WARNER, JAMES ALEX, Ph.D. An Analysis of Factors Contributing to Sixth-Grade Students' Selective Attention to Music Elements: Melodic Contour, Timbre, Rhythm, and Tempo; and Variables Associated with Demographics, Self-Perception, Music Background, Music Genre, and Temporal Difference. (2009)
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Two research questions were formulated for the present study: (1) Are there significant differences ($p \leq .05$) among sixth-grade participants' selective attention to music elements as affected by variables associated with music genre and temporal difference?; and (2) To what extent do the following variables significantly predict ($p \leq .05$) sixth-grade participants' selective attention to melodic contour, timbre, rhythm, and tempo: demographics, self-perception, music background, music genre, and temporal difference?

Subjects ($N = 87$), suburban middle school students from the sixth-grade level within Fulton County Public Schools of Atlanta, Georgia completed the *Music Background Questionnaire II, Self-Perception Profile for Adolescents (SPPA)*, and the *Music Element Profile (MEP)*. The first research question was analyzed using a Three-Way Repeated Analysis of Variance. Regarding differences among selective attention to music elements, participants rated rhythm ($M = 5.15$) significantly higher ($p \leq .01$) than melodic contour ($M = 4.74$), timbre ($M = 4.87$), or tempo ($M = 4.82$). Regarding differences among music genre, participants rated rhythm and blues ($M = 5.12$) significantly higher than jazz ($M = 4.83$; $p \leq .05$) or classical ($M = 4.66$; $p \leq .01$); participants rated rock ($M = 4.98$) significantly higher ($p \leq .01$) than classical ($M = 4.66$). Regarding differences between fast and slow tempi, participants did not rate fast tempi ($M = 4.94$) significantly differently than slow tempos ($M = 4.86$). A significant two-way

interaction effect ($p \leq .05$) was found among participants' selective attention for music elements by genre ($p = .006$). A significant two-way interaction effect ($p \leq .05$) was found among sixth-grade students' selective attention for music elements by temporal difference ($p = .002$). A significant two-way interaction effect ($p \leq .05$) was found among sixth-grade students' ratings for music genre by temporal difference ($p = .000$). No significant three-way interaction effects ($p \leq .05$) were found among sixth-grade students' selective attention for music elements by ratings for music genre and temporal difference.

Data from the MEP, MBQII, SPPA, and from the demographic information were analyzed in four multiple regression procedures, each placing a different music element as the dependent variable. Classical and rock were found to be the best predictors ($p \leq .001$) of melodic contour. Fast tempi were found to be the best predictor ($p \leq .001$) of timbre. Classical, rock, rhythm and blues, jazz, and fast tempi were found to be the best predictors ($p \leq .05$) of rhythm. Jazz and fast tempi were found to be the best predictors ($p \leq .05$) of tempo.

From the results of the data analysis of both research questions, conclusions were drawn to provide suggestions for future research.

AN ANALYSIS OF FACTORS CONTRIBUTING TO SIXTH-GRADE STUDENTS' SELECTIVE ATTENTION TO MUSIC ELEMENTS: MELODIC CONTOUR, TIMBRE, RHYTHM, AND TEMPO; AND VARIABLES ASSOCIATED WITH DEMOGRAPHICS, SELF-PERCEPTION, MUSIC BACKGROUND, MUSIC GENRE, AND TEMPORAL DIFFERENCE

by

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Approved by

_____
Committee Chair

This dissertation is dedicated to my family, friends, teachers, and students who have supported and motivated me throughout my academic pursuits.

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of The Graduate School at The University of North Carolina at Greensboro.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Music is an abstract entity composed of sounds that represent underlying concepts and meanings. Through the association of symbols and classification of ideas to perceived auditory stimuli, music becomes concrete to the listener. The processes of music listening and attention are integral to music education and the education of each individual. Listening and attention contribute to music perception; whereas, individuals use sensory information to make sense of the world (Lipscomb & Hodges, 1996). Learning is the construction of meaning. Holistic learning experiences include the processes of selection, retention, and transformation. Holistic learning experiences that employ synthesis of action, cognition, and emotion facilitate critical thinking (Boardman, 2001).

A fissure seems to exist between research in music learning and the pedagogical applications that involve listening and attention. Hargreaves (1986) states, "I am not alone in having been concerned for some time about the need for bridge building between research on musical development and classroom practice in music education" (p. 34). Eagle (1996) supports Hargreaves with the observation that understanding "the relationship among research findings and practiced applications will help us to emerge with a more general, theoretical comprehension" (p. 12). Therefore, important

connections must be employed among theories, research, and practice to achieve substantive advancement of music teaching and learning.

Music instruction is the sequential presentation of music elements (Geringer & Madsen, 1996). Additional research is necessary to identify and clarify human attention to musical elements. Further, research is also necessary to determine the magnitude of relationships between music elements, the acquisition of music knowledge, and the effect of music element perception on human psychology. Providing teachers with research results regarding music element perception and potential applications of these results in the music classroom can result in increased student sensitivity to music elements and promote effective instruction in the perception of music elements.

The goal of the present study was to examine sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo). Two primary purposes were the foci of the present study. The first purpose was to investigate whether significant differences ($p \leq .05$) existed among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and by variables associated with temporal difference (i.e., fast and slow). The second purpose of the study was to investigate the extent to which variables associated with demographics, self-perception, music background, music genres, and temporal differences significantly predicted ($p \leq .05$) sixth-grade participants' selective attention to music elements. The variables within the second purpose include: demographic variables (i.e., gender and ethnicity), self-perception variables (i.e., scholastic competence, social

acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth), music background (i.e., participants' in- and out-of-school music experiences), and variables associated with music genre and temporal difference that were examined in the first purpose.

Background of the Study

Psychological Implications of Human Music Behaviors

Psychology is the study of mind and behavior in relation to a particular field of knowledge or activity (Borders Group, 2006). Music is a form of human behavior that is unique, powerful, and influential in human development (Gaston, 1968). Human music abilities are stimulated through psychological experiences (i.e., sensation, perception, and cognition) within the environment. The process of music learning involves synergistic functions (combination of elements that produce a total effect greater than the sum of all elements) of the psychological processes that promote musical behaviors and development (Gaston, 1968).

Information processing is an important operation within human psychology. Information processing includes the processes that lead to the identification and interpretation of stimuli that, in turn, produce perceptions guiding conscious behaviors. Information processing involves sensation, perception, and cognition. Sensation is the initial contact with an object or environment. Perception is the conscious experience of objects and object relationships. Cognition involves the process of attention and the conscious representation and interpretation of stimuli (Corens, Porac, & Ward, 1993). All

three of these processes are integral in the construction of meaning, selection, retention and acquisition of music information.

Learning Theory

Bigge (1976) defines learning theory as system building or programmed instruction whereas, the subject matter is broken down into small discrete steps then organized for instruction using a logical sequence. This description is similar to the theoretical position of learning developed in the first half of the twentieth century (Amsel, 1989). Researchers who published from 1950 to 1960 were less concerned with theory than with questioning the importance and application of learning theory in the resolution of educational problems (Skinner, 1950, Snygg, 1954, Spence, 1959). These learning theories were categorized as *deconstructionist* (Boardman, 2001). Deconstruction (Derrida, 1967) was a philosophical movement in the 1960's which asserted that meanings, metaphysical (highly abstract) constructs, and hierarchical oppositions (as between key elements or phenomena) are always rendered unstable by their dependence on ultimately arbitrary symbols, sounds, or images that represent underlying concepts or meanings (Borders Group, 2006).

A contrasting theory to the deconstructionist concept is *constructivism*. Constructivism occurs when an individual actively constructs knowledge and makes sense of information using the processes of assimilation, accommodation, and adaptation (Boardman, 2002; Woolfolk, 2008). Constructivism incorporates a holistic view of the learning process. Holistic learning is further identified as simultaneous and synergistic

interactions that affect all dimensions (i.e., action, cognition, and emotion) of the learner through the cognitive, psychomotor, and affective domains (Boardman, 2001).

Three types of constructivism are *exogenous, endogenous, and dialectic* identified by Moshman (1982). Exogenous constructivism considers knowledge to be the reconstruction of structures that exist in the external world. Endogenous constructivism emphasizes that learners construct their own knowledge through the transformation and reorganization of existing concepts. Finally, dialectical constructivism advocates that the source of knowledge occurs from interactions between the learner and the environment.

Within the present study, sensation, perception and cognition are three processes used by sixth-grade students' to investigate selective attention to music elements. Information processing is a foundational operation within sensation, perception and cognition. The three types of constructivist learning will be applied within the research method to investigate the extent to which variables associated with demographics, self-perception, music background, music genre, and temporal difference predict sixth-grade students' selective attention to music elements.

Music Perception and Cognition

In *On the Sensations of Tone as a Psychological Basis for the Theory of Music*, Hermann von Helmholtz (1863, 1954) created a foundation for empirical research on music as a psychological phenomenon. Within Helmholtz's theory, musical elements are the stimuli that engage a listener's attention, stimulate sensory organs of the auditory system, and then transfer information to the brain. In the brain, musical information is coded, recoded, and organized into relevant data for cognitive tasks. This theory was an

approach that involved the reduction of complex perceptual events into elementary units (i.e., single tones or isolated intervals). Krumhansl (1983), however, states that reducing music to a tone-by-tone process inhibits the normal perceptual and cognitive processes that operate when listening to music.

A group of researchers (Koffka, 1935; Kohler, 1923; Wertheimer, 1912, 1923, 1955, 1961) developed the Gestalt Theory of Perception that advanced the theories of perception. Elements of Gestalt psychology also have been researched in music and include the concepts of proximity, similarity, good continuation and completion, and organization (Bregman, 1978; Deutsch, 1975, 1978; Deutsch & Feroe, 1981; Dowling & Harwood, 1986; Lerdahl & Hackendoff, 1983). In an investigation, Bregman (1978) found that increasing the tempo of music reduced the separation of sound (less space heard between sound occurrences) in the time dimension. Further, Bregman found that when frequency separations were held constant, additional time compression differences (space perceived between sound occurrences) were evident. Therefore, frequencies close in temporal proximity tend to be perceived as a group or unit. Bregman also suggested that with an increase in the number of tones and tempo, a definite difference exists between the end of proximity (perceived attack, sustain and release) and beginning of similarity between grouped frequencies. Hence, elements with perceived similarities or likeness tend to be combined during the perceptual process.

The Gestalt psychologists also maintain that elements following the same direction tend to have related groupings or good continuation and completion. A musical example of this application occurs when a sequential grouping of tones, preceded and

followed by a period of noise or silence, facilitates an organized observation of tonal changes (Deutsch, 1999). Organization is another element Gestalt psychologists describe. An example of organization is the tendency for a visual perception of a picture to contain the elements of a figure and ground. A musical application occurs when an individual listens to music, and one sound phenomenon becomes the focus of attention while others are perceived as the background. As the listening experience continues, listeners shift their attention among sound phenomena for example, switching a phenomenon from the background to the foreground (Deutsch, 1999).

Selective Attention

While attending to a few stimuli, an individual excludes many other stimuli through a process known as "filtering" (Coren, Ward, & Enns, 1993). Filtering involves attending to only one, or a few distinct and separate stimuli among a large group of sensory stimuli. When individuals perceive sensory stimulation, they may continue to attend to the source of stimulation by excluding other sensory stimulations within the environment. Selective attention refers to a procedure where a listener searches for a specific stimulus and ignores other stimuli in the achievement of a perception (Jones, Boltz, & Kidd, 1982). The perception of the specific stimulus, however, is affected by peripheral stimuli (Lewis, 1970), but individuals can successfully monitor subordinate stimuli (Treisman, 1964) while attending a specific stimulus. Filtering is performed in the early stages of information processing but characteristics of the stimulus and task may induce shifts in attention and selection among characteristics of the stimulus

(Ridderinkhof & Stelt, 2000). However, Jones & Yee (1993) maintain that selective attention is facilitated most efficiently when a listener receives specific instructions.

An individual who actively participates in the auditory process (the act of perceiving sound) is considered a listener however, an individual who passively participates is considered to be hearing (Lipscomb, 1996). When listening to a musical excerpt, an individual's selective attention mechanisms exhibit a high magnitude perception for a specific music element or a variety of elements that exhibit similar degrees of relationship. Auditory stream segregation involves the categorization of auditory stimuli from a single environmental source into one perceptual unit (Bregman, 1990). Physical sound properties, such as frequency and timbre, are perceived to have the highest magnitude of influence on attentional selectivity (Jones, Kidd, & Wetzel, 1981).

Of all possible age groups in the general population, adolescence is a critical stage in the development of selective attention (Bilder, Charney, Ernst, Leibenluft, Monk, McClure, Nelson, Pine & Zarahn, 2003). There is a need for instructional strategies in music education that assist adolescents in selectively attending to information. Piaget (1954) identified the stage of formal operations as a stage that begins at age 11 (early stage of adolescence) and continues to develop into adulthood. The formal operational stage involves the application of cognitive functions to established psychological functions within the stage of concrete operations. The concrete operational stage (i.e. approximate ages of 7 to 11) is a time period when individuals begin thinking logically (organized though processes of the mind) about concrete events, but have difficulty understanding abstract or hypothetical concepts (Woolfolk, 2008). During the stage of

formal operations individuals develop the ability to think logically about concrete events, hypothesize situations, and create mental experiments in the achievement of logical outcomes. Thinking strategies within the stage of formal operations involve an individual's consideration of alternatives, identification of all possible combinations, and analysis of personal thinking strategies. The stage of formal operations also includes the increased development and use of critical thinking (careful and evaluative judgments) processes and skills. Researchers (Pflederer, 1963, 1964; Zimmerman & Sechrest, 1968) examined children's thought processes while engaged with music tasks and activities. These studies provided evidence that individuals within the stage of formal operations demonstrate not only the ability to perceive music concepts but also formulate hypotheses to carefully make evaluative judgments when applying music concepts.

Critical Thinking and Creativity

The development of music perception skills among adolescent students is strongly influenced by critical thinking (careful and evaluative judgments) and creativity (imagination). Adolescence (i.e., approximately ages 11-19) is a stage of human growth that is motivated by preferences and influenced by various external forces, and the development of identity that forms a foundation for adulthood. Adolescence is also important to an individual's development and use of critical and creative thinking. Research on adolescent use and development of critical thinking may foster further understanding of relationships between adolescent perception and selective attention of music elements.

The process of creativity is dependent on an individual's ability to think critically. When completing music tasks such as composing, performing, and listening, an individual must think critically (Priest, 2002). Critical thinking involves the evaluation of conclusions through logical and systematical re-examination of problems, evidence of knowledge, and solutions to problems (Deturk, 2002). As stated in *Dimensions of Thinking: A Framework for Curriculum and Instruction* (Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, & Suhor, 1988), it is impossible to think creatively without thinking critically. Hence, critical and creative thinking coalesce to form a higher order of thinking (Lipman, 1991).

Young adolescents (ages 11-15) seek further understanding of technical and expressive details when listening critically to a music performance. Adolescent students must develop critical thinking skills—the ability to generate an understanding of symbolic systems is essential when humans convert ideas into reality (Boardman, 2001). Music instruction must prepare students to meet three requirements that enable them to exhibit proper use and development of critical thinking skills (Deturk, 2002). The first requirement is for students to understand music elements and develop a conceptual knowledge of music. The second requirement is providing students with high quality music examples that represent appropriate music phenomena (music elements involved in instructional tasks). The third requirement involves teaching students to apply critical thinking skills during each task to make informed decisions about music concepts.

The Consortium of National Arts Education Associations in collaboration with the National Association of Music Education produced the document *National Standards for*

Arts Education (Consortium of National Arts Education Associations, 1994). Standards 1, 2 and 5 address student skills in the perception of music elements but require low to medium levels of listening as related to achieving creative and critical thinking skills. Standards 1 and 2 involve singing and playing of instruments alone and with others in varied repertoires, whereas, standard 5 involves the reading and notation of music. Two of the nine national standards of music education (i.e., Standards 3 and 4), outlined in the Consortium of National Arts Education Associations (1994), require creative thinking. Standard 3 involves the improvisation of melodies, variations, and accompaniments, whereas, Standard 4 involves the composition and arrangement of music within specific guidelines.

Standards 6, 7, 8, and 9 of the Consortium of National Arts Education Associations (1994) identify specific critical thinking skills used in music learning. The development and attainment of these skills are necessary for students to demonstrate their perception of music elements. Students use critical and creative thinking to perceive and distinguish relationships among musical elements and various musical genres. Standards 6, 7, 8, and 9 are listed below:

6. Listening to, analyzing, and describing music;
7. Evaluating music and music performances;
8. Understanding relationships between music, the other arts, and disciplines outside the arts; and
9. Understanding music in relation to history and culture.

The development of critical thinking skills in music instruction is dependent on the accumulated knowledge of music elements. The creative thinking process also involves student manipulation of music elements and application to musical tasks (Kendall & Marzano, 2000).

Music Elements

Individuals begin to develop the ability to hear in utero during the second half of the mother's pregnancy (Lasky & Williams, 2005). The human ear is functionally mature shortly after birth, however the central auditory system continues to develop for at least the first decade of life (Moore, 2002). Mechanisms and processes that are involved in the music element perception and listening continue to develop during infancy, childhood, adolescence, and into adulthood. Hufstader (1977) indicated that a learning sequence existed for the detection of alterations within the selected music elements of timbre, rhythm, melodic pitch patterns, and harmony among first, third, fifth, and seventh grade students. Further, Hufstader concluded that skills in the detection of alterations in timbre were developed by first grade, melodic pitch pattern between third and fifth grade, along with rhythm skills by the fifth grade, and harmonic skills by the seventh grade or later.

Geringer and Madsen (1991) found that similar rank orders exist for music elements among instructional presentations and literary references. Using a survey, the researchers established that music educators and music therapists ranked the music elements according to the amount of time they taught them in the following order (respectively): rhythm, melody, pitch, tempo, dynamic, tone quality, style, harmony, and form (i.e., dynamic and tone quality received the same rank score) (see Table 1). Further,

A survey of music elements in books, dictionaries, and research journals by Geringer and Madsen (1991) revealed the following rank order (respectively): rhythm, melody, pitch, harmony, tone quality, form, tempo, dynamic, style, (tone quality and form received the same rank score) (see Table 1). Hence, both research methods provided similar results for the rank order presentation of music elements (see Table 1).

Table 1
Geringer and Madsen (1991) Rank Order Summary of Music Elements

Source	RH	ME	PI	TE	DY	TQ	ST	HA	FO
Study Participants	1	2	3	4	5.5	5.5	7	8	9
Review of Literature	1	2	3	7	8	5.5	9	4	5.5
Overall Mean	**1**	**2**	**3**	**5.5**	**6.75**	**5.5**	**8**	**6**	**7.25**

*Note. RH = Rhythm, ME = Melody, PI = Pitch, TE = Tempo, DY = Dynamic, TQ = Tone Quality, ST = Style, HA = Harmony, FO = Form

The first five elements (i.e., rhythm, melody, pitch, tempo, and tone quality) that received the highest overall rank order mean of presentation in Geringer and Madsen (1991) received further investigation within the present study (see Table 1). For the present study, melody and pitch were consolidated into “melodic contour,” which includes the movement of pitches either upward or downward, interval size (i.e., the distance between consecutive pitches), and key relation (i.e., the psychological relationship of pitches to a primary tone). Additionally, tone quality was labeled “timbre” in the present study and rhythm, which includes melodic rhythm, harmonic rhythm, and rhythmic patterns, was labeled “rhythm” in the present study. Timbre relates to frequency or number and intensity of partials within a single sound (Lipscomb & Hodges, 1996). Rhythm relates to regularly recurring patterns of accented and unaccented beats that are

perceived as equivalent or of different durations. As described in Geringer and Madsen (1991), tempo and rhythm were investigated as individual attributes. As a result, the four music elements investigated within the present study include melodic contour, timbre, rhythm, and tempo.

Melodic contour. Aiello (1994) defines melody as "a sequence of single pitches organized as an aesthetic whole" (p. 173). In the process of music listening, melody is frequently considered the most salient feature of music perception. Dowling (1994) identifies four features of melody: contour, interval size, key (or tonality), and melodic rhythm. Within the present study, melodic contour includes the movement of pitches upward and downward, intervallic movement in regards to key relationships. Dowling (1994) also defines melodic contour as melodic rhythmic patterns, the pattern of accents and pitch durations inherent to a melody. For the purposes of this investigation, Dowling's (1994) definition served as the operational definition of melodic contour within the present study.

Timbre. The American National Standards Institute (1960) defines timbre as, "that attribute of auditory sensation in terms of which a listener can judge that two sounds similarly presented and having the same loudness and pitch are dissimilar" (p.45). Krumhansl and Iverson (1992) identify timbre as a multidimensional attribute of perceptual importance that includes: (a) brightness of the sound (relative amplitude of the higher harmonics), (b) the speed of the attack portion, (c) the synchronization within the rise of harmonics, (d) the presence and absence of noise in the onset, and (e) the presence or absence of even harmonics. Lipscomb and Hodges (1996) define timbre as a

multidimensional musical phenomenon based on the configuration of partials (number and placement on the frequency scale) and respective amplitudes, and additional influence from the onset and offset of partials. Lipscomb and Hodges (1996) definition timbre served as the operational definition of timbre within the present study.

Rhythm and tempo. Time is an aspect of music and encompasses a number of musical concepts. For purposes of clarification, Monahan and Carterette (1985) provide definitions for the terms duration, beats, tempo, meter, and rhythmic pattern. Duration is the psychological and physical variable associated with time. Beats divide a temporal period into equivalent units of duration. Tempo is the rate at which beats occur. Meter functions as a measurement of pulse in music when ordered along a regularly recurring pattern of accented and unaccented beats. Rhythmic patterns result when the presentations of an ordered recurrent alternation of strong and weak elements occur during a flow of sounds and silences. Lerdahl and Jackendoff (1983) define rhythmic patterns as tonal and metric music that exist of two independent levels: (a) grouping—the manner in which music is subdivided at a variety of levels and (b) meter—the regular alternation of strong and weak beats in music. Within the present study, the operational definition of rhythm is defined as an ordered recurrent alternation of strong and weak elements that occur at two different levels: (a) individual and grouped tonal elements (i.e., pitch, melody, timbre, harmony) and (b) individual and grouped metrical elements (i.e., tempo, rhythmic patterns, strong beats, and weak beats) (Lerdahl & Jackendoff, 1983; Monahan and Carterette, 1985). The operational definition of tempo is defined as the rate at which beats occur (Monahan & Carterette, 1985).

Adolescence

Adolescence (i.e., approximately ages 11 through 19 years) is a stage of human growth that is motivated by preference and various external influences. During adolescence, an individual develops an identity that forms a foundation for adulthood. One of the primary goals of this stage is to search for answers to the question "Who am I?" (Woolfolk, 2008). Individual experiences that begin and occur during infancy influence the formation of an identity (i.e., an individual's organization of drives, abilities, beliefs, and consistent image of self). Identity formation controls the organization of adolescent drives, abilities, beliefs, and history into consistent images of the self (Woolfolk, 2008). A popular theory in the field of education that delimits adolescence as a stage in human development is Erickson's (1968) *Eight Stages of*

Psychosocial Development

Erickson describes human development as a passage through a series of stages that corresponded to particular goals, concerns, accomplishments, and dangers. Erickson (1963) expands and transforms Freud's genital stage in adolescence with three stages of adulthood to emphasize the emergence of the self (i.e., the individual's search for identity and relationships with others that develop during a lifetime). The stages of Erickson's theory are interdependent, meaning that the accomplishment of late stages is dependent upon the resolution of conflicts associated with early stages. Stages and resolutions have developmental crises with direct implications for adolescent self-perceptions, serving critical roles in development and academic progress.

Another popular theory of development that delimits a period or stage of adolescence is Piaget's *Theory of Cognitive and Affective Development* (1954). The stage of formal operations involves adolescence, which begins at age 11 years and continues to develop into adulthood. Formal operations involve the application of cognitive functions to concrete operations where hypothesized situations and mental experiments achieve logical outcomes. Cognitive thinking involves the ability to consider alternatives, identify all possible combinations, and analyze personal thinking. These thinking strategies lead to the development and use of critical thinking processes and skills.

Two additional theories (Bruner, 1960; Gagné, 1977) provide informative sequences of human development and specifically address the stage of adolescence. Bruner's (1960) theory of discovery learning is an inquiry-based, constructivist learning theory that takes place in problem solving situations where the learner draws on his or her own past experience and existing knowledge to discover facts and relationships and new truths to be learned. Students interact with the world by exploring and manipulating objects, wrestling with questions and controversies, or performing experiments. Teachers present students with questions and situational problems. However, instead of teachers presenting explanations on how to solve problems, the teacher provides appropriate materials and encourages students to make observations, form hypothesis, and test solutions (Woolfolk, 2008). The theory is closely related to work by Jean Piaget, particularly for thinking process that take place during the stage of formal operations.

Gagné (1977) proposed a theory of instruction that was less concerned with discovery learning but emphasized quality, permanence, and practical use of the learning

process. Gagné's theory of learning and instruction contains three major events: preparation for learning, acquisition and performance, and transfer of learning. Preparation for learning involves the engagement of student's attention. The second event, acquisition and performance include the presentation of materials where students encode and distribute information for long and short-term memorization using selected methods. The third event, transfer of learning involves the transmission of learning to tasks that employ various degrees of similarities to original tasks (Gagné and Driscoll, 1988).

Adolescence is also a critical stage in music development and instruction. During adolescence, music students develop abilities to perceive musical elements, and to formulate hypotheses that further examine the application and use of music concepts (Cutietta, 1984). Woody (1998) maintains that music provides young adolescents, including at-risk students, necessary opportunities for achievement and success.

Middle School

In the present study, sixth-grade students in the middle school served as the focus of adolescent instruction. In most school systems of the United States, middle school is characterized by initial offerings of instrumental music and the continuation of general and choral music instruction. The middle school continues instruction from the elementary school and introduces the first stage of the secondary school level instruction. The primary functions and principles of music instruction within the middle school involve describing, creating, performing, and music criticism (i.e., making evaluative or analytical judgments) (Yoder-White, 1993).

Middle school students experience extreme physical, intellectual, social, moral, and emotional development (Yoder-White, 1993). Students matriculate to sixth grade when they are approximately 11-12 years of age and begin the formation or development of an identity (i.e., personality of an individual). The conflict of this stage is ego identity versus role confusion. During this stage, students should achieve industry (i.e., diligence toward work or task, steady or habitual effort), the ability to cope with academics, group activities, and friends (Woolfolk, 2008). Conversely, the inability to achieve industry or the experience of difficulty in meeting challenges associated with industry may lead the student to develop inferiority (i.e., low satisfaction with oneself).

Music and Self-Perception

Self-perception theory is the awareness of individual experiences and the nature of these experiences (Laird & Bressler, 1992). Self-perception in the present study pertains to an individual's knowledge of personal reactions and emotional behaviors. Self-perception is associated and sometimes used interchangeably with self-esteem and self-concept (Woolfolk, 2008). Self-concept is referred to as "the composite of ideas, feelings and attitudes people have about themselves" (Hilgard, Atkinson & Atkinson, 1979, p. 605). Self-esteem is an evaluative component of self-concept (Gergen, 1971; Rosenberg 1965) and is measured by the degree of difference between the ideal self and perceived self (Leonard, Beauvais & Scholl, 1995).

James' landmark proposals, *What is Emotion* (1884) and *A definition of Habit* (1887), served as an impetuses for further study into self-perceptions. James (1884, 1887) explained that a collection of habits emanate from innate tendencies identified as

instincts, which form habits that are influenced by educational means or acts of reason. The process of self-perception involves an individual's knowledge and identification of habitual or emotional experiences. These habitual or emotional experiences originate from physiological responses, expressive behavior, instrumental behavior, and contextual elements (Laird & Bressler, 1992). Accordingly, Gardner (1983) considered an individual's knowledge of the self and others as personal intelligence and also considers personal intelligence as preeminent as and more integrated than other types of intelligences. Gardner (1999) maintained that an individual's sense of self mediates other capabilities since it regulates processes and reflects on other abilities, reactions, and behaviors.

The greatest contribution of music to the growth and development of young adolescents is the development of aesthetics (i.e., human feeling and expression, empathy, responsiveness, feelingful involvement) (Woody, 1998). Regardless of cultural background and music training, individuals listen to music for the pleasure and entertainment offered through its dynamic and tonal motion (Taylor, 1993). Humans are influenced by external forces associated with music and affected by internal tensions and releases associated with the perception of musical elements. In 1880, Dogiel discovered that music affects blood circulation, heart rate, and respiration. Wigram (2004) described therapeutic methods and music techniques that lead to Baker and Wigram (2005) undertaking a collaborative effort among an international group of music therapist to defined procedures and methods that are associated with the formation of habitual tendencies in individuals.

Music education provides young adolescents, including at-risk students, with opportunities for success (Woody, 1998). During early adolescence (approximately ages 11-15 years), problems begin and escalate, which sometimes result in a student's decision to drop out of school. Several researchers (Acer, 1987; Barry, Taylor, & Walls, 1990; California State Department of Education, 1990; Trusty & Olivia, 1994; Thompson, 1995; Barry et al., 1997) reported results in which the arts provided curricular designs and framework that supplied social and educational connections positively affecting at-risk students. Results from an investigation by Austin (1990) indicated that the level of musical self-esteem was found to be a significant predictor of participation in music activities. However, Zimmerman (2001) found no significant effects on self-esteem based on gender, grade level, or band participation.

In experimental research designs where music served as the treatment to increase self-esteem, Lomen (1970) and Wamhopff (1971) reported little effect, whereas, Leggette (1993), Michel (1971), and Michel and Farrell (1973) found no effect. Linch (1994) found no significant differences in the level of self-esteem among instrumental music participants, participants who discontinued instrumental music participation, and non-instrumental music participants. Investigations by Hietolahti-Ansten and Kalliopuska (1991), Nolin and Vander Ark (1977), and Wood (1973) revealed positive correlations between participation in choir, band, or private instruction and self-esteem.

Need and Significance of the Study

Music is an aural art form. Listening is a fundamental part of all music activities; music instructors need to be aware of differences in adolescent selective attention to

music elements. Adolescence is a critical period of human development where cognitive, sensory, and perceptual functions interact and integrate to influence the formation of self-perception. There is a presumption that the student's ability to discern music elements contribute to music understanding, enjoyment, and aesthetic sensitivity (Madsen, 1997a). Knowledge of these interactions and relationships among selective attention for music elements, demographic variables, self-perception, music background, and effect on genre and temporal difference perceptions may be used to facilitate moods, enhance emotional responses, and facilitate habitual music listening experiences. Further research on the relationships between music listening skills and the selected predictors may provide additional information about factors of music instruction and its contribution to the developmental processes associated with adolescent students.

