered to serve as liason with our not-for-profit daycare, one of our main philosophical goals is multiculturalism.

Roberta M. Closkey

Roberta McCloskey

1807 S. Highland • Bloomington, Indiana 47401 • (812) 336 6600

APPENDIX F

Informed Parental Consent and Demographic Data Forms

Dear Parent:

My name is Eric Nichols, I am a graduate student working towards my Ph.D. in Music Education. I am writing this letter in order to get your permission to observe and make audio tape recordings of your child or children, as they are involved in play situations where they might exhibit examples of spontaneous chant (songs that they make up and sing as they play). This is a research project, entitled *"A Comparative Study of the Musical Characteristics of Children as Observed in the Spontaneous Chant of Native American and Anglo American Children."* I am conducting this research as a part of my required course of study at the University of Oklahoma and under it's auspice. The faculty members who are sponsoring my research and to whom I am responsible during this study are Dr. Steven Curtis, Professor of Music Education at the University of Oklahoma and Dr. David G. Woods, Professor of Music Education and Dean of the School of Fine Arts at the University of Connecticut.

The purpose of this study is to compare the spontaneous chant of children, ages three to five, from both Native American and Anglo American cultures. The reason for doing this is that the more music educators know about young children, from the two different cultures being studied, the better we will be able develop music curricula to implement when teaching these children. In this study I will not be interacting with your children, but observing their natural play. As they play, I will be looking for children that are participating in spontaneous chant. I will record the chants and transcribe them into musical notation. I will then make an analysis of the chants in order to discover differences and similarities of musical characteristics, between the children of Native American and Anglo American cultures. I will be visiting several daycares, preschools, and Head Start programs to gather this information. I anticipate visiting your child's school from one to three times, where I will then observe for two to four hours per visit.

As the principal investigator, I cannot see any risks that would be present or occur for your child as a result of participating in this study. The major benefits would be an increased knowledge of young children's musical characteristics and how to more effectively teach music to young children from these two different cultures.

Participation in this study by the subjects is voluntary, refusal to participate will not result in any penalty or loss of benefits to which your child is otherwise entitled. Withdrawal from participation at any time during the study, likewise, will not result in any penalty or loss of benefits to which your child is otherwise entitled.

Confidentiality of the individual participants will be maintained by the principal investigator. Your child's identity by name will be unknown and will be referred to in the study by a subject number. Any identifiable data will be destroyed after the completion of the study. Refined data that does not divulge the names of individuals participating in the study will become the property of the principal investigator.

If you have any questions about your child's participation in this study or the research, please contact Eric Nichols at 812-335-8518, Dr. David G. Woods at 860-486-3016, or Dr. Steven Curtis at 405-325-5390. If you have any questions about his/her rights as a research subject contact the Office of Research Administration, University of Oklahoma at 405-325-4757.

Child's Name _____

Parent's Signature _____

Date _____

DEMOGRAPHIC DATA

Parent Copy

(Keep for your records, you do not have to fill out this copy.)

Please print information clearly.

Child's Name _____

Date of Birth _____

Sex: Male _____ Female _____

Ethnic Background:

Anglo American _____

Native American _____

Tribal Affiliation _____

Other _____

School attending _____

City _____

Parent's Name _____

DEMOGRAPHIC DATA

Principal Investigator Copy

(Fill out and return to school, along with the signed consent letter.)

Please print information clearly.

Child's Name _____

Date of Birth _____

Sex: Male _____ Female _____

Ethnic Background:

Anglo American _____

Native American _____

Tribal Affiliation _____

Other _____

School attending _____

City _____

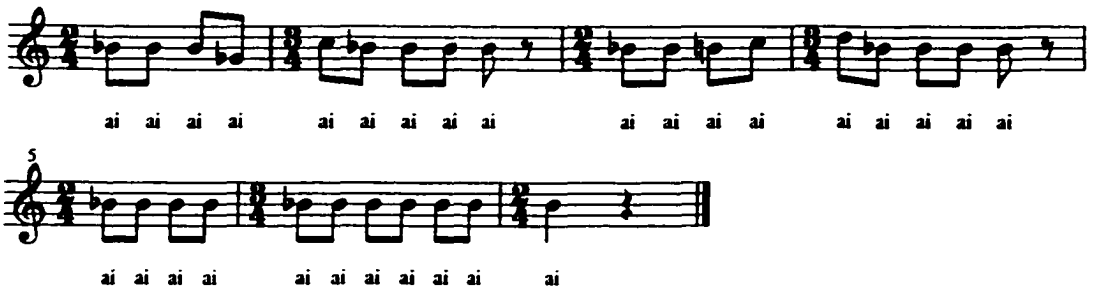
Parent's Name _____

APPENDIX G

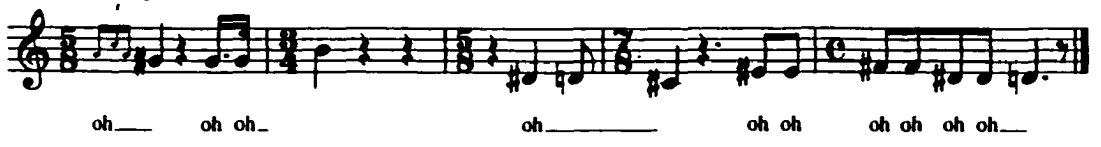
Native American: Transcriptions

Native American Transcriptions

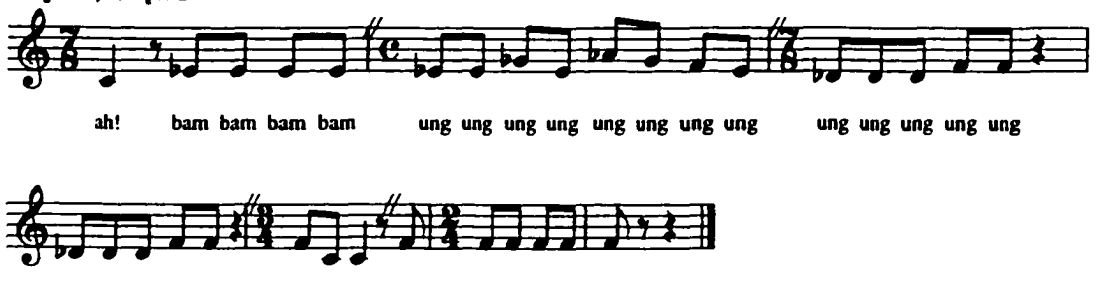
Subject 1, Sample 1



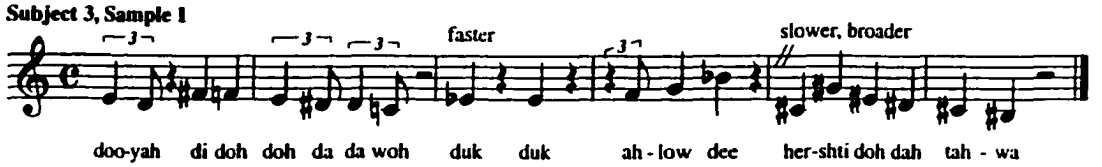
Subject 2, Sample 1



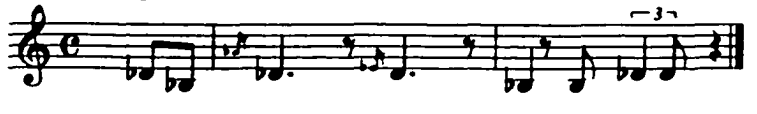
Subject 2, Sample 2



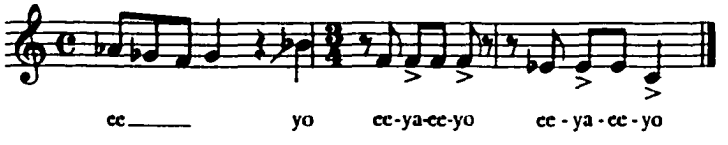
Subject 3, Sample 1

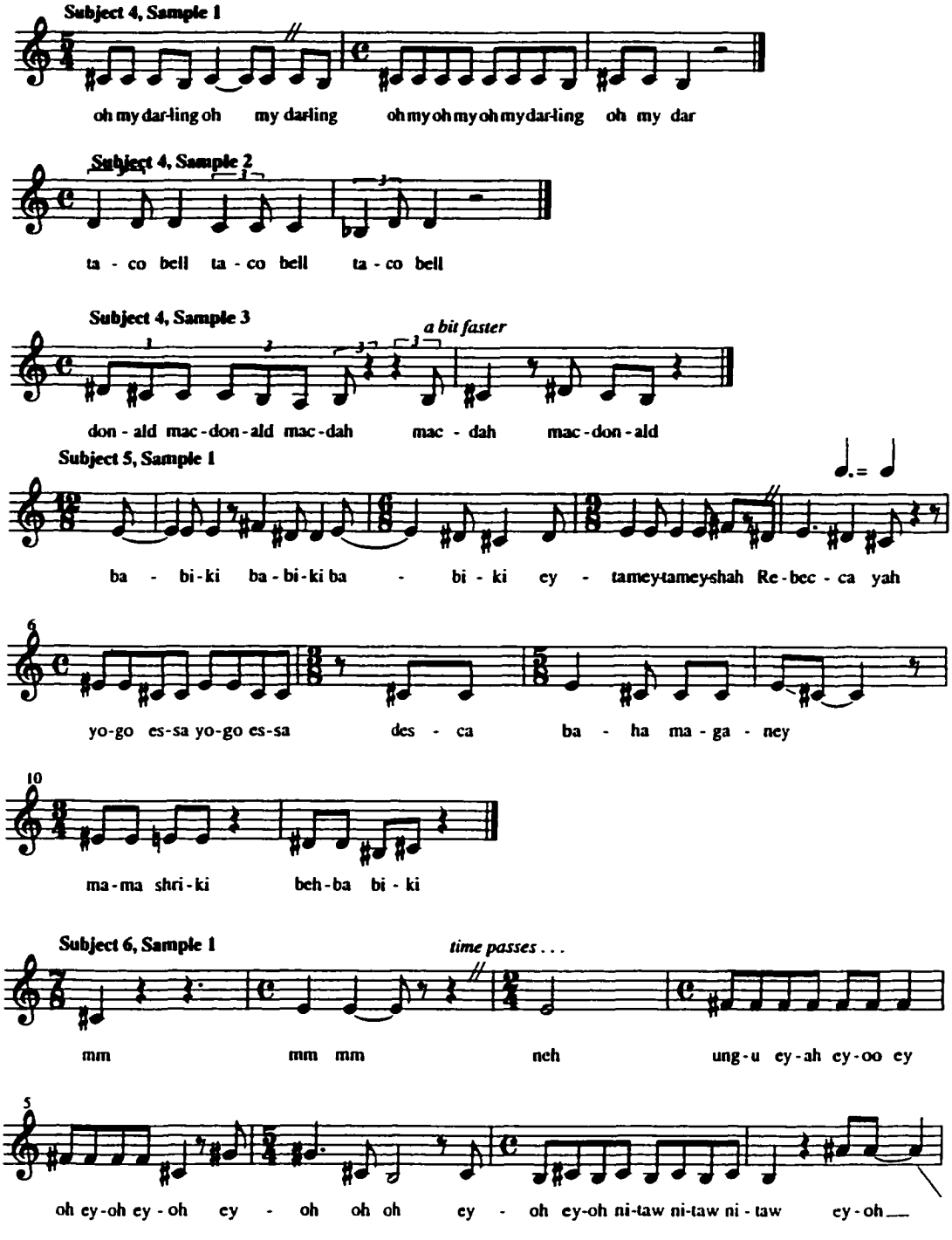


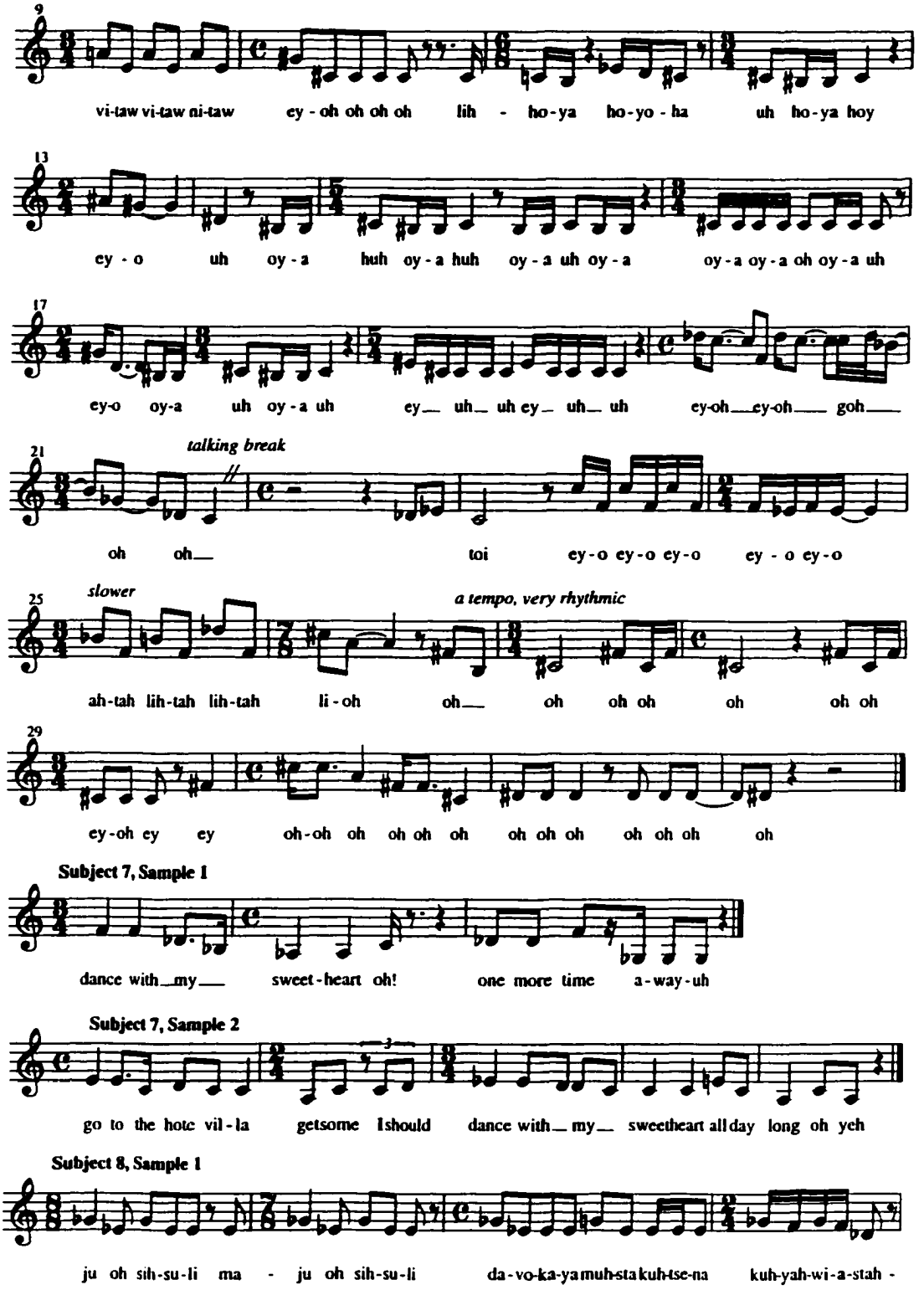
Subject 3, Sample 2

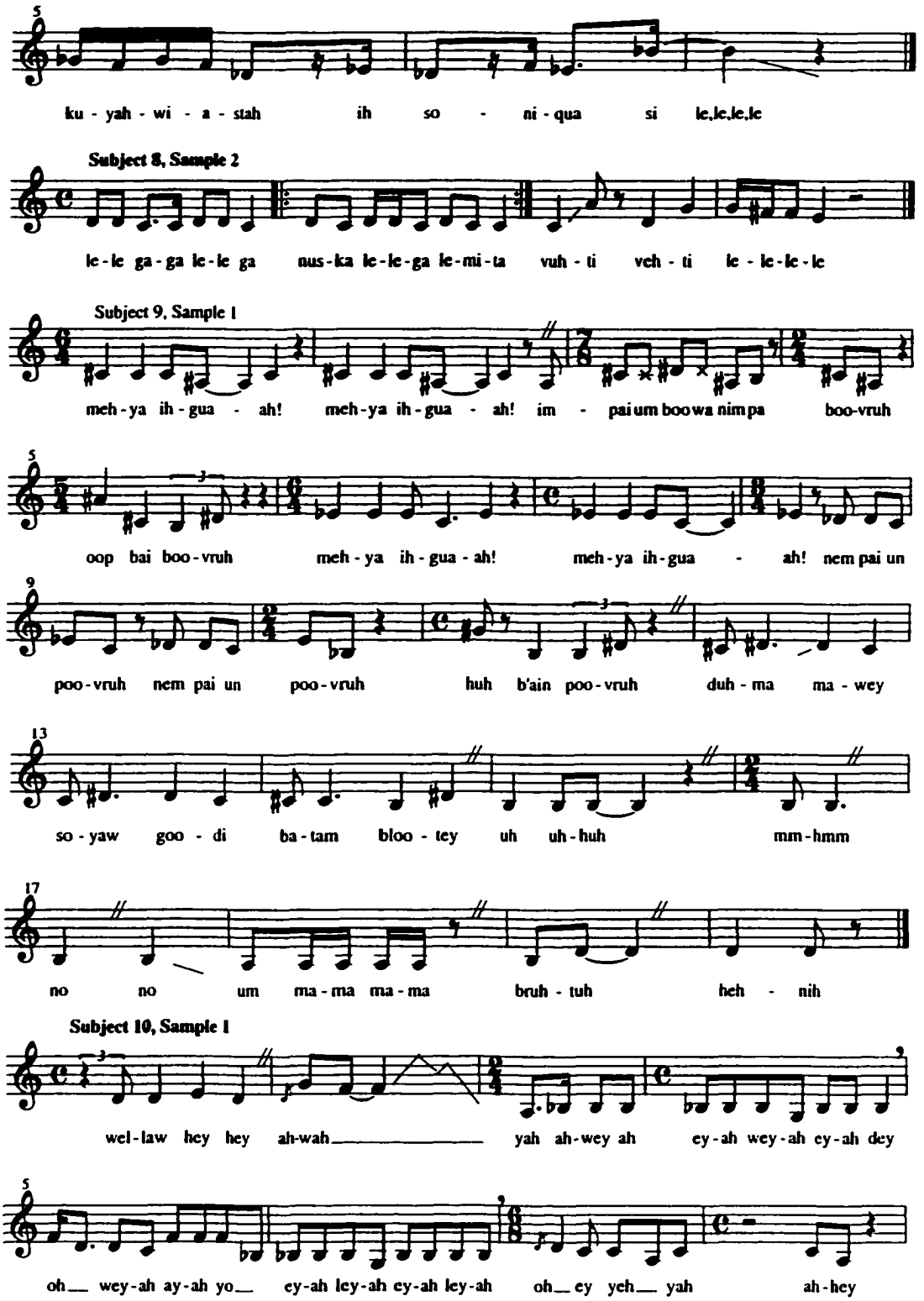


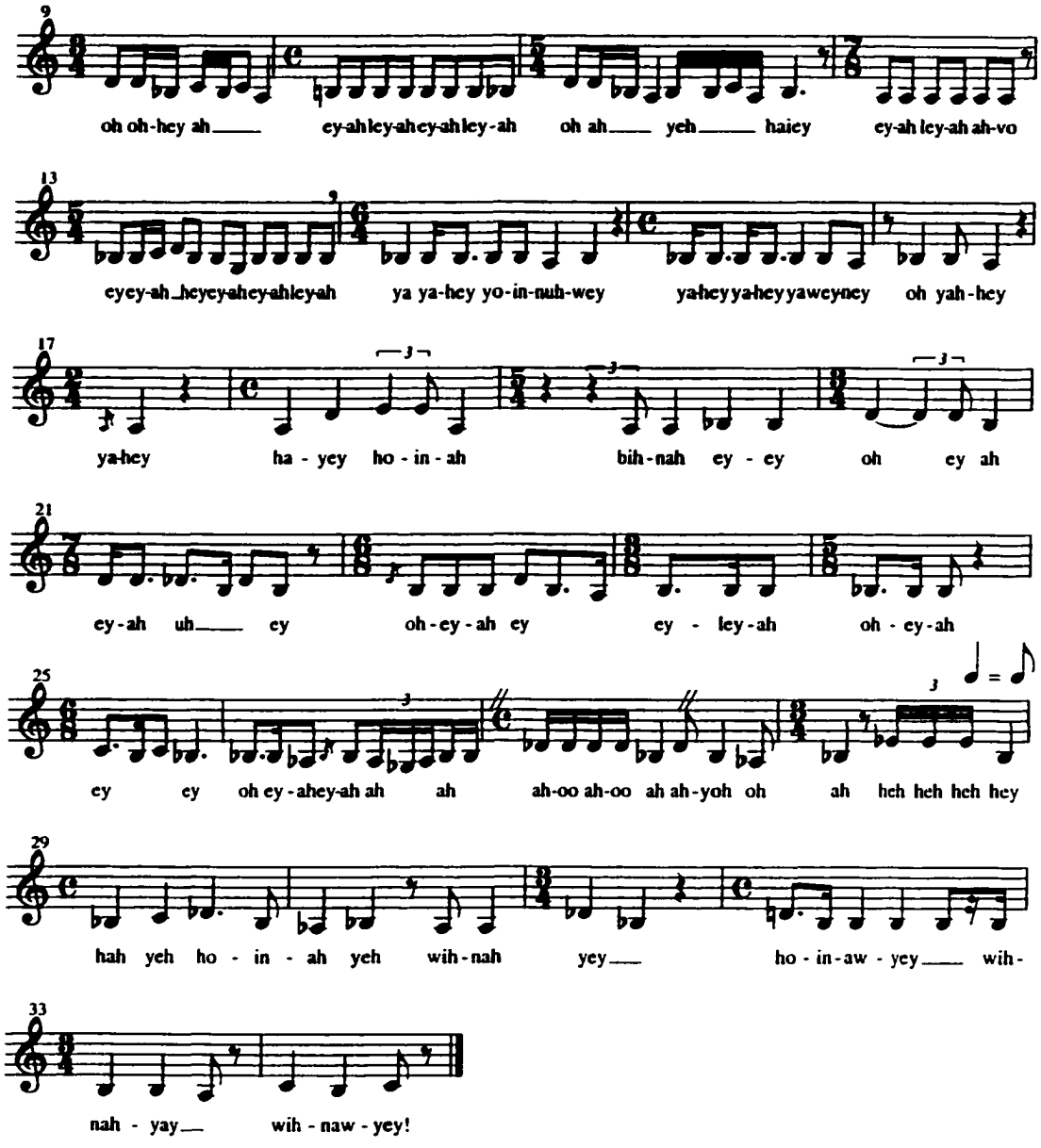
Subject 3, Sample 3




Subject 4, Sample 1
oh my dar-ling oh my dar-ling oh my oh my oh my dar-ling oh my dar
Subject 4, Sample 2
ta - co bell ta - co bell ta - co bell
Subject 4, Sample 3
a bit faster
don - ald mac - don - ald mac - dah mac - dah mac - don - ald
Subject 5, Sample 1
ba - bi - ki ba - bi - ki ba - bi - ki ey - tamey-tamey-shah Re - bec - ca yah
yo-go es-sa yo-go es-sa des - ca ba - ha ma - ga - ney
ma - ma shri - ki beh - ba bi - ki
Subject 6, Sample 1
time passes . . .
mm mm mm neh ung - u ey - ah ey - oo ey
oh ey - oh ey - oh ey - oh oh oh ey - oh ey-oh ni-taw ni-taw ni - taw ey - oh


9
vi-taw vi-taw ni-taw ey - oh oh oh oh lih - ho-ya ho-yo - ha uh ho-ya hoy
13
ey - o uh oy - a huh oy - a huh oy - a uh oy - a oy - a oy - a oh oy - a uh
17
ey-o oy-a uh oy - a uh ey__ uh__ uh ey__ uh__ uh ey-oh__ey-oh__ goh__
21
talking break
oh oh__ toi ey-o ey-o ey-o ey - o ey-o