Results of the present study may be important to music education and music therapy because the findings will outline ratings among sixth-grade students selective attention to melodic contour, rhythm, timbre, and tempo. The identification of significant differences ($p \leq .05$), if any, among sixth-grade students' selective attention to music elements will establish a foundation for additional research. The identification of significant predictors ($p \leq .05$), if any, among sixth-grade students' selective attention to music elements and the selected independent variables may provide knowledge regarding the degree of prediction for music elements in the process of music education. The results of the study could also address implications in the following areas.

1. Promote further understanding and knowledge of the degree of relationships and differences among sixth-grade students' selective attention to music elements.

2. Promote further understanding and knowledge about the degree of differences among sixth-grade students' selective attention to music elements as affected by variables associated with music genre and temporal difference.

3. Promote further understanding and knowledge regarding the degree of relationships among sixth-grade students' selective attention to music elements among variables associated with demographic, self-perception, music background, music genre and temporal difference.

4. Serve as a source of data for the development and implementation of additional instructional strategies in music listening and music instruction.

5. Serve as a catalyst for further research in the areas of music perception, cognition, and sensation and their relationship to adolescent psychology and development.

Purpose

The goal of the present study was to examine sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo). Two primary purposes were the foci of this study. The first purpose was to investigate whether significant differences ($p \leq .05$) existed among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and by variables associated with temporal difference (i.e., fast and slow). The second purpose of the study was to investigate the extent to which variables associated with demographics, self-perception, music background, music genres, and temporal differences significantly predicted ($p \leq .05$) sixth-grade participants' selective attention to music elements. The variables within the second purpose include: demographic variables (i.e., gender and ethnicity), self-perception variables (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal,

behavioral conduct, close friendship, and global self-worth), music background (i.e., participants' in- and out-of-school music experiences), and variables associated with music genre and temporal difference that were examined in the first purpose.

Results of the investigation may provide informative data regarding adolescent listening patterns to music excerpts among sixth-grade students. Implications observed in this research could be directly applied to instructional frameworks, standards, and benchmarks for use in music pedagogy, music therapy, and interdisciplinary applications. This study could also provide further understanding of adolescent music perceptions, their relationships and interactions with demographic variables, self-perception, music background, and effect on music genres and temporal differences. Results of the investigation could also provide a foundation and guide for additional research in music education. Below are the primary research questions that formed the foundation for this study.

1. Are there significant differences ($p \leq .05$) among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo), as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and temporal difference (i.e., fast and slow)?

2. To what extent do the following variables significantly predict ($p \leq .05$) sixth-grade participants' selective attention to melodic contour, timbre, rhythm, and tempo:

    a. ***Demographic Variables***—gender and ethnicity,
    b. ***Self-Perception Variables***—scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth,
    c. ***Music Background***—Composite Score from Music Background Questionnaire II,
    d. ***Music Genre Variables***—classical, rock, rhythm and blues, and jazz,
    e. ***Temporal Difference Variables***—fast and slow tempi?

CHAPTER II

REVIEW OF THE LITERATURE

Three functions that influence musical behaviors involve sensation, perception, and cognition. Sensation involves the acquisition of energy via the sensory mechanisms (ears, eyes, nose, skin, and tongue) and transmission to the neural system (Lipscomb, 1996). Perception involves the use of sensory information to process and achieve a conscious representation of objects or object relationships (Coren, Enns & Ward, 1993). Cognition is the interrelated processes of memory and thinking (Radocy & Boyle, 1996). Sensation, perception, and cognition affect the music learning process and the development of self-perception.

Music influences human emotions and movement within the body and also affects the biological, psychological, sociological, and spiritual functions (Eagle, 1996) . While it is important to determine music element sensation, perception, and cognition, it is important to find connections between these behaviors and other variables. This chapter contains reviews of literature specific to the selective attention of music elements (i.e., melodic contour, timbre, rhythm, and tempo). Further, this chapter also contains reviews of literature specific to variables associated with music genre, temporal difference, self-perception, and connections to the process of selective attention to music elements.

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primary purposes were the foci of this study. The first purpose was to investigate whether significant differences ($p \leq .05$) existed among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and by variables associated with temporal difference (i.e., fast and slow). The second purpose of the study was to investigate the extent to which variables associated with demographics, self-perception, music background, music genre, and temporal difference significantly predicted ($p \leq .05$) sixth-grade participants' selective attention to music elements. The variables within the second purpose include: demographic variables (i.e., gender and ethnicity), self-perception variables (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth), music background (i.e., participants' in- and out-of-school music experiences), and variables associated with music genre and temporal difference which were examined in the first purpose.

Selective Attention of Music Elements

Selective attention is the attempt to process one of many simultaneously occurring stimulus events (Coren & Ward, 1993). For a listener to adequately perceive simultaneous sounds, the auditory process selects the most appropriate sounds to use during each activity or event (Ridderinkhof & Stelt, 2000). Ridderinkhof and Stelt also suggest that the ability to filter and select appropriate elements of sound are apparent in children and continue to develop during adolescence into adulthood.

Cherry (1953) and Broadbent (1954, 1958) examined selective attention using auditory sequences of words presented simultaneously to both ears. In subsequent investigations, the importance of physical differences in the dimensions of sound (i.e. spatial location, frequency (Hz), intensity (dB), etc…) that affect the listener's ability to selectively attend to elements of sound within one or two simultaneous messages (Egan, Carterette, & Thwing, 1954; Kahneman, 1973; Moray, 1959; Triesman, 1964). The theory of "Auditory Scene Analysis" was proposed by Bregman (1978a) as an alternative explanation of selective attention for tasks that involve music listening (Mondor & Terrio, 1998).

Auditory Scene Analysis

Based on principles of Gestalt psychology, the theory of Auditory Scene Analysis outlines musical processes that involve a listener's analysis of several auditory stimuli from a single environmental source and the organization of separate stimuli into one perceptual unit. The theory states that the perceptual process involves the following principles: similarity, simplicity, good continuation, competition of organization (belongingness), and common fate. Bregman (1978a) discusses and justifies the application and integration of these principles (Bregman and Campbell, 1971; Bregman, 1978b; Bregman & Dannenbring, 1973; Bregman & Dannenbring, 1977; Bregman & Pinker, 1978; Bregman & Rudnicky, 1975).

Similarity. The principle of similarity states that elements will be grouped if they are identified as having similar characteristics. Bregman and Campbell (1971) used 32 participants (university students) to investigate the principle of similarity. Six tones (A =

2500, B = 2000, C = 1600, D = 550, E = 430, and F = 350 Hz) were presented within two conditions. Condition 1 was HLHLHL (H = high tone and L = low tone) and condition 2 was HHLLHL using the previously stated order of frequency. Participants were instructed to listen to each condition until the perceived order was identifiable and then list the correct order of tones.

The researchers found that participants in condition 1 identified within-stream order (high = ABC or low = DEF) 73% versus across-stream order 60% mean value correct. In condition 2, participants identified within stream order 66% versus across stream order 60% mean value correct. Both conditions exhibited a significant difference ($p < .001$) between within- and across-stream order scores. These results imply that listeners identify and recognize the order of tones more easily by splitting tones into two streams: high or low.

Simplicity. Bregman (1978a) describes the principle of simplicity as individual's preference for two categorical streams of perception when presented with a bimodal distribution of frequencies. During a perceptual task, individuals exhibit an ability to parse (analyze a set of characters in order to associate a group of characters into one unit) and then find a description that minimizes the task to two fundamental objectives: identify the number of streams and rate of change within each stream.

Bregman (1978b) examined the effects of splitting using the process of titration (examination of the quality of a constituent attribute by adding another attribute of known strength and measuring the effect of change within the constituent attribute). The investigator included 12 participants (ages 19-32) who were instructed to listen to four

conditions (each presented five times within randomized blocks). Participants were instructed to use a knob to increase the speed of each condition until splitting was perceived. Each condition consisted of three frequencies, two high (H1 = 784 and H2 = 831 Hz) and one low (L = 330 Hz), presented within varied sets of 4, 8, 16 tones with 4s intermittent silences and no silences (i.e., H1, L, H2, L); and indefinitely repeated sequences (set, silence, set, silence, etc.).

A significant difference occurred across conditions ($p < .001$), where as set size increased, the speed necessary to determine splitting increased. Bregman concluded that frequency separation interacts with the speed of presentation because the presentation of a tonal sequence at higher rates of speed produced additional splitting.

Good continuation. Following the completion of simplicity, the individual engages in the task of good continuation. Good continuation involves the perception of sequence or frequency changes that occur in the same direction as part of the same stream. The effect of good continuation also involves the reduction of splitting (segregation of frequencies into different streams) during the perception of repeated high and low frequencies connected by sequential tones or frequency glides.

Bregman and Dannenbring (1973) examined 36 participants (undergraduate and graduate students) to study the effect of frequency glides (a linear rise or fall of frequency and amplitude) on the perception of two separate streams. The investigation employed a 3 x 3 x 2 x 2 design that included three ramped (frequency glide) conditions, three steady state times (100, 150, and 225 ms), standard and comparison sequences (two high [2000 and 1600 Hz] and two low tones [614 and 400 Hz], and two presentations orders (1: H_1,

L_1, H_2, L_2, and 2: H_1, L_2, H_2, L_1). The three ramped conditions included discrete (40 ms silence between high and low tones), semi ramped (steady state followed by a 10 ms 45 dB rise or fall in amplitude, 20 ms silence, and 10 ms resumption of frequency glide to next tone), and ramped conditions (40 ms frequency glide between each tone).

Within 72 trials, participants were instructed to listen to the standard and comparison sequences and indicate whether the order of tones were similar or different. A significant difference was found among the three ramping conditions ($p < .001$) and among the three steady state times ($p < .025$). At each steady state time, the overall performance of participants on ramped and semi ramped conditions were superior to performance within the discrete conditions. As length of tones increased and continuation in frequency glide increased, participants' overall performance increased. Hence, this investigation provides evidence to support the effect of good continuation in music perception.

Competition of organization. Bregman and Rudnicky (1975) outlines competition of organization in an experiment in which they examined whether the perception of three tonal streams were involved in the competition for attention during the listening process (Bregman & Rudnicky, 1975). Thirteen participants (university students, ages 16-26) were instructed to listen to a standard pair of tones (A = 2200 Hz and B = 2400 Hz – alternating order of presentation) followed by a comparison sequence of tones to determine if the order of AB (imbedded in the comparison sequence) was the same or different. The comparison sequences include the two target tones (AB – imbedded between distracter tones and alternating order presentations), two distracter

tones (X = 1460 Hz), and five captor tones (C = 590, 1030, and 1460 Hz – one frequency used in each condition).

The experimental design consisted of four conditions: one condition had no captor stream (i.e., XABX) and three conditions which included captor streams (i.e., CCCXABXCC). The captor streams were created to examine captor tones' effect on the absorption of distracter tones, frequency effect on the isolation of the target stream, and enhancement of the participant's ability to perceive the target stream's order. The researchers found a significant effect of captor condition ($p < .001$). Tasks with no captor stream provided the most difficulty in the identification of target stream order. Intermediate difficulty was observed when captors were close in frequency to the XABX pattern, and less difficulty was observed when captors were the same tone as the distracters. When individuals process two simultaneously structured streams, the captor tones strip the distracter tones from the domain of attention thus allowing efficient perception of the target tones.

Closure and belongingness. Bregman included the principle of closure and belongingness within the illusion of continuity (when a portion of a pure tone signal is removed and replaced with a noise burst, and the pure tone continues to be heard). The illusion of continuity is supported by two findings: when the offset of the tone precedes the onset of the noise, the tone is not heard during the noise burst (Elfner & Homick, 1967). Bregman and Dannenbring (1977) examined the effect of loudness changes just before the noise on the illusion of continuity. Twenty participants (graduate and undergraduate students) were informed that they would hear an alternating order of

presentation between a tone (1000 Hz) and a noise burst (91 dB with adjustable duration). The four basic conditions included: two steady state tones of 66 or 76 dB, one 66 dB steady state tone with a rise of dB just before the noise and a fall of 10 dB following the noise burst, and one 76 dB steady state tone with a fall of dB just before the noise and a rise of 10 dB following the noise burst. The rise and fall conditions were given further examination based on the duration of the ramps (10, 25, or 50 ms - length of time rise or fall). Participants were instructed to adjust the duration of the noise burst using a knob until the tone changed from continuous to discontinuous, or vice versa.

A significant difference was found between the perceived continuity and discontinuity (threshold adjustment) for the two steady state tone levels ($p < .01$) and duration of amplitude ramp ($p < .005$). The condition where the 76 dB of loudness decreased before the noise burst elicited less continuity as the duration of the amplitude ramp increased. Warren (1970) also suggests that removing the noise burst from the tone (leaving a gap) does not produce perceptual closure but creates the perception of a tone with a gap. Hence, continuity, independent of other factors, is not enough to produce closure.

Common fate. Finally, the principle of common fate is outlined as the grouping of two elements, which undergo similar changes, simultaneously, into one event. Bregman (1978a) suggested that the individual's parsing mechanism associated with the process of common fate depends upon the cooperation and competition available within good sequential organizations and will not occur in isolation.

Bregman and Pinker (1978) investigated individuals' ability to parse between timbre and similar pitch. Experiment 1 used 22 participants (graduate and undergraduate students) within 15 conditions (45 trials = three presentations of 15 tonal patterns). The tonal patterns consisted of a single pure tone (A = 559, 978 or 1713 Hz) and a compound tone (B = 527 Hz) and (C = 300 Hz), both of equal loudness and duration. The captor tone A varied in each trial and lasted 117 ms whereas B began 47 ms after the onset of A and lasted 147 ms. The single tone C was synchronous or asynchronous with B (lead or lagged by 29 or 58 ms). Participants were instructed to judge the richness of the lowest tone (a 7-point scale, endpoints 1 and 7, "pure" and "rich"), relative to the two tones that were presented separately.

A significant effect of asynchrony was found between B and C ($p < .001$) and asynchrony between A and BC ($p < .001$). The timbre of C was identified as richest when C was synchronous with B and as the frequency of A became higher; the combination of BC was identified as richer.

Music Elements

Jones, Kidd, and Wetzel (1981) suggested that pitch and timbre (collectively designated "pitch context") are commonly recognized as the foremost elements in the facilitation of selective attention. These researchers designed an experiment of investigate the roles of tempo and rhythmic pattern (collectively designated "temporal context") in the process of selective attention. Using the theory of auditory stream segregation (Bregman & Campbell, 1971) as a foundation, Jones et al. (1981) developed three

experiments to investigate the effect of temporal context on pitch context during the process of selective attention.

The first experiment involved 20 participants (undergraduate students with at least two years of musical training) who listened to a standard pair of tones (A = 2217 Hz, B = 2637 Hz – alternating order of presentation) followed by a comparison sequence to determine if the order of AB (imbedded in the comparison sequence) was the same or different. The comparison sequences consist of 10 tones (i.e., CCCFABFCCC), which include the two target tones (AB –imbedded between flanking tones [same as distracter tones] and alternating order of presentation), two flanking tones (F = 1480 Hz), and six captor tones (C = 880 and 1396 Hz – one frequency used in each condition). Comparison sequences presented to the control group (4 tones) used only target and flanking tones with no captor stream (i.e., FABF or FBAF). The experimental design (2 x 2 x 2 x 3 x 4) included order of standard pair (AB or BA), order of target tones (AB or BA), pitch distance (close, far), rhythm (two-tone, four-tone, isochronous [not occurring at the same time]), and four random arrangements of presentation. Pitch distance conditions involved the frequency between captor and flanking tones: close (captor = 1396 Hz and flanking = 1480 Hz) and far (captor = 880 Hz and flanking = 1480 Hz) whereas as all tone durations were 60 ms. Rhythmic conditions also referred to two-tone rhythms (180 ms of silence between first 4 and last 4 tones; 20 ms between flanking and target tones), four tone rhythms (180 ms of silence between first 3 and last 3 tones; 20 ms between remaining tones), and isochronous (20 ms of uniformed silence between all tones).

Rhythm was found to affect accuracy of recognition significantly ($p < .025$). Two-tone rhythms were significantly easier to recognize when compared to four tone and isochronous rhythms ($p < .025$). Pitch distance exhibited no significant effects on accuracy ($p > .10$) but a significant interaction ($p < .001$) was exhibited between pitch distance and rhythm where the effects of the two-tone rhythm were greatest in the close pitch distance condition (captor tones were close in frequency to flanking tones). In the far pitch conditions (captor tones were far in frequency from flanking tones) the effects of rhythm were not significant which is contrary to results reported by Bregman and Rudnicky (1975). These results indicate that rhythmic context has a greater effect on recognition accuracy than pitch distance.

Experiment 2 involved 48 participants (freshmen and sophomore students with at least two years musical training) and was an extension of experiment 1. The experimental design was modified to increase temporal predictability, reduce learning over trials, and maximize the captor tones' effect on the isolation of target tones. To achieve these goals, a third pitch distance conditions was added to close and far; zero pitch difference (captor and flanking tones were same frequency) and comparison sequences were reduced from 10 to 9 tones. The researchers found that the two-tone rhythmic condition produced better accuracy in recognition than the four-tone and isochronous rhythmic conditions, but was marginally significant ($p < .10$). A main effect of captor frequency was found whereas; accuracy of performance was greatest when the captor and flanking frequencies were the same ($p < .05$). Most important was the significant effect exhibited between rhythm and

pitch distance ($p < .05$), which indicates pitch had its greatest effect in the capture of flanking tones within the two-tone rhythm.

Experiment 3 used 48 participants (freshmen and sophomore students with at least two years musical training) to further extend experiment 2 by adding two captor tones and extending the comparison sequences to 11 tones. The researchers investigated a previous proposal by Bregman and Rudnicky (1975) that lengthening the captor string should improve accuracy. Slight but nonsignificant improvements were found in performance.

Jones, Boltz, and Kidd (1982) examined the effects of rhythmic and temporal context on the recognition of melodic sequences. Forty-eight participants (university students) listened to 40 standard and comparison nine tone sequences to determine whether both sequences were same or different. Participants were also instructed to indicate their confidence levels using the following ratings: "same," "sure same," "different," and "sure different." The experimental design (4 x 3 x 3 x 2) involved four melodic and three rhythmic context, three serial positions (same, different at SP 4, and different at SP 6), and two random order conditions. Four rules (Jones, 1978): (identity [i.e., $C_4D_4E_4 = C_4D_4E_4$], complement [i.e., $C_4D_4E_4 = C_5B_4A_4$], transpose [i.e., $C_4D_4E_4 = G_4A_4B_4$], and reflection [i.e., $C_4D_4E_4 = F_4E_4D_4$]) were used to control the degree of melodic predictability within the melodic sequences. These rules included the no rule, one rule (transposition or reflection), and two rule (transposed/complement or reflection/complement) melodic conditions. The four rhythmic context conditions included isochronous (UUU – three unaccented tones [U = 250 ms]), irregular (AUU –

one accented tone [A = 500 ms] followed by two unaccented tones), whereas both contained metrically equivalent pauses [50 ms]. The rhythmic conditions of dactyl (AUU – one accented tone, two unaccented tones) contained a 350 ms pause [induced accent] between tones 3 and 4 (SP 4), and anapest (UUA – two unaccented tones, one accented tone) contained a 350 ms pause [induced accent] between tones 6 and 7 (SP 6); however, within both conditions all other pauses were metrically equivalent [50 ms]).

Participants performed more accurately in the identification of higher order rules violations with same serial position and lower order rules with SP 6 than higher order rules with SP 4 ($p < .001$), indicating that temporal predictability enhances recognition of higher order melodic structures and transposed melodies are especially easy to identify. Also of importance is the significant interaction between rhythm and position ($p < .0025$). Anapest and irregular rhythms produced lower accuracy in the identification of sequences with rule violations at SP 4 than dactyl and isochronous. Identification of sequences with rule violations at SP 6 exhibited most accuracy with anapest rhythms. These results imply that rhythmic context (higher order rule that involve induced accents) affects the accurate recognition of melodic sequences. The researchers also suggest that the time structure of a sequence may encourage selective attending to tones within the melodic context.

Listening and attention. Flowers (1983, 1984) investigated listening and attention to music elements. Flowers examined elements and attributes of music listening that facilitate meaning and importance within student music experiences. Using 140 undergraduate nonmusic majors, Flowers (1983) examined the effect of instruction in vocabulary and listening on the number of changes, verbal descriptions, and use of music

vocabulary. Each participant was randomly assigned to one of four groups: vocabulary only, listening only, vocabulary plus listening, and a contact control group. The experimental design involved a pretest, a four week instructional period, and posttest design. Participants were presented with the first 115 measures of Igor Stravinsky's *Petrouska* and asked to identify perceived number of changes (no specific definition of musical change was given to participants), number of references to musical instruments, and annotation of technical music descriptions. Participants identified musical changes by speaking consecutive numbers into a microphone or depressing a handheld counter and provided written descriptions of the music excerpt.

No significant differences were found among the four groups regarding number of changes on the pre- and posttest ($p > .01$). Vocabulary study and listening with verbalization conditions produced changes similar to the control group. The vocabulary plus listening group also produced significantly higher verbal description scores than the vocabulary only condition and contact control groups. No significant difference was exhibited from the listening only group. The isolated activities of vocabulary study, repeated listening, and description of music produced no increase in verbal attention to music elements. Significant increases were found among the vocabulary ($p < .01$) and vocabulary plus listening ($p < .01$) groups in total vocabulary between the pre- and posttest scores. Vocabulary study may increase technical descriptions of changes in music, but gains are more substantial when vocabulary words are applied to music during the learning process.

Flowers (1984) completed 2 experiments to further examine the use and effect of music terminology in describing music excerpts. In experiment 1, Flowers assessed which elements were used in descriptions by third graders, fourth graders, and undergraduate nonmusic majors during listening tasks. One hundred thirty-six third graders, 62 fourth graders, and 52 undergraduate nonmusic majors (N = 250) were instructed to listen to eight piano excerpts and write technical music descriptions. Participants made references to the following music elements and attributes: dynamics, articulation, tempo, pitch/melody, beat/meter/rhythm, timbre, harmony/texture, form, style, extramusical (images or analogies), and value judgments. Flowers found no significant differences between the overall patterns of responses of third and fourth grades but significant differences were found between undergraduates and third graders ($p < .001$) and between undergraduates and fourth graders ($p < .001$). Upon further analysis of significant differences among grade level references to music elements, Flowers found that undergraduates referenced the following music elements more often than third or fourth graders: articulation, tempo, pitch/melody, beat/meter/rhythm, harmony/texture, form, and style. Consequently, third and fourth graders provided similar responses while undergraduate pattern of responses significantly differed in relation to both groups of children.

In experiment 2, Flowers investigated the effect of music vocabulary instruction on the referenced descriptions of third and fourth graders on a listening assignment. Results from experiment 1 served as a pretest and changes were made in the classification of the music elements and attributes which included the combination of value judgments

with extramusical experiences, and the deletion of harmony/texture, form, style (due to a lack of reference to these elements by third and fourth graders on the pretest). Sixty-six third graders and 54 fourth graders ($N = 120$), randomly chosen from the original population were combined and randomly divided into three groups (40 participants per group). Through an analysis of pretest data, Flowers established that no significant differences ($p > .05$) existed among the pattern of descriptions elicited from the three groups. Participants were assigned to Group D (Dynamics – learned "piano" and 'forte"), Group A (Articulation – learned "staccato" and "legato"), and Group T (Tempo – learned "allegro" and "adagio"); and given two class periods of instruction. Following the two instructional periods, participants were directed to listen to the tape of piano excerpts and write descriptions.

A significant difference was found among the three groups in the overall pattern of responses ($p < .001$), which might suggest the existence of large differences among the assigned music element groupings and direction due to instruction. A significant change was found between pre- and posttest measures in attention to the music element that corresponded to vocabulary instruction within each group. From the results (Group D, $p < .01$; Group A, $p < .01$; and Group T, $p < .01$), Flowers found that during the posttest, vocabulary instruction increased verbal attention to specified music elements. Flowers suggested that children might listen for the many changes that occur in music for additional application to new knowledge instead of application to previously learned information.

Focus of attention. Focus of attention is attention directed toward only a single source of stimulus information or perceptual task. Selective attention is similar to focus of attention but involves the shifting of attention between various elements of stimulus information during a perceptual task. Focus of attention to music elements occurs when a student listens to a music example, and then displays the ability to discern designated music elements, attributes or entire music listening tasks. Researchers have investigated many aspects of focused attention to music elements (Geringer & Madsen, 1991 and 1996).

Geringer and Madsen (1991) investigated the patterns of music listening among music and nonmusic majors for four primary elements of music: rhythm, dynamics, timbre, and melody. One hundred-twenty participants listened to 10 music excerpts while manipulating a *Continuous Response Digital Interface* (CRDI). The 10 excerpts included two excerpts for each music element and or category of rhythm, dynamics, timbre, melody, and "everything." Participants listened to each excerpt and then indicated their focus of attention across the designated music elements or category of "everything." Music excerpts were selected intentionally for their salience of designated music elements. Results revealed that musicians' magnitude of attention toward music attributes differed in comparison to nonmusicians. Music majors attended to melody, then rhythm, then dynamics, and finally timbre. Nonmusic majors attended to dynamics, then melody, then timbre, then "everything," and finally rhythm.

Geringer and Madsen (1996) replicated and extended the previous study using 120 participants (60 music majors and 60 nonmusic majors) who listened to 10 music

excerpts then rated each excerpt on a 7-point Likert-type preference scale. The music excerpts were identical to those used in the previous study. A partial replication of the previous results found that music majors' attention patterns differed from those of nonmusic majors. Music majors demonstrated higher percentages of attention for timbre across all excerpts while nonmusic majors demonstrated higher percentages of attention for dynamics and melody across the music excerpts. The researchers used Spearman rank correlations between ratings and designated salience of melody between the previous and current study to reveal a general relationship (r_s = .76 for music majors and r_s = .82 for nonmusic majors). A comparison between both investigations for music element attention regarding the relationship between music and nonmusic majors revealed that music majors were more consistent (rhythm = .89, dynamics = .95, timbre = .98, melody = .90 and "everything" = .67) than nonmusic majors (melody = .83, dynamics = .82, rhythm = .59, "everything" = .48, and timbre = -.03).

Melodic Contour, Timbre, Rhythm, and Tempo

While many music elements are used in the formulation of musical structures, four music elements will serve as the foundation of music information processing within the present study: melodic contour, rhythm, tempo, and timbre. Tempo and rhythm are related to time or temporal organization (Handel, 1986), melodic contour is the organization of sequences, interval size and direction (Rosner & Meyer, 1986), and timbre is the unique "color" of the musical sound that involves the number and intensity of partials within a single sound (Lipscomb and Hodges, 1996). These music elements

were selected based of their influence, representation, existence in basic levels of music learning, and overall rank in an investigation by Geringer and Madsen (1991).

Melodic Contour

Several researchers have investigated individual recognition and identification of changes in melodic contour during the music listening process. Werner (1925) analyzed listener recognition of music contour using melodies transformed unto scales where the octave was replaced by a different ratio (a fifth or two octaves with each micro or macro octave being divided into 12 equal intervals). Werner reported that melodies of this type were difficult to recognize but with repeated presentations became easily recognizable. A replication of this study by Vicario (1983) resulted in listeners' limited recognition of familiar melodies due to distortion attributed to the degree of compression and expansion associated with the octave ratios.

White (1960) used similar transformations employed by Werner (1925) but within the conventional musical scale. Within four sessions (nine participants [adults, members of laboratory] participated in the first session and eight participants participated in the remaining sessions), participants were instructed to listen to 10 familiar melodic patterns (the first 24 notes), then listen to 12 variations of each melodic pattern, and finally indicate which of the 10 melodic patterns was most similar. Listeners recognized similar melodic contours when intervals were set at one semitone and recognition of music contour was relative to the size of the intervals retained. Additional researchers (Croonen, 1994; Dowling, 1978; Dowling & Fujitani, 1971; Edworthy, 1985; Idson & Massaro,

1978; and Kallman & Massaro, 1979) have confirmed melodic contour as a salient clue in the process of melody recognition.

Contour recognition and memory. Dowling and Fujitani (1971) examined melodic contour as an important factor in listeners' recognition of altered melodies using 2 experiments. Experiment 1 was a 2 x 3 factorial design using 49 participants to analyze short term melodic contour recognition within 2 conditions (nontransposed versus transposed comparison melodies). Participants were assigned to three groups and listened to sixty, 5-note melodies to identify: (a) same and different melodies, (b) same and different melodies and melodies with the same contour, and (c) melodies with same and different contour. The effects of transposition, task, and interaction were found to be significant ($p < .001$). Identification of transposed comparison melodies was more difficult than nontransposed melodies and the easiest task was differentiating same from random comparisons. The interaction was also attributed to the observed differences between participants' performances on tasks with and without transposition, whereas participants used recognition of pitches to solve nontransposed tasks. These researchers suggest that contour provides a foundation for melodic recognition because in tasks with transposition, participants identified same and same contour comparisons with equal proficiency. The researchers concluded that melodic contour was an important factor in the recognition of transposed melodies.

Experiment 2 involved 28 participants (undergraduates), the researchers investigated participants' ability to recognize distorted versions of familiar melodies using long term memory. Participants were instructed to listen to five familiar melodies

("Twinkle, Twinkle, Little Star," "Auld Lang Syne," "Good King Wenceslaus," "Yankee Doodle," and "Oh Susanna") and write the correct title of each melody following its presentation. Following this procedure, three distorted versions of each familiar melody were presented randomly: (a) preservation of contour and relative size of successive intervals, (b) preservation of contour, and (c) retention of first note within each measure and alteration of other notes to destroy the contour while preserving the harmonic basis of the melodies. Participants were asked to correctly identify the familiar melody perceived from the distorted version. A significant difference was found in recognition accuracy across the four types of trials ($p < .001$), recognition of original versions was almost perfect, recognition of first beat plus harmonic preservation was just above chance, and recognition of contour plus relative interval-size preservations was slightly better than recognition of contour-preserving distortions. The researchers suggested that melodic contour was an important factor in the recognition of distorted versions of familiar melodies.

Dowling (1978) outlined a two-component model regarding the storage of melodies in long and short term memory. With the two-component melodic model, Dowling proposed that musical scales are cross cultural, consist of logarithmic forms, and melodic contour functions independently of pitch during memorization. In an additional experiment, Dowling analyzed a recognition memory paradigm where 21 participants (undergraduates) compared stimulus comparison types: target versus tonal answer, target versus atonal answer, and target versus random. A significant interaction was found

between the stimulus comparisons ($p < .001$), which suggest an interdependence of scale and melodic contour in the memorization of melodies.

Croonen (1994) completed four experiments on the recognition of tone series by listeners with no formal music training. In the first experiment, Croonen examined 30 participants' (ages 18-24) ability to identify melodic-interval information (tone association to a given pitch alphabet) in relation to length (7 or 10 tones), contour complexity, and tonal structure of the series (stimuli consisting of successive root position triads on scale steps I and VII, concluding with the tonic). In experiment 2, Croonen examined 20 participants (ages 21-35) and used only the 7-tone series with a strong (Ionian) and weak (Phrygian) tonal structure for melody presentation. In both experiments, a same-different task was used for listeners to make comparisons between exact and inexact transpositions. Seven tone series were more easily recognized than 10-tone series, strong tonal structure was more easily recognized than weak tonal structure, and contour complexity did not influence responses. Experiments 3 and 4 were control experiments using mistuned tone series. These experiments showed that outcomes of experiments 1 and 2 were not attributable to the larger size alterations found in diatonic examples (experiment 2) when compared to nondiatonic examples (experiment 1).

Bidimensional contour recognition. Idson and Massaro (1978) used four experiments to investigate the magnitude of pitch perception as a bidimensional quantity of overall pitch level (tone height) and octave position (tone chroma). In experiment 1, the researcher used 25 participants (university students) in a 2 x 5 x 5 factorial design where the three factors included melody length (8 and 12 notes), melody identification

(five familiar songs - “Happy Birthday,” London Bridge,” “Pop Goes the Weasel,” “On Top of Old Smokey,” and “God Rest Ye Merry Gentlemen”), and transformation type (five alterations of the familiar melodies). The five melodic transformations included: original melody (O); octave violation contour (OVC = displaced tones of melody by octaves, reversing the direction of approximately half of the successive intervals); octave preservation contour (OPC = displaced tones of melody by octaves with contour maintained); preserved contour (PC = only direction of successive intervals were maintained); and linear transformation (LC = reduced component interval sizes by half). All participants had prior knowledge of the five familiar melodies that were presented with the transformed melodies. Participants were instructed to identify the familiar melody that served as the basis for each structural transformation. All interactions involving melody length were not significant—length of melody was only affecting the overall performance, not the individual melodies and transformations. Type of transformation also had a large effect on participant identification of familiar melodies ($p < .001$) with the following order of decrement (highest to lowest): O, OPC, LT, PC, and OVC. Idson and Massaro concluded that tone chroma is functional in melodic perception. The magnitude of this conclusion was minimized by the excellent performance of participants in the identification of OPC transformations.

In experiment 2, the researchers examined differences in recognition accuracy between cross octave contour preserving transformations (displacement of component tones by octave intervals while preserving contour) of LT [LT*] and PC [PC*] with OPC. Eighteen participants (undergraduate students) participated in a 2 x 5 x 7 experimental

design with the following factors: melody length (8 and 12 notes), melody identification (five songs used in experiment 1), and seven transformation types (O, OVC, OPC, PC, LT, LT*, and PC*). Melody length was not significant but transformation type exhibited a large effect on performance ($p < .001$) with the following order of decrement: O, OPC, LT, LT*, PC, PC*, and OVC. The recognition accuracy level on transformation OPC was substantially higher than transformations LT* and PC* which indicates that chroma plays a role in recognition accuracy. Specific comparisons of LT versus LT* and PC versus PC* were not significant, which also suggest that chroma influenced equivalent performance between the original transformations of LT and PC and their corresponding octave alterations.

In experiment 3, the researchers further investigated the effect of contour and chroma on the superior performance of transformation OPC. Transformation OPC was given two comparable alterations: expanded contour (EC = each interval was increased by one or two semitones) and contrasted contour (CC = each interval was decreased by one or two semitones). Sixteen participants participated in an experimental design similar to experiment 2, using the seven transformation types of O, OVC, OPC, PC, LT, EC, and CC. No difference was found between melody lengths and no significant interactions were found among melody length and other factors. Transformation type was found to exhibit a large effect on performance ($p < .001$) with the following order of decrement: O, OPC, LT, PC, CC, EC, and OVC. The new transformations were found to exhibit poor performance in relation to original melodies and yielded significant differences: EC ($p < .001$) and CC ($p < .001$). Transformations designed to preserve only contour (LT, PC,

CC, and EC) were found to exhibit a substantially lower performance ($p < .001$) than the transformations that were designed to preserve both contour and chroma (OPC). The researchers concluded that chroma and contour are critical in melodic perception.

In experiment 4, the researchers used 22 participants to examine the relationship of contour during the identification of abstract intervals within the task of melodic perception. A new transformation, preservation inverse (PI), was developed where the absolute magnitude of each interval was preserved but its direction reversed. Idson and Massaro used a 2 x 5 x 6 factorial design. This experiment also included a new transformation type, preservation inverse (PI) where the absolute magnitude of each interval was preserved but its direction reversed. The factors were melody length (12 and 16 notes), melody identification (five songs used in previous experiments), and seven transformation types (O, OVC, OPC, PC, LT, and PI). The main effect of melody length was significant ($p < .001$) and the length x melody interaction was marginally significant ($p < .05$). Transformation type was also significant ($p < .001$), with the following order of decrement: O, OPC, LT, PC, OVC, and PI. Transformation PI was found to exhibit a substantially low performance decrement in relation to performance on original melodies (60%) and OPC (55%). Considering the poor performance on PI, the researchers concluded that unless melodic contour is preserved, interval magnitude could not be effectively used in melodic perception.

Kallman and Massaro (1979) replicated the work of Idson and Massaro (1978) by examining reduced presentation times of the same melodies using a forced choice procedure. Each melody was presented one time and participants were not informed of

melodies used in the experiment. The researchers produced results similar to the previous study.

Timbre

The theorem of Fourier (1822) defines a periodic waveform as the perceived relationship among amplitudes and phases of a harmonic series and its frequency components. This definition motivated researchers to examine the characteristics of timbre. Ohm's acoustical law (1843) suggests that the ear is phase deaf (perceives complex sounds while ignoring phase relationships) whereas, if Fourier's representation of two sounds has the same pattern of harmonic amplitudes but different patterns of phase relationships, a listener perceives no difference between the two sounds. Helmholtz (1868) supported this position, claiming that timbre perception is solely dependent upon the spectrum of a sound wave.

Timbre, phase, and loudness. Within three experiments, Chapin and Firestone (1934) investigated the validity of Ohm's acoustical law in three experiments by examining the influence of phase on loudness and tone quality. In experiment 1, the researchers examined twelve participants' ability to recognize differences in sound quality of tones that contained fundamental frequencies and a single harmonic. All participants listened to six pure tones (a fundamental frequency of 108 Hz, and its harmonics: 216, 324, 432, 540, and 648 Hz labeled I, II, III, IV, V, VI, respectively) produced by six independent electrostatic inductor alternators. With a receiver in one ear, each participant was presented with tone I at 104 and then asked to introduce tone II turning a dial until both tones were perceived as one tone. Participants were instructed to

manipulate a phase shifter (adjusted the phase of tone II) and report changes in loudness and quality within the combination. This process was repeated for each harmonic and results revealed definite but different setting on the phase shifter for minimal loudness and maximum loudness conditions. Participants described of minimal loudness condition as “smooth” and the maximum loudness condition as “rough” or “dissonant.” Participants were able to identify tone quality changes when presented with a fundamental frequency and its relative harmonic.

In experiment 2, the researchers used three participants to further investigate the ability of participants to recognize differences in sound quality of tones that contained fundamental frequencies and a single harmonic. In addition to the procedures of experiment 1, participants’ phase shifter settings for the two loudness conditions were recorded and tones were presented to both ears. An average of the recorded setting revealed a similar phase setting among participants for the minimum loudness condition, which was also 180 degrees removed from the recorded setting obtained for the maximum loudness condition.

In a third experiment, participants’ ability to recognize loudness changes in the intensity of a harmonic with constant relative phase was examined. Three participants were presented with the fundamental (I) of 108 Hz at 104 dB and instructed to introduce each harmonic without adjusting the phase relationship. Each harmonic was set to the following three conditions (information withheld from participants): minimum (A), intermediate (B) or maximum (C) loudness phase. Participants were instructed to increase the intensity of the harmonic until a just noticeable increase or decrease of loudness was

perceived within the frequency combination. After recording the change in sound quality and intensity, participants were instructed to increase the intensity of the harmonic until another change was perceived. Results revealed that within the C condition (presentation of harmonic II with the fundamental [I] in the maximum loudness phase), participants increased the intensity of II immediately. Conversely, within the phase A condition (presentation of harmonic II with the fundamental [I] in the minimal loudness phase), participants initially decreased the intensity from 96 to 86 dB while increasing harmonic II, and then rapidly increasing the loudness. The researchers concluded that the ear perceives change in loudness and tone quality of complex tones during phase changes.

Timbre identification. Musical tones generally are comprised of four temporal sections: attack, decay, sustain, and release. Helmholtz (1868) suggested that timbre of a tone is determined by the spectrum of its sustain section, however; other researchers have analyzed musical instruments tones and have concluded that musical sounds are periodic and tone quality is particularly associated with variations in waveform (Culver, 1956; Meyer & Buchmann, 1931; Miller, 1926; Olson, 1967; Richardson, 1954). Researchers (Berger, 1964; Clark, Robertson & Luce, 1964; Saldanha & Corso, 1964) have found that removal of the temporal sections (especially the attack) of a tone impairs timbre identification. Timbre is a multidimensional attribute of auditory sensation a listener uses to create judgments (similar or different) regarding two steady state (sustain) complex tones of the same loudness and pitch (American National Standards Institute, 1960).

Eagleson and Eagleson (1947) examined 35 participants' (musicians and nonmusicians) ability to recognize and identify music instrument timbres. Participants

were assigned to one of three groups: Group 1 – fourteen college musicians; Group 2 – thirteen nonmusicians; and Group 3 – eight advanced college musicians, teachers and performers. Each group was presented with middle C or its octave by nine instruments: viola, alto horn, trumpet, piccolo, flute, clarinet, saxophone, bells, and cymbals. Each test period involved 10 series of instruments and within each series, participants listened to five presentations of different instruments (selected from nine instruments; the violin was in each sequence). Each test period was presented across two conditions: directly (performed in same room as participants and pitches heard from attack to completion) or over a public address system (sustained section of note heard through speaker for 5s). The percentage of correct responses was lower for all groups when the music instrument timbre was presented over the public address system versus direct presentation. No significant differences were found among the mean number of correct instrument identifications of the three groups indicating no difference in recognition accuracy between musicians and nonmusicians. The researchers also suggested that the lack of significant difference between musical experience and identification of timbres may be due to the uncharacteristic presentation used in the investigation.

Krumhansl and Iverson (1992) used three experiments to examine the perceptual interactions of musical pitch and timbre. In experiment 1, the researchers used 11 participants who had studied an instrument for at least 5 years. Participants listened to four tones and categorized them into two groups (1 = high trumpet and 2 = high piano). Before each trial, participants were presented with the categorical selection (via speaker and computer screen) for each tone and instructed to depress 1 or 2 on a keyboard pad

indicating the category. Participants were also instructed to make the selection as quickly as possible without making errors, as speed was more important than accuracy. The four tones included two levels of pitch (P_1 = 375 Hz and P_2 = 523 Hz) varied with two levels of timbre (T_1 = synthesized trumpet and T_2 = piano) for attribute combinations of P_1T_1, P_1T_2, P_2T_1, and P_2T_2. Comparisons of mean reaction times were evaluated across five different types of categorization tasks: four control, two correlated dimension, two selective attention, one divided attention (condensation), and four focusing tasks. Within the control tasks participants categorized two stimuli that varied on a single attribute (i.e., P_1T_1 vs. P_1T_2) while the correlated dimension tasks involved the categorization of two stimuli that were different within both groups (i.e., P_1T_1 vs. P_2T_2). Selective attention tasks involved the categorization of four stimuli based on a single attribute while ignoring the unrelated difference in the other attribute (i.e., P_1T_1 and P_2T_1 vs. P_1T_2 and P_2T_2). In the condensation or divided attention tasks, participants categorized the four stimuli into two groups not defined by a single attribute (i.e., P_1T_1 and P_2T_2 vs. P_1T_2 and P_2T_1) and focusing tasks involved the categorization of one tone into one group and the other three notes into another group (i.e., P_1T_1 vs. P_1T_2 and P_2T_1 and P_2T_2).

A significant effect of task ($p < .001$) was found among the nine conditions. The reaction times of the four control tasks (340 ms) were significantly longer than the reaction times for the two correlated dimension tasks (305.5 ms; $p < .001$). The mean reaction time (362 ms) of the two control tasks where timbre defined the categories (P_1T_1 vs. P_1T_2; P_2T_1 vs. P_2T_2) was significantly shorter ($p < .01$) than the mean (420 ms) of the selective attention task where timbre defined the categories (P_1T_1 and P_2T_1 vs. P_1T_2 and

P_2T_2). Of equal importance, the mean (319 ms) of the two control tasks where pitch defined the categories (P_1T_1 vs. P_2T_1; P_1T_2 vs. P_2T_2) was significantly shorter ($p < .01$) than the mean (405 ms) of the selective attention task where timbre defined the categories (P_1T_1 and P_1T_2 vs. P_2T_1 and P_2T_2). These results indicate that participants could not attend to the pitch of a tone without being influenced by its timbre and the inverse.

Mean reaction times (413 ms) of the two selective attention tasks (P_1T_1 and P_2T_1 vs. P_1T_2 and P_2T_2; P_1T_1 and P_1T_2 vs. P_2T_1 and P_2T_2) were significantly shorter ($p < .001$) than the mean reaction times (708 ms) condensation task (divided attention). The mean reaction times (340 ms) of the four control tasks (P_1T_1 vs. P_1T_2, P_2T_1 vs. P_2T_2, P_1T_1 vs. P_2T_1 and P_1T_2 vs. P_2T_2) were significantly shorter ($p < .001$) than the mean reaction times (708 ms) of the condensation task, $p < .001$; $p < .001$, respectively. The researchers concluded that condensation tasks provided the most difficulty in the categorization of timbre and pitch. Due to the low error rates, the researchers also concluded that listeners could recognize similarities in pitch when presented with two tones on different instruments, and listeners could recognize similarities in timbre when presented with two tones of different pitch.

In experiment 2, the researchers used 22 participants (selected using same criteria as experiment 1) to examine possible interactions between pitch and timbre in successive tone sequences, specifically the level of interference perceived from tones in the context (tones preceding or following target tone). Participants listened to a standard seven-tone sequence, then a comparison sequence, and indicated perceived changes in timbre or pitch that occurred on the fourth tone (target) of the comparison sequence. Each tone

sequence contained seven of eight synthesized timbres (trumpet, harpsichord, piano, guitar, harp, flute, clarinet, and oboe; one timbre was omitted in each sequence) and seven of eight pitch values (370, 392, 440, 466, 523, 554, 622, and 659 Hz; one pitch was omitted in each sequence). The presentation context was either same, different on the relevant attribute (timbre or pitch) or different on the irrelevant attribute, which comprised six conditions. The six conditions contained three levels of pitch (no context change, relevant attribute change, and irrelevant attribute change) and three levels of timbre (no context change, relevant attribute change, and irrelevant attribute change). Forty-eight experimental trials were presented whereas 24 were same trials (standard and comparison sequences target had no change) and 24 were different trials. Following this procedure, participants entered a response between 1 (very sure no change) and 6 (very sure change) designating the level of preference regarding change.

A significant overall effect was found for the pitch relevant condition ($p < .05$). The mean of the relevant attribute context change condition ($M = .807$) was marginally lower ($p > .05$) than the no context change condition ($M = .857$). Although participants remained focused on the target, interference from changes in the pitch context affected the recognition of other pitches. No significant difference ($p > .05$) was found between the means of the irrelevant attribute context change condition and no context change condition. Consistent interference from changes in timbre context occurs when the target pitch is independently recognized from timbre context. Within the timbre relevant conditions, no significant overall effect ($p > .05$) was found and with further analysis, no significant difference ($p > .05$) between the means of the irrelevant attribute context

change condition and no context change condition indicating no consistent interference from changes in pitch context. The researchers suggested that perception of target pitches and timbres was independent of the opposing attribute context of pitch or timbre.

In experiment 3, Krumhansl and Iverson used 16 participants who had studied an instrument for at least 5 years to investigate whether the attributes of tones are recognized in relation to contextual pitch and timbre when presented in tone sequences. The procedures, instructions, and materials were similar to experiment 2 with the following exception: during the presentation, the pitch (523 Hz) and timbre (piano) were the constant opposing irrelevant attributes. Within the pitch relevant condition, a significant overall effect for the relevant attribute context ($p < .001$) was found and further analysis revealed no main effect between the constant or varied relevant attribute condition and constant or varied irrelevant attribute condition. These results infer that recognition of the target pitch was unaffected by constant or varied timbres. Analysis of the timbre relevant condition showed no significant overall effect for the relevant attribute context but further analysis revealed a significant interaction between the relevant attribute context and the constant or varied irrelevant attribute condition ($p < .01$). The researchers concluded that timbre was perceived in relation to other timbres (similarity or difference judgments) when pitch was held constant and relative perception of timbre is participant to interference from pitch variations.

Rhythm

Investigations in rhythmic pattern perception have been hindered by the lack of a concise definition of rhythm (Radocy and Boyle, 1997). Descriptions attributed to

rhythmic functions did not always have common meanings. Mursell (1937) recognized two qualities of musical rhythm: underlying beat and phrase rhythm (the combination of phrase structures across measures within a metrical scheme). Cooper and Meyer (1960) delineated three basic modes of temporal organization: pulse, meter, and rhythm. Creston (1964) identified four basic elements of rhythm: meter, pace, accent, and pattern. Maintaining a divergent view to traditional terminology, Gordon (1971) proposed three basic elements of rhythm: tempo beats, meter beats, and melodic rhythm, where a listener assimilates and combines these three elements into rhythmic patterns to achieve musical meaning.

Cooper and Meyer's (1960) work served as a foundation for Lerdahl and Jackendoff's publication, *A Generative Theory of Tonal Music* (1983), which provides clarification of the different elements of rhythmic structure. The major theory postulated by Lerdahl and Jackendoff states that tonal and metric music of the Western tradition possesses two independent attributes: grouping—the method by which music is subdivided at various levels (i.e., note groupings to large scale forms) and meter—the regular variation of strong and weak elements. The authors proposed that grouping is essential in the formation of hierarchical properties of music, and they outlined formal conditions relative to hierarchical rhythmic perception in "Grouping Well-Formedness Rules." Grouping Well-Formedness Rules aligned with "Grouping Preference Rules" determine the possible subdivisions that are likely to be perceived from a musical passage. The preference rules are not strict in the determination of perceived subdivisions, but identify various stimuli within the musical context. Identification of

stimuli may reinforce the perception of other stimuli or provide competition that result in further variations in subdivisions among different listeners.

The Grouping Preference Rules consist of three components: Gestalt principles (proximity in time or change in pitch, duration, loudness or articulation), abstract formal concerns (principles of symmetry and the equivalents of variations in subdivision or musical passage), and principles of pitch stability. Lerdahl and Jackendoff provide no empirical evidence for the operations of the Grouping Well-Formedness and Grouping Preference Rules, relying on personal musical intuitions for guidance (Deutsch, 1999).

Todd (1994) developed a model of rhythmic grouping that produced solutions similar to the theories of Lerdahl and Jackendoff. Based on perceptual processes and properties within the auditory system, this model proposes that auditory function begins with energy-integrating low-pass filters that produce different time constraints based on perceived individual events. Once detected, these individual events integrate acoustical energy over durations of ms or a few tenths of a ms. During a high level of auditory processing, small groups of events are detected at durations of approximately 1 s with relatively discrete packets of integrated energy, whereas large groups are detected using the same process with larger intervals of duration. A representation of rhythmic events at a number of levels and grouping relationships between events are attained with the identification of peaks in the output of the low-pass filters and their relationships to outputs in all filters. The result is a rhythmogram, which is similar to the tree diagrams developed by Lerdahl and Jackendoff.

Todd's model is based on energy integration, which is sensitive to acoustical changes received via integrated energy levels. These integrated levels of energy include note duration, pitch, intensity, timbre, and vibrato. This model avoids score-based descriptors of musical events and expressive properties (written values of rhythm, pitch, dynamic, etc.) that surround the perception of rhythm when listening process to musical performances.

Sink (1983) using 54 participants noted that the simultaneous presentation of rhythmic and melodic content may reduce a listener's attention to absolute rhythmic structure. With additional inquiry into the auditory processing of monotonic melodic-rhythmic patterns, Sink (1984) suggested that when presenting musical content for rhythmic perception, material should be presented in a monotonic instead of a melodic-rhythmic context. Hence, the simultaneous presentation of melodic and rhythmic elements inhibited the participant's focus of attention to rhythmic concepts.

Tempo

Human life, its existence and evolution, is based on complexities of cyclical events. The existence of tides, seasons, day and night, menstruation, respiration, sleep, birth, and death maintain certain degrees of periodicity and regularity (Madsen, 1978). Our attempts to organize the environment have two influences: external influences—natural and manmade timekeepers, and internal influences—an acquired physiological clock (Fraisse, 1963). Evidence of this organization includes the various schedules individuals keep, the watches people wear, and the calendars on walls and desks.

Organization of time is a significant aspect of human existence and addressed by Fraisse (1963):

> The security of a normal human being does not lie in liberation from time. Temporal pressure is constricting, but it is also the framework within which our personality is organized. When it is absent we are disoriented. There is nothing to bind the sequence of our activities; we are alone. From this confusion there arises not only a feeling of emptiness but also a vague fear; we are afraid of facing unarmed the compulsions that the socialization of behavior usually inhibits or makes us suppress. When some people fervently seek new occupations to "divert" themselves from their anxiety and other bind themselves to rigid timetables, their actions arise from the same need. Human equilibrium is too precarious to do without fixed positions in space and regular cues in time. (pp. 289-290)

The organization of time is also a framework for the regularity of music events (Sheldon, 1991). Radocy and Boyle (1997) stated that tempo is a critical variable; it serves as a factor in the individual's discrimination of the stimulative and sedative functions of music. Researchers have given considerable attention to the effect of music, including its affective response and preference by music listeners.

Tempo, style, and music genre preference. Wapnick (1980) investigated the preference for tempo within a study that involved the manipulation of pitch, tempo, and timbre. Participants included 96 undergraduate music majors who listened to 12 excerpts of piano performances. Participants were asked to select preferred tempi and pitch levels using a continuously variable dial linked to a Lexicon Corporation Varispeech II Speed/Timecompressor/ Expander. Wapnick found a significant interaction ($p < .05$) between preferred tempo and excerpt familiarity. When pitch and timbre were held constant within the experimental design, participants demonstrated a preference for faster tempi. Wapnick suggested that the bias included differences between performance

standards and listener preferences of the composition. Wapnick also suggested that although musicians might perform compositions at tempos slightly slower because of technical demands, they prefer listening performances at faster tempos.

LeBlanc (1981) used 107 fifth grade students to investigate the effects of style, tempo and performing medium. Results of the study revealed a strong effect for style with preferences for Rock/Pop, then Country, then Band, then New Jazz, then Old Jazz, and then Art Music. There was a slight preference for faster tempi and the instrumental performance medium. A two-way interaction was found between New Jazz and Tempo. A majority of the examples were fast (77%). Behavioral observations included foot tapping or other rhythmical body movements during the performance of music with fast tempi. LeBlanc also stated that other movements were observed when listening to musical examples with an obvious tempo.

LeBlanc and Cote (1983) used 354 participants to investigate preferences across three levels of tempi (slow, medium, and fast). Style was limited to traditional jazz and the performance medium included vocal and instrumental examples. Participants demonstrated a preference for faster tempi and the instrumental medium. Free response comments from 30% of participants were about slow tempos and 93% of these respondents reported a lack of preference for slowness in tempo. Twenty-eight percent of the participants gave free response comments about the vocal performance medium and 80% of these respondents reported a lack of preference for the vocal performance medium. Finally, 14% of participants provided free response comments about the beat

and 88% of these respondents indicated a preference for music with an obvious beat (relative prominence of a continual pulse).

LeBlanc and McCrary (1983) examined children's preferential responses of various tempi while listening to music. This investigation used four levels of tempi: slow (mean tempo MM = 74, *SD* 11), moderately slow (mean tempo MM = 101, *SD* 5), moderately fast (mean tempo MM = 134, *SD* 9), and fast (mean tempo MM = 210, *SD* 40) presented within the traditional jazz style. One hundred sixty-three fifth- and sixth-graders listened to 24 instrumental music excerpts that ranged from 23 to 64 s in length (complete musical phrases). After listening to music excerpts, participants were instructed to complete 24 seven-step responses based on "like" and "dislike." A significant positive relationship was found between tempo and preference ($r_s = .78$, $p < .01$), which indicates a strong relationship between increases of tempo and increases of preference. Results also revealed a significant positive relationship between tempo and the standard deviation of preference ratings ($r_s = .64$, $p < .01$), which indicates a strong relationship between increases in tempo and variability of preference. Within written summaries (free response comments), participants reported an increase of preference when examples became faster. Seventy-seven percent of the participants who gave free response comments indicated that tempo was the variable that elicited the most attention.

Sims (1987) selected 247 participants ranging from preschool through fourth grade to examine tempo effects on music preference. Listening examples were piano music with two tempo levels (slow and fast). Pictures with three faces served as descriptors: one smiling, one without expression, and one frowning, (representing "like,"

"neutral," and "dislike," respectively). Results revealed significant test-retest reliability correlations across all grade levels between tempo and preference ($p < .01$) with the exception of "kindergarten/slow," which revealed a significance of $p < .05$. Weighted preference selection resulted in many high scores for the fast examples with a significant difference in preference ratings across age groups ($p < .001$). Individuals seem to develop a tendency to prefer tempo discriminations for fast tempi by fourth grade, which corroborates the results of Huebner (1976).

LeBlanc, Colman, McCrary, Sherrill, and Malin (1988) investigated the preferences of 926 participants in grade levels ranging from third grade to college seniors. With a design similar to one used by LeBlanc and McCrary (1983), the researchers used traditional instrumental jazz music examples and four tempi (slow, moderately slow, moderately fast, and fast) to investigate tempo preferences across different age groups. Similar to previous findings by LeBlanc and McCrary (1983), the researchers found strong and positive relationships between faster tempi and magnitude of preferences across all participants despite differences in age.

Christenson and Peterson (1988) examined the genre and gender preferences among 239 undergraduate students. The 26 genre preferences were assessed using a 26-item survey that participants rated each genre from 1 (Hate It) to 5 (Love It). Results from the study revealed the following order of genre preference (respectively): Mainstream Pop, 70's Rock, 80's Rock, 60's Rock, Rhythm and Blues, Older New Wave, Motown, 50's Rock, Art Rock, Jazz, Southern Rock, Classical, Reggae, Psychedelic Rock, Soul, Jazz Fusion, Folk, Post-new Wave, Blues, 70's Funk, Country

Pop, Late 70's Disco, Heavy Metal, Christian Rock, Hardcore Punk, and Black Gospel. Differences among gender preference for genres were also found within the investigation. The genres preferred more by females than males were Pop, Rhythm and Blues, Soul, Black Gospel, and Disco. The genres preferred more by males than females were 70's Rock, Southern Rock, Psychedelic Rock, and Blues.

LeBlanc, Obert, Simms, and Siivola (1996) examined the music preference of 2262 participants ranging from first grade students to senior citizens. The listening examples were 21 to 52 seconds in length and outline musical phrases. Music styles used for the study included Art Music, Rock, and Jazz. Results revealed that among all participants Rock received the highest preference, followed by Jazz, and then Art Music. Preference for all three styles was consistent among all age groups.

Tempo discrimination. A number of investigations suggest musicians and nonmusicians detect reductions in tempo with better precision than increments in tempo (Drake, 1969; Geringer & Madsen, 1984; Kuhn, 1974, 1977; Kuhn & Gates, 1975; Madsen, Duke, & Geringer, 1984, 1986). Madsen (1979) studied the accuracy of 200 participants (100 musicians and 100 nonmusicians) in detecting directional changes in tempo when listening to auditory stimuli. The auditory stimuli were comprised of nine tempi (40, 60, 80, 100, 120, 140, 160, 180, and 200 beats per minute). Variations in tempo included increase, decrease, and remain constant, with the exceptions of 40 beats per minute (remained constant or increased in speed) and 200 beats per minute (remained constant or decreased in speed). Tempo deviations occurred at a rate of ±1 beat per minute for a total rate change of ±10 beats per minute. After each listening example,

participants were asked to identify if tempo increased, decreased, or remained the same. Participants identified more correct answers for examples that decreased in tempo than for examples that increased in tempo. Results also revealed that musicians are more accurate in assessing increments in tempo; however, both groups made considerable errors in assessing reductions in tempo.

Wang (1983) examined the effects of rhythm pattern, texture, beat location of tempo change, and direction of tempo change. Wang used 42 undergraduate and graduate music education majors to study the musician's ability to discern sudden and gradual derivations in tempo. Computer-generated musical compositions with gradual tempo changes of ±1 or ±2 beats per seconds every four measures were used in this investigation. Participants were instructed to listen to the music compositions and select one of three responses: tempo change, no change, or in doubt. As in previous research, participants were found to be more accurate when identifying increasing tempi ($p < .01$).

Selective Attention of Music Element Summary

The goal of the present study was to examine sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo). Two primary purposes were the foci of this study. The first purpose was to investigate whether significant differences ($p \leq .05$) existed among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and by variables associated with temporal difference (i.e., fast and slow). The previous section contained reviews of literature specific to the selective attention of music

elements, music genre, temporal difference, and music background. Music instruction efficiently occurs through the sequential presentation and facilitation of music elements (Geringer and Madsen, 1996). Flowers (1983, 1984) suggests that attention to music is dependent upon instruction in the identification and recognition of music elements and attributes. Hence, the selective attention of music elements involves the individual's ability to process one of many simultaneously occurring music elements. The music elements selected for the present study are melodic contour, rhythm, tempo, and timbre. Jones, Kidd, and Wetzel (1981) concluded that the perception of pitch (melodic contour), timbre, tempo, and rhythm perform a major role in selective attention.