25
slower
a tempo, very rhythmic
ah-tah lih-tah lih-tah li - oh oh__ oh oh oh oh oh oh
29
ey-oh ey ey oh-oh oh oh oh oh oh oh oh oh oh oh
Subject 7, Sample 1
dance with__my__ sweet-heart oh! one more time a-way-uh
Subject 7, Sample 2
go to the hotc vil - la getsome Ishould dance with__ my__ sweetheart all day long oh yeh
Subject 8, Sample 1
ju oh sih-su-li ma - ju oh sih-su-li da-vo-ka-ya muh-sta kuh-tse-na kuh-yah-wi-a-stah -


5
ku - yah - wi - a - stah ih so - ni - qua si le,le,le,le
Subject 8, Sample 2
le - le ga - ga le - le ga nus - ka le - le - ga le - mi - ta vuh - ti veh - ti le - le - le - le
Subject 9, Sample 1
meh - ya ih - gua - ah! meh - ya ih - gua - ah! im - pai um boo wa nim pa boo-vruh
5
oop bai boo - vruh meh - ya ih - gua - ah! meh - ya ih - gua - ah! nem pai un
9
poo - vruh nem pai un poo - vruh huh b'ain poo - vruh duh - ma ma - wey
13
so - yaw goo - di ba - tam bloo - tey uh uh - huh mm - hmm
17
no no um ma - ma ma - ma bruh - tuh heh - nih
Subject 10, Sample 1
wel - law hey hey ah-wah yah ah - wey ah ey - ah wey - ah ey - ah dey
5
oh wey - ah ay - ah yo ey - ah ley - ah ey - ah ley - ah oh ey yeh yah ah - hey

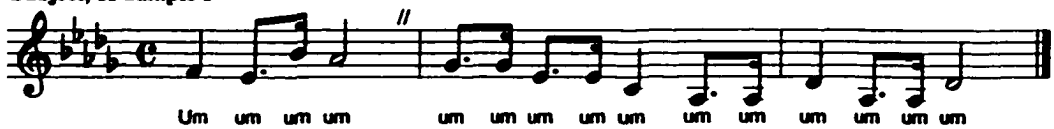

9
oh oh-hey ah ey-ah hey-ah hey-ah hey-ah oh ah yeh haiey ey-ah hey-ah ah-vo
13
eyey-ah heyey-ah hey-ah hey-ah ya ya-hey yo-in-nuh-wey ya-hey ya-hey ya wey-ney oh yah-hey
17
ya-hey ha - yey ho - in - ah bih-nah ey - ey oh ey ah
21
ey-ah uh ey oh-ey-ah ey ey - hey-ah oh - ey-ah
25
ey ey oh ey-ah hey-ah ah ah ah-oo ah-oo ah ah-yoh oh ah heh heh heh hey
29
hah yeh ho - in - ah yeh wih-nah yey ho - in-aw - yey wih-
33
nah - yay wih - naw - yey!

APPENDIX H

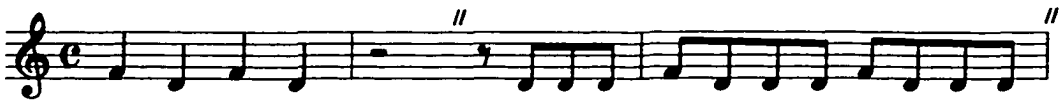
Anglo American: Transcriptions

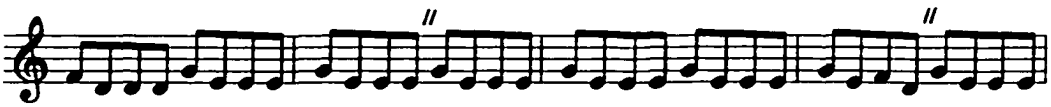
Anglo American Transcriptions

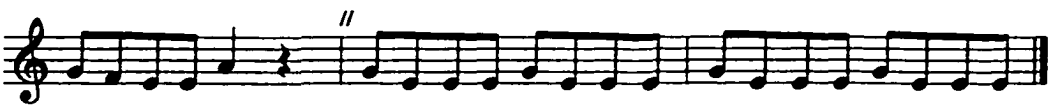
Subject, 11 Sample 1



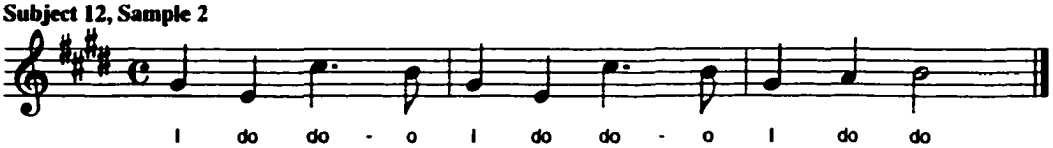
Subject, 12 Sample 1



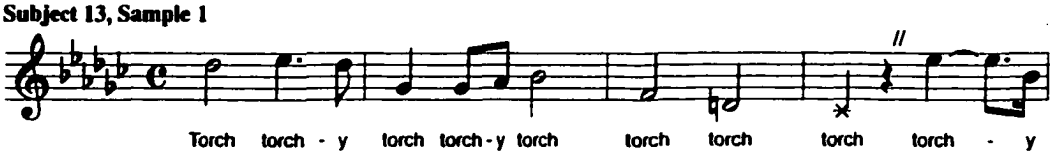


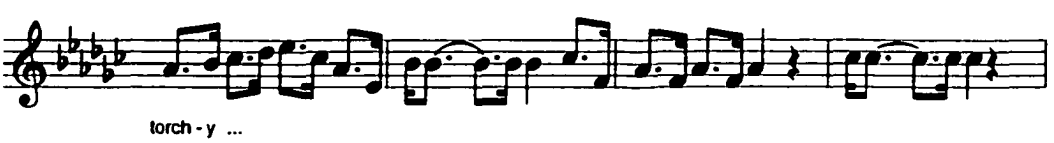


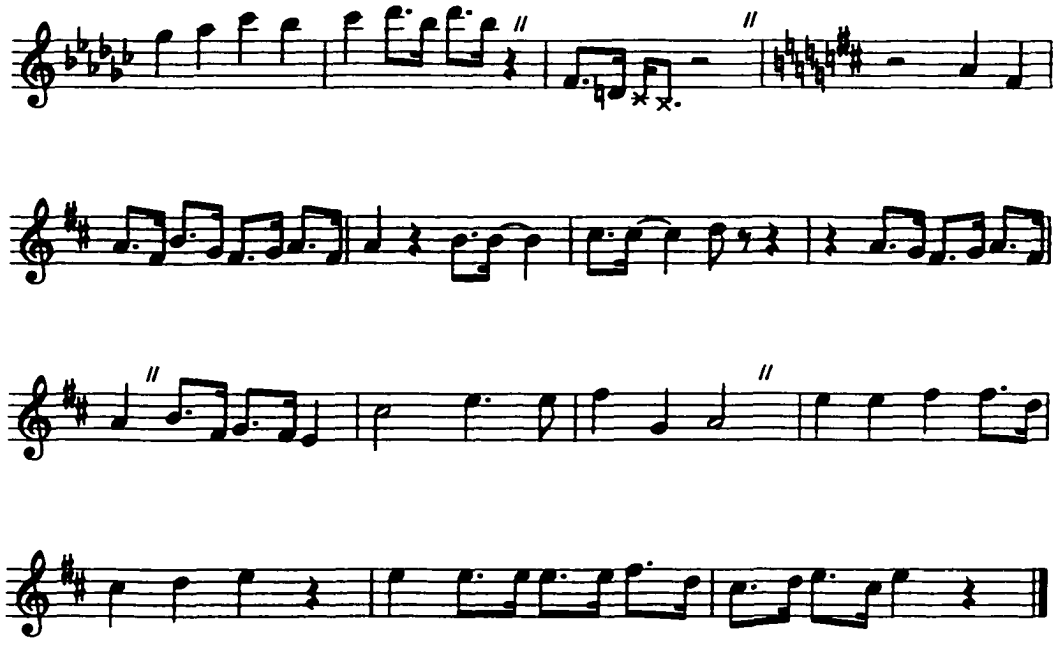
Subject 12, Sample 2



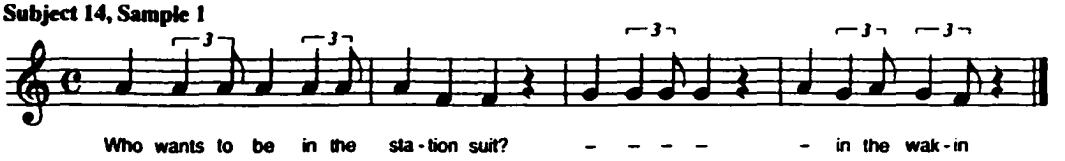
Subject 13, Sample 1



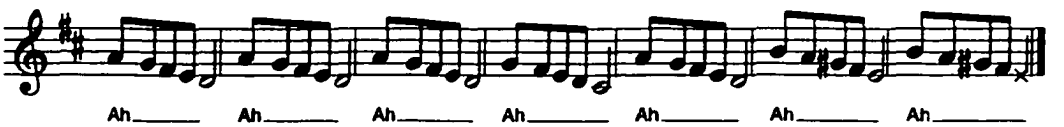




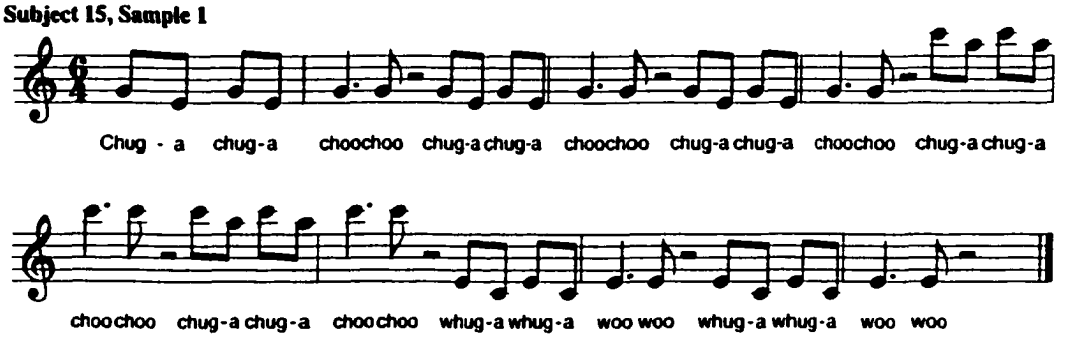
Subject 14, Sample 1



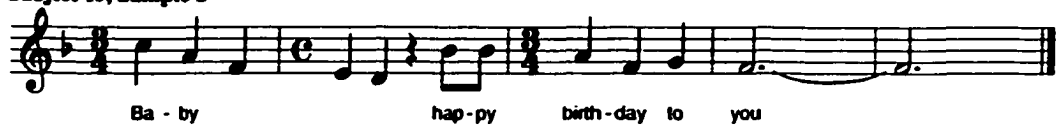
Subject 14, Sample 2



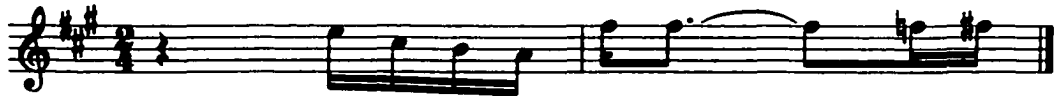
Subject 15, Sample 1



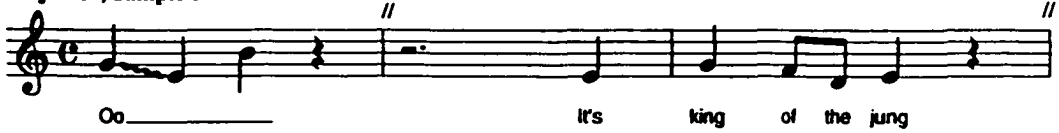
Subject 15, Sample 2

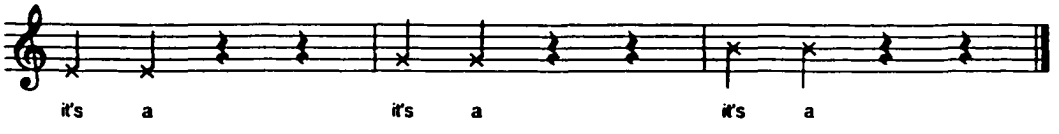


Subject 15, Sample 3

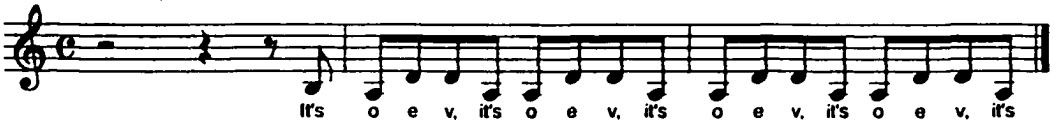


Subject 16, Sample 1

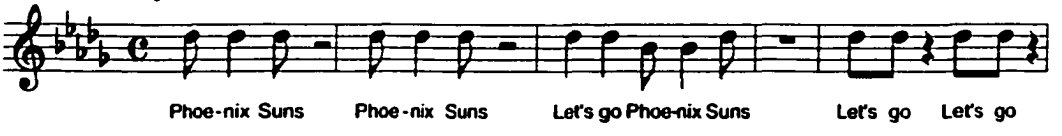


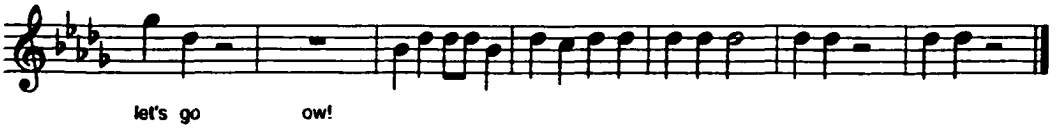


Subject 17, Sample 1

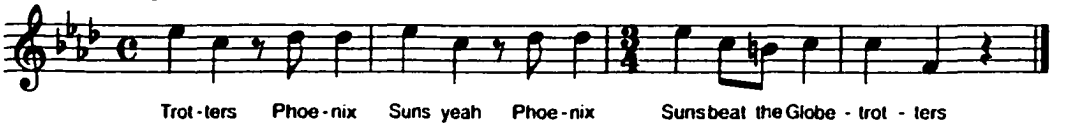


Subject 17, Sample 2

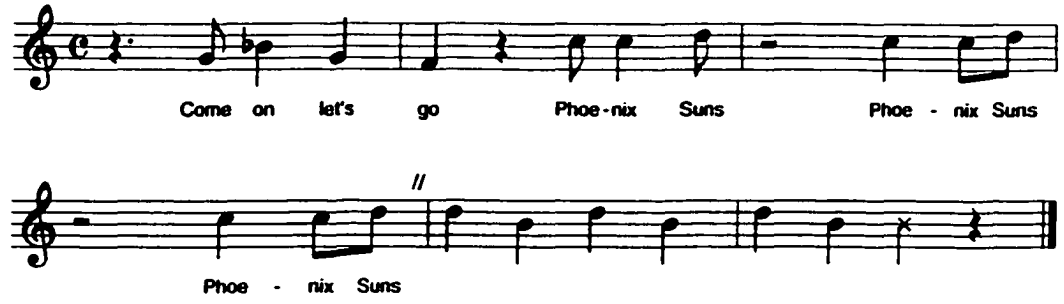




Subject 17, Sample 3

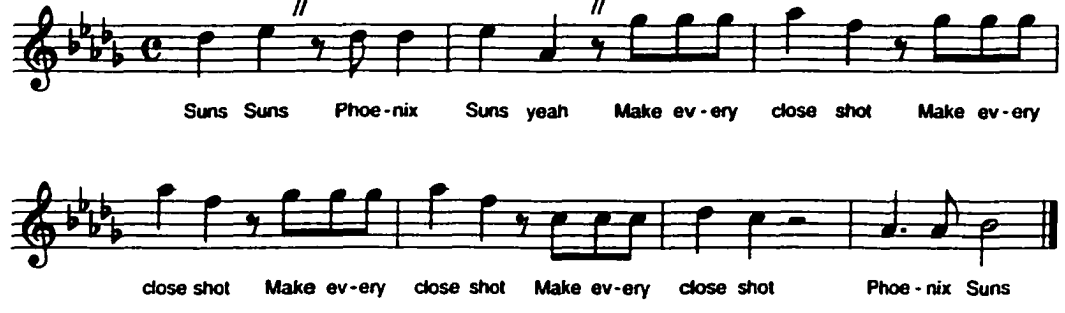


Subject 17, Sample 4

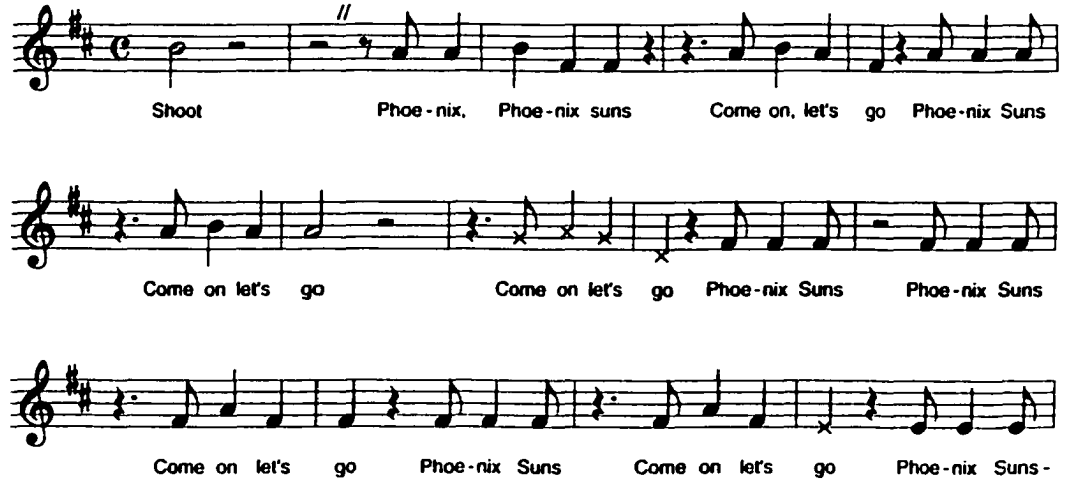


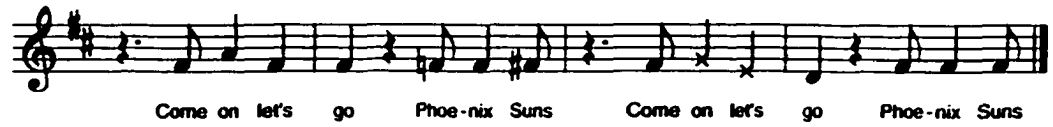
Subject 18, Sample 1

Subject 18, Sample 2

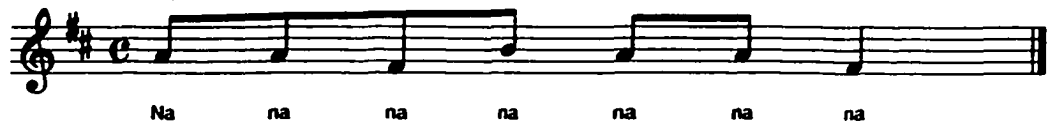


Subject 18, Sample 3

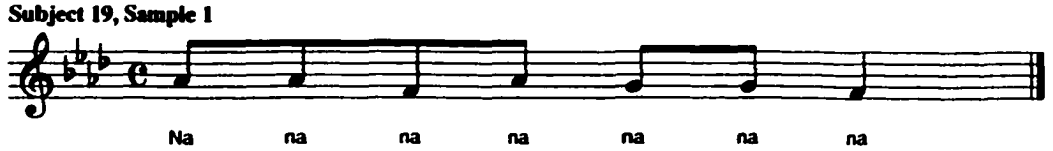




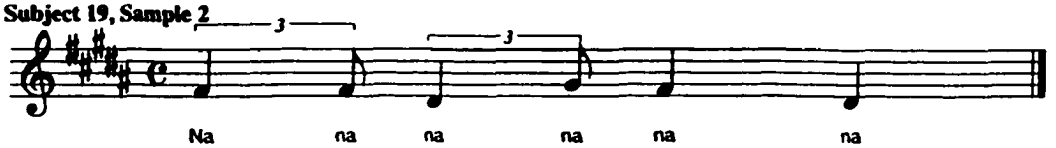
Subject 18, Sample 4



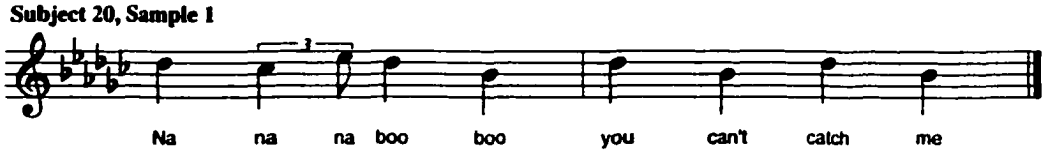
Subject 19, Sample 1



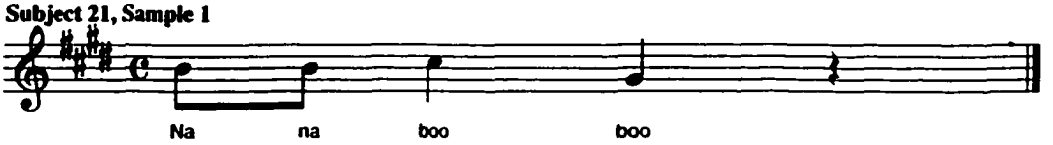
Subject 19, Sample 2



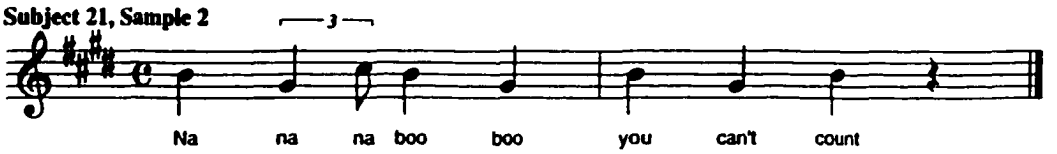
Subject 20, Sample 1



Subject 21, Sample 1



Subject 21, Sample 2



APPENDIX I

Native American: Composite Matrix of Musical Characteristics

Native American

Reoccurance of Ascending Intervals

	m2	M2	m3	M3	P4	A4	P5	m6	M6	m7	M7	P8	
Subject 1, Sample 1	1	1											
Subject 2, Sample 1	1		2					1					
Subject 2, Sample 2			2	2	2								
Subject 3, Sample 1		2	2	1			1						
Subject 3, Sample 2		1	1							1			
Subject 3, Sample 3		1	1							1			
Subject 4, Sample 1		3											
Subject 4, Sample 2				1									
Subject 4, Sample 3		3											
Subject 5, Sample 1	4	3	2	3									
Subject 6, Sample 1	9	10	1	4	7	1	6	3	1		1	2	
Subject 7, Sample 1	1		1	1									
Subject 7, Sample 2	1	2	2	1									
Subject 8, Sample 1	2	1	5	2	1		1						
Subject 8, Sample 2		7			1				1				
Subject 9, Sample 1	3	3	8	4	1					1		1	
Subject 10, Sample 1	10	17	10	4	6		1						
Total	**32**	**54**	**37**	**23**	**18**	**1**	**9**	**4**	**2**	**3**	**1**	**3**	**187**
Percent	**17**	**29**	**20**	**12**	**10**	**0.5**	**5**	**2**	**1**	**1.5**	**0.5**	**1.5**	

187 ascending intervals is 46% of the total 406 ascending and descending intervals.

Native American

Reoccurance of Descending Intervals

	m2	M2	m3	M3	P4	A4	P5	m6	M6	m7	M7	P8	
Subject 1, Sample 1		1		2									
Subject 2, Sample 1	4		2	1									
Subject 2, Sample 2	1	3	1	1	1								
Subject 3, Sample 1	4	3	2						1				
Subject 3, Sample 2		1	2				1						
Subject 3, Sample 3		1	2				1						
Subject 4, Sample 1		4											
Subject 4, Sample 2		2											
Subject 4, Sample 3		5											
Subject 5, Sample 1	4	2	5	2									
Subject 6, Sample 1	13	10	5	5	12	2	7	1					
Subject 7, Sample 1		1	1	1							1		
Subject 7, Sample 2	1	2	3	2									