Cherry (1953) and Broadbent (1954, 1958) proposed that individuals listen using selective attention. In a later study, Bregman's (1978a) theory of "Auditory Scene Analysis," proposed an alternative explanation of selective attention to music elements. Further, studies identified individual listening preferences and attention to music elements (Jones, Kidd, and Wetzel, 1981; Flowers, 1983 and 1984; and Madsen & Geringer, 1990 and 1996), gender (Christenson and Peterson, 1988); genre (LeBlanc, 1981); temporal differences (Wapnick, 1980; LeBlanc, 1981; LeBlanc and Cote, 1983; LeBlanc and McCrary, 1983; Sims, 1987; and LeBlanc, Colman, McCrary, Sherrill, and Malin, 1988). Many investigations and theories were found regarding the individual's ability to identify, recognize, memorize, and make preferences for the selected music elements of melodic contour (Croonen, 1994; Dowling, 1978; Dowling & Fujitani, 1971; Edworthy, 1985; Idson & Massaro, 1978; and Kallman & Massaro, 1979; Werner, 1925; White, 1960; and Vicario), timbre (Chapin and Firestone, 1934; Eagleson and Eagleson,

1947; Krumhansl and Iverson, 1992), rhythm (Cooper & Meyer, 1970; Gordon, 1971; Lerdahl and Jackendoff, 1983; Mursell, 1937; Sink, 1983 and 1984), tempo (LeBlanc, 1981; LeBlanc & Cote, 1983; LeBlanc, Colman, McCrary, Sherrill, & Malin, 1988; LeBlanc & McCrary, 1983; Madsen, 1979; Sims, 1987; Todd, 1994; Wang, 1983; and Wapnick, 1980). In many of these studies, one set of variables was examined (tempo, genre, gender, etc.). In several studies, two sets of variables were examined (i.e., genre by gender, tempo by age, etc.). Currently there exists no research that investigates the specific variable groups of music elements by music genre by temporal difference. The present study is an attempt to fill such a gap in the literature.

Adolescence, Psychosocial Development, and Self-Perception

Adolescence is a transitional period that involves the emergence of enhanced cognitive abilities and a stage where the individual is influenced by societal expectations. This occurrence leads to the development and shaping of self-perceptions (Harter, 1990). In 1904, Hall published *Adolescence*, which popularized this stage of human growth and development that occurs between the ages of 11 through 19. Hall described the stage of adolescence as storm and strife. Freud (1964), Piaget (1954), Elkind (1967), Erickson (1968), and Gagné (1970) proposed theoretical models that address salient psychological, psychosocial, and cognitive factors that influence adolescent development and growth.

Freud's Psychoanalytic Theory

Sigmund Freud (1905) outlined five stages of psychosexual development: oral (birth to first year of age), anal (1 to 3 years of age), phallic (3 to 5 or 6 years of age), latency (5 or 6 to puberty [adolescence]), and genital (puberty until death). Two of the

five stages (latency and genital) outlined by Freud directly involve adolescence. Further, Freud (1964) proposed that an individual's personality is driven by instinctive motives that are stored within the unconscious (area of the psyche or mind that influences behavior). The action or behaviors that emanate from the instinctive motive may be influenced by conscious and or unconscious thoughts.

Freud (1964) also proposed that the personality consists of three components: the id (pleasure principle associated with biological functions), ego (reality principle associated with the rational, decision making attributes of personality), and super ego (principles of moral behavior or conscience which begin to develop during the phallic stage). When the id produces instinctive motivations that the superego considers inappropriate, this produces the feeling of guilt. To resolve the conflict, the ego may accept the motivations produced by the id (avoids the moral implications of the superego) or accepts the emotion of guilt caused by the superego (avoid the id's impulses). Anxiety occurs during this conflict and the ego employs the following defense mechanisms to suppress the anxiety: repression, denial, rationalization, displacement, regression, projection, reaction formation, and sublimation.

Piaget's Stages of Development

Jean Piaget's *Theory of Cognitive and Affective Development* (1954, 1963, and 1970) is a popular theory of human development that includes four major stages, *sensorimotor, preoperational, concrete*, and *formal operations.* These stages, approximate age delineations, represent a continuous progression of human growth from infancy to adulthood that are stratified according to perceived observations of human

ability levels, behaviors, and experience. The first stage is sensorimotor, which begins at birth and culminates around the age of two. During the sensorimotor stage, the child recognizes objects using the five senses (i.e., vision, taste, audition, touch, and smell) and demonstrates goal directed actions. Preoperational is the second stage and begins at approximately age two, and is achieved by age seven or eight. During the preoperational stage, the individual begins to use thinking strategies, internalizes action, and performs acts mentally (i.e., these activities are limited to one direction) rather than only demonstrating goal directed actions. Another major characteristic of the preoperational stage is the individual's rapid development in the formation and utilization of symbols and language.

The next stage of affective and cognitive development is concrete operations. This stage begins at approximately age seven or eight and ends at eleven or twelve. The stage of concrete operations involves knowledge and application of the following operations: *conservation, classification, and seriation*. The principle of conservation ascribes that even though the arrangement or appearance of an object changes, the amount, value, or number remains the same. The individual's ability to master conservation is based on the understanding of three aspects of reasoning: *identity* (i.e., if nothing is added or removed from property [i.e., water in a glass], the property remains the same), *compensation* (i.e., a change in one direction may receive balance with a change in the opposite direction), and *reversibility* (i.e., mental ability to cancel a previous change). The operation of classification is explained through the individual's ability to focus on a single characteristic of an object within a set and group the objects according to the identified

characteristic. The final operation is seriation, which involves the ability to arrange objects in a sequential order based on one aspect (i.e., size, weight, volume). Some individuals remain in the concrete operational stage throughout adulthood however, individuals who use the knowledge and application of skills attained during the stage of concrete operations enters the stage of formal operations.

An individual's ability to manipulate mental operations leads to the development of a logical system of thinking, which provides a foundation for the onset of formal operations. Formal operations, a stage occurring at approximately age 11 or 12 to adulthood, engenders the ability to reason about hypothetical and abstract problems, consider alternatives, and identify possible combinations involving the coordination of multiple and simultaneous factors. Hence, this stage outlines the development and use of critical thinking skills and processes.

Based on Piaget's theory of formal operations, Elkind (1967) proposed that the major developmental task of early adolescence is the ability to fully access the thought processes to solve problems and engage in social interactions. With the emergence of formal operations, adolescents develop the ability to conceptualize their own thoughts (i.e., produce logical sequences based on their own perceptions and experiences) and those of other people. However, the adolescent's development of egocentrism (i.e., the inability to separate one's actions from their effect on other objects or people) limits his or her ability to fully conceptualize thought processes during this period. According to Elkind (1990), adolescent egocentrism is overcome by a twofold transformation. First, with respect to cognitive processes, the adolescent must develop the ability to

differentiate preoccupations associated with individual appearance and behavior from the thoughts of others. Second, with respect to affect, the adolescent gradually integrates the feelings of others with personal emotions.

Marilyn Pflederer-Zimmerman (1964) pioneered the application of Piaget's stage of concrete operations in the area of music development. Other researchers that replicated or extended these applications include: Pflederer 1964, 1967; Webster & Zimmermann, 1983; Zimmerman and Sechrest, 1968, 1970; Jones, 1976; Serafine, 1980, 1983 & 1988; Crowther, Durkin, Shire & Hargeaves, 1985; Swanwick & Tillman, 1986; Hargreaves & Galton, 1992; and Hargreaves, 1996, 1999. These researchers identified the individual's ability to identify and manipulate music elements according to the operations and reasoning outlined in the stage of concrete operations.

Psychosocial Development

Erikson (1963) expanded and transformed Freud's genital stage into adolescence and three stages of adulthood to emphasize the emergence of the self, the individual's search for identity and relationships with other individuals that develop throughout a lifetime. Erikson (1968) proposed *Eight Stages of Psychosocial Development*, a series of stages that corresponds to particular goals, concerns, accomplishments, and dangers. Erikson, like Piaget, perceived human development as a passage through a series of stages that correspond to particular goals, concerns, accomplishments, and dangers.

Erikson's Eight Stages of Psychosocial Development are interdependent: the accomplishment of later stages is dependent upon the resolution of conflicts encountered within earlier stages. The eight stages include: Infancy (birth through 18 months),

Toddler (18 months through 3 yrs), Pre-School (3 through 6 yrs), School Age (6 through 12 yrs), Adolescence (12 through 18 yrs), Young Adulthood (18 through 26 yrs), Middle Adulthood (26 through 50 yrs), and Late Adulthood (age 50 until death). Stage 5 outlines adolescence (ages 11-18), and during this stage the adolescent is engaged in a conflict of identity versus role confusion. A positive outcome from this stage involves the adolescent's development of a sense of identity. Adversely, with a negative outcome the adolescent develops role confusion (aimlessly moves through life without security or a plan of action).

Self-Perception

Self-perception is defined as an individual's ability to respond differently to personal behavior and other controlling variables (Bem, 1967; Mead, 1934; Ryle, 1949; Skinner, 1957, 1989). Subsequently, Bem also suggests that the community must teach children appropriate verbal responses to internal stimuli when an internal stimulus is accompanied by a simultaneously observed behavior. Hence, the community's instruction provides restrictions on the function of the individual's ability to associate internal stimuli and attitudes or beliefs with concurrent behaviors.

Harter (1990) discusses factors that influence the adolescent self-concept, issues of self-evaluation's effect on self-esteem, and the influence of self-definition on identity formation. According to Harter, there is considerable evidence that reveals the occurrence of a developmental shift from concrete descriptions to abstract generalization of the self during the transition from childhood to adolescence. During the stage of formal operations (Piaget, 1960, 1963), concrete self-descriptors become higher order

generalizations about the self that are typically unobservable without more inferences to latent (potential) characteristics. Adolescence also involves the process of differentiation—an increased need for various domains of self-description and evaluation.

Harter further suggests that despite the numerous studies on adolescent self-esteem, only recently has a comprehensive understanding been achieved. This is due to the lack of theory regarding measurement and assessment of self-esteem. Recently, the development of assessment instruments that measure various domains of self-concept separately and the shift of emphasis from correlates to determinants have provided constructive measures of self-esteem. Harter recognizes identify formulation (adaptation of a general role in the larger society) as a major determinant in the adolescent's maturation into adulthood.

Theories of Self-Perception

The Theory of Self-Perception was initially formulated by Bem (1967) to address questions within philosophical works that described human conceptual operations (Chappell, 1962; Ryle, 1949; Skinner, 1957). The philosophies of James (1890) and Ryle (1949, with an investigation by Schachter & Singer [1962], where participants wrote self-descriptive statements received from internal and external stimuli to describe behavioral patterns) served as a foundation for the theory of self-perception. Furthermore, the theory of self-perception outlines an alternative interpretation to major findings within Festinger's (1957) *Theory of Cognitive Dissonance*. The theory of cognitive dissonance states that if an individual retains two opposing cognitions (dissonance), other experiences or pressures force the individual to remove or alter one of the two opposing

cognitions. Bem (1967) stated that a functional relationship exists between cognitive dissonance and self-perception and presented a series of experiments where applications integrating cognitive dissonance (Festinger & Carlsmith, 1959; Brehm & Cohen, 1959) were replaced with applications of self-perception.

Forced compliance. Festinger and Carlsmith (1959) examined the principle of *forced compliance* within the theory of cognitive dissonance. Forced compliance occurs when an individual is induced to engage in behaviors that are contrary to originally held attitudes or beliefs. The experiment used 60 participants (undergraduate males) with three experimental groups: $1 (participants received one dollar to complete a series of tasks), $20 (participants received twenty dollars to complete a series of tasks), and a control (participants received no compensation to complete a series of tasks). The researchers required all participants to perform long repetitive tasks and upon completion of the repetitive tasks, participants were given compensation according to the completion of tasks within their assigned groups. Participants from all three conditions had tape recorded conversations with a fellow female student (stooge) regarding the tasks, and then asked four questions by an interviewer (rated on an 11 point scale [i.e., -5 to +5, extremely dull and boring to extremely interesting and enjoyable]).

Results revealed that the participants in the $1 condition indicated significantly more enjoyment in the completion of tasks than participants in the $20 condition, ($p <$ .03). Participants in the $1 and $20 conditions both held two dissonant cognitions; however, the participants in the $1 condition reduced the high magnitude of dissonance by changing their original perceptions of the task. This change occurred because the

elicited behavior did not agree with the original behavior or small amount of compensation. Hence, the greater reward elicited a smaller effect of changed behavior.

Subsequently, Bem (1967) replicated the previous investigation by merging the observer (interviewer) and communicator (participant) into one individual. Using 75 undergraduates, 25 participants assigned to 3 experimental groups ($1, $20, and a control), participants were required to listen to a tape recording of an experimental participant who completed two motor tasks. Participants in the control group were asked to describe the experimental participant's attitudes toward the tasks. However, the participants in the $1 and $20 conditions instructed that the experimental participant received payment for the completion of the tasks ($1 condition – participant received $1 or $20 condition – participant received $20), which involved informing another experimental participant (a stooge) that the tasks were enjoyable. Participants in the $1 and $20 conditions then rated the experimental participant's attitude. Results revealed that the participants in the $1 condition indicated significantly more enjoyment than participants in the $20, ($p < .001$) and control conditions, ($p < .02$). Hence, result by Bem (1967) on self-perception replicated the results achieved in the study of forced compliance by Festinger and Carlsmith (1959).

Another experiment by Bem (1967) extended self-perception replication of forced compliance using two tape recorded communications (the original [from previous experiment] and a shorter communication). Using 125 participants, the experimental design contained four experimental groups: $1 long communication, $1 short communication, $20 long communication, $ 20 short communication. The procedure was

similar to the previous experiment where participants listened to the communication and evaluated the experimental participant's attitude toward the tasks. Results of the investigation replicated the correlation pattern found by Festinger and Carlsmith (1959). Bem suggests that within the principle of forced compliance, the interpersonal model of self-perception provides a viable alternative to the theory of cognitive dissonance.

Free choice. Another principle of dissonance theory is free choice—when an individual is allowed to make a selection from a set of objects or courses of action. Bem (1967) replicated an investigation by Brehm and Cohen (1959), who observed school children selecting toys from either two or four alternative conditions. Some children chose or rejected qualitatively similar toys (swimming snorkel, mask, fins, and life jacket) and others chose qualitatively dissimilar alternate toys (swimming snorkel vs. archery set and bowling game vs. ship model). After a week, the children made another choice of toys and a comparison was made between pre- and post-choice ratings. The researcher found a main displacement effect where liked toys were displaced in a favorable direction while the rejected toys were displaced in an unfavorable direction. Additionally, the displacement effect was larger when the selection was made from the larger alternatives. This result substantiates the predictions of the dissonance theory: The greater the number of alternatives, the more an individual must yield to achieve a greater magnitude of dissonance.

Bem's (1967) self-perceptual interpretation of Brehm and Cohen (1959) assumed a comparison between the ratings of two observers (an observer who has not seen the child interact with the toys and a second observer who sees the child select the toy as a

gift for himself). This observation is similar to a pre- and post-choice rating. Bem hypothesized that due to behavioral evidence, the second observer would be more likely to displace the chosen and rejected alternatives further from one another. To investigate this hypothesis, Bem selected 24 college students to serve as control participants. The control group estimated an experimental participant's (11-year-old boy) rating of eight toys. Ninety-six college students were assigned to four conditions: two-similar alternatives (swimming snorkel and swimming mask), four-similar alternatives (swimming snorkel, swimming mask, swimming fins, and life jacket), two-dissimilar alternatives (swimming snorkel and archery set), and four-dissimilar alternatives (swimming snorkel, archery set, bowling game, and ship model). Participants were instructed to estimate the experimental participant's (11-year-old boy) rating of eight toys. Participants were also informed of toys, which the experimental participant had chosen for himself and the alternate toys for selection.

Results revealed a significant displacement effect in both of the two-alternative conditions ($p < .01$) and the four-alternative conditions ($p < .001$). This indicates a replication of the main displacement effects. Additionally, within the four-alternative conditions a significant difference ($p < .05$) was found between the dissimilar and similar conditions, which confirm the hypothesis.

Measures of self-perception. Within this section, five widely used measures of self-perception will be reviewed and described. Self-perception is used interchangeably with self-esteem and self-concept (Woolfolk, 2008). The measure of self-perception include the *Coopersmith Self-Esteem Inventory*, *Multidimensional Self-Concept Scale*,

Piers—Harris Self-Concept Scale; Rosenberg Self-Esteem Scale, and Self-Perception Profile for Adolescents.

The Coopersmith Self-Esteem Inventory (1967, 1989) was designed to measure any individual's evaluative attitude toward the self (self-esteem). The assessment is comprised of 58 forced choice items within two sections and intended for individual or group administration. The School Form which is used with ages 8 through 15 contains 50 questions that are allocated to four self-esteem domains: General – Personal Self (26 items), Social Self – Peers (8 items), Home – Parents (8 items); and a Lie Scale (8 items). The Adult Form, which is an adaptation of the School Form, contains 25 items and is used with ages 16 and above. The Self-Esteem Inventories (Coopersmith, 1989) report a normative sample of 8 groups, varying from 129 to 7,593 with an internal consistency reliability of .80 to .92, parallel form reliability estimates of .71 and .80, and a 5-week retest correlation of .88 for the School Form. The reliability of the total score for the School Form was .85. The Adult Form's internal consistency reliability ranged from .71 to .80, retest reliability estimates of .80 and .82, and a reliability estimate of .80 for college students.

The Multidimensional Self-Concept Scale (Bracken, 1992) consists of 150 Likert-type items designed for individual or group administration. Bracken defines self-concept as a multidimensional and context dependent learned behavior pattern that is revealed within an individual's evaluation of past behaviors and experiences—which then influences and predicts current and future behaviors. This assessment measures global self-concept and 6 content dependent self-concept domains (25 items each): Academic,

Social, Family, Physical, Affect, and Competence. Each domain can be assessed independently or in combination. The Multidimensional Self-Concept Scale Manual reported a total internal consistency of .98 and 2-week retest correlation of .90. Independent domain estimates of internal consistency ranged from .87 to .97.

Piers and Harris (1984) developed an assessment that consists of 80 forced choice items designed to be administered individually or in groups to children in grades 4-12. The Piers—Harris Self-Concept Scale is a one dimensional scale that evaluates six aspects of self-esteem: Behavior, Intellect and School Status, Physical Appearance and Attributes, Anxiety, Popularity, and Happiness and Satisfaction. The Piers—Harris Self-Concept Scale Manual reported a reliability of .88 to .93 and test-retest reliabilities ranging of .42 to .96, with retest intervals between a few weeks to one year.

The Rosenberg Self-Esteem Scale (1965) consists of 10 items that are administered individually or in a group. This assessment is a one dimensional scale for the measurement of global self-esteem and intended for use with adolescents. Using a sample of 2,000 students in grades 7 through 12, McCarthy and Hoge (1982) reported alpha coefficients of .74 and .77. Silber and Tippett (1965) reported a 2-week test-retest reliability of .85 using a sample of 44 college students.

The Self-Perception Profile for Adolescents (Harter, 1988) is an extension of the Self-Perception Profile for Children (Harter, 1985) and was designed to measure an individual's global self-worth and self-competency in eight domains. The Self-Perception Profile for Adolescents uses a 45-item questionnaire to assess the following domains: scholastic competence, athletic competence, social acceptance, behavioral conduct,

physical appearance, close friendships, romantic appeal, and job competence (five items for each domain and five items for global self-worth). Each item consists of two contrasting descriptions (one more positively worded than the other with a 4-point scale) and for each description; there are two alternative choices "sort of true for me or really true for me." The Self-Perception Profile for Adolescents Manual (Harter, 1988) reported a normative sample of 4 groups, varying from 109 to 180 ($N = 641$) with an internal consistency reliability, which ranged from .74 to .93. Factor loading (correlations between a variable and other factors) for each subscale identified cross loading no greater than .30, which indicates that each subscale is defined independently of other factors and thus provides a meaningful profile of self-perception.

Adolescence, Psychosocial Development, and Self-Perception Summary

The goal of the present study was to examine sixth-grade students' selective attention for music elements (i.e., melodic contour, timbre, rhythm, and tempo). The study was designed to examine significant differences ($p \leq .05$) among sixth-grade students' selective attention to music elements as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and by variables associated with temporal difference (i.e., fast and slow). The study was also designed to examine the extent to which variables associated with demographics (i.e., gender and ethnicity), self-perception (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth), music background (i.e., participants' in- and out-of-school music experiences), music genre, and temporal difference significantly predicted

($p \leq .05$) sixth-grade participants' selective attention to music elements. The previous section contained reviews of literature specific to adolescents, psychosocial development, and self-perception.

Freud (1905, 1964) suggested that sexuality and instinct were two basic psychological motives. Freud proposed five stages of psychosexual development and three components of personality that are driven by instinctive motives within the unconscious and affect actions and behaviors. Piaget outlined four stages that begin at infancy and continue through adulthood. Concrete operations and formal operations provide important functions regarding adolescence, which is the age level of sixth-graders. Erikson (1963) expanded Freud's genital stage into adolescence and proposed Eight Stages of Psychosocial Development, whereby each stage is interdependent and adolescence is the stage that involves the conflict identity versus role confusion. Elkind (1967) also expanded Piaget's stage of formal operations and outlined the adolescent's conflict with egocentrism.

Self-descriptive verbal statements are the most common responses of self-perception. Instruction provided by the community teaches the individual verbal responses to internal stimuli while restricting the individual's ability to associate internal stimuli and attitudes or beliefs with observed behaviors. Based on Festinger and Carlsmith's Theory of Cognitive Dissonance (1959), Bem completed investigations to provide evidence and develop an interpersonal model of self-perception. By merging the interviewer and participant into one individual, Bem (1967) replicated previous results by Festinger and Carlsmith (1959). Bem's (1967) also completed a self-perceptual

interpretation of free choice and replicated the main effects found in Brehm and Cohen (1959).

Harter (1990) stated that issues of self-evaluation's effect on self-esteem and the effect of self-definition on identity formation are major influences on the adolescent self-concept. Harter also suggests that only recently has a comprehensive understanding of adolescent self-esteem been achieved with recent developments of assessment instruments that measure various domains of self-concept separately. Five widely used models of self-perception include the Coopersmith Self-Esteem Inventory, Multidimensional Self-Concept Scale, Piers—Harris Self-Concept Scale; Rosenberg Self-Esteem Scale, and Self-Perception Profile for Adolescents. Each evaluation contained the author or authors, number of items, administrative systems, subscales, and relevant statistical data.

The literature review above provides evidence for predictable characteristics of self-perception associated with individuals at adolescence. For music teachers of adolescent students, variables associated with self-perception may be important to consider when planning music lessons. Currently there exists no research connecting adolescents' self-perception with their selective attention to specific music elements. The present study is intended to fill such a gap.

Summary

The ability to filter and select appropriate elements of sound is apparent in children. This ability to filter and select music variables continues to develop through the stage of adolescence and into adulthood. Auditory scene analysis outlines the processes

of similarity, simplicity, good continuation, competition of organization, closure and belonginess, and common fate as auditory process that facilitates and analyzes musical stimuli. Through this process, musical stimuli is perceived from a single environmental source, organized into separate streams, and conceptualized as one perceptual unit.

During the process of attention, an individual filters or subordinates peripheral stimuli to facilitate meaning or attain the importance of auditory experiences. Flowers (1983, 1984) proposed that music instruction, which involved listening, verbalization, and vocabulary study, enhanced students' ability to recognize music elements and attributes. Selective attention occurs when auditory sequences are presented simultaneously to both ears and affected by perceived physical differences in the dimensions of sound. The individual variables of interest within this study has received intensive research however, there is limited published research regarding the interrelationships among these variables. Research relative to the correlation of music participation, its effect on the at-risk student's populations, and student self-perceptions are formulated from the assumption that music and the arts enhance self-perception (Barry, Taylor, Walls & Wood, 1990; Mehuron, 1990; Sarakon, 1986; Smith, 1988). Through additional research, additional connections between the variables of interest will receive further examination.

Adolescence (approximately ages 11 through 19) is a stage of human growth that is motivated by preference and various external influences. During adolescence, an individual develops an identity that forms a foundation for adulthood. Freud (1905, 1964) proposed five stages of psychosexual development. Erikson (1963) expanded Freud's

genital stage into adolescence and proposed Eight Stages of Psychosocial Development, whereby each stage is interdependent and adolescence is the stage that involves the conflict identity versus role confusion. Later, Piaget (1963 and 1970) outlined four stages that begin at infancy and continue through adulthood. Concrete operations (approximately ages 8-11) develop into formal operations (begin at approximately age 11 and continues to develop adulthood) provide important functions regarding the musical abilities within this study. Elkind (1967) expanded Piaget's stage of formal operations and outlined the adolescent's conflict with egocentrism. Marilyn Pflederer-Zimmerman (1964) applied of Piaget's stage of concrete and formal operations into the area of music development. This investigation led to further research regarding the individual's ability to identify and manipulate music elements according to the operations and reasoning outlined in the stage of concrete operations and further into the stage of formal operations.

Self-perception shares many developmental traits and age related stages with music development. Using philosophies of James (1890) and Ryle (1949) and investigations by (Skinner, 1957), Festinger's (1957), Festinger and Carlsmith (1959), (Chappell, 1962), Schachter and Singer (1962), Bem (1967), the concept of self-perception involves an individual's ability to respond differently to personal behaviors and other controlling variables while making conscious decisions. The identification and evaluation of self-perception involves self-descriptive statements that assist in self-perceptual assessments.

Music influences human emotions and movement within the body and also affects the biological, psychological, sociological, and spiritual functions (Eagle, 1996) . It is important to determine connections among sixth-grade students' selective attention, behaviors, and other variables. Therefore, the two primary research questions that formed the foundation for this study are listed below.

1. Are there significant differences ($p \leq .05$) among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo), as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and temporal difference (i.e., fast and slow)?

2. To what extent do the following variables significantly predict ($p \leq .05$) sixth-grade participants' selective attention to melodic contour, timbre, rhythm, and tempo:

    a. ***Demographic Variables*** – gender and ethnicity,
    b. ***Self-Perception Variables*** – scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth,
    c. ***Music Background*** – Composite Score from Music Background Questionnaire II,
    d. ***Music Genre Variables*** – classical, rock, rhythm and blues, and jazz,
    e. Temporal Difference Variables – fast and slow tempi?

CHAPTER III

OUTLINE OF PROCEDURES

The goal of the present study was to examine sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo). Two primary purposes were the foci of this study. The first purpose was to investigate whether significant differences ($p \leq .05$) existed among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and by variables associated with temporal difference (i.e., fast and slow). The second purpose of the study was to investigate the extent to which variables associated with demographics, self-perception, music background, music genres, and temporal differences significantly predicted ($p \leq .05$) sixth-grade participants' selective attention to music elements. The variables within the second purpose include: demographic variables (i.e., gender and ethnicity), self-perception variables (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth), music background (i.e., participants' in- and out-of-school music experiences), and variables associated with music genre and temporal difference that were examined in the first purpose.

Participants

Participants for the study were suburban middle school students from the sixth-grade level within Fulton County Public Schools of Atlanta, Georgia. A written request for permission to conduct the study was obtained from the Fulton County Board of Education and designated administrators at each School (see Appendix A). A total of 87 students participated in the investigation. A school administrator provided the researcher with a list of students in sixth grade who would serve as possible participants in the study. Based on the return of parental consent and student assent forms (see Appendix B), students were included as participants in the current study.

Data Collection Instruments

Four evaluative instruments were used to assess participants' music backgrounds, selective attention for music elements, and self-perception: *Music Background Questionnaire II*, *Music Element Profile, Music Excerpt Listening List* and Harter's (1988) *Self-Perception Profile for Adolescents*.

Music Background Questionnaire II

The Music Background Questionnaire II (MBQ II) is based upon the Music Background Questionnaire (MBQ) developed by Yoder White (1993). The MBQ II was designed by the researcher to collect demographic data and assess students' levels of music instruction, training, and instrumental or vocal experience (see Appendix C). The MBQ developed by Yoder-White was similar to the Home Musical Environment Scale (HOMES), originally developed by Brand (1985). The HOMES was a 15-item questionnaire that was completed by parents to assess a participant's home musical

environment whereas, the MBQ was a 16-item assessment that was completed by participants to assess the home musical environment. The reliability estimate obtained for the HOMES was $r = .86$ while the MBQ developed by Yoder-White obtained a reliability estimate of $r = .75$.

The MBQ II was a 24-item assessment similar to the MBQ developed by Yoder-White. Participants' answers provided a profile of their music background. The MBQ II included questions relating to instrumental and/or vocal music experience, number of years played, and years of private lessons. Questions relating to students' parents were used to assess students' perception of their parents' or guardians' music backgrounds and included instrumental and or vocal music experience, and ensemble participation. The MBQ II also included questions that referenced music listening practices among the participant and the participants' parents and friends, ensemble participation, music equipment (i.e. compact disc, tape, and mp3 [digital audio encoding] players, and computer) in the household, and attitudes toward music. After an extensive review and evaluation by two experts in the area of psychometrics, the following changes were made to the MBQ II to enhance clarity and meet the needs of the present investigation.

1. Gender and ethnicity were added to the area of demographic data.

2. Viola, cello, and bass were added to question 2, which relates to instrument(s) played by the participant.

3. Questions 5, 8, 14, 15, 18, 21, 24 were added to measure students' perceptions of their close friends' music backgrounds, length of time listening to music, ensemble participation, ownership of music equipment (i.e. compact disc, tape, and mp3 [digital audio encoding] players, and computer), and attitudes toward music.

The scoring procedure for the Music Background Questionnaire II included the assignment of numerical values to each participant's responses that were summed and reported as a total background score. There are six sections within the Music Background Questionnaire II (see Appendix C). Section 1 (items 1 and 2 [0-10 points]) assesses the participants' experiences with instrumental performance and private study. Section 2 (items 3-5 [3-9 points]) assesses the participant and the participant's parents' and close friends' hours of daily music listening. Section 3 (items 6-15 [3-19 points]) assesses the participant and the participant's parents' and close friends' ownership of music equipment and music participation. Section 4 (items 16-18 [0-9 points]) elicits descriptions of participant and the participant's parents' and close friends' attitudes toward music. Section 5 (items 19-24 [6-18 points]) elicit descriptions of the participant and participant's parents' and close friends' ownership and acquisition of music recordings on compact discs, audio tapes, and digital music files. The MBQ II had a Total Background Score that ranged from 12-65 points and all participants were also categorized by gender and ethnicity.

The Music Element Profile

The *Music Element Profile* (*MEP*) was designed by the researcher to assess participants' overall level of selective attention to each music element and overall selective attention for the listening activity within the current study (see Appendix D). The MEP contained four items for each music excerpt. The four items addressed melodic contour, rhythm, timbre, and tempo. Participants were asked to select their level of attention for each music element during the listening activity. Each item was given a

Likert type numerical score of 1 to 7, where 7 was the highest level of attention and 1 was the lowest level of attention. The scoring procedure for the MEP included the assignment of numerical values to each participant's response, summed and reported as the *Music Element Preference Level*.

Music Excerpt Listening List

The *Music Excerpt Listening List* (*MELL*) is a group of music excerpts used to measured sixth-grade students' selective attention to music elements as affected by genre and temporal differences (see Appendix E). The MELL was compiled using the following methodology. In a study by Christensen and Peterson (1988), the researchers examined preferences for music genres. Results of the study indicated the following order of preference among music genres: Rock, Rhythm and Blues, Jazz, and Classical Music (respectively). According to LeBlanc (1981), participants preferred Rock/Pop, then Country, then Band, then New Jazz, then Old Jazz, and then Art Music (Classical). Another investigation by LeBlanc et al (1996) found that participants preferred Rock, then Jazz, and then Art Music. The music genres of Classical, Rock, Rhythm and Blues, and Jazz Music were selected for further research within the current study.

To further complete the selection of music excerpts for the MELL, twenty elementary, middle, and high school music teachers were asked to submit a list of music compositions via a *Music Teacher Excerpt Survey* (see Appendix F). Each teacher was asked to select vocal and/or instrumental music compositions from the genres of classical, jazz, rock, and rhythm and blues. Within the four genres of classical, jazz, rock, and rhythm and blues, teachers were asked to list excerpts or music compositions from

each of the following tempo categories: slow and fast tempi. The researcher asked that all suggested works be appropriate for a general music class offered to adolescents in sixth grade.

The final eight music excerpts for the MELL were selected using the following procedures and requirements. The music excerpts or compositions selected by the school music teachers were placed in categories specific to genre and tempo and randomly selected for the study. Using Sonar 5 Studio Edition, the researcher created music excerpts of at least 32 s in duration that accommodated music phrases (Banister, 1993; Leblanc & McCrary, 1983). Music phrases were used to determine the length of each excerpt and no excerpt contained less than two complete phrases. The final listening list comprised eight music excerpts: two from each genre (i.e., classical, rock, rhythm and blues, and jazz) and four from each tempo designation (i.e., slow, and fast). Slow music examples ranged from MM beat note = 60 to 78, with a mean of 69 and a standard deviation of 10. Fast music examples ranged from MM beat note = 104 to 168, with a mean of 134 and a standard deviation of 28. Each music excerpt of the MELL was 32 to 53 s in length and accommodated music phrases.

Self-Perception Profile for Adolescents

The *Self-Perception Profile for Adolescents* (Harter, 1988) is an advanced version of the earlier *Self-Perception Profile for Children* (Harter, 1985). The *Self-Perception Profile for Adolescents* (SPPA) is a questionnaire used to evaluate judgments of competence within nine specific domains. In eight domains, students were asked for personal judgments regarding Scholastic Competence, Social Acceptance, Athletic

Competence, Physical Appearance, Job Competence, Romantic Appeal, Behavioral Conduct, and Close Friendship. A separate domain, Global Self-Worth was used to assess how much an adolescent likes oneself as a person. Table 2 contains a short description of each domain (Harter, 1988, p. 3). Harter maintained that an individual's global judgments are best assessed directly and independently through questions pertaining to self-worth.

Table 2
Self-Perception Profile for Adolescents' Domain Content

Domain	Description
Scholastic competence	Competence or ability in scholastic performance: completion of class assignments, level of intelligence, and academic skill.
Social acceptance	Degree of perceived acceptance by peers, popularity, amount of friendships, and degree difficulty in attaining companionship.
Athletic competence	Perception of athletic ability and competence in sports activities.
Physical appearance	Degree of personal appearance—likes one's body and feels attractive.
Job competence	Perception of personal possession of job skills, readiness, competence to do well at part-time jobs, current job, or employment.
Romantic appeal	Romantic attraction to individuals of interest, currently dates individuals of interest, and feels like they are fun and interesting on a date.
Behavioral conduct	Perception of personal behavior, ability to complete appropriate behavioral tasks and activities, and avoidance of problematic situations.
Close friendship	Evaluates individual's ability to make close friends and to share personal thoughts and secrets.
Global self-worth	Likes or is content with oneself as a person. A global judgment of self-worth rather than domain specific competence or adequacy.

The SPPA was designed with a structured alternative format in which an adolescent makes one choice for each question. Questions on the SPPA use a scale of 1-4 where each number was only used once for each question and the items within each domain are counter balanced (some questions are worded with the most adequate statement on the right while some question are worded with the most adequate statement on the right). Each participant was asked to select one of four variables that identify his or her perception of self (see Figure 1). The structured alternative format provided respondents with the opportunity to qualify responses and corrected a major problem within self-perception scales where participants had a tendency to select socially desired responses (Harter, 1999). Confidence in the structured alternative format increased when participants indicated that selected response were relatively accurate degree of self-perception rather than socially desirable responses or norms (Harter, 1988). The participant's self-perception profile score is determined by calculating the relationship between the selected variable within selected self-perception domains and the assessed values of various self-perception categories.

Really True for Me	**Sort of True for Me**				**Sort of True for Me**	**Really True for Me**
☐	☐	This individual is intelligent	**OR**	This individual is not that intelligent	☐	☐
4	3				2	1

Figure 1. ***Self-Perception Profile for Adolescents Question Format***

The reliability of the SPPA was assessed using Cronbach's coefficient alpha (Harter, 1988). The reliability for all nine domains was scholastic competence (r = .81), social acceptance (r = .78), athletic competence (r = .92), physical appearance (r = .86), job competence (r = .74), romantic appeal (r = .80), behavioral conduct (r = .78), close friendship (r = .83), and global self-worth (r = .88).

For the present study, self-perception scores were computed for each participant using Harter's (1988) SPPA. The SPPA contained 45 items: nine domains (scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and self-worth) with five items in each domain. Each item was given a numerical score of 4, 3, 2, or 1, where 4 represented the most adequate judgment and 1 represented the least adequate judgment of self-worth. Within each subscale, items were counterbalanced. Two or three items were positive statements (scored 4, 3, 2, and 1— from left to right) and two or three items are negative statements (scored 1, 2, 3, and 4—from right to left). The SPPA had an overall possible total score that ranged from 45-180 points. Scores from the SPPA were grouped by domain to calculate means that produced a specific adolescent profile for each participant.

Administration of Data Collection Process

The present study was conducted within Fulton County Public Schools of Atlanta, Georgia using middle school students from the sixth-grade level. A request was made by the investigator for a room to meet the following minimal requirements: (a) ample space for 10 participants, (b) 10 desks and chairs, (c) 10 computers, (d) adequate

light, and (e) reduced external noise and distractions. There were 8-12 administrations of this procedure with 8-12 participants participating in each testing session.

The approximate time necessary for the study was 26-48 days (three or four days for each of 12 administrations. Each administration was completed in four phases. On the first day of the study, participants completed the *Music Background Questionnaire II* (*MBQ II*) during Phase 1 and *Self-Perception Profile for Adolescents* (*SPPA*) during Phase 2. The second day of the study included a training session on listening to music elements using the *Music Element Training Session Worksheets* (Phase 3) (see Appendix G). The third day of the study only accommodated up to 10 participants during the completion of the *Music Element Profile* (*MEP*) while listening to the *Music Excerpt Listening List* (*MELL*) (Phase 4). The use of headphones while completing the MEP and listening to the MELL limited the participation to ten during the last two days. Depending on class size (above 20), Phase 4 was administered over a two-day period.

On the first day of data collection, participants entered the classroom and received instructions from the investigator to sit at a desk that matched their assigned investigation number. On the desk and in front of each student were copies of the MBQ II and the SPPA. For the second day of data collection, participants entered the classroom and received instructions from the investigator to sit at a desk that matched their assigned investigation number. On the desk and in front of each student were a pencil and a copy of a worksheet for training on listening to music elements. On the third and fourth day of data collection, participants entered the classroom and received instructions from the investigator to sit at a desk that matched their assigned investigation number. On the desk

and in front of each student were a pair of headphones, a pencil, and a copy of the MEP. Prior to the commencement of each day of data collection, the investigator provided an introduction and training on completing each data collection instrument (i.e., MBQ II, MEP, MELL, and SPPA).

Phase 1

On the first day of data collection, each participant was given a MBQ II (see Appendix E) and informed that they had 20 minutes to complete all questions. Prior to the completion of the MBQ II, the investigator read the MBQ II - Instructional Statement (see Appendix H) to all participants.

Phase 2

On the first day of data collection, the SPPA was also introduced as a survey. Participants were instructed to complete all information in the top portion of the survey. A sample item was read aloud. Participants were informed that there are two responses for each item and it is important to select one answer. Prior to the completion of the SPPA, the investigator read the SPPA - Instructional Statement (see Appendix I) to all participants.

Phase 3

On the second day of data collection, each participant was given a copy of the Music Element Training Session Worksheet (see Appendix G), and was informed of procedures necessary to complete the worksheets. During the training session, each music element received 8-10 minutes of instructional time. The researcher designed the training session to review participants' abilities to identify and selectively attend to the music

elements of melodic contour, timbre, rhythm, and tempo. The worksheet included one lesson for each music element. At the beginning of this training session, the researcher provided a definition and example of each music element. Each lesson contained a series of listening exercises for each music element and a series of items that elicited the participant to circle the best response on the answer sheet. During the training session, all participants heard the same music examples. There were music examples representative of Classical, Jazz, Rock, and Rhythm and Blues.

Phase 4

On the third day (may be fourth day depending upon size of group) of data collection, the investigator introduced Phase 4 as an assessment of participants' selective attention of music elements (i.e., melodic contour, rhythm, tempo, and timbre). Before each listening session of Phase 4, the researcher read the MEP - Instructional Statement (see Appendix J) to all participants.

After the researcher answered regarding the MEP - Instructional Statement, participants were instructed to place the headphones securely on their ears and prepare for the first music excerpt. During the study, all participants heard the same music excerpts. The MELL was comprised of eight music excerpts that included two music excerpts from each genre (i.e., classical, rock, rhythm and blues, and jazz) and four music excerpts from each tempo designation (i.e., slow and fast). Each music excerpt was 32 to 53 seconds in length ensuring the proper accommodation of musical phrases. At least 20 seconds of silence followed each excerpt for participants to complete the associated item on the MEP.

Data Analysis

The goal of the present study was to examine sixth-grade students' selective attention for music elements (i.e., melodic contour, timbre, rhythm, and tempo). The first of two primary research questions that formed the foundation for the present study and associated analytical methods is listed below:

1. Are there significant differences ($p \leq .05$) among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo), as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and temporal difference (i.e., fast and slow)?

Seven null hypotheses were formulated to address the first research question. Using data from the *Music Element Profile*, a three-way analysis of variance with repeated measures was used to determine whether significant differences ($p \leq .05$) existed among sixth-grade students' selective attentions to music elements (i.e., melodic contour, timbre, rhythm, and tempo), as affected by variables associated with genre (i.e., classical, rock, rhythm and blues, and jazz), and temporal difference (i.e., fast and slow). All possible two-way and three-way interaction effect analyses were calculated to investigate significance among the variables. The seven null hypotheses are listed below.

1. There are no significant differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo).
2. There are no significant differences ($p > .05$) among sixth grade participants' ratings of variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz).

3. There are no significant differences ($p > .05$) between sixth grade participants' ratings of variables associated with temporal difference (i.e., fast and slow).

4. There are no significant two-way interaction effect differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz).

5. There are no significant two-way interaction effect differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with temporal difference (i.e., fast and slow).

6. There are no significant two-way interaction effect differences ($p > .05$) among sixth grade participants' ratings of variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) by variables associated with temporal difference (i.e., fast and slow).

7. There are no significant three-way interaction effect differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and by variables associated with temporal difference (i.e., fast and slow).

The second of two primary research questions that formed the foundation for the present study and associated analytical methods is listed below:

2. To what extent do the following variables significantly predict ($p \leq .05$) sixth-grade participants' selective attention to melodic contour, timbre, rhythm, and tempo:

    a. ***Demographic Variables*** – gender and ethnicity,
    b. ***Self-Perception Variables – scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth,***
    c. ***Music Background – Composite Score from Music Background Questionnaire II,***
    d. ***Music Genre Variables – classical, rock, rhythm and blues, and jazz,***
    e. ***Temporal Difference Variables – fast and slow tempi?***

Four specific secondary questions were formulated to address research question two. In a series of analyses, the extent of association among the following independent variables associated with demographics (i.e., gender and ethnicity), self-perception (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth), music background, genre (i.e., classical, rock, rhythm and blues, and jazz), and temporal difference (i.e., fast and slow) significantly predicted ($p \leq .05$) sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo). Four full regression and four hierarchical regression analyses were performed to determine the best predictors of participants' selective attention among melodic contour, timbre, rhythm, and tempo. The four specific secondary questions are listed below.

1. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **melodic contour** ($p \leq .05$)?

2. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **timbre** ($p \leq .05$)?

3. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **rhythm** ($p \leq .05$)?

4. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **tempo** ($p \leq .05$)?

CHAPTER IV

RESULTS

The goal of the present study was to examine sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo). Two primary purposes were the foci of this study. The first purpose was to investigate whether significant differences ($p \leq .05$) existed among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and by variables associated with temporal difference (i.e., fast and slow). The second purpose of the study was to investigate the extent to which variables associated with demographics, self-perception, music background, music genre, and temporal difference significantly predicted ($p \leq .05$) sixth-grade participants' selective attention to music elements. The variables within the second purpose include: demographic variables (i.e., gender and ethnicity), self-perception variables (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth), music background (i.e., participants' in- and out-of-school music experiences), and variables associated with music genre and temporal difference that were examined in the first purpose.

Two primary research questions were addressed in the present study.

1. Are there significant differences ($p \leq .05$) among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo), as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and temporal difference (i.e., fast and slow)?

2. To what extent do the following variables significantly predict ($p \leq .05$) sixth-grade participants' selective attention to melodic contour, timbre, rhythm, and tempo:

    a. ***Demographic Variables*** – gender and ethnicity,
    b. ***Self-Perception Variables*** – scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth,
    c. ***Music Background*** – Composite Score from Music Background Questionnaire II,
    d. ***Music Genre Variables*** – classical, rock, rhythm and blues, and jazz,
    e. ***Temporal Difference Variables*** – fast and slow tempi?

Seven null hypotheses were formulated and tested to address the first research question. A three-way analysis of variance with repeated measures was used to test the seven null hypotheses of research question one. Four specific secondary questions were formulated to address research question two. In the present study, full and hierarchical regression analyses were used to answer the four secondary questions of research question two.

Data collected for the present study were analyzed using both descriptive and inferential statistics. Additionally, reliability of the researcher-developed *Music Element Profile* (MEP) was established using Cronbach's alpha internal consistency procedure. A high level of internal consistency ($r = .89$) was found among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) when testing for the effect of variables associated with music genre (i.e., classical, rock,

rhythm and blues, and jazz) and temporal difference (i.e., fast and slow). Moderate levels of internal consistency were found for each component of the MEP, including melodic contour (r = .78), rhythm (r = .78), tempo (r = .76), and timbre (r = .67).

Research Question One: Selective Attention to Music Elements as Affected by Music Genre and by Temporal Difference

To answer research question one, the following seven null hypotheses were tested at the significance level of less than or equal to .05. A 4 (music elements) X 4 (music genre variables) X 2 (temporal difference variables) factorial analysis of variance with repeated measures and Least Square Difference (LSD) post-hoc comparisons (i.e., as appropriate) were used to test the null hypotheses.

1. There are no significant differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo).

2. There are no significant differences ($p > .05$) among sixth grade participants' ratings of variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz).

3. There are no significant differences ($p > .05$) between sixth grade participants' ratings of variables associated with temporal difference (i.e., fast and slow).

4. There are no significant two-way interaction effect differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz).

5. There are no significant two-way interaction effect differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with temporal difference (i.e., fast and slow).

6. There are no significant two-way interaction effect differences ($p > .05$) among sixth grade participants' ratings of variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) by variables associated with temporal difference (i.e., fast and slow).

7. There are no significant three-way interaction effect differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and by variables associated with temporal difference (i.e., fast and slow).

Means and Standard Deviations

Prior to analyzing the MEP data via the three-way analysis of variance, descriptive statistics were calculated with the data. Table 2 presents the means and standard deviations of the selected attention ratings for music elements and variables associated with music genre and temporal difference.

Using a 7-point scale, participants were asked to rate the degree of selective attention to music elements as affected by variables associated with music genre and by temporal difference (see Table 3). Among the overall pattern of selective attention to music elements, participants selectively attended to rhythm to the greatest degree (M = 5.15), followed by timbre (M = 4.87), tempo (M = 4.82), and melodic contour (M = 4.74). Among the overall pattern of ratings for music genre, participants rated rhythm and blues highest (M = 5.11), followed by rock music (M = 4.98), jazz music (M = 4.84), and classical music (M = 4.66). Among the overall pattern of ratings for temporal difference, participants rated fast tempi higher (M = 4.94) than slow tempi (M = 4.86). Standard deviations were narrow indicating minimal variance among all selective attention ratings for music elements and variables associated with music genre, and temporal difference.

Means and standard deviations were calculated for two-way interactions among participants' degree of selective attention to music elements while listening to excerpts with variables associated with music genre (see Table 4).

Table 3
Means and Standard Deviations of Selective Attention Ratings for Music Elements, Music Genre, and Temporal Difference

Music Elements

Melodic Contour		**Timbre**		**Rhythm**		**Tempo**	
Mean	SD	Mean	SD	Mean	SD	Mean	SD
4.74	1.89	4.87	1.67	5.15	1.78	4.82	1.83

Music Genre

Classical		Rock		Rhythm & Blues		Jazz	
Mean	SD	Mean	SD	Mean	SD	Mean	SD
4.66	1.85	4.98	1.73	5.11	1.72	4.84	1.86

Temporal Difference

Fast		**Slow**	
Mean	SD	Mean	SD
4.94	1.77	4.86	1.81

N = 87
*Note. SD = Standard Deviations

Table 4
Means and Standard Deviations of Selective Attention Ratings for Music Elements as Affected by Music Genre (Two-Way Interactions)

		Music Elements							
		Melodic Contour		Timbre		Rhythm		Tempo	
		Mean	Mean	Mean	SD	Mean	SD	Mean	SD
Music Genre	Classical	4.73	2.05	4.83	1.73	4.61	1.66	4.47	1.95
	Rock	4.67	1.85	4.97	1.64	5.40	1.59	4.87	1.83
	Rhythm/Blues	4.82	1.73	4.93	1.75	5.48	1.71	5.20	1.70
	Jazz	4.74	1.89	4.75	1.99	5.12	1.71	4.74	1.82

N = 87
*Note. SD = Standard Deviations

Among the overall patterns for selective attention to music elements while listening to variables associated with music genre, participants' highest-rated condition occurred

when selectively attending to rhythm while listening to rhythm and blues music (M = 5.48). Conversely, participants' lowest-rated condition occurred when selectively attending to tempo while listening to classical music (M = 4.47). Standard deviations were narrow indicating minimal variance among all two-way interactions among participants' degree of selective attention to music elements while listening to excerpts with variables associated with music genre.

Among the overall patterns for selective attention to music elements while listening to variables associated with music genre, participants' highest-rated condition occurred when selectively attending to rhythm while listening to rhythm and blues music (M = 5.48). Conversely, participants' lowest-rated condition occurred when selectively attending to tempo while listening to classical music (M = 4.47). Standard deviations were narrow indicating minimal variance among all two-way interactions among participants' degree of selective attention to music elements while listening to excerpts with variables associated with music genre.

Means and standard deviations were calculated for possible two-way interactions among participants' degree of selective attention to music elements as affected by variables associated with temporal difference (see Table 5). Among the overall patterns for selective attention to music elements while listening to excerpts with temporal difference, the highest-rated condition occurred when participants selectively attended to rhythm while listening to excerpts at fast tempi (M = 5.27). Conversely, the two lowest-rated conditions occurred when participants selectively attended to melodic contour while listening to excerpts at fast tempi (M = 4.68) and when participants selectively attended

to tempo while listening to excerpts at slow tempi (*M* = 4.68). Standard deviations were narrow indicating minimal variance among all two-way interactions for participants' degree of selective attention to music elements while listening to excerpts with temporal difference variables.

Table 5
Means and Standard Deviations of Selective Attention Ratings for Music Elements as Affected by Temporal Difference (Two-Way Interactions)

		Music Elements							
		Melodic Contour		Timbre		Rhythm		Tempo	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
TD	Fast	4.68	1.90	4.83	1.77	5.27	1.63	4.97	1.77
	Slow	4.81	1.88	4.91	1.79	5.03	1.70	4.68	1.88

N = 87
*Note. TD = Temporal Differences, SD = Standard Deviations

Means and standard deviations were calculated for possible two-way interactions among participants' ratings for variables associated with music genre by temporal difference (see Table 6). Among the overall pattern of ratings for variables associated with music genre across temporal difference, participants' highest-rated condition occurred while listening to rhythm and blues music presented at slow tempi (*M* = 5.37). Conversely, participants' lowest-rated condition occurred when listening to classical music presented at fast tempi (*M* = 4.60). Standard deviations were narrow among all two-way interactions indicating minimal variance among participants' ratings for variables associated with music genre by temporal difference.

Table 6
Means and Standard Deviations of Selective Attention Ratings for Temporal Difference as Affected by Music Genre (Two-Way Interactions)

		Music Genres							
		Classical		Rock		Rhythm & Blues		Jazz	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
TD	Fast	4.60	1.84	5.33	1.71	4.85	1.68	4.97	1.85
	Slow	4.72	1.86	4.63	1.75	5.37	1.76	4.70	1.88

N = 87
*Note. TD = Temporal Differences, SD = Standard Deviations

Among the overall pattern of ratings for variables associated with music genre across temporal difference, participants' highest-rated condition occurred while listening to rhythm and blues music presented at slow tempi (*M* = 5.37). Conversely, participants' lowest-rated condition occurred when listening to classical music presented at fast tempi (*M* = 4.60). Standard deviations were narrow among all two-way interactions indicating minimal variance among participants' ratings for variables associated with music genre by temporal difference.

Means and standard deviation were calculated for possible three-way interactions among all selective attention ratings for music elements as affected by variables associated with music genre and temporal difference (see Table 7). The overall means for possible three-way interactions among all selective attention ratings for music elements as affected by music genre and temporal difference were relatively high and negatively skewed. The standard deviations of all possible three-way interactions were narrow indicating minimal variance among all interactions for participants' degree of selective

attention to music elements by variables associated with music genre and by temporal difference.

Table 7
Means and Standard Deviations of Selective Attention Ratings for Music Elements as Affected by Music Genre and by Temporal Difference (Three-Way Interactions)

Melodic Contour by Music Genre by Temporal Difference							
MC x CL x F		**MC x RO x F**		**MC x RB x F**		**MC x JA x F**	
Mean	SD	Mean	SD	Mean	SD	Mean	SD
4.64	1.98	4.97	2.03	4.47	1.61	4.63	1.97
MC x CL x S		**MC x RO x S**		**MC x RB x S**		**MC x JA x S**	
Mean	SD	Mean	SD	Mean	SD	Mean	SD
4.82	2.13	4.38	1.66	5.17	1.86	4.85	1.89
Timbre by Music Genre by Temporal Difference							
TI x CL x F		**TI x RO x F**		**TI x RB x F**		**TI x JA x F**	
Mean	SD	Mean	SD	Mean	SD	Mean	SD
4.71	1.80	5.15	1.65	4.62	1.70	4.84	1.94
TI x CL x S		**TI x RO x S**		**TI x RB x S**		**TI x JA x S**	
Mean	SD	Mean	SD	Mean	SD	Mean	SD
4.95	1.67	4.79	1.63	5.24	1.80	4.66	2.05
Rhythm by Music Genre by Temporal Difference							
RH x CL x F		**RH x RO x F**		**RH x RB x F**		**RH x JA x F**	
Mean	SD	Mean	SD	Mean	SD	Mean	SD
4.48	1.66	5.95	1.33	5.28	1.83	5.37	1.70
RH x CL x S		**RH x RO x S**		**RH x RB x S**		**RH x JA x S**	
Mean	SD	Mean	SD	Mean	SD	Mean	SD
4.74	1.66	4.85	1.86	5.68	1.58	4.86	1.71
Tempo by Music Genre by Temporal Difference							
TE x CL x F		**TE x RO x F**		**TE x RB x F**		**TE x JA x F**	
Mean	SD	Mean	SD	Mean	SD	Mean	SD
4.56	1.92	5.26	1.81	5.01	1.60	5.02	1.77
TE x CL x S		**TE x RO x S**		**TE x RB x S**		**TE x JA x S**	
Mean	SD	Mean	SD	Mean	SD	Mean	SD
4.38	1.98	4.48	1.85	5.39	1.80	4.45	1.87

N = 87
*Note. MC = Melodic Contour, TI = Timbre, RH = Rhythm, TE = Tempo, RO = Rock, RB = Rhythm & Blues, JA = Jazz, F = Fast, S = Slow, SD = Standard Deviations

Among the overall patterns for selective attention to melodic contour while listening to excerpts with genre and temporal difference, participants' highest-rated condition for melodic contour occurred while listening to rhythm and blues music at slow tempi (*M* = 5.17) (see Table 7). Conversely, participants' lowest-rated condition for melodic contour occurred while listening to rock music at slow tempi (*M* = 4.38). Participants' highest-rated condition for timbre occurred while listening to rhythm and blues music at slow tempi (*M* = 5.24). Conversely, participants' lowest-rated condition for timbre occurred when listening to rhythm and blues music at fast tempi (*M* = 4.62). Participants' highest-rated condition for rhythm occurred while listening to rock music at fast tempi (*M* = 5.95). Conversely, participants' lowest-rated condition for rhythm occurred while listening to classical music at fast tempi (*M* = 4.48). Participants' highest-rated condition for tempo occurred while listening to rhythm and blues music at slow tempi (*M* = 5.39). Conversely, participants' lowest-rated condition for timbre occurred while listening to classical music at slow tempi (*M* = 4.38).

Three-Way Analysis of Variance

Prior to testing the seven null hypotheses via a three-way analysis of variance, Mauchley's test was used to determine whether sphericity could be assumed. The results from Mauchley's test indicated that participants' selective attention, grouped by the main effect of variables associated with temporal difference met the assumptions of sphericity. Participants' selective attention, grouped by the interaction effect of music elements by temporal difference variables, and by the interaction effect of music element by music genre by temporal difference met the assumption of sphericity. However, participants'

selective attention, grouped by the main effects of music elements and music genre violated the sphericity assumption. The sphericity assumption was also violated when selective attention data were grouped by the interaction effects of music element by variables associated with music genre, and by the interaction effect of music genre by temporal difference (see Table 8).

Table 8
ANOVA Table for Linear Within-Participant Effects for Music Elements, Music Genre, and Temporal Difference Using Mauchly's Test of Sphericity

Source	Mauchly's W	Approx. Chi-Square	df	Sig.	Greenhouse-Geisser	Huyn-Feldt	Lower-Bound
ME*	.751	24.232	5	.000	.830	.857	.333
MG*	.863	12.454	5	.029	.908	.941	.333
TD*	1.000	.000	0	.	1.000	1.000	1.000
ME x MG	.308	97.412	44	.000	.798	.879	.111
ME x TD	.969	2.640	5	.755	.981	1.000	.333
MG x TD	.559	49.240	5	.000	.721	.740	.333
ME x MG x TD	.501	57.265	44	.087	.866	.961	.111

*Note. ME = Music Elements, MG = Music Genre, TD = Temporal Difference

For the main effects and interaction effects that violated the sphericity assumption, the Greenhouse-Giesser correction was used to adjust the degrees of freedom to increase the accuracy of significance values obtained via the three-way ANOVA (see Table 9). Post-hoc comparisons were performed for each main effect and two-way interaction using the Least Significant Difference (LSD) adjustment for multiple comparisons.

Significant main effect differences (p = .006) were found among sixth-grade participants' selective attention to music elements (see Table 9). LSD post-hoc multiple comparisons were used to examine mean differences.

Table 9
ANOVA Table for Linear Within-Participant Effects for Music Elements, Music Genre, and Temporal Difference Using Greenhouse-Geisser Adjustments

Source	Type III SS	*df*	Mean Square	F	Sig.	Partial Eta^2	Observed Power
ME*	66.272	2.491	26.604	4.671	.006	.052	.844
Error	1220.228	214.227	5.696				
MG*	77.180	2.725	28.322	7.133	.000	.077	.972
Error	930.570	234.359	3.971				
TD*	4.506	1.000	4.506	1.411	.238	.016	.217
Error	274.619	86.000	3.193				
ME x MG	59.053	7.186	8.218	2.853	.006	.032	.929
Error	1780.197	617.966	2.881				
ME x TD	23.957	3.000	7.986	4.930	.003	.054	.908
Error	417.918	258.000	1.620				
MG x TD	144.991	2.162	67.054	14.676	.000	.146	.999
Error	849.634	185.957	4.569				
ME x MG x TD	15.121	9.000	1.680	.923	.495	.011	.467
Error	1409.254	774.000	1.821				

*Note. ME = Music Elements, MG = Music Genre, TD = Temporal Difference

Music Elements

The results of the post-hoc comparison indicated that sixth-grade participants attended to rhythm ($M = 5.15$) to a significantly greater degree than to melodic contour ($M = 4.74$, $p = .000$), timbre ($M = 4.87$, $p = .010$), or tempo ($M = 4.82$, $p = .002$). No significant differences ($p > .05$) were found among participants' selective attention to melodic contour, timbre, and tempo (see Tables 10 and 11). The null hypothesis that there are no significant main effect differences ($p > .05$) among sixth-grade participants' selective attention to music elements, was rejected.

Table 10
Means for Selective Attention to Music Elements

Rhythm	Timbre	Tempo	Melodic Contour
5.15	4.87	4.82	4.74

No significant differences were found among the underlined music elements ($p > .05$).