Subject 8, Sample 1	4	2	5	3									
Subject 8, Sample 2	1	9					1						
Subject 9, Sample 1	3	6	9	1	1	1			2				
Subject 10, Sample 1	10	16	16	3	1		2	1					
Total	**41**	**68**	**53**	**21**	**15**	**3**	**12**	**2**	**3**	**0**	**1**	**0**	**219**
Percent	**19**	**31**	**24**	**10**	**7**	**1**	**5**	**1**	**1**	**0**	**0.5**	**0**	

219 descending intervals is 54% of the total 406 ascending and descending intervals.

Native American

Pitch Center

Subject 1, Sample 1	bb	
Subject 2, Sample 1	d#	
Subject 2, Sample 2	f	
Subject 3, Sample 1	eb/d#	enharmonic
Subject 3, Sample 2	db	
Subject 3, Sample 3	f	
Subject 4, Sample 1	c#	
Subject 4, Sample 2	d	
Subject 4, Sample 3	c#	
Subject 5, Sample 1	c#	
Subject 6, Sample 1	f#	c#
Subject 7, Sample 1	f	db
Subject 7, Sample 2	c	
Subject 8, Sample 1	eb	
Subject 8, Sample 2	c	
Subject 9, Sample 1	c#	
Subject 10, Sample 1	Bb	

Total Pitch Centers **19**

Pitch Centers			**Total**	**Percent**
bb			1	5
f#			1	5
f			3	16
eb - 2	d# - 1	enharmonic	3	16
d			1	5
db - 2	c# - 5	enharmonic	7	37
c			2	11
Bb			1	5

8 - Different Pitch Centers

Native American

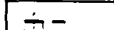
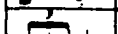
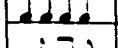
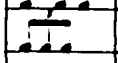
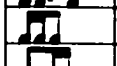
Meter

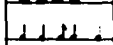
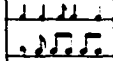
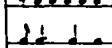
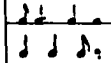
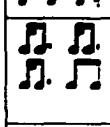
Subject 1, Sample 1	Multimetric
Subject 2, Sample 1	Multimetric
Subject 2, Sample 2	Multimetric
Subject 3, Sample 1	Duple
Subject 3, Sample 2	Duple
Subject 3, Sample 3	Multimetric
Subject 4, Sample 1	Multimetric
Subject 4, Sample 2	Duple
Subject 4, Sample 3	Duple
Subject 5, Sample 1	Multimetric
Subject 6, Sample 1	Multimetric
Subject 7, Sample 1	Multimetric
Subject 7, Sample 2	Multimetric
Subject 8, Sample 1	Multimetric
Subject 8, Sample 2	Duple
Subject 9, Sample 1	Multimetric
Subject 10, Sample 1	Multimetric

Meter	Total	Percent
Multimetric	12	71
Duple	5	29

Native American

Frequency of Rhythmic Patterns

Patterns	Subject, Sample-Number of Occurrences																	total	Percent
	1,1-13	2,1-3	2,2-9		3,2-1		4,1-7		4,3-1	5,1-10	6,1-17	7,1-2	7,2-4	8,1-3	8,2-2		10,1-16	104	49%
			2,2-2															2	
				3,1-3	3,2-1													4	
				3,1-4								7,1-2						6	
					3,2-2													2	
						3,3-1												1	
						3,3-2												2	
							4,1-1				6,1-3		7,2-2		8,2-3		10,1-2	11	5%
								4,2-3										3	
									4,3-2									2	
										5,1-3								3	
										5,1-4								4	
										5,1-1	6,1-4					9,1-3	10,1-1	9	4%
											6,1-3							3	
											6,1-2							2	
											6,1-1			8,1-1	8,2-3			5	
											6,1-2							2	
											6,1-3							3	
											6,1-8							8	4%
											6,1-4							4	

																			
												7,1-1	7,2-1	8,1-1	8,2-1			4	
														8,1-2				2	
														8,1-2			10.1-2	4	
																9,1-4		4	
																9,1-2		2	
																9,1-3		3	
																	10,1-2	2	
																	10,1-3	3	
																	10,1-2	2	
																	10,1-5	5	
																	Total	211	

The numbers in each box identify the subject number, sample number, and the number of times that the rhythmic pattern occurred in the sample. For example, 1, 1-13 means – subject 1, sample 1, and 13 occurrences of the double eighth-note pattern.