Table 11
Significance Levels for Differences among Selective Attention to Music Elements

	Timbre	Rhythm	Tempo
Melodic Contour	.329	.000	.580
Timbre		.010	.099
Rhythm			.002

Music Genre

Significant main effect differences ($p = .000$) were found among sixth-grade participants' selective attention as affected by variables associated with music genre (see Table 9). LSD post-hoc multiple comparisons were used to examine mean differences. The results of the post-hoc comparison indicated that sixth-grade participants rated rhythm and blues music ($M = 5.11$) significantly higher than jazz music ($M = 4.83$, $p = .024$) or classical music ($M = 4.66$, $p = .000$). Participants also rated rock music ($M = 4.98$) significantly higher than classical music ($M = 4.66$, $p = .001$). No significant differences ($p > .05$) were found among participants' selective attention as affected by rhythm and blues and rock music, rock and jazz music, and jazz and classical music (see Tables 12 and13). The null hypothesis that there are no significant main effect differences ($p > .05$) among sixth-grade participants ratings for variables associated with music genre was rejected.

Table 12
Means for Music Genre Ratings

Rhythm/Blues	Rock	Jazz	Classical
5.11	4.98	4.83	4.66

No significant differences were found among the underlined Music Genre ($p > .05$).

Table 13
Significance Levels for Differences among Music Genre Ratings

	Rock	Rhythm & Blues	Jazz
Classical	.001	.000	.115
Rock		.151	.167
Rhythm & Blues			.024

Temporal Difference

No significant main effect differences ($p > .05$) were found to exist among sixth-grade participants' selective attention as affected by variables associated with temporal difference (see Table 9). LSD post-hoc multiple comparisons were used to examine mean differences. The results of the post-hoc comparison indicated that sixth-grade participants did not rate fast tempi ($M = 4.94$) significantly differently than they rated slow tempi ($M = 4.86$). The null hypothesis that there are no significant main-effect differences ($p > .05$) among sixth-grade participants' ratings of variables associated with temporal difference failed to be rejected.

Music Elements as Affected by Music Genre

A significant interaction effect ($p = .006$) was found to exist among sixth-grade participants' selective attention to music elements as affected by variables associated with music genre (see Table 9). Further, a two-way ANOVA was used to examine interaction effects among sixth-grade participants' selective attention for music elements as affected by variables associated with music genre (see Table 14). LSD post-hoc multiple comparisons were used to examine differences (see Table 14).

Two significant differences were found among the two-way interactions between music elements and music genre (see Table 15 and Figure 2): (a) significant differences ($p = .001$) among sixth-grade participants' selective attention to melodic contour and rhythm when listening to classical music and rock music, and (b) significant differences ($p = .003$) among sixth-grade participants' selective attention to rhythm and timbre when listening to classical music and rock music.

No significant differences ($p > .05$) were found among participants' selective attention to any of the music elements when listening to classical music. However, while listening to rock music, participants attended to rhythm to a significantly greater degree ($p \leq .01$) than to any of the other music elements. Further, when listening to the rhythm and blues music and jazz music, rhythm continued to receive significantly greater attention ($p \leq .05$) than did the rest of the music elements (see Figure 2). No significant differences ($p > .05$) were found among participants' attention to melodic contour, timbre, or tempo while listening to classical, rock or jazz. However, while listening to rhythm and blues music, participants attended to tempo to a significantly greater degree

($p \leq .05$) than they did to melodic contour (see Figure 2). The null hypothesis that there are no significant two-way interaction effects ($p > .05$) among sixth-grade participants' selective attention to music elements as affected by variables associated with music genre was rejected.

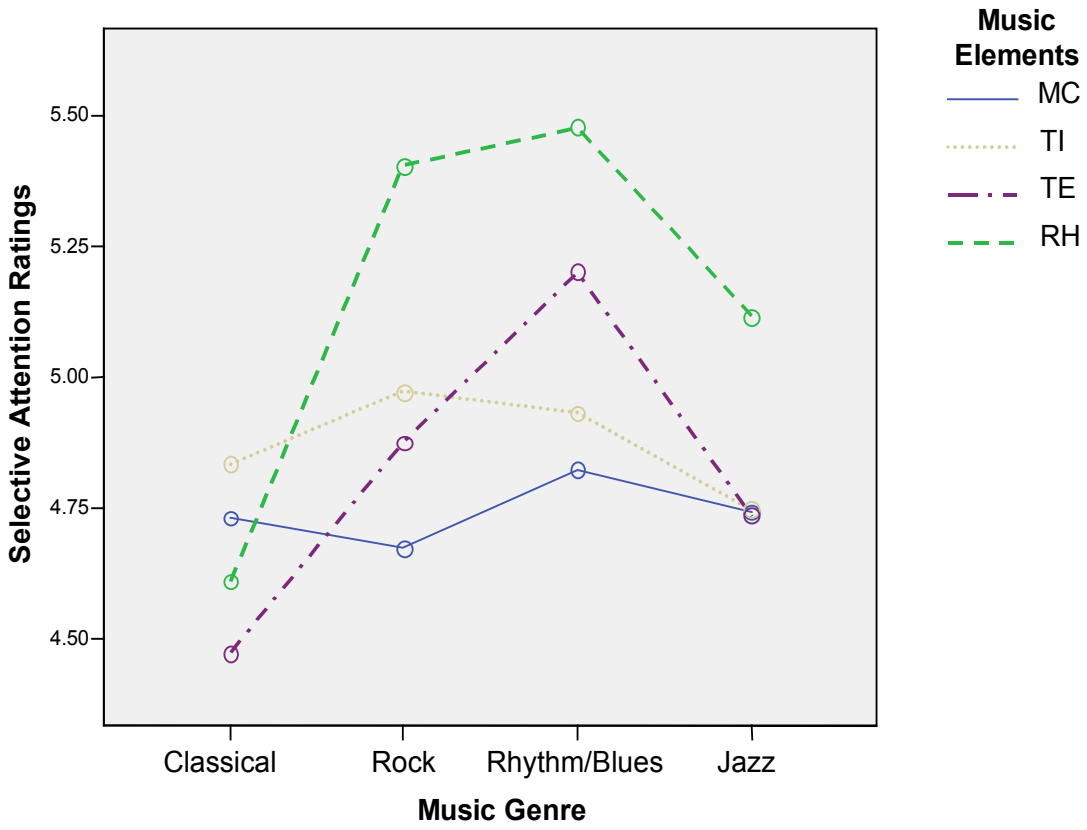
Table 14
ANOVA Table of Within-Subject Contrasts for Music Elements as Affected by Music Genre

Source	Music Elements	Music Genre	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
ME by MG	MC x RH	CL x RO	62.943	1	62.943	12.218	.001
		RO x RB	.486	1	.486	.132	.717
		RB x JA	6.899	1	6.899	1.528	.220
	RH x TI	CL x RO	37.345	1	37.345	9.512	.003
		RO x RB	1.149	1	1.149	.356	.552
		RB x JA	2.761	1	2.761	.523	.472
	TI x TE	CL x RO	6.080	1	6.080	1.339	.250
		RO x RB	11.770	1	11.770	3.406	.068
		RB x JA	6.899	1	6.899	1.111	.295
Error (ME by MG)	MC x RH	CL x RO	443.057	86	5.152		
		RO x RB	316.264	86	3.677		
		RB x JA	388.351	86	4.516		
	RH x TI	CL x RO	337.655	86	3.926		
		RO x RB	277.351	86	3.225		
		RB x JA	454.489	86	5.285		
	TI x TE	CL x RO	390.420	86	4.540		
		RO x RB	297.230	86	3.456		
		RB x JA	533.851	86	6.208		

*Note. ME = Music Elements, MG = Music Genres, MC = Melodic Contour, RH = Rhythm, TI = Timbre, TE = Tempo, CL = Classical, RO = Rock, RB = Rhythm and Blues, JA = Jazz

Table 15
Significance Levels and Means for Music Elements as Affected by Music Genre

	Classical		
	Timbre (M = 4.83)	Rhythm (M = 4.61)	Tempo (M = 4.47)
Melodic Contour (M = 4.73)	.665	.513	.283
Timbre (M = 4.83)		.323	.086
Rhythm (M = 4.61)			.433
	Rock		
	Timbre (M = 4.97)	Rhythm (M = 5.40)	Tempo (M = 4.87)
Melodic Contour (M = 4.67)	.094	.000	.296
Timbre (M = 4.97)		.002	.478
Rhythm (M = 5.40)			.002
	Rhythm and Blues		
	Timbre (M = 4.93)	Rhythm (M = 5.48)	Tempo (M = 5.20)
Melodic Contour (M = 4.82)	.534	.001	.044
Timbre (M = 4.93)		.001	.114
Rhythm (M = 5.48)			.043
	Jazz		
	Timbre (M = 4.75)	Rhythm (M = 5.12)	Tempo (M = 4.74)
Melodic Contour (M = 4.74)	.978	.030	.975
Timbre (M = 4.75)		.047	.951
Rhythm (M = 5.12)			.022



*Note. MC = Melodic Contour, RH = Rhythm, TI = Timbre, TE = Tempo

Figure 2. ***Interaction of Music Elements as Affected by Music Genre***

Music Elements as Affected by Temporal Difference

A significant interaction effect (p = .003) was found to exist among sixth-grade participants' selective attention to music elements as affected by variables associated with temporal difference (see Table 9). A two-way ANOVA was used to examine interactions effects among sixth-grade participants' selective attention for music elements as affected variables associated with temporal difference (see Table 16). LSD post-hoc multiple comparisons were used to examine differences (see Table 17).

Significant differences were found among all two-way interactions between music elements and temporal difference (see Table 16 and Figure 3). Significant differences (p = .008) were found between sixth-grade participants' selective attention to melodic contour and rhythm while listening to music across fast tempi and slow tempi. At fast tempi, participants attended to rhythm to a significantly greater degree than they did to melodic contour; at slow tempi, however, no significant difference was found between attention to rhythm and attention to melodic contour. Significant differences (p = .014) were found between sixth-grade participants' selective attention to rhythm and timbre while listening to music across fast tempi and slow tempi. At fast tempi, participants attended to rhythm to a significantly greater degree than they did to timbre; at slow tempi, however, no significant difference was found between attention to rhythm and attention to timbre. Significant differences (p = .012) were found between sixth-grade participants' selective attention to timbre and tempo while listening to music across fast tempi and slow tempi. At fast tempi, participants attended to tempo to a greater degree than they did

to timbre; at slow tempi, however, participants attended to timbre to a greater degree than they did to tempo.

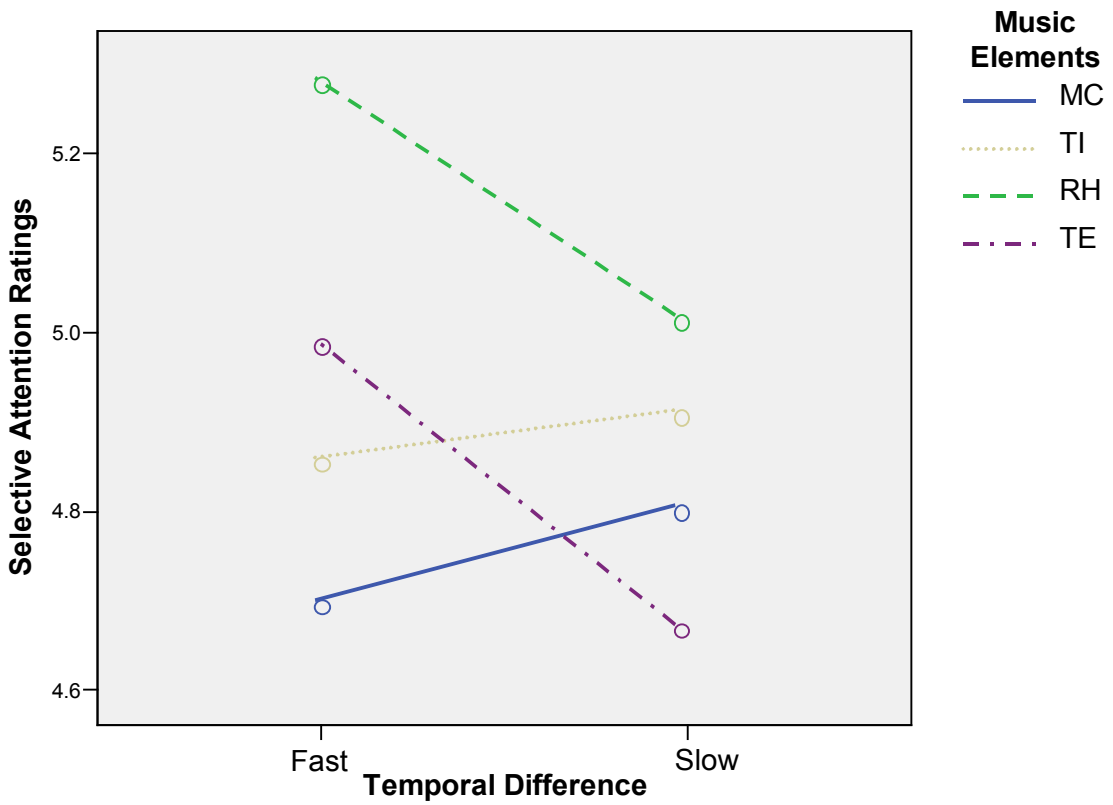
Table 16
ANOVA Table of Within-Subject Contrasts for Music Elements as Affected by Temporal Difference

Source	Music Elements	Temporal Difference	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
ME by TD	MC x RH	Fast x Slow	11.587	1	11.587	7.315	.008
	RH x TI	Fast x Slow	8.851	1	8.851	6.254	.014
	TI x TE	Fast x Slow	11.955	1	11.955	6.513	.012
Error (ME by TD)	MC x RH	Fast x Slow	136.226	86	1.584		
	RH x TI	Fast x Slow	121.711	86	1.415		
	TI x TE	Fast x Slow	157.858	86	1.836		

*Note. ME = Music Element, TD = Temporal Differences
MC = Melodic Contour, RH = Rhythm, TI = Timbre, TE = Tempo

Table 17
Significance Levels and Means for Music Elements as Affected by Temporal Difference

	Fast Tempi		
	Timbre (M = 4.83)	Rhythm (M = 5.27)	Tempo (M = 4.97)
Melodic Contour (M = 4.68)	.291	.000	.096
Timbre (M = 4.83)		.001	.280
Rhythm (M = 5.27)			.017
	Slow Tempi		
	Timbre (M = 4.91)	Rhythm (M = 5.03)	Tempo (M = 4.68)
Melodic Contour (M = 4.81)	.496	.096	.374
Timbre (M = 4.91)		.332	.055
Rhythm (M = 5.03)			.004



*Note. MC = Melodic Contour, RH = Rhythm, TI = Timbre, TE = Tempo

Figure 3. ***Interaction of Music Elements as Affected by Temporal Difference***

While listening to music at fast tempi, participants attended to rhythm to a significantly greater degree ($p \leq .05$) than to melodic contour, tempo, and timbre. No significant differences ($p > .05$) were found among participants' selective attention to rhythm, melodic contour, or timbre when listening to music at slow tempi. However, while listening to music at slow tempi, participants attended to rhythm at a significantly greater degree ($p = .004$) than tempo (see Figure 3). The null hypothesis that there are no significant two-way interaction effects ($p > .05$) among sixth-grade participants' selective

attention to music elements as affected by variables associated with temporal difference was rejected.

Music Genre by Temporal Difference

A significant interaction effect (p = .000) was found to exist among sixth-grade participants' selective attention to variables associated with music genre as affected by temporal difference (see Table 9). A two-way ANOVA was used to examine interactions effects among sixth-grade participants' selective attention for music genres as affected by variables associated with temporal difference (see Table 18). LSD post-hoc multiple comparisons were used to examine differences (see Table 19).

Significant differences were found among all two-way interactions between music genre and temporal difference (see Table 18 and Figure 4). Significant differences (p = .000) were found between sixth-grade participants' ratings for classical music and rock music while listening to music across fast tempi and slow tempi. At fast tempi, participants' ratings for rock music were significantly higher than for classical music; at slow tempi, however, no significant difference was found between participants' ratings for rock music and classical music. Significant differences (p = .000) were found between sixth-grade participants' ratings for rock and rhythm and blues while listening to music across fast tempi and slow tempi. At fast tempi, participants' ratings for rock music were significantly higher than for rhythm and blues music; at slow tempi, however, participants' ratings for rhythm and blues music were significantly higher than for rock music. Significant differences (p = .000) were found between sixth-grade participants' ratings for rhythm and blues music and jazz music while listening to music across fast

tempi and slow tempi. At fast tempi, there was no significant different between participants' ratings for rhythm and blues music and jazz music; at slow tempi, however, participants' ratings for rhythm and blues music were significantly higher than for jazz music. LSD post-hoc multiple comparisons were used to examine differences.

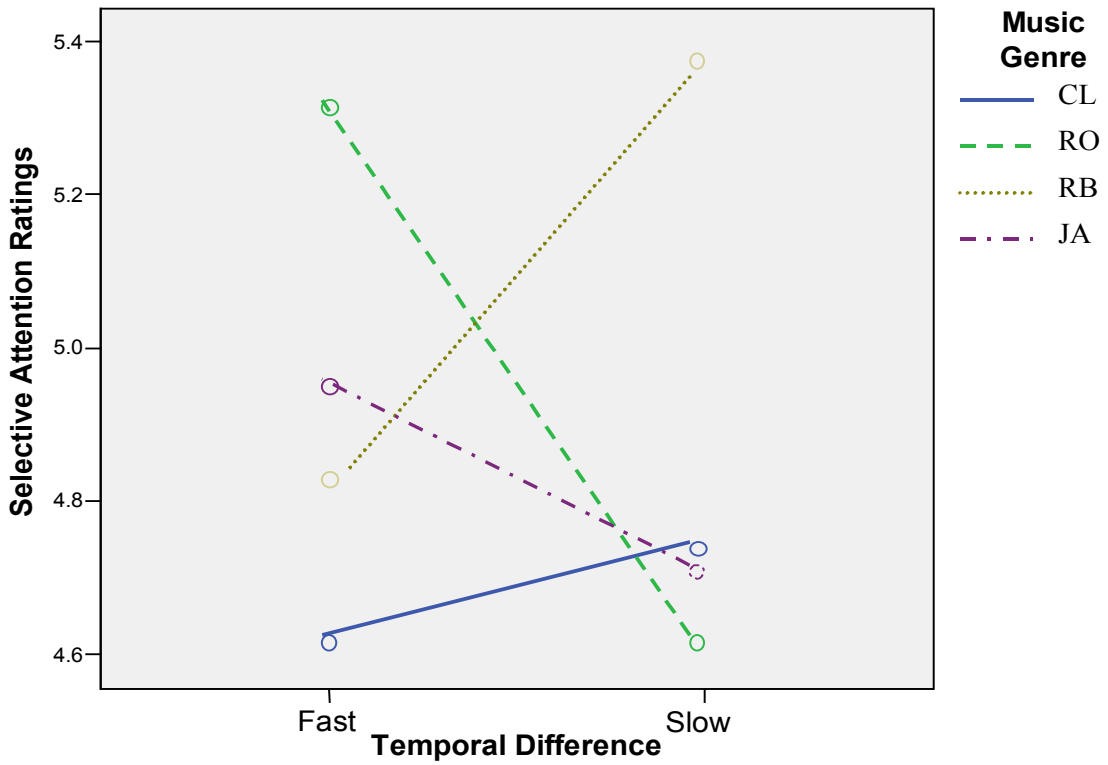
Table 18
ANOVA Summary of Within-Subject Contrasts for Temporal Difference by Music Genre

Source	Temporal Differences	Genre	Type III Sum of Squares	*df*	Mean Square	*F*	Sig.
TD by Genre	Fast x Slow	CL x RO	59.586	1	59.586	13.900	.000
		RO x RB	132.213	1	132.213	24.284	.000
		RB x JA	53.934	1	53.934	15.680	.000
Error (TD by Genre)	Fast x Slow	CL x RO	368.664	86	4.287		
		RO x RB	468.224	86	5.444		
		RB x JA	295.816	86	3.440		

*Note. TD = Temporal Differences
CL = Classical, RO = Rock, RB = Rhythm and Blues, JA = Jazz

Table 19
Significance Levels and Means for Music Genre by Temporal Difference

Fast Tempi			
	Rock (*M* = 5.33)	Rhythm/Blues (*M* = 4.85)	Jazz (*M* = 4.97)
Classical (*M* = 4.60)	.000	.061	.002
Rock (*M* = 5.33)		.001	.011
Rhythm/Blues (*M* = 4.85)			.376
Slow Tempi			
	Rock (*M* = 4. 63)	Rhythm/Blues (*M* = 5.37)	Jazz (*M* = 4.70)
Classical (*M* = 4.72)	.531	.000	.910
Rock (*M* = 4.63)		.000	.511
Rhythm/Blues (*M* = 5.37)			.000



*Note. CL = Classical, RO = Rock, RB = Rhythm and Blues, JA = Jazz

Figure 4. ***Interaction of Music Genre by Temporal Difference***

While listening to music at fast tempi, participants rated rock music significantly higher ($p \leq .05$) than they did any of the other music genres (i.e., classical, rhythm and blues, and jazz) (see Figure 4). Additionally while listening to music at fast tempi, participants rated jazz music significantly higher ($p \leq .01$) than they did classical music. However, while listening to music at slow tempi, participants rated rhythm and blues significantly higher ($p = .000$) than they did any of the other genres (i.e., classical, rock, and jazz), among which there were no significant differences ($p > .05$). The null hypothesis that there are no significant two-way interaction effects ($p > .05$) among sixth-

grade participants' ratings for variables associated with music genre by temporal difference was rejected.

Music Elements as Affected by Music Genre by Temporal Difference

No significant three-way interaction effects ($p > .05$) were found to exist among sixth-grade participants' selective attention to music elements as affected by variables associated with music genre and by temporal difference (see Table 9). The null hypothesis that there are no significant main-effect differences ($p > .05$) among sixth-grade participants' selective attention as affected by variables associated with music genres and by temporal differences failed to be rejected.

Research Question Two: Variables Contributing to Sixth-Grade Participants' Selective Attention to Music Elements

To determine the extent to which selected variables contribute to sixth-grade participants' selective attentions to music elements, one primary research question was formulated. Research question two examined to what extent the following variables significantly predict ($p \leq .05$) sixth-grade participants' selective attention to the music elements of melodic contour, timbre, rhythm, and tempo:

1. ***Demographic Variables*** – gender and ethnicity,
2. ***Self-Perception Variables*** – scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth,
3. ***Music Background*** – Composite Score from Music Background Questionnaire II,
4. ***Music Genre Variables*** – classical, rock, rhythm and blues, and jazz,
5. ***Temporal Difference Variables*** – fast and slow tempi?

To answer research question two, four specific secondary research questions were formulated for the present study. These secondary research questions were answered using multiple regression analyses (i.e., both full regression analyses and hierarchical regression analyses).

1. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **melodic contour** ($p \leq .05$)?

2. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **timbre** ($p \leq .05$)?

3. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **rhythm** ($p \leq .05$)?

4. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **tempo** ($p \leq .05$)?

Within the present study, full regression analyses included all of the predictor variables and established boundaries of the hierarchical regression analyses (Stockburger, 2006). For each criterion variable (i.e., music elements), a full regression analysis was completed to determine which of the 22 predictor variables significantly predict participants' selective attention to each music element. With a sample of 87 participants, eight of the 22 predictor variables were identified as significant predictor variables ($p \leq .05$), using the size of the standardized beta coefficients (β). This selection process was based on the stipulation there should be at least 10 observations for every predictor variable (Howell, 2007). The size of the β was used to establish the order of entry (highest to lowest) for each set of predictors into the regression model. Following this

procedure, eight selected predictors were entered into a hierarchical regression analyses to examine interactions among the eight predictor variables contributing to participants' selective attention to each of the four music elements (Stockburger, 2006).

The demographic variables of gender and ethnicity are categorical data. Within the regression analyses, these variables were binary coded (i.e., indicator or dummy) coded to prevent perfect multicollinearity (Garson, 2008). The process of binary coding involved the omission of one category of data from two sets of data (gender) and the coding of variables using 0 and 1. Within the present study, the demographic variables for gender were binary coded (male = 0 and female =1), and the variable male was omitted from the data that were entered into the regression analyses. Demographic variables for ethnicity (Asian American, African American, American Indian, Hispanic, White [Non-Hispanic], and Other) were all independently binary coded (e.g. for Asian American, the codes were as follows: Asian American = 1, African American = 0, American Indian = 0, Hispanic = 0, White [Non-Hispanic] = 0, and Other = 0), and each was entered separately into the regression analyses. The variable Hispanic was omitted from the data that were entered into the regression analyses using the following criteria: (a) clearly defined reference group, (b) group consisted of a moderate number of participants, and (c) a median reference group that eliminated comparisons among the extremes (Garson, 2008).

Melodic Contour

A full regression analysis was performed to determine which eight predictor variables were the best predictors for melodic contour. Additionally, a hierarchical

regression analysis was completed using the eight predictor variables to examine the degree of interaction among the eight predictor variables contributing to participants' selective attention to melodic contour.

Full regression analysis for melodic contour. Results for the full regression analysis for melodic contour are presented in Table 20. The relative importance of each predictor variable in predicting participant's selective attention to melodic contour was indicated by standardized beta coefficients. The standardized beta coefficient (β) represented the degree to which selective attention to melodic contour increased when the predictor variable increased while the other predictor variables were held constant (Garson, 2008). If a β value was positive, there is a positive relationship between the predictor variable and melodic contour. Conversely, if a β value was negative, there was a negative relationship between the predictor variable and melodic contour (Field, 2008). Across the full regression analyses, the β was an accurate measure because it was not dependent on the unit of measurements associated with the predictor and criterion variables (Field, 2008).

The eight variables selected as the best predictors for melodic contour were Asian American (β = .169), fast tempi (β = -.278), classical music (β = .459), rock music (β = .334), rhythm and blues music (β = .219), jazz music (β = .207), athletic competence (β = .189), and physical appearance (β = -.112) (see highlighted variables in Table 20). Because ethnicity was binary coded, ethnicity data for Asian American was analyzed for its relationship to the Hispanic or Latino ethnicity (omitted from the regression analysis).

As a result, Asian American (β = .169, t = 1.889, p = .063) provided information relating Asian American to the Hispanic or Latino ethnicity.

Table 20
Summary of Full Regression Analysis for Variables Predicting Melodic Contour

Model	Predictor	B	*SE*	β	*t*	Sig.
		Melodic Contour (21, 65)				
1	Female	-.222	.214	-.093	-1.033	.305
	Asian American	.963	.510	.169	1.889	.063
	African American	.177	.278	.064	.635	.528
	American Indian	.054	.451	.011	.120	.905
	Other	.265	.421	.056	.628	.532
	White	.133	.258	.052	.516	.608
	Fast Tempi	-.370	.337	-.278	-1.097	.277
	Classical	.523	.161	.459	3.249	.002
	Rock	.406	.187	.334	2.165	.034
	Rhythm & Blues	.286	.171	.219	1.671	.100
	Jazz	.205	.118	.207	1.740	.087
	Scholastic Competence	-.077	.157	-.049	-.487	.628
	Social Acceptance	-.018	.166	-.011	-.106	.916
	Athletic Competence	.254	.125	.189	2.029	.047
	Physical Appearance	-.165	.119	-.122	-1.386	.171
	Job Competence	.134	.134	.085	.997	.322
	Romantic Appeal	-.017	.157	-.011	-.110	.913
	Behavioral Conduct	-.019	.134	-.014	-.141	.889
	Close Friendship	-.053	.156	-.034	-.342	.734
	Global Self-Worth	.010	.170	.006	.059	.953
	Music Background	-.004	.013	-.026	-.280	.780

Of the variables suggested by the researcher to be possible predictors of melodic contour, slow tempi were excluded from the previous model (see Table 21). Slow tempi did not indicate a significant t value (t = .660, p = .511) and demonstrated a low partial correlation (r = -.082).

Table 21
Excluded Variable for Full Regression Predicting Melodic Contour

Model	Predictor	Beta In	*t*	Sig.	Partial Correlation	Collinearity Tolerance
1	Slow Tempi	-9.960	.660	.511	-.082	0.0000245

Hierarchical regression analysis for melodic contour. Eight models were tested via the hierarchical analysis. Results of the hierarchical regression analysis for ***melodic contour*** are presented in Table 22. The first variable entered in the regression analysis was classical music. Model 1 included classical music and predicted 47.6% of the variance in participants' selective attention to melodic contour ($\Delta R^2 = 0.476$, $p \leq .001$). Model 2, with the addition of rock music, predicted 54.1% of the variance to melodic contour and revealed a significant difference from Model 1 ($\Delta R^2 = 0.066$, $p \leq .001$). Model 3, with the addition of fast tempi, predicted 54.5% of the variance in participants' selective attention to melodic contour and revealed no significant difference from Model 2 ($\Delta R^2 = 0.004$, $p = .420$). Model 4, with the addition of rhythm and blues music, predicted 55.5% of the variance in participants' selective attention to melodic contour and revealed no significant difference from Model 3 ($\Delta R^2 = 0.001$, $p = .164$). Model 5, with the addition of jazz music, predicted 57.4% of the variance in participants' selective attention to melodic contour and revealed no significant difference from Model 4 ($\Delta R^2 = 0.019$, $p = .060$). Model 6, with the addition of athletic competence, predicted 58.7% of the variance in participants' selective attention to melodic contour and revealed no significant difference from Model 5 ($\Delta R^2 = 0.012$, $p = .124$). Model 7, with the addition of the Asian American ethnicity, predicted 60.3% of the variance in participants'

selective attention to melodic contour, and exhibited no significant change from Model 6 ($\Delta R^2 = 0.016$, $p = .074$). Model 8, with the addition of physical appearance, predicted 62.1% of the variance in participants' selective attention to melodic contour and revealed no significant difference from Model 7 ($\Delta R^2 = 0.017$, $p = .062$).

Table 22
Summary of Hierarchical Regression Analysis for Variables Predicting Melodic Contour

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	ΔR^2	ΔF	df	Sig. ΔF
1	.690	.476	.469	.87454	.476	77.094	1, 85	.001
2	.736	.541	.530	.82295	.066	11.991	1, 84	.001
3	.738	.545	.528	.82464	.004	.657	1, 83	.420
4	.745	.555	.534	.81985	.011	1.973	1, 82	.164
5	.758	.574	.548	.80700	.019	3.631	1, 81	.060
6	.766	.587	.556	.80002	.012	2.419	1, 80	.124
7	.777	.603	.568	.78887	.016	3.279	1, 79	.074
8	.788	.621	.582	.77631	.017	3.576	1, 78	.062

Model 1. Predictors: Classical
Model 2. Predictors: Classical, Rock
Model 3. Predictors: Classical, Rock, Fast Tempi
Model 4. Predictors: Classical, Rock, Fast Tempi, Rhythm & Blues
Model 5. Predictors: Classical, Rock, Fast Tempi, Rhythm & Blues, Jazz
Model 6. Predictors: Classical, Rock, Fast Tempi, Rhythm & Blues, Jazz, Athletic Competence
Model 7. Predictors: Classical, Rock, Fast Tempi, Rhythm & Blues, Jazz, Athletic Competence, Asian American
Model 8. Predictors: Classical, Rock, Fast Tempi, Rhythm & Blues, Jazz, Athletic Competence, Asian American, Physical Appearance

Analyses of Variance (ANOVA) were conducted to determine whether the eight predictors within the overall model significantly predicted melodic contour. Results of the ANOVA are presented in Table 23. Based on the ANOVA results, all of the models were significant in the prediction of participants' selective attention to melodic contour accounting for 62.1% of the variance ($p \leq .001$). However, classical music and rock music were found to be the best predictors of melodic contour as revealed by the

hierarchical regression analysis, providing a combined contribution to the variance of 54.1% (see Table 22).