APPENDIX J

Anglo American: Composite Matrix of Musical Characteristics

Anglo American

Reoccurance of Ascending Intervals

	m2	M2	m3	M3	P4	A4	P5	m6	M6	m7	M10	m11	
Subject 11, Sample 1					2		1						
Subject 12, Sample 1	1		13		3								
Subject 12, Sample 2	1	1							2				
Subject 13, Sample 1	11	19	10		1		3		2		1		
Subject 14, Sample 1		3											
Subject 14, Sample 2					1		3		2				
Subject 15, Sample 1			10	4								1	
Subject 15, Sample 2		1						1					
Subject 15, Sample 3	1							1					
Subject 16, Sample 1		1	2	1			1						
Subject 17, Sample 1					4								
Subject 17, Sample 2	1		3		1								
Subject 17, Sample 3	3	2											
Subject 17, Sample 4		3	3				1						
Subject 18, Sample 1		2	1		1								
Subject 18, Sample 2	3	6								1			
Subject 18, Sample 3	2	5	5	2									
Subject 18, Sample 4					1								
Subject 19, Sample 1			1										
Subject 19, Sample 2					1								
Subject 20, Sample 1			2	1									
Subject 21, Sample 1		1											
Subject 21, Sample 2			2		1								
Total	**23**	**44**	**52**	**8**	**16**	**0**	**9**	**2**	**6**	**1**	**1**	**1**	**163**
Percent	**14**	**27**	**32**	**5**	**10**	**0**	**6**	**1**	**4**	**0.5**	**0.5**	**0.5**	

163 ascending intervals is 45% of the total 366 ascending and descending intervals.

Anglo American

Reoccurance of Descending Intervals

	m2	M2	m3	M3	P4	A4	P5	m6	M6	M7	M11	M12	
Subject 11, Sample 1		3	2	1	1								
Subject 12, Sample 1	1	1	17										
Subject 12, Sample 2		2	2	2									
Subject 13, Sample 1	5	5	14	4	5	1	1			1	1		
Subject 14, Sample 1		3		1									
Subject 14, Sample 2	8	20											
Subject 15, Sample 1			10	4								1	
Subject 15, Sample 2	2	2	1	2									
Subject 15, Sample 3	1	2	1										
Subject 16, Sample 1		1	2				1						
Subject 17, Sample 1		1			4								
Subject 17, Sample 2	1		3		1								
Subject 17, Sample 3	1		3				1						
Subject 17, Sample 4		3	7										
Subject 18, Sample 1	1	3	1										
Subject 18, Sample 2	1	1	3	1	1		1						
Subject 18, Sample 3	1	7	5		2								
Subject 18, Sample 4		1	2										
Subject 19, Sample 1	1	1	1										
Subject 19, Sample 2		1	2										
Subject 20, Sample 1		2	3										
Subject 21, Sample 1					1								
Subject 21, Sample 2		1	3										
Total	**23**	**60**	**82**	**15**	**15**	**1**	**4**	**0**	**0**	**1**	**1**	**1**	**203**
Percent	**11**	**30**	**40**	**7**	**7**	**0.5**	**2**	**0**	**0**	**0.5**	**0.5**	**0.5**	

203 descending intervals is 55% of the total 366 ascending and descending intervals.

Anglo American

Pitch Center

Subject 11, Sample 1	db		
Subject 12, Sample 1	d	e	
Subject 12, Sample 2	b		
Subject 13, Sample 1	bb	e'	
Subject 14, Sample 1	a		
Subject 14, Sample 2	d		
Subject 15, Sample 1	g	c"	e
Subject 15, Sample 2	f		
Subject 15, Sample 3	f#		
Subject 16, Sample 1	e		
Subject 17, Sample 1	d		
Subject 17, Sample 2	db'		
Subject 17, Sample 3	c		
Subject 17, Sample 4	bb		
Subject 18, Sample 1	b		
Subject 18, Sample 2	gb'		
Subject 18, Sample 3	f#		
Subject 18, Sample 4	f#		
Subject 19, Sample 1	f		
Subject 19, Sample 2	d#		
Subject 20, Sample 1	bb		
Subject 21, Sample 1	g#		
Subject 21, Sample 2	b		
Total Pitch Centers		**27**	

Pitch Centers	**Total**	**Percent**
c"	1	3.7
gb'	1	3.7
e'	1	3.7
db'	1	3.7
b	3	11
bb	3	11
a	1	3.7
g#	1	3.7
g	1	3.7
f#	3	11
f	2	8
e	3	11
d#	1	3.7
d	3	11
db	1	3.7
c	1	3.7

16 - Different Pitch Centers

Anglo American

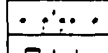
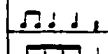
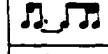
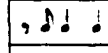
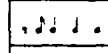
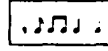
Meter	
Subject 11, Sample 1	Duple
Subject 12, Sample 1	Duple
Subject 12, Sample 2	Duple
Subject 13, Sample 1	Duple
Subject 14, Sample 1	Duple
Subject 14, Sample 2	Duple
Subject 15, Sample 1	Duple
Subject 15, Sample 2	Multimetric
Subject 15, Sample 3	Duple
Subject 16, Sample 1	Duple
Subject 17, Sample 1	Duple
Subject 17, Sample 2	Duple
Subject 17, Sample 3	Multimetric
Subject 17, Sample 4	Duple
Subject 18, Sample 1	Duple
Subject 18, Sample 2	Duple
Subject 18, Sample 3	Duple
Subject 18, Sample 4	Duple
Subject 19, Sample 1	Duple
Subject 19, Sample 2	Duple
Subject 20, Sample 1	Duple
Subject 21, Sample 1	Duple
Subject 21, Sample 2	Duple

Meter	Total	Percent
Multimetric	2	9
Duple	21	91

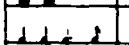
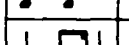
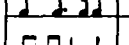
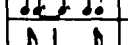
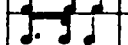
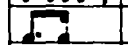
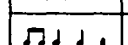
Anglo American

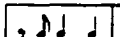
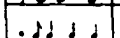
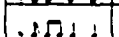
Frequency of Rhythmic Patterns

Patterns	Subject, Sample-Number of Occurrences																				
		12,1-30						15,2-1			17,1-8	17,2-2						18,4-2	19,1-2	
			12,2-2																	
					14,1-3															19,2-2
		12,1-2						15,2-1		16,1-3		17,2-8	17,3-2	17,4-3	18,1-4	18,2-1				19,2-1
	11,1-2																			
							15,1-7													
			12,2-1																	
		12,1-1										17,2-1						18,4-1	19,1-1	
					14,1-2															
								15,2-2							18,4-1					
				13,1-2																
												17,2-3		17,4-1			18,3-6			
														17,4-2						
				13,1-2																
															18,4-1					
																18,2-1				
				13,1-2																
									15,3-1											
										16,1-1										

	11,1-3			13,2-25																
																				
																				
						14,2-7														
									15,3-1											
													17,3-2							
														17,4-1		18,2-1	18,3-7			
																18,2-4				

Cont.: Anglo American
Frequency of Rhythmic Patterns

				45	26%
				2	
				5	
	20,1-2			27	15%
				2	
				7	
				1	
				4	
				2	
			21, 2-1	4	
				2	
				10	6%
				2	
				2	
				1	
				1	
				2	
				1	
				1	
				28	16%
	20,1-1		21, 2-1	2	
		21,1-1		1	
				7	
				1	

				2	
				9	
				4	
			Total	175	

The numbers in each box identify the subject number, sample number, and the number of times that the rhythmic pattern occurred in the sample. For example, 12, 1-30 means – subject 12, sample 1, and 30 occurrences of the double eighth-note pattern.

APPENDIX K

Native American: Individual Analysis Worksheets

Subject 1, Sample 1

a = ascending
d = descending

Intervals
M3 - d M2 - d m2 - a M2 - a M3 - d

Reoccurance of Intervals

1	m2	1 - a	
2	M2	1 - a	1 - d
2	M3		2 - d

Pitch Center
bb

Meter
2/4 3/4 2/4 3/4 2/4 3/4 2/4

Frequency of Rhythmic Patterns

13 

Subject 2, Sample 1

a = ascending
d = descending

Intervals

m3 - a m3 - d m2 - d m3 - a m6 - d m2 - d m2 - d M3 - a m2 - a m3 - d m2 - d

Reoccurance of Intervals

5	m2	1 - a	4 - d
4	m3	2 - a	2 - d
1	M3		1 - d
1	m6	1 - a	

Pitch Center

d#

Meter

5/8 3/4 5/8 7/8 4/4

Frequency of Rhythmic Patterns

3 

Subject 2, Sample 2

a = ascending
d = descending

Intervals

m3 - a m3 - a m3 - d P4 - a M2 - d m2 - d M2 - d M2 - d M3 - a M3 - d M3 - a
P4 - d P4 -a

Reoccurance of Intervals

1	m2		1 - d
3	M2		3 - d
3	m3	2 - a	1 - d
3	M3	2 - a	1 - d
3	P4	2 - a	1 - d

Pitch Center

f

Meter

7/8 4/4 7/8 7/8 3/4 2/4 2/4

Frequency of Rhythmic Patterns

9 

2 

Subject 3, Sample 1

a = ascending
d = descending

Intervals

M2 - d M3 - a m2 - d m2 - d m2 - d m3 - d m3 - a M2 - a M2 - a m3 - a M6 - d
P5 - a m3 - d M2 - d M2 - d m2 - d

Reoccurance of Intervals

4	m2		4 - d
5	M2	2 - a	3 - d
4	m3	2 - a	2 - d
1	M3	1 - a	
1	P5	1 - a	
1	M6		1 - d

Pitch Center

eb d#

Meter

4/4

Frequency of Rhythmic Patterns

3 

4 

Subject 3, Sample 2

a = ascending
d = descending

Intervals
m3 - d m7 - a P5 - d M2 - a M2 - d m3 - d m3 - a

Reoccurance of Intervals

2	M2	1 - a	1 - d
3	m3	1 - a	2 - d
1	P5		1 - d
1	m7	1 - a	

Pitch Center
db

Meter
4/4

Frequency of Rhythmic Patterns

1 

1 

2 

Subject 3, Sample 3

a = ascending
d = descending

Intervals
m3 - d m7 - a P5 - d M2 - a M2 - d m3 - d m3 - a

Reoccurance of Intervals

2	M2	1 - a	1 - d
3	m3	1 - a	2 - d
1	P5		1 - d
1	m7	1 - a	

Pitch Center
f

Meter
4/4 3/4 4/4

Frequency of Rhythmic Patterns

1 

2 

Subject 4, Sample 1

a = ascending
d = descending

Intervals
M2 - d M2 - a M2 - d M2 - a M2 - d M2 - a M2 - d

Reoccurance of Intervals
7 M2 3 - a 4 - d

Pitch Center
c#

Meter
5/4 4/4 4/4

Frequency of Rhythmic Patterns

7 

1 

Subject 4, Sample 2

a = ascending
d = descending

Intervals
M2 - d M2 - d M3 - a

Reoccurance of Intervals

2	M2	2 - d
1	M3	1 - a

Pitch Center
d

Meter
4/4

Frequency of Rhythmic Patterns

3 

Subject 4, Sample 3

a = ascending
d = descending

Intervals
M2 - d M2 - d M2 - d M2 - a M2 - a M2 - a M2 - d M2 - d

Reoccurance of Intervals
8 M2 3 - a 5 - d

Pitch Center
c#

Meter
4/4

Frequency of Rhythmic Patterns

1 

2 

Subject 5, Sample 1

a = ascending
d = descending

Intervals

M2 - a m3 - d m2 - a m2 - d M2 - d M2 - a m2 - a M2 - a m3 - d m2 - a m2 - d
M2 - d M3 - a M3 - d M3 - a M3 - d m3 - a m3 - d m3 - a m3 - d M3 - a m2 - d
m2 - d m3 - d m2 - a