Table 23
Analysis of Variance for Melodic Contour Multiple Regression Models

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	58.963	1	58.963	77.094	≤ .001
	Residual	65.009	85	.765		
	Total	123.972	86			
2	Regression	67.083	2	33.542	49.527	≤ .001
	Residual	56.889	84	.677		
	Total	123.972	86			
3	Regression	67.530	3	22.510	33.102	≤ .001
	Residual	56.442	83	.680		
	Total	123.972	86			
4	Regression	68.856	4	17.214	25.610	≤ .001
	Residual	55.116	82	.672		
	Total	123.972	86			
5	Regression	71.221	5	14.244	21.872	≤ .001
	Residual	52.751	81	.651		
	Total	123.972	86			
6	Regression	72.769	6	12.128	18.949	≤ .001
	Residual	51.203	80	.640		
	Total	123.972	86			
7	Regression	74.809	7	10.687	17.173	≤ .001
	Residual	49.163	79	.622		
	Total	123.972	86			
8	Regression	76.964	8	9.621	15.963	≤ .001
	Residual	47.008	78	.603		
	Total	123.972	86			

Model 1. Predictors: Classical
Model 2. Predictors: Classical, Rock
Model 3. Predictors: Classical, Rock, Fast Tempi
Model 4. Predictors: Classical, Rock, Fast Tempi, Rhythm & Blues
Model 5. Predictors: Classical, Rock, Fast Tempi, Rhythm & Blues, Jazz
Model 6. Predictors: Classical, Rock, Fast Tempi, Rhythm & Blues, Jazz, Athletic Competence
Model 7. Predictors: Classical, Rock, Fast Tempi, Rhythm & Blues, Jazz, Athletic Competence, Asian American
Model 8. Predictors: Classical, Rock, Fast Tempi, Rhythm & Blues, Jazz, Athletic Competence, Asian American, Physical Appearance

Timbre

A Full regression analyses was performed to determine which eight predictor variables were the best predictors for timbre. Additionally, a hierarchical regression analysis was completed using the eight predictor variables to examine the degree of interaction between the eight predictor variables contributing to participants' selective attention to timbre.

Full regression analysis for timbre. Results for the full regression analysis for timbre are presented in Table 24. The eight variables selected as the best predictors for timbre were African American (β = -.096), American Indian (β = -.099), White (β = -.110), fast tempi (β = .346), rock music (β = .180), rhythm and blues music (β = .113), jazz music (β = .180), and job competence (β = -.112) (see highlighted variables in Table 24). Because ethnicity was binary coded, ethnicity data for Asian American, African American, American Indian, White [Non-Hispanic], and Other were examined for their relationship to the Hispanic or Latino ethnicity (omitted from the regression analysis). As a result, African American (β = -.096, t = -.989, p = .326), American Indian (β = -.099, t = -1.080, p = .284), and White (β = -.110, t = -1.134, p = .261) provided information relating each ethnicity to the Hispanic or Latino ethnicity.

Of the variables suggested by the researcher to be possible predictors of timbre, slow tempi were excluded from the Model (see Table 25). Slow tempi did not indicate a significant t value (t = 1.767, p = .082) and demonstrated a low partial correlation (r = .216).

Table 24
Summary of Full Regression Analysis for Variables Predicting Timbre

Model	Predictor	B	*SE*	*β*	*t*	Sig.
		Timbre (21, 65)				
1	Female	.038	.170	.019	.222	.825
	Asian American	-.118	.404	-.025	-.293	.770
	African American	-.218	.221	-.096	-.989	.326
	American Indian	-.386	.357	-.099	-1.080	.284
	Other	-.238	.334	-.061	-.713	.479
	White	-.232	.205	-.110	-1.134	.261
	Fast Tempi	.380	.267	.346	1.421	.160
	Classical	.083	.128	.089	.654	.515
	Rock	.181	.149	.180	1.215	.229
	Rhythm & Blues	.121	.136	.113	.894	.375
	Jazz	.147	.094	.180	1.567	.122
	Scholastic Competence	.066	.125	.052	.529	.598
	Social Acceptance	.083	.132	.062	.633	.529
	Athletic Competence	-.058	.099	-.052	-.584	.562
	Physical Appearance	.035	.094	.031	.367	.715
	Job Competence	-.158	.107	-.122	-1.483	.143
	Romantic Appeal	.008	.124	.006	.068	.946
	Behavioral Conduct	.100	.106	.092	.944	.348
	Close Friendship	-.020	.123	-.015	-.159	.874
	Global Self-Worth	.005	.135	.003	.035	.972
	Music Background	-.004	.010	-.033	-.374	.709

Table 25
Excluded Variable for Full Regression Predicting Timbre

Model	Predictor	Beta In	*t*	Sig.	Partial Correlation	Collinearity Tolerance
1	Slow Tempi	25.115	1.767	.082	.216	0.0000245

Hierarchical regression analysis for timbre. Results of the hierarchical regression analysis for timbre are presented in Table 26. The first variable entered in the regression analysis was fast tempi. Model 1 included fast tempi and predicted 60.4% of the variance in participants' selective attention to timbre and revealed a significant difference from Model 1 ($\Delta R^2 = 0.604$, $p \leq .001$). Model 2, with the addition of rock music, predicted 61.0% of the variance in participants' selective attention to timbre and

revealed no significant difference from Model 1 ($\Delta R^2 = 0.006$, $p = .273$). Model 3, with the addition of jazz music, predicted 62.0% of the variance in participants' selective attention to timbre and revealed no significant difference from Model 2 ($\Delta R^2 = 0.010$, $p = .136$). Model 4, with the addition of job competence, predicted 63.4% of the variance in participants' selective attention to timbre and revealed no significant difference from Model 3 ($\Delta R^2 = 0.013$, $p = .090$). Model 5, with the addition of rhythm and blues music, predicted 63.7% of the variance in participants' selective attention to timbre and revealed no significant difference from Model 4 ($\Delta R^2 = 0.004$, $p = .372$). Model 6, with the addition of athletic competence, predicted 63.8% of the variance in participants' selective attention to timbre and revealed no significant difference Model 5 ($\Delta R^2 = 0.000$, $p = .772$). Model 7, with the addition of the Asian American ethnicity predicted 64.1% of the variance in participants' selective attention to timbre and revealed no significant difference from Model 6 ($\Delta R^2 = 0.003$, $p = .403$). Model 8, with the addition of physical appearance, predicted 64.4% of the variance in participants' selective attention to timbre and revealed no significant difference from Model 7 ($\Delta R^2 = 0.003$, $p = .414$).

Analyses of Variance (ANOVA) were conducted to determine whether the eight predictors within the overall model significantly predicted timbre. Results of the ANOVA are presented in Table 27. Based on the ANOVA results, all of the models were significant in the prediction of participants' selective attention to timbre accounting for 64.4% of the variance ($p \leq .001$). However, fast tempi were found to be the best predictor of timbre as revealed by the hierarchical regression analysis, providing a combined contribution to the variance of 60.4% (see Table 26).

Table 26

Summary of Hierarchical Regression Analysis for Variables Predicting Timbre

Model	R	R^2 Square	Adjusted R^2	Std. Error of the Estimate	ΔR^2	ΔF	df	Sig. ΔF
1	.777	.604	.600	.62643	.604	129.857	1, 85	.001
2	.781	.610	.601	.62562	.006	1.219	1, 84	.273
3	.788	.620	.607	.62095	.010	2.270	1, 83	.136
4	.796	.634	.616	.61381	.013	2.942	1, 82	.090
5	.798	.637	.615	.61454	.004	.806	1, 81	.372
6	.798	.638	.610	.61804	.000	.084	1, 80	.772
7	.800	.641	.609	.61918	.003	.707	1, 79	.403
8	.802	.644	.607	.62046	.003	.675	1, 78	.414

Model 1. Predictors: Fast Tempi
Model 2. Predictors: Fast Tempi, Rock
Model 3. Predictors: Fast Tempi, Rock, Jazz
Model 4. Predictors: Fast Tempi, Rock, Jazz, Job Competence
Model 5. Predictors: Fast Tempi, Rock, Jazz, Job Competence, Rhythm & Blues
Model 6. Predictors: Fast Tempi, Rock, Jazz, Job Competence, Rhythm & Blues, White
Model 7. Predictors: Fast Tempi, Rock, Jazz, Job Competence, Rhythm & Blues, White, American Indian
Model 8. Predictors: Fast Tempi, Rock, Jazz, Job Competence, Rhythm & Blues, White, American Indian, African American

Table 27
Analysis of Variance for Timbre Multiple Regression Models

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	50.958	1	50.958	129.857	≤ .001
	Residual	33.355	85	.392		
	Total	84.313	86			
2	Regression	51.435	2	25.718	65.706	≤ .001
	Residual	32.878	84	.391		
	Total	84.313	86			
3	Regression	52.311	3	17.437	45.223	≤ .001
	Residual	32.003	83	.386		
	Total	84.313	86			
4	Regression	53.419	4	13.355	35.446	≤ .001
	Residual	30.894	82	.377		
	Total	84.313	86			
5	Regression	53.723	5	10.745	28.451	≤ .001
	Residual	30.590	81	.378		
	Total	84.313	86			
6	Regression	53.756	6	8.959	23.455	≤ .001
	Residual	30.558	80	.382		
	Total	84.313	86			
7	Regression	54.026	7	7.718	20.132	≤ .001
	Residual	30.287	79	.383		
	Total	84.313	86			
8	Regression	54.286	8	6.786	17.627	≤ .001
	Residual	30.027	78	.385		
	Total	84.313	86			

Model 1. Predictors: Fast Tempi
Model 2. Predictors: Fast Tempi, Rock
Model 3. Predictors: Fast Tempi, Rock, Jazz
Model 4. Predictors: Fast Tempi, Rock, Jazz, Job Competence
Model 5. Predictors: Fast Tempi, Rock, Jazz, Job Competence, Rhythm & Blues
Model 6. Predictors: Fast Tempi, Rock, Jazz, Job Competence, Rhythm & Blues, White
Model 7. Predictors: Fast Tempi, Rock, Jazz, Job Competence, Rhythm & Blues, White, American Indian
Model 8. Predictors: Fast Tempi, Rock, Jazz, Job Competence, Rhythm & Blues, White, American Indian, African American

Rhythm

A full regression analysis was performed to determine which eight predictor variables were the best predictors for rhythm. Additionally, a hierarchical regression analysis was completed using the eight predictor variables to examine the degree of interaction between the eight predictor variables contributing to participants' selective attention to rhythm.

Full regression analysis for rhythm. Results for the full regression analysis predicting rhythm are presented in Table 28. The eight variables selected as the best predictors for rhythm were other ethnicities (β = .079), fast tempi (β = -.376), classical music (β = .250), rock music (β = .333), rhythm and blues music (β = .360), Jazz (β = .525), athletic competence (β = -.067), and job competence (β = .114) (see highlighted variables in Table 28). Since ethnicity was binary coded, data for other ethnicities were analyzed for their relationship to the Hispanic or Latino ethnicity (omitted from the regression analysis). As a result, other ethnicities (β = .079, t = 1.211, p = .230) provided information relating Asian American to the Hispanic or Latino ethnicity.

Of the variables suggested by the researcher to be possible predictors of rhythm, slow tempi were excluded from the Model (see Table 29). Slow tempi did not indicate a significant t value (t = 8.08, p = .746) and demonstrated a low partial correlation (r = .533).

Table 28
Summary of Full Regression Analysis for Variables Predicting Rhythm

Model	Predictor	B	*SE*	*β*	*t*	Sig.
		Rhythm (21, 65)				
1	Female	-.100	.138	-.047	-.723	.472
	Asian American	-.293	.328	-.058	-.893	.375
	African American	.160	.179	.066	.891	.376
	American Indian	.118	.290	.028	.405	.687
	Other	.328	.271	.079	1.211	.230
	White	.084	.166	.037	.505	.615
	Fast Tempi	-.442	.217	-.376	-2.033	.046
	Classical	.251	.104	.250	2.424	.018
	Rock	.356	.121	.333	2.948	.004
	Rhythm & Blues	.415	.110	.360	3.760	.001
	Jazz	.458	.076	.525	6.024	.001
	Scholastic Competence	.090	.101	.066	.891	.376
	Social Acceptance	-.054	.107	-.038	-.506	.615
	Athletic Competence	-.079	.081	-.067	-.980	.331
	Physical Appearance	.070	.077	.059	.920	.361
	Job Competence	.157	.087	.114	1.819	.074
	Romantic Appeal	.026	.101	.019	.261	.795
	Behavioral Conduct	-.077	.086	-.066	-.890	.377
	Close Friendship	.066	.100	.049	.661	.511
	Global Self-Worth	-.023	.109	-.016	-.213	.832
	Music Background	-.003	.008	-.022	-.329	.743

Table 29
Excluded Variable for Full Regression Predicting Rhythm

Model	Predictor	Beta In	*t*	Sig.	Partial Correlation	Collinearity Tolerance
1	Slow Tempi	8.99	8.08	.746	.533	0.0000245

Hierarchical regression analysis for rhythm. Results of the hierarchical regression analysis for rhythm are presented in Table 30. The first variable entered in the regression analysis was jazz music. Model 1 included jazz music and predicted 58.1% of the variance in participants' selective attention to rhythm and revealed a significant difference from Model 1 ($\Delta R^2 = 0.581$, $p \leq .001$). Model 2, with the addition of fast tempi, predicted 65.7% of the variance in participants' selective attention to Rhythm and

revealed a significant difference from Model 1 ($\Delta R^2 = 0.076$, $p \leq .001$). Model 3, with the addition of rhythm and blues music, predicted 70.6% of the variance in participants' selective attention to rhythm and revealed a significant difference from Model 2 ($\Delta R^2 = 0.049$, $p \leq .001$). Model 4, with the addition of rock music, predicted 76.4% of the variance in participants' selective attention to rhythm and revealed a significant difference from Model 4 ($\Delta R^2 = 0.058$, $p \leq .001$). Model 5, with the addition of classical music, predicted 77.6% of the variance in participants' selective attention to rhythm and revealed a significant difference from Model 4 ($\Delta R^2 = 0.013$, $p = .035$). Model 6, with the addition of job competence, predicted 78.6% of the variance in participants' selective attention to rhythm and revealed no significant difference from Model 5 ($\Delta R^2 = 0.010$, $p = .053$). Model 7, with the addition of other ethnicities, predicted 79.0% of the variance in participants' selective attention to rhythm and revealed no significant difference from Model 6 ($\Delta R^2 = 0.004$, $p = .230$). Model 8, with the addition of athletic competence, predicted 79.2% of the variance in participants' selective attention to rhythm and revealed no significant difference for Model 7 ($\Delta R^2 = 0.002$, $p = .398$).

Analyses of Variance (ANOVA) were conducted to determine whether the eight predictors within the overall model significantly predicted rhythm. Results of the ANOVA are reported in Table 31. Based on the ANOVA results, all of the models were significant in the prediction of participants' selective attention to rhythm accounting for 79.2% of the variance ($p \leq .001$). However, classical music, rock music, rhythm and blues music, jazz music, and fast tempi were found to be the best predictors of rhythm as

revealed by hierarchical regression analysis providing a combined contribution to the variance of 77.6% (see Table 30).

Table 30
Summary of Hierarchical Regression Analysis for Variables Predicting Rhythm

Model	R	R^2 Square	Adjusted R^2	Std. Error of the Estimate	ΔR^2	ΔF	df	Sig. ΔF
1	.762	.581	.576	.68890	.581	117.722	1, 85	.001
2	.810	.657	.648	.62709	.076	18.582	1, 84	.001
3	.840	.706	.695	.58414	.049	13.809	1, 83	.001
4	.874	.764	.752	.52674	.058	20.072	1, 82	.001
5	.881	.776	.762	.51563	.013	4.574	1, 81	.035
6	.887	.786	.770	.50680	.010	3.847	1, 80	.053
7	.889	.790	.772	.50534	.004	1.463	1, 79	.230
8	.890	.792	.771	.50623	.002	.722	1, 78	.398

Model 1. Predictors: Jazz
Model 2. Predictors: Jazz, Fast Tempi
Model 3. Predictors: Jazz, Fast Tempi, Rhythm & Blues
Model 4. Predictors: Jazz, Fast Tempi, Rhythm & Blues, Rock
Model 5. Predictors: Jazz, Fast Tempi, Rhythm & Blues, Rock, Classical
Model 6. Predictors: Jazz, Fast Tempi, Rhythm & Blues, Rock, Classical, Job Competence
Model 7. Predictors: Jazz, Fast Tempi, Rhythm & Blues, Rock, Classical, Job Competence, Other
Model 8. Predictors: Jazz, Fast Tempi, Rhythm & Blues, Rock, Classical, Job Competence, Other, Athletic Competence

Table 31
Analysis of Variance for Rhythm Multiple Regression Models

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	55.869	1	55.869	117.722	≤ .001
	Residual	40.340	85	.475		
	Total	96.209	86			
2	Regression	63.177	2	31.588	80.327	≤ .001
	Residual	33.033	84	.393		
	Total	96.209	86			
3	Regression	67.888	3	22.629	66.320	≤ .001
	Residual	28.321	83	.341		
	Total	96.209	86			
4	Regression	73.457	4	18.364	66.188	≤ .001
	Residual	22.752	82	.277		
	Total	96.209	86			
5	Regression	74.674	5	14.935	56.173	≤ .001
	Residual	21.536	81	.266		
	Total	96.209	86			
6	Regression	75.662	6	12.610	49.097	≤ .001
	Residual	20.547	80	.257		
	Total	96.209	86			
7	Regression	76.035	7	10.862	42.536	≤ .001
	Residual	20.174	79	.255		
	Total	96.209	86			
8	Regression	76.221	8	9.528	37.179	≤ .001
	Residual	19.989	78	.256		
	Total	96.209	86			

Model 1. Predictors: Jazz
Model 2. Predictors: Jazz, Fast Tempi
Model 3. Predictors: Jazz, Fast Tempi, Rhythm & Blues
Model 4. Predictors: Jazz, Fast Tempi, Rhythm & Blues, Rock
Model 5. Predictors: Jazz, Fast Tempi, Rhythm & Blues, Rock, Classical
Model 6. Predictors: Jazz, Fast Tempi, Rhythm & Blues, Rock, Classical, Job Competence
Model 7. Predictors: Jazz, Fast Tempi, Rhythm & Blues, Rock, Classical, Job Competence, Other
Model 8. Predictors: Jazz, Fast Tempi, Rhythm & Blues, Rock, Classical, Job Competence, Other, Athletic Competence

Tempo

A full regression analyses was performed to determine which eight predictor variables were the best predictors for tempo. A hierarchical regression analysis was also completed using the eight predictor variables to examine the degree of interaction between the eight predictor variables contributing to participants' selective attention to tempo.

Full regression analysis for tempo. Results for the full regression analysis predicting tempo are presented in Table 32. The eight variables selected as the best predictors for tempo were female (β = .125), Asian American (β = -.102), fast tempi (β = .344), classical music (β = .131), rhythm and blues music (β = .142), jazz music (β = .204), athletic competence (β = -.093), and job competence (β = -.090) (see highlighted variables in Table 32). Since gender was binary coded, the data for gender was examined for its relationship to the male gender (omitted from the regression analysis). As a result, female (β = .125, t = 1.560, p = .124) provided information relating the female gender to the male gender.

Of the variables suggested by the researcher to be possible predictors of tempo, slow tempi were excluded from the Model (see Table 33). Slow tempi did not indicate a significant t value (t = -1.952, p = .885) and demonstrated a low partial correlation (r = -.018).

Table 32
Summary of Full Regression Analysis for Variables Predicting Tempo

Model	Predictor	B	*SE*	*β*	*t*	Sig.
		Tempo (21, 65)				
1	Female	.281	.180	.125	1.560	.124
	Asian American	-.548	.428	-.102	-1.280	.205
	African American	-.116	.234	-.045	-.497	.621
	American Indian	.217	.378	.049	.575	.567
	Other	-.351	.354	-.079	-.992	.325
	White	.018	.217	.007	.081	.936
	Fast Tempi	.432	.283	.344	1.525	.132
	Classical	.141	.135	.131	1.044	.300
	Rock	.058	.157	.051	.371	.712
	Rhythm & Blues	.175	.144	.142	1.215	.229
	Jazz	.190	.099	.204	1.920	.059
	Scholastic Competence	-.079	.132	-.054	-.596	.553
	Social Acceptance	-.012	.139	-.008	-.084	.933
	Athletic Competence	-.118	.105	-.093	-1.120	.267
	Physical Appearance	.060	.100	.047	.597	.552
	Job Competence	-.134	.113	-.090	-1.187	.239
	Romantic Appeal	-.019	.132	-.012	-.143	.887
	Behavioral Conduct	-.004	.113	-.003	-.034	.973
	Close Friendship	.006	.131	.004	.044	.965
	Global Self-Worth	.009	.143	.006	.064	.949
	Music Background	.010	.011	.077	.947	.347

Table 33
Excluded Variable for Full Regression Predicting Tempo

Model	Predictor	Beta In	*t*	Sig.	Partial Correlation	Collinearity Tolerance
1	Slow Tempi	-1.952	-.145	.885	-.018	.0000245

Hierarchical regression analysis for tempo. Results of the hierarchical regression analysis for tempo are presented in Table 34. The first variable entered in the regression analysis was fast tempi. Model 1 included fast tempi and predicted 63.2% of the variance in participants' selective attention to tempo ($\Delta R^2 = 0.632$, $p \leq .001$). Model 2, with the addition of Jazz, predicted 65.3% of the variance in participants' selective attention to tempo and revealed a significant difference from Model 1 ($\Delta R^2 = 0.021$, $p = .026$). Model

3, with the addition of rhythm and blues music predicted 65.8% of the variance in participants' selective attention to tempo and did not revealed a significant difference from Model 2 ($\Delta R^2 = 0.005$, $p = .256$). Model 4, with the addition of classical music, predicted 66.6% of the variance in participants' selective attention to tempo and did not revealed a significant difference from Model 3 ($\Delta R^2 = 0.008$, $p = .165$). Model 5, with the addition of the female gender, predicted 67.7% of the variance in participants' selective attention to tempo and did not revealed a significant difference from Model 4 ($\Delta R^2 = 0.011$, $p = .102$). Model 6, with the addition of the Asian American ethnicity predicted 67.8% of the variance in participants' selective attention to tempo and did not revealed a significant difference from Model 5 ($\Delta R^2 = 0.001$, $p = .615$). Model 7, with the addition of athletic competence, predicted 68.7% of the variance in participants' selective attention to tempo and did not revealed a significant difference from Model 6 ($\Delta R^2 = 0.009$, $p = .130$). Model 8, with the addition of job competence, predicted 69.1% of the variance in participants' selective attention to tempo and did not revealed a significant difference from Model 7 ($\Delta R^2 = 0.004$, $p = .319$).

Analyses of Variance (ANOVA) were conducted to determine whether the eight predictors within the overall model significantly predicted tempo. Results of the ANOVA are presented in Table 35. Based on the ANOVA results, all of the models were significant in the prediction of participants' selective attention to tempo accounting for 69.1% of the variance ($p \leq .001$). However, fast tempi and jazz music were found to be the best predictors of tempo as revealed by the hierarchical regression analysis, providing a combined contribution to the variance of 65.3% (see Table 34).

Table 34

Summary of Hierarchical Regression Analysis for Variables Predicting Tempo

Model	R	R^2 Square	Adjusted R^2	Std. Error of the Estimate	ΔR^2	ΔF	df	Sig. ΔF
1	.795	.632	.627	.69075	.632	145.800	1, 85	.001
2	.808	.653	.645	.67457	.021	5.127	1, 84	.026
3	.811	.658	.646	.67334	.005	1.308	1, 83	.256
4	.816	.666	.650	.66946	.008	1.965	1, 82	.165
5	.823	.677	.657	.66247	.011	2.738	1, 81	.102
6	.824	.678	.654	.66554	.001	.255	1, 80	.615
7	.829	.687	.660	.66005	.009	2.337	1, 79	.130
8	.832	.691	.660	.66002	.004	1.007	1, 78	.319

Model 1. Predictors: Fast Tempi
Model 2. Predictors: Fast Tempi, Jazz
Model 3. Predictors: Fast Tempi, Jazz, Rhythm & Blues
Model 4. Predictors: Fast Tempi, Jazz, Rhythm & Blues, Classical
Model 5. Predictors: Fast Tempi, Jazz, Rhythm & Blues, Classical, Female
Model 6. Predictors: Fast Tempi, Jazz, Rhythm & Blues, Classical, Female, Asian American
Model 7. Predictors: Fast Tempi, Jazz, Rhythm & Blues, Classical, Female, Asian American, Athletic Competence
Model 8. Predictors: Fast Tempi, Jazz, Rhythm & Blues, Classical, Female, Asian American, Athletic Competence, Job Competence

Table 35
Analysis of Variance for Tempo Multiple Regression Models

Model		Sum of Squares	*df*	Mean Square	*F*	Sig.
1	Regression	69.566	1	69.566	145.800	≤ .001
	Residual	40.556	85	.477		
	Total	110.122	86			
2	Regression	71.899	2	35.949	79.002	≤ .001
	Residual	38.223	84	.455		
	Total	110.122	86			
3	Regression	72.492	3	24.164	53.297	≤ .001
	Residual	37.631	83	.453		
	Total	110.122	86			
4	Regression	73.372	4	18.343	40.928	≤ .001
	Residual	36.750	82	.448		
	Total	110.122	86			
5	Regression	74.574	5	14.915	33.984	≤ .001
	Residual	35.548	81	.439		
	Total	110.122	86			
6	Regression	74.687	6	12.448	28.102	≤ .001
	Residual	35.436	80	.443		
	Total	110.122	86			
7	Regression	75.705	7	10.815	24.824	≤ .001
	Residual	34.417	79	.436		
	Total	96.209	86			
8	Regression	76.143	8	9.518	21.849	≤ .001
	Residual	33.979	78	.436		
	Total	110.122	86			

Model 1. Predictors: Fast Tempi
Model 2. Predictors: Fast Tempi, Jazz
Model 3. Predictors: Fast Tempi, Jazz, Rhythm & Blues
Model 4. Predictors: Fast Tempi, Jazz, Rhythm & Blues, Classical
Model 5. Predictors: Fast Tempi, Jazz, Rhythm & Blues, Classical, Female
Model 6. Predictors: Fast Tempi, Jazz, Rhythm & Blues, Classical, Female, Asian American
Model 7. Predictors: Fast Tempi, Jazz, Rhythm & Blues, Classical, Female, Asian American, Athletic Competence
Model 8. Predictors: Fast Tempi, Jazz, Rhythm & Blues, Classical, Female, Asian American,Athletic Competence, Job Competence

Summary of Results

The goal of the present study was to examine sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo). Two primary purposes were the foci of this study. The first purpose was to investigate whether significant differences ($p \leq .05$) existed among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) and as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and temporal difference (i.e., fast and slow). The second purpose of the study was to investigate the extent to which variables associated with demographics, self-perception, music background, music genre, and temporal difference significantly predicted ($p \leq .05$) sixth-grade participants' selective attention to music elements. The variables within the second purpose include: demographic variables (i.e., gender and ethnicity), self-perception variables (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth), music background (i.e., participants' in- and out-of-school music experiences), and variables associated with music genre and temporal difference that were examined in the first purpose.

Participants' selective attention to music elements was measured using the *Music Element Profile* that contained four music elements (i.e., melodic contour, rhythm, timbre, and tempo) for each music excerpt. Participants selected a numerical score of 1 to 7 to indicate their overall selective attention to each music element. Self-perception was measured using the *Self-Perception Profile for Adolescents* (Harter, 1988) and was used

is used to quantify participants' judgments of self-perceived competence across nine specific domains (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth). Music Background was assessed using the *Music Background Questionnaire II* was used to measure participants' instrumental and/or vocal music experiences, number of years played, years of private lessons, perception of the parents' music background, music listening practices, ensemble participation, musical equipment in the household, and attitudes toward music.

A three-way analysis of variance (ANOVA) with repeated measures was used to analyze effects among participants' selective attention to music elements and variables associated with music genre and temporal difference. Results revealed that sixth-grade participants rated rhythm ($M = 5.15$) significantly higher ($p \leq .01$) than melodic contour ($M = 4.74$), timbre ($M = 4.87$), or tempo ($M = 4.82$). The analysis also revealed that sixth-grade participants' rated rhythm and blues music ($M = 5.12$) significant higher than jazz music ($M = 4.83$; $p \leq .05$) or classical music ($M = 4.66$; $p \leq .01$); participants rated rock music ($M = 4.98$) significantly higher ($p \leq .01$) than classical music ($M = 4.66$). Sixth-grade participants did not rate fast tempi ($M = 4.94$) significantly differently ($p > .05$) than slow tempi ($M = 4.86$).

The three-way ANOVA with repeated measures also revealed significant two-way interaction effects among participants' selective attention to music elements as affected by variables associated with music genre and/or temporal difference. There were significant two-way interaction effects among participants' selective attention to music

elements as affected by variables associated with music genre (p = .006). Significant two-way interaction effects were found among participants' selective attention to music elements as affected by variables associated with temporal differences (p = .003). Significant two-way interaction effects were also found among participants' rating of variables associated with music genre by temporal difference (p = .000). However, no significant three-way interactions were found among participants' selective attention to music elements as affected by variables for music genre and by temporal difference ($p > .05$)

Through a series of full and hierarchical regression analyses, the extent to which variables associated with demographics (i.e., gender and ethnicity), self-perception (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth), music background, music genre (i.e., classical, rock, rhythm and blues, and jazz), and temporal difference (Fast and Slow) predicted sixth-grade participants' selective attention to music elements (i.e., melodic contour, rhythm, tempo, and timbre) were measured. Four full regression analyses were used to identify eight variables that best predicted each of the four music elements. Consequently, four hierarchical regression analyses were used to identify the extent to which interactions among variables predicted participants' selective attention to each music element.