Reoccurance of Intervals

8	m2	4 - a	4 - d
5	M2	3 - a	2 - d
7	m3	2 - a	5 - d
5	M3	3 - a	2 - d

Pitch Center

c#

Meter

12/8 6/8 9/8 9/8 4/4 3/8 5/8 5/8 3/4 3/4

Frequency of Rhythmic Patterns

10 

3 

4 

1 

Subject 6, Sample 1

a = ascending
d = descending

Intervals

m3 - a	M2 - a	P4 - d	P5 - a	P5 - d	M2 - d	M2 - a	M2 - d	M2 - a	M2 - d	M2 - a
M2 - d	M2 - a	M2 - d	M2 - a	M2 - d	M7 - a	m2 - d	P4 - d	P4 - a	P4 - d	P4 - a
P4 - d	M3 - a	P5 - d	m2 - d	m2 - d	M3 - a	m2 - d	m2 - d	m2 - d	m2 - a	M6 - a
M2 - d	P4 - d	m3 - d	m2 - a	m2 - d	m2 - a	m2 - d	m2 - a	m2 - d	m2 - a	P5 - a
A4 - d	M2 - d	m2 - a	m2 - d	m 2 - a	M3 - a	M3 - d	M3 - a	M3 - d	P8 - a	m2 - d
P5 - d	m6 - a	m2 - d	m2 - a	m3 - d	M3 - d	P4 - d	m2 - d	m2 - a	M2 - a	m3 - d
P8 - a	P5 - d	P5 - a	P5 -d	P5 - a	P5 - d	M2 - d	M2 - a	M2 - d	P5 - a	P4 - d
A4 - a	A4 - d	m6 - a	m6 - d	m6 - a	M3 - d	m3 - d	P5 - d	M2 - a	P4 - a	P4 - d
P4 - a	P4 - d	P4 - a	P4 - d	P4 - a	P4 - d	P4 - a	P5 - a	M3 - d	m3 - d	P4 - d
M2 - a										

Reoccurance of Intervals

22	m2	9 - a	13 - d
20	M2	10 - a	10 - d
6	m3	1 - a	5 - d
9	M3	4 - a	5 - d
19	P4	7 - a	12 - d
3	A4	1 - a	2 - d
13	P5	6 - a	7 - d
4	m6	3 - a	1 - d
1	M6	1 - a	
1	M7	1 - a	
2	P8	2 - a	

Pitch Center

f#	c#

Meter

7/8	4/4	2/4	4/4	4/4	5/4	4/4	4/4	3/4	4/4	6/8
3/4	2/4	2/4	5/4	3/4	2/4	3/4	5/4	4/4	3/4	4/4
4/4	2/4	3/4	7/8	3/4	4/4	3/4	4/4	4/4	4/4	

Frequency of Rhythmic Patterns

17		1			
3		2			
4		3			
3		8			
2		4			

Subject 7, Sample 1

a = ascending
d = descending

Intervals
M3 - d m3 - d M2 - d m3 - a m2 - a M3 - a M7 - d

Reoccurance of Intervals

1	m2	1 -a	
1	M2		1 - d
2	m3	1 - a	1 - d
2	M3	1 - a	1 - d
1	M7		1 - d

Pitch Center
f db

Meter
3/4 4/4 4/4

Frequency of Rhythmic Patterns

2 

2 

1 

Subject 7, Sample 2

a = ascending
d = descending

Intervals
M3 - d M2 - a M2 - d m3 - d m3 - a M2 - a m2 - a m2 - d M2 - d M3 - a M3 - d
m3 - d m3 - a m3 - d

Reoccurance of Intervals

2	m2	1 - a	1 - d
4	M2	2 - a	2 - d
5	m3	2 - a	3 - d
3	M3	1 - a	2 - d

Pitch Center
C

Meter
4/4 2/4 3/4 3/4 3/4

Frequency of Rhythmic Patterns

4 

2 

1 

Subject 8, Sample 1

a = ascending
d = descending

Intervals

m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	M3 - a	M3 - d
m3 - a	m2 - d	m2 - a	m2 - d	M3 - d	P4 - a	m2 - d	m2 - a	m2 - d	M3 - d	M2 - a
M2 - d	M3 - a	M2 - d	P5 - a							

Reoccurance of Intervals

6	m2	2 - a	4 - d
3	M2	1 - a	2 - d
10	m3	5 - a	5 - d
5	M3	2 - a	3 - d
1	P4	1 - a	
1	P5	1 - a	

Pitch Center
eb

Meter

8/8	7/8	4/4	2/4	2/4	2/4	2/4

Frequency of Rhythmic Patterns

3 

1 

1 

2 

2 

Subject 8, Sample 2

a = ascending
d = descending

Intervals

M2 - d M2 - a M2 - d M2 - a M2 - d M2 - a M2 - d M2 - a M2 - d M2 - a M2 - d
M2 - a M2 - d M2 - a M2 - d M6 - a P5 - d P4 - a m2 - d M2 - d

Reoccurance of Intervals

1	m2		1 - d
16	M2	7 - a	9 - d
1	P4	1 - a	
1	P5		1 - d
1	M6	1 - a	

Pitch Center

c

Meter

4/4

Frequency of Rhythmic Patterns

2 

3 

3 

1 

Subject 9, Sample 1

a = ascending
d = descending

Intervals

m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	P4 - a	P4 - d	m2 - a	M2 - a
m3 - d	P8 - a	M6 - d	M2 - d	M3 - a	m3 - d	m3 - a	m3 - d	m3 - a	M2 - d	m2 - d
m3 - a	m3 - d	m2 - a	m2 - d	M3 - a	A4 - d	m7 - a	M6 - d	m3 - a	M2 - d	M2 - a
M2 - d	m2 - d	m3 - a	m3 - d	m2 - a	M2 - d	M3 - a	m3 - d	M2 - d	M2 - a	m3 - a

Reoccurance of Intervals

6	m2	3 - a	3 - d
9	M2	3 - a	6 - d
17	m3	8 - a	9 - d
5	M3	4 - a	1 - d
2	P4	1 - a	1 - d
1	A4		1 - d
2	M6		2 - d
1	m7	1 - a	
1	P8	1 - a	

Pitch Center

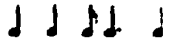
c#

Meter

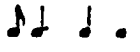
6/4	6/4	7/8	2/4	5/4	6/4	4/4	3/4	3/4	2/4	4/4
4/4	4/4	4/4	4/4	2/4	2/4	2/4	2/4	2/4		

Frequency of Rhythmic Patterns

3 

4 

2 

3 

Subject 10, Sample 1

d = descending
a = ascending

Intervals

M2 - a	M2 - d	P4 - a	M2 - d	m6 - d	m2 - a	m3 - d	m3 -a	P5 - a	m3 - d	M2 - d
P4 - a	P5 - d	m3 - d	m3 - a	M3 - a	M2 - d	m3 - d	m3 - a	m3 - d	P4 - a	M3 - d
M2 - a	M2 - d	M2 - a	m3 - d	M2 - a	m2 - d	M3 - a	M3 - d	m2 - d	m2 - a	M2 - a
m3 - d	m2 - a	m2 - d	m2 - a	M2 - a	M2 - a	M3 - d	m3 - d	m3 - a	m2 - d	m2 - a
m2 - d	m2 - a	m2 - d	P4 - a	M2 - a	P5 - d	m2 - a	M3 - a	m3 - d	m3 - a	m2 - d
M2 - d	M2 - a	M2 - d	m3 - a	m3 - d	m3 - a	m3 - d	M2 - d	M2 - a	m2 - d	M2 - a
m2 - d	m2 - a	M2 - d	M2 - d	M2 - a	M2 - d	M2 - d	M2 - a	M2 - a	m3 - a	m3 - d
m3 - a	m3 - d	M2 - d	M2 - a	P4 - a	P4 - d	M2 - a	m2 - d	m3 - d	M2 - d	M2 - a
M2 - d	P4 - a	m3 - d	M3 - a	m3 - d	M2 - d	m3 - a	m2 - d	m2 - a		

Reoccurance of Intervals

20	m2	10 - a	10 - d
33	M2	17 - a	16 - d
26	m3	10 - a	16 - d
7	M3	4 - a	3 - d
7	P4	6 - a	1 - d
3	P5	1 - a	2 - d
1	m6		1 - d

Pitch Center

Bb

Meter

4/4	4/4	2/4	4/4	4/4	4/4	6/8	4/4	3/4	4/4	5/4
7/8	5/4	6/4	4/4	4/4	2/4	4/4	5/4	3/4	7/8	6/8
3/8	5/8	6/8	6/8	4/4	3/4	4/4	4/4	3/4	4/4	3/4
3/4										

Frequency of Rhythmic Patterns

16 

2 

1 

2 

2 

3 

2 

5 

APPENDIX L

Anglo American: Individual Analysis Worksheets

Subject 11, Sample 1

a = ascending
d = descending

Intervals
M2 - d P5 - a M2 - d M2 - d m3 - d m3 - d M3 - d P4 - a P4 - d P4 - a

Reoccurance of Intervals

3	M2		3 - d
2	m3		2 - d
1	M3		1 - d
3	P4	2 - a	1 - d
1	P5	1 - a	

Pitch Center
db

Meter
4/4

Frequency of Rhythmic Patterns

2 

3 

Subject 12, Sample 1

a = ascending
d = descending

Intervals

m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	P4 - a	m3 - d
m3 - a	m3 - d	m3 - a	m3 -d	m3 - a	m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	m2 - a
m3 - d	P4 - a	m3 - d	m3 - a	M2 - d	m2 - d	P4 - a	M2 - d	m3 - d	m3 - a	m3 - d
m3 - a	m3 - d	m3 - a	m3 - d							

Reoccurance of Intervals

2	m2	1 - a	1 - d
2	M2		1 - d
30	m3	13 - a	17 - d
3	P4	3 - a	

Pitch Center

d	e

Meter

4/4

Frequency of Rhythmic Patterns

30 

2 

1 

Subject 12, Sample 2

a = ascending
d = descending

Intervals
M3 - d M6 - a M2 - d m3 - d M3 - d M6 - a M2 - d m3 - d m2 - a M2 - a

Reoccurance of Intervals

1	m2	1 - a	
3	M2	1 - a	2 - d
2	m3		2 - d
2	M3		2 - d
2	M6	2 - a	

Pitch Center
b

Meter
4/4

Frequency of Rhythmic Patterns

2 

1 

Subject 13, Sample 1

a = ascending
d = descending

Intervals

M2 - a	M2 - d	P5 - d	M2 - a	M2 - a	P4 - d	m3 - d	m3 - d	M10 - a	P4 - d	M2 - d
M2 - a	m2 - a	M2 - a	M2 - a	M3 - d	m3 - d	P4 - d	P5 - a	m2 - a	A4 - d	m3 - a
m3 - d	m3 - a	m3 - d	m3 - a	m3 - a	P5 - a	M2 - a	m2 - a	m2 - d	m2 - a	M2 - a
m3 - d	m3 - a	m3 - d	m11 - d	m3 - d	m3 - d	M2 - d	M6 - a	m3 - d	m3 - a	m3 - d
P4 - a	M3 - d	m2 - d	m2 - a	M2 - a	m3 - d	m3 - a	M2 - a	M2 - a	m2 - a	P4 - d
M2 - d	m2 - a	m2 - a	M2 - a	m3 - d	m3 - a	M2 - a	P4 - d	m2 - a	m2 - d	M2 - d
M6 - a	m3 - a	M2 - a	M7 - d	M2 - a	P5 - a	M2 - a	M3 - d	m2 - d	m2- a	M2 - a
M2 - a	M3 - d	m2 - d	m2 - a	M2 - a	m3 - d	m3 - a				

Reoccurance of Intervals

16	m2	11 - a	5 - d
24	M2	19 - a	5 - d
24	m3	10 - a	14 - d
4	M3		4 - d
6	P4	1 - a	5 - d
1	A4		1 - d
4	P5	3 - a	1 - d
2	M6	2 - a	
1	M7		1 - d
1	M10	1 - a	
1	m11		1 - d

Pitch Center

bb e'

Meter

4/4

Frequency of Rhythmic Patterns

2 

2 

2 

25 

Subject 14, Sample 1

a = ascending
d = descending

Intervals
M3 - d M2 - a M2 - a M2 - d M2 - a M2 - d M2 - d

Reoccurance of Intervals

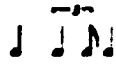
6	M2	3 - a	3 - d
1	M3		1 - d

Pitch Center
a

Meter
4/4

Frequency of Rhythmic Patterns

3 

2 

Subject 14, Sample 2

a = ascending
d = descending

Intervals

M2 - d m2 - d M2 - d M2 - d P5 - a M2 - d m2 - d M2 - d M2 - d P5 - a M2 - d
m2 - d M2 - d M2 - d P4 - a m2 - d M2 - d M2 - d m2 - d M6 - a M2 - d m2 - d
M2 - d M2 - d M6 - a M2 - d m2 - d M2 - d M2 - d P5 - a M2 - d m2 - d M2 - d
M2 - d

Reoccurance of Intervals

8	m2		8 - d
20	M2		20 - d
1	P4	1 - a	
3	P5	3 - a	
2	M6	2 - a	

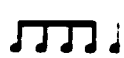
Pitch Center

d

Meter

4/4

Frequency of Rhythmic Patterns

7 

Subject 15, Sample 1

a = ascending
d = descending

Intervals

m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	m3 - a	m3 - d
m3 - a	m11 - a	m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	m3 - a	m3 - d	m3 - a	M12 - d
M3 - d	M3 - a	M3 - d	M3 - a	M3 - d	M3 - a	M3 - d	M3 - a			

Reoccurance of Intervals

20	m3	10 - a	10 - d
3	M3	4 - a	4 - d
1	m11	1 - a	
1	M12		1 - d

Pitch Center

g	c"	e

Meter

6/4

Frequency of Rhythmic Patterns

7 

Subject 15, Sample 2

a = ascending
d = descending

Intervals

m3 - d M3 - d m2 - d M2 - d m6 - a m2 - d M3 - d M2 - a M2 - d

Reoccurance of Intervals

2	m2		2 - d
3	M2	1 - a	2 - d
1	m3		1 - d
2	M3		2 - d
1	m6	1 - a	

Pitch Center

f

Meter

3/4 4/4 3/4 3/4 3/4

Frequency of Rhythmic Patterns

1 

1 

2 

Subject 15, Sample 3

a = ascending
d = descending

Intervals
m3 - d M2 - d M2 - d m6 - a m2 - d m2 - a

Reoccurance of Intervals

2	m2	1 - a	1 - d
2	M2		2 - d
1	m3		1 - d
1	m6	1 - a	

Pitch Center
f#

Meter
2/4

Frequency of Rhythmic Patterns

1 

1 

Subject 16, Sample 1

a = ascending
d = descending

Intervals
m3 - d P5 - a P5 - d m3 - a M2 - d m3 - d M2 - a m3 - a M3 - a

Reoccurance of Intervals

2	M2	1 - a	1 - d
4	m3	2 - a	2 - d
1	M3	1 - a	
2	P5	1 - a	1 - d

Pitch Center
e

Meter
4/4

Frequency of Rhythmic Patterns

3 

1 

Subject 17, Sample 1

a = ascending
d = descending

Intervals
M2 - d P4 - a P4 - d P4 - a P4 - d P4 - a P4 - d P4 - a P4 - d

Reoccurance of Intervals

1	M2		1 - d
8	P4	4 - a	4 - d

Pitch Center
d

Meter
4/4

Frequency of Rhythmic Patterns

8 

Subject 17, Sample 2

a = ascending
d = descending

Intervals
m3 - d m3 - a P4 - a P4 - d m3 - d m3 - a m3 - d m3 - a m2 - d m2 - a

Reoccurance of Intervals

2	m2	1 - a	1 - d
6	m3	3 - a	3 - d
2	P4	1 - a	1 - d

Pitch Center
db'

Meter
4/4

Frequency of Rhythmic Patterns

2 

8 

1 

3 

Subject 17, Sample 3

a = ascending
d = descending

Intervals

m3 - d m2 - a M2 - a m3 - d m2 - a M2 - a m3 - d m2 - d m2 - a P5 - d

Reoccurance of Intervals

4	m2	3 - a	1 - d
2	M2	2 - a	
3	m3		3 - d
1	P5		1 - d

Pitch Center

c

Meter

4/4 4/4 3/4 3/4

Frequency of Rhythmic Patterns

2 

2 

Subject 17, Sample 4

a = ascending
d = descending

Intervals
m3 - a m3 - d M2 - d P5 - a M2 - a M2 - d M2 - a M2 - d M2 - a m3 - d m3 - a
m3 - d m3 - a m3 - d

Reoccurance of Intervals

6	M2	3 - a	3 - d
7	m3	3 - a	7 - d
1	P5	1 - a	

Pitch Center
bb

Meter
4/4

Frequency of Rhythmic Patterns

3 

1 

2 

1

Subject 18, Sample 1

a = ascending
d = descending

Intervals
M2 - a M2 - d m2 - d M2 - d m3 - a M2 - a M2 - d m3 - d P4 - a

Reoccurance of Intervals

1	m2		1 - d
5	M2	2 - a	3 - d
2	m3	1 - a	1 - d
1	P4	1 - a	

Pitch Center
b

Meter
4/4

Frequency of Rhythmic Patterns

4 

1 

1 

Subject 18, Sample 2

a = ascending
d = descending

Intervals

M2 - a M2 - d M2 - a P5 - d m7 - a M2 - a m3 - d m2 - a M2 - a m3 - d
m2 - a M2 - a m3 - d P4 - d m2 - a m2 - d M3 - d M2 - a

Reoccurance of Intervals

4	m2	3 - a	1 - d
7	M2	6 - a	1 - d
3	m3		3 -d
1	M3		1 - d
1	P4		1 - d
1	P5		1 - d
1	m7	1 - a	

Pitch Center

gb'

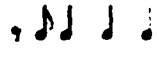
Meter

4/4

Frequency of Rhythmic Patterns

1 

1 

1 

4 

Subject 18, Sample 3

a = ascending
d = descending

Intervals

M2 - d M2 - a P4 - d m3 - a M2 - a M2 - d m3 - d m3 - a M2 - a M2 - d M2 - d
M2 - a M2 - d P4 - d M3 - a m3 - a m3 - d m3 - a m3 - d M2 - d M2 - a m3 - a
m3 - d m2 - d m2 - a m2 - a m3 - d M2 - d M3 - a

Reoccurance of Intervals

3	m2	2 - a	1 - d
12	M2	5 - a	7 - d
10	m3	5 - a	5 - d
2	M3	2 - a	
2	P4		2 - d

Pitch Center

f#

Meter

4/4

Frequency of Rhythmic Patterns

6 

7 

Subject 18, Sample 4

a = ascending
d = descending

Intervals
m3 - d P4 - a M2 - d m3 - d

Reoccurance of Intervals

1	M2	1 - d
2	m3	2 - d
1	P4	1 - a

Pitch Center
f#

Meter
4/4

Frequency of Rhythmic Patterns

2 

1 

Subject 19, Sample 1

a = ascending
d = descending

Intervals
m3 - d m3 - a m2 - d M2 - d

Reoccurance of Intervals

1	m2		1 - d
1	M2		1 - d
2	m3	1 - a	1 - d

Pitch Center
f

Meter
4/4

Frequency of Rhythmic Patterns

2 

1 

Subject 19, Sample 2

a = ascending
d = descending

Intervals
m3 - d P4 - a M2 - d m3 - d

Reoccurance of Intervals

1	M2	1 - d
2	m3	2 - d
1	P4	1 - a

Pitch Center
d#

Meter
4/4

Frequency of Rhythmic Patterns

2 

1 

Subject 20, Sample 1

a = ascending
d = descending

Intervals
M2 - d M3 - a M2 - d m3 - d m3 - a m3 - d m3 - a m3 - d

Reoccurance of Intervals

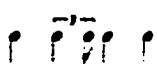
2	M2		2 - d
5	m3	2 - a	3 - d
1	M3	1 - a	

Pitch Center
bb

Meter
4/4

Frequency of Rhythmic Patterns

2 

1 

Subject 21, Sample 1

a = ascending
d = descending

Intervals
M2 - a P4 - d

Reoccurance of Intervals
1 M2 1 - a
1 P4 1 - d

Pitch Center
g#

Meter
4/4

Frequency of Rhythmic Patterns

1 

Subject 21, Sample 2

a = ascending
d = descending

Intervals
m3 - d P4 - a M2 - d m3 - d m3 - a m3 - d m3 - a

Reoccurance of Intervals

1	M2		1 - d
5	m3	2 - a	3 - d
1	P4	1 - a	

Pitch Center
b

Meter
4/4

Frequency of Rhythmic Patterns

1 

1