Based on the full regression analyses for melodic contour, the eight variables found to be the best predictors of participants' selective attention to melodic contour were Asian American (β = .169), fast tempi (β = -.278), classical music (β = .459), rock music

(β = .334), rhythm and blues music (β = .219), jazz music (β = .207), athletic competence (β = .189), and physical appearance (β = -.112). Results of the hierarchical regression model revealed that classical music and rock music were the best predictors of participants' selective attention to melodic contour ($p < .001$).

Based on the full regression analyses for timbre, the eight variables found to be the best predictors of participants' selective attention to timbre were African American (β = -.096), American Indian (β = -.099), White (β = -.110), fast tempi (β = .346), rock music (β = .180), rhythm and blues music (β = .113), jazz music (β = .180), and job competence (β = -.112). Results of the hierarchical regression model revealed that fast tempi were the best predictor of selective attention to timbre ($p \leq .001$).

Based on the full regression analyses, the eight variables found to be the best predictors of participants' selective attention to rhythm were other ethnicities (β = .079), fast tempi (β = -.376), classical music (β = .250), rock music (β = .333), rhythm and blues music (β = .360), jazz music (β = .525), athletic competence (β = -.067), and job competence (β = .114). Results of the hierarchical regression model revealed that classical music, rock music, rhythm and blues music, jazz music, and fast tempi were the best predictors of rhythm ($p < .05$).

Based on the full regression analyses for *tempo*, the eight variables found to be the best predictors of participants' selective attention to tempo were female (β = .125), Asian American (β = -.102), fast tempi (β = .344), classical music (β = .131), rhythm and blues music (β = .142), jazz music (β = .204), athletic competence (β = -.093), and job

competence (β = -.090). The hierarchical regression model revealed that classical music and rock music were the best predictors of tempo ($p \leq .05$).

CHAPTER V

SUMMARY AND DISCUSSION

The goal of the present study was to examine sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo). Two primary purposes were the foci of this study. The first purpose was to investigate whether significant differences ($p \leq .05$) existed among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and by variables associated with temporal difference (i.e., fast and slow). The second purpose of the study was to investigate the extent to which variables associated with demographics, self-perception, music background, music genre, and temporal difference significantly predicted ($p \leq .05$) sixth-grade participants' selective attention to music elements. The variables within the second purpose include: demographic variables (i.e., gender and ethnicity), self-perception variables (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth), music background (i.e., participants' in- and out-of-school music experiences), and variables associated with music genre and temporal difference that were examined in the first purpose.

Participants consisted of 87 sixth-grade students from a suburban middle school within Fulton County Public Schools of Atlanta, Georgia. Three evaluation instruments

were used to assess participants' music backgrounds, preference for music elements, and self-perception: *Music Background Questionnaire II, Music Element Profile,* and *The Self-Perception Profile for Adolescents*. The Music Background Questionnaire II is a 25-item assessment that provided a profile of each participant's gender, ethnicity and music background. The assessment of music background included questions relating to instrumental and or vocal music experience, number of years played, and years of private lessons, parents' music background, listening practices, ensemble participation, musical equipment in the household, and attitudes toward music. The *Music Element Profile* was used to assess participants' overall level of selective attention to each music excerpt for the listening activity within the current study. The *Self-Perception Profile for Adolescents* was used to evaluate judgments of competence within nine specific domains: Scholastic Competence, Social Acceptance, Athletic Competence, Physical Appearance, Job Competence, Romantic Appeal, Behavioral Conduct, Close Friendship, and Global Self-Worth.

Two primary research questions were addressed in the present study.

1. Are there significant differences ($p < .05$) among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo), as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and temporal difference (i.e., fast and slow)?

2. To what extent do the following variables significantly predict ($p < .05$) sixth-grade participants' selective attention to melodic contour, timbre, rhythm, and tempo:
   a. ***Demographic Variables*** – gender and ethnicity,
   b. ***Self-Perception Variables*** – scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth,

c. ***Music Background*** – Composite Score from Music Background Questionnaire II,
d. ***Music Genre Variables*** – classical, rock, rhythm and blues, and jazz,
e. ***Temporal Difference Variables*** – fast and slow tempi?

Data collected for the present study were analyzed using both descriptive and inferential statistics. Seven null hypotheses were formulated and tested to address research question one. A three-way analysis of variance with repeated measures was used to test the seven null hypotheses of research question one. Four specific secondary questions were formulated to address research question two. In the present study, full and hierarchical regression analyses were used to answer the four secondary questions of research question two.

Summary of Research Question One

Seven null hypotheses were developed and tested ($p \leq .05$) to answer research question one. The data were analyzed using descriptive statistics; a 4 (music elements) X 4 (music genres) X 2 (temporal differences) factorial analysis of variance with repeated measures, and least square difference (LSD) post-hoc comparisons (i.e., as appropriate) were used to test the null hypotheses.

1. There are no significant differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo).

2. There are no significant differences ($p > .05$) among sixth grade participants' ratings of variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz).

3. There are no significant differences ($p > .05$) between sixth grade participants' ratings of variables associated with temporal difference (i.e., fast and slow).

4. There are no significant two-way interaction effect differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e.,

melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz).

5. There are no significant two-way interaction effect differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with temporal difference (i.e., fast and slow).

6. There are no significant two-way interaction effect differences ($p > .05$) among sixth grade participants' ratings of variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) by variables associated with temporal difference (i.e., fast and slow).

7. There are no significant three-way interaction effect differences ($p > .05$) among sixth grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and by variables associated with temporal difference (i.e., fast and slow).

Differences among Selective Attention to Music Elements

An analysis of means indicated that sixth-grade participants selectively attended to music elements in the following order: rhythm, timbre, tempo, and melodic contour (respectively). These findings were clarified by the results of the factorial analysis of variance with repeated measures, which indicated that participants' selectively attended to rhythm to a significantly greater degree ($p \leq .01$) than to melodic contour, timbre, and tempo. No significant differences ($p > .05$) were found among participants' selective attention to melodic contour, timbre, and tempo. Hence, when participants listened to music examples, rhythm received the highest level of attention among the four music elements. Based on the results of the present study, the researcher rejected the first null hypothesis of the first research question.

The findings within the present study differed from those by Madsen and Geringer (1990) who concluded that during focused attention, musicians attended in the

order of melody, then rhythm, then dynamics, and finally timbre. Nonmusic majors attended to dynamics, then melody, then timbre, then "everything," and finally rhythm. In a follow-up study, Madsen and Geringer (1996) found music majors demonstrated higher percentages of attention for timbre across all excerpts while nonmusic majors demonstrated higher percentages of attention for dynamics and melody across the music excerpts. Three elements were common among the present study and both studies by Madsen and Geringer (i.e., melody, rhythm, and timbre). The difference between Madsen and Geringer's (1990, 1996) results and those of the present study may be a product of differences in the developmental levels of the two populations: college-aged students vs. sixth-grade students. Differences among research results also may be due to the use of selective attention within the present study and focused attention in Madsen and Geringer (1990, 1996). Differences among the results may also be attributed to differences between the processes of selective attention (i.e., a listener shifts attention among various elements to discern designated music elements) and focused attention (i.e., a listener directs attention toward only a single music element).

The results of the present study, however, support findings by Jones, Kidd, and Wetzel (1981) and Jones, Boltz, and Kidd (1982) regarding the idea that sixth-grade students attend to rhythm to a greater degree than to melodic contour, timbre or tempo when listening to music examples. Jones et al. (1981) used undergraduate students within three experiments to investigate the effect of temporal context (tempo and rhythm collectively designated "temporal context") on pitch context during the process of selective attention. The results of all three experiments indicated that rhythm significantly

($p < .05$) affected the accuracy of recognition and a significant interaction ($p < .05$) was exhibited between pitch distance and rhythm. Accordingly, the results of Jones et al. (1981) and Jones et al. (1982) imply that rhythmic context affects the accurate recognition of melodic sequences. Although, results are similar between both studies, a major difference occurs among participants. Jones et al. (1981) used undergraduates and the present study used sixth-grade students.

Overall, findings within the present study support the idea that sixth-grade students attend to rhythm to a greater degree than to melodic contour, timbre or tempo when listening to music examples. However, when considered in context with current mixed results in the literature, more investigations are recommended to affirm rhythm as a music element receiving sixth graders' primary attention.

Differences among Ratings for Music Genres

An analysis of means indicated that sixth-grade participants while selective attending to music elements rated variables associated with genres in the following order: rhythm and blues highest, followed by classical music, rock music, and jazz music. These findings were clarified by the results of the factorial analysis of variance with repeated measures, which indicated that participants' rated rhythm and blues music significantly higher ($p \leq .05$) than classical music or jazz music. Participants also rated rock music significantly higher ($p \leq .001$) than classical music. No significant differences ($p > .05$) were found between participants' ratings of rhythm and blues and rock music, rock and jazz music, or jazz and classical music. Based on the results of the present study, the researcher rejected the second null hypothesis of the first research question.

The results of the present study were similar to those found by LeBlanc (1981). LeBlanc (1981) concluded that participants' preference ratings for genre (style) were in the respective order of rock/pop, then country, then band, then new jazz, then old jazz, and then art music (classical). In another study by LeBlanc et al. (1996) using a sample that included first graders to senior citizens, preference ratings for music genres received the following order: rock, then jazz, and then art music (classical). Ratings for all three genres were found to be consistent among all age groups. Rock, jazz, and classical were common among the present study, LeBlanc (1981) and Leblanc et al (1996), however, the music genre of rhythm and blues music was not a variable in the LeBlanc (1981) or Leblanc et al. (1996) studies; and participants in the present study demonstrated a highly significant high degree of attention to rhythm and blues.

The results of the present study were also similar to those found by Christenson and Peterson (1988), who concluded that among undergraduate students preference ratings for music genres were in the order of mainstream pop, 70's rock, 80's rock, 60's rock, rhythm and blues, older new wave, motown, 50's rock, art rock, jazz, southern rock, classical, reggae, psychedelic rock, soul, jazz fusion, folk, post-new wave, blues, 70's funk, country pop, late 70's disco, heavy metal, Christian rock, hardcore punk, and black gospel. The major difference between findings in the present study and those of Christenson and Peterson (1988) was in the presents study, participants rated rhythm and blues music higher than rock music. This difference may be attributed to the consolidation of music genres with the present study (i.e., rock = 50's, 60's, 70's, 80's, art, southern, and psychedelic rock, heavy metal, and hardcore punk; rhythm and blues =

rhythm and blues, motown, soul, 70's funk, and blues). This difference also may be attributed to the number of music genres that are considered mainstream pop (i.e., rock, rhythm and blues, and jazz).

No previous studies were found that specifically addressed sixth-grade students' ratings for variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz). The difference between the results of LeBlanc's (1981) and the present study may be in the omissions of the rhythm and blues music as a music genre and the inclusion of country music as a music genre of interest. The difference between results of Christenson and Peterson (1988) and the present study may be a product of differences among the combination of music genres used in both studies.

Findings from the present study provide initial support for the idea that sixth-grade students, when selectively attending to music elements, exhibit a higher degree of attention to rhythm and blues music than to classical music, rock music, or jazz music. The findings also provide support for the idea that when sixth-grade students selectively attending to music elements, their level of attention to rhythm and blues music is significantly different from levels of attention to jazz music and classical. Additionally, the findings of the present study provide support for the idea that sixth-grade students' level of attention to rock music is significantly different from their level of attention to classical music. However, more investigations need to be conducted to substantiate these claims.

Differences between Ratings for Temporal Difference

An analysis of means indicated that sixth-grade participants, while selectively attending to music elements, rated temporal differences in the following order: fast tempi highest followed by slow tempi. These findings were clarified by the results of the factorial analysis of variance with repeated measures in which participants did not rate fast tempi significantly differently ($p > .05$) than they rated slow tempi. Based on the results of the present study, the researcher failed to reject the third null hypothesis of the first research question.

The results of the present study were similar to LeBlanc and Cote (1983) who found that from free response comments 30% of participants were about slow tempos and 93% of these respondents reported a lack of preference for slowness in tempo. Results of the present study differed from those of LeBlanc and McCrary (1983) who found a significant positive relationship between tempo and preference ratings ($r_s = .78$, $p < .01$).

Results of the present study did not have a significant difference between slow and fast slow tempi. However, LeBlanc and McCrary (1983) found a significant positive relationship between tempo and preference ratings. The difference between the results of the present study and those of LeBlanc and McCrary (1983) may be attributed to LeBlanc and McCrary's use of four levels of tempi (slow, moderately slow, moderately fast, and fast) whereas the present study used two levels of tempi (slow and fast). The present study along with previous studies provides support for the idea that sixth-grade students exhibit higher levels of preference for fast tempi over slow tempi, though not

significantly so. More investigation needs to be conducted to provide conclusive evidence regarding differences between participants' ratings of slow and fast tempi.

Differences among Selective Attention to Music Elements as Affected by Music Genre

An analysis of means among music elements as affected by variables associated with music genre indicated that sixth-grade participants' highest-rated condition occurred when selectively attending to rhythm while listening to rhythm and blues music. Conversely, participants' lowest-rated condition occurred when selectively attending to tempo while listening to classical music.

These findings were clarified by the results of the factorial analysis of variance with repeated measures. The results indicated a significant interaction ($p = .006$) among participants' selective attention to music elements while listening to variables associated with music genre. When listening to rock music, participants attended to rhythm to a significantly greater degree ($p \leq .01$) than to melodic contour, timbre, or tempo. When listening to rhythm and blues music, participants attended to rhythm to a significantly greater degree ($p \leq .01$) than to tempo, timbre, or melodic contour (respective order). When listening to jazz music, participant's attended to rhythm to a significantly greater degree ($p \leq .05$) than to timbre, melodic contour, or tempo (respective order). Based on the results of the present study, the researcher rejected the fourth null hypothesis of the first research question.

Figure 2 presents interaction effects and differences among music elements and music genres. When participants selectively attended to the condition of classical music, all music elements functioned closely as a group. This result is consistent with the finding

whereas, no significant differences ($p > .05$) were found among the music elements when participants listened to classical music. The mean difference (.36) between timbre (M = 4.83, highest) and tempo (M = 4.47, lowest) demonstrate a moderate grouping effect among participants selective attention to music elements when listening to classical music (see Table 4).

When comparing conditions of classical music to those of rock music, rhythm and blues music, and jazz music, however, a significant difference is apparent among participants' selective attention to rhythm. When participants listened to rock, rhythm and blues, or jazz music, rhythm functioned independently of melodic contour, timbre, and tempo. This result is consistent with the finding whereas, when participants listened to rock music they selectively attend to rhythm to a significantly greater degree ($p \leq .01$) than they did to melodic contour, timbre, or tempo. Similarly, when listening to rhythm and blues or jazz, participants selectively attend to rhythm to a significantly greater degree ($p \leq .05$) than they did to melodic contour, timbre, or tempo.

Another interaction effect was found when comparing melodic contour and tempo across genres. There were no significant differences between participants' selective attention to melodic contour and tempo when listening to classical, rock or jazz music. When listening to rhythm and blues music, however, participants attended to tempo to a significantly greater degree than to melodic contour.

It is apparent that rhythm functions independently of the other music elements among the conditions of rock music, rhythm and blues music, and jazz music. This result is consistent with the significant differences ($p \leq .05$) that occur among rhythm and the

other music elements (i.e., melodic contour, timbre and tempo) when participants listened to rock music, rhythm and blues music, and jazz music.

No studies were found that specifically addressed sixth-grade participants' selective attention to music elements as affected by variables associated with music genre (classical, jazz, rock, and rhythm and blues). Hence, findings from the present study provide initial support for the idea that when sixth-grade students listen to rock, rhythm and blues, and jazz music, they selectively attend to rhythm at a significantly greater degree than to each of the other music elements. Further, the findings also suggest that sixth-grade students will exhibit significantly higher levels of attention to tempo than to melodic contour when listening to rhythm and blues. However, more investigations need to be conducted to substantiate these claims.

Differences among Selective Attention to Music Elements as Affected by Temporal Difference

An analysis of means for the selective attention to music elements as affected by variables associated with temporal difference indicated that rhythm was the highest-rated condition while sixth-grade participants listened to excerpts at fast tempi. Conversely, two of the lowest-rated conditions occurred when participants selectively attended to melodic contour while listening to excerpts at fast tempi and selectively attended to tempo at slow tempi. These findings were clarified by the results of the factorial analysis of variance with repeated measures. The results indicated a significant interaction (p = .003) among participants' selective attention to music elements while listening to variables associated with temporal difference. Further, results indicated that when

participants listened to music at fast tempi, they selectively attended to rhythm to a significantly greater degree ($p \leq .05$) than they did to tempo, timbre, or melodic contour (respective order). The results also indicated no significant differences ($p > .05$) among participants selective attention to rhythm, melodic contour, or timbre while listening to music at slow tempi; however, rhythm received significantly greater attention than did tempo when listening to excerpts at slow tempi. Based on the results of the present study, the researcher rejected the fifth null hypothesis of the first research question.

Figure 3 presents interaction effects and differences among music elements and with temporal difference conditions. A two-way interaction effect was found between sixth-grade participants' selective attention to melodic contour and rhythm while listening to music across fast tempi and slow tempi. At fast tempi, participants attended to rhythm to a significantly greater degree than they did to melodic contour; at slow tempi, however, no significant difference was found between attention to rhythm and attention to melodic contour. Another significant interaction effect was found between sixth-grade participants' selective attention to rhythm and timbre while listening to music across fast tempi and slow tempi. At fast tempi, participants attended to rhythm to a significantly greater degree than they did to timbre; at slow tempi, however, no significant difference was found between attention to rhythm and attention to timbre. Finally, a third significant interaction effect was found between sixth-grade participants' selective attention to timbre and tempo while listening to music across fast tempi and slow tempi. At fast tempi, participants attended to tempo to a greater degree than they did to timbre; at slow

tempi, however, participants attended to timbre to a greater degree than they did to tempo.

No studies were found that specifically addressed sixth-grade participants' selective attention to music elements as affected by variables associated with temporal difference. However, some experimental research found positive relationships between preference to tempo and music listening (Wapnick, 1980; LeBlanc, 198; LeBlanc and Cote, 1983; LeBlanc and McCrary, 1983; Sims, 1987). Findings from the present study suggest that when sixth-grade students listen to music at fast tempi, they are more likely to selectively attend to rhythm to a greater degree than to tempo, timbre, and melodic contour. Findings from the present study also provide initial support for the idea that when sixth-grade students listen to music at slow tempi, they are more likely to attend to rhythm than to tempo. When considering all two-way interaction effects, excerpts at slow tempi seem to minimize the primacy of rhythm and tempo, while enhancing attention afforded the pitch-oriented elements of melodic contour and timbre. Perhaps slow tempi allow listeners time needed to process the cognitive complexities indigenous to melodic contour and timbre. However, more investigations need to be conducted to substantiate these claims.

Differences among Ratings for Music Genre by Temporal Difference

An analysis of means among variables associated with music genre by temporal difference indicated that sixth-grade participants' highest-rated condition occurred while listening to rhythm and blues music presented at slow tempi. The lowest-rated condition occurred while participants listened to classical music at fast tempi. These findings were

clarified by the results of the factorial analysis of variance with repeated measures. The results indicated a significant interaction ($p = .006$) among participants' ratings for variables associated with music genre by temporal difference. Further, when participants listened to music at fast tempi, they rated rock music significantly higher ($p \leq .05$) than jazz music, rhythm and blues, and classical (respective order). When participants listen to music at fast tempi, jazz music was rated significantly higher ($p \leq .05$) than classical music. Alternatively, when participants' listened to music at slow tempi, rhythm and blues music was rated significantly higher ($p = .000$) than classical music, rock music, and jazz music.

Figure 4 presents interaction effects and differences among variables associated with music genre and temporal difference conditions. A significant difference is apparent between rock and all other variables associated with music genre within the fast tempi condition. This result is consistent with the significant difference that occurred when participants listened to music at fast tempi; rock music was rated significantly higher ($p \leq .05$) than jazz music, rhythm and blues music, or classical music (respective order). Rock music and classical music functions independently while jazz music and rhythm and blues exhibit a group effect within fast tempi condition.

A significant difference is apparent between rhythm and blues and all other music genres within the slow tempi condition. This result is consistent with the significant difference that occurred when participants' listened to music at slow tempi, rhythm and blues music was rated significantly higher ($p \leq .000$) than all of the other music elements. Rhythm and blues music functions independently while the classical music, jazz music,

and rock music function as a group within the condition of slow tempi. A significant effect is also apparent for rhythm and blues music between the fast tempi and slow tempi conditions. Based on the results of the present study, the researcher rejected the sixth null hypothesis of the first research question.

The results of the present study were similar to LeBlanc (1981) who found a significant two-way interaction ($p < .01$) among fifth-grade students' preferences for tempo by preference for the styles (genres) of new jazz music by art music (classical). However, no significant two-way interactions ($p > .05$) were found among fifth grade students preference for tempo by preference for genres (rock/pop by art music [classical], country by art music or older jazz by art music).

No previous studies were found that specifically addressed sixth-grade participants' ratings for variables associated with music genre by temporal difference. Findings from the present study suggest that when sixth-grade students listen to music at fast tempi, they are more likely to exhibit at greater degree of attention to rock than to jazz music, rhythm and blues music, or classical music (respective order). Findings from the present study also suggest that when sixth-grade students listen to music at fast tempi, they are more likely to exhibit a greater degree of attention to jazz music than to classical music. Further, the findings from the present study provides initial support for the idea that when sixth-grade students listen to music at a slow tempi, they are more likely exhibit a greater degree of attention to rhythm and blues music than to classical music, jazz music, or rock music (respective order). However, more investigations need to be conducted to substantiate these claims.

Differences among Music Elements as Affected by Music Genre by Temporal Difference

An analysis of means among selective attention to music elements as affected by variables associated with music genre and by temporal difference indicated that sixth-grade participants' highest-rated condition for melodic contour occurred while listening to rhythm and blues music at slow tempi. Participants' lowest-rated condition for melodic contour occurred while listening to rock music at slow tempi. Participants' highest-rated condition for timbre occurred while listening to rhythm and blues music at slow tempi and the lowest-rated condition occurred while listening to rhythm and blues music at fast tempi. Participants' highest-rated condition for rhythm occurred while listening to rock music at a fast tempo and the lowest-rated condition occurred while listening to classical music at a fast tempo. Participants' highest-rated condition for tempo occurred while listening to rhythm and blues music at slow tempi and the lowest-rated condition for tempo occurred while listening to classical music at slow tempi.

These findings were not clarified by the results of the three-way analysis of variance with repeated measures. Results from the three-way interactions among sixth-grade participants' selective attention to music elements as affected by variables associated with music genre and temporal difference did not yield significant three-way interaction effects ($p > .05$), however, it is interesting to note that rhythm and blues music presented at slow tempi was participants' highest rated condition for selective attention to three of the four music elements examined in the present study (i.e. melodic contour, timbre, and tempo). No previous studies were found that specifically addressed sixth

grade participants' selective attention to music elements as affected by variables associated with music genre and temporal difference. Based on the results of the present study, the researcher failed to reject the seventh null hypothesis of the first research question.

Summary of Research Question Two

To answer research question two, four specific secondary research questions were formulated for the present study. These secondary research questions were answered using multiple regression analyses (i.e., both full regression analyses and hierarchical regression analyses).

1. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **melodic contour** ($p \leq .05$)?

2. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **timbre** ($p \leq .05$)?

3. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **rhythm** ($p \leq .05$)?

4. To what extent do demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to **tempo** ($p \leq .05$)?

Predictors for Selective Attention to Melodic Contour

A full regression analysis for melodic contour indicated that Asian, fast tempi, classical music, rock music, rhythm and blues music, jazz music, athletic competence, and physical appearance were significant predictors for the extent to which demographic, self-perception, music background, music genre, and temporal difference variables

significantly predict sixth-grade participants' selective attention to melodic contour. A hierarchical regression analysis was used to identify the best predictors among sixth-grade participants' selective attention to melodic contour. Results indicated that among the significant predictors, classical music ($p \leq .001$) and rock music ($p \leq .001$) were the best predictors for sixth-grade participants' selective attention to melodic contour. Further, when listening to classical music and rock music, sixth-grade participants were more likely to exhibit a higher degree of attention to melodic contour than Asian American, fast tempi, rhythm and blues music, jazz music, athletic competence, and physical appearance.

No previous studies were found that specifically examined the extent to which demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to melodic contour. Consequently, the present study provides initial support for the idea that the best predictors for sixth-grade students' selective attention to melodic contour from among demographic, self-perception, music background, music genre, and temporal difference variables were classical music and rock music. However, more investigations need to be conducted to substantiate this claim.

Predictors for Selective Attention to Timbre

A full regression analysis for timbre indicated that African American, American Indian, White, fast tempi, rock music, rhythm and blues music, jazz music, and job competence were significant predictors for the extent to which demographic, self-perception, music background, music genre, and temporal difference variables

significantly predict sixth-grade participants' selective attention to timbre. A hierarchical regression analysis was used to identify the best predictors among sixth-grade participants' selective attention to timbre. Results indicated that among the significant predictors, fast tempi ($p \leq .001$) were the best predictor for sixth-grade participants' selective attention to timbre. Further, when listening to music at fast tempi, sixth-grade participants were more likely to exhibit a higher degree of attention to timbre than African American, American Indian, White, rock music, rhythm and blues music, jazz music, and job competence.

No previous studies were found that specifically examined the extent to which demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to timbre. Consequently, the present study provides initial support for the idea that the best predictors for sixth-grade students' selective attention to timbre from among demographic, self-perception, music background, music genre, and temporal difference variables was fast tempi. However, more investigation needs to be conducted to substantiate this claim.

Predictors for Selective Attention to Rhythm

A full regression analysis for rhythm indicated that other ethnicities, fast tempi, classical music, rock music, rhythm and blues music, jazz music, athletic competence, and job competence were significant predictors for the extent to which demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to rhythm. A hierarchical

regression analysis was used to identify the best predictors among sixth-grade participants' selective attention to rhythm. Results indicated that among the significant predictors, classical music ($p \leq .035$), rock music ($p \leq .001$), rhythm and blues music ($p \leq .001$), jazz music ($p \leq .001$), and fast tempi ($p \leq .001$) were the best predictors for sixth-grade participants' selective attention to tempo. Further, when listening to classical music, rock music, rhythm and blues music, jazz music, and music at fast tempi, sixth-grade participants were more likely to exhibit a higher degree of attention to tempo than other ethnicities, athletic competence, and job competence.

No previous studies were found that specifically examined the extent to which demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to rhythm. Consequently, the present study provides initial support for the idea that the best predictors for sixth-grade students' selective attention to rhythm from among demographic, self-perception, music background, music genre, and temporal difference variables were classical music, rock music, rhythm and blues music, jazz music, and fast tempi. However, more investigation needs to be conducted to substantiate this claim.

Predictors for Selective Attention to Tempo

A full regression analysis for tempo indicated that female, Asian American, fast tempi, classical music, rhythm and blues music, jazz music, athletic competence, and job competence were significant predictors for the extent to which demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to tempo. A hierarchical

regression analysis was used to identify the best predictors among sixth-grade participants' selective attention to tempo. Results indicated that among the significant predictors, jazz music ($p \leq .026$) and fast tempi ($p \leq .001$) were the best predictors for sixth-grade participants' selective attention to rhythm. Further, when listening to jazz music and music at fast tempi, sixth-grade participants were more likely to exhibit a higher degree of attention to tempo than female, Asian American, classical music, rhythm and blues music, athletic competence, and job competence.

No previous studies were found that specifically examined the extent to which demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to tempo. Consequently, the present study provides initial support for the idea that the best predictors for sixth-grade students' selective attention to rhythm from among demographic, self-perception, music background, music genre, and temporal difference variables were jazz music and fast tempi. However, more investigation needs to be conducted to substantiate this claim.

Statistical Connections among the Results of Research Questions One and Two

The goal of the present study was to examine sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo). Two primary research questions were formulated as the foundation of the present study. Further, seven null hypothesis were formulated to address research question one and four specific research questions were formulated to address research question two. A three-way analysis of variance with repeated measures was used to examine research question

one while full and hierarchical regression analyses were used to examine research question two. Among the statistical analyses of both methods, several connections were found among the variables used in the seven null hypotheses of question one and four specific research questions of question two.

Predictors for Rhythm and Music Elements as Affected by Music Genre

A connection was found among the results regarding *Predictors for Selective Attention to Rhythm* and *Differences Among Selective Attention to Music Elements as Affected by Music Genre* (ME by MG) (see Tables 14, 15, 30, and Figure 2). Results regarding *Predictors for Rhythm* indicate that classical music, rock music, rhythm and blues, and jazz music were among the best predictors of sixth-grade participants' selective attention to rhythm ($p \leq .001$) (see Table 30). Concurrently, Table 14 displays a significant interaction between melodic contour and rhythm across classical music and rock music ($p \leq .001$) and between rhythm and timbre across classical music and rock music ($p \leq .003$). Interaction effects are apparent among the attention ratings for rhythm and timbre across the conditions of classical music and rock music (see Figure 2). When participants selectively attended to rock music, rhythm received a significantly ($p \leq .01$) greater degree of attention than, and functioned independently of, timbre, tempo, and melodic contour (respective order). Further, across the remainder of the music genres (i.e., rhythm and blues music and jazz music), rhythm continued to receive significantly greater attention ($p \leq .05$) than did the rest of the music elements (see Table 15 and Figure 2). These results establish connections among the results of *Predictors for Rhythm and Music Elements as Affected by Music Genre.*

Predictors for Rhythm and Music Elements as Affected by Temporal Difference

Within the present study, a connection was found among the results regarding *Predictors for Rhythm* and *Music Elements as Affected by Temporal Difference* (ME by TD) (see Tables 16, 17, 30, and Figure 3). Results regarding *Predictors for Rhythm* indicate that fast tempi were among the best predictors of sixth-grade participants' selective attention to rhythm ($p \leq .001$) (see Table 30). Concurrently, Table 14 displays significant interactions between melodic contour and rhythm across fast tempi and slow tempi ($p \leq .008$) and between rhythm and timbre across fast tempi and slow tempi ($p \leq .014$). An interaction effect is apparent among the attention ratings for melodic contour and rhythm across the conditions of fast tempi and slow tempi (see Figure 3). While listening to music at fast tempi, participants attended to rhythm to a significantly greater degree than to either melodic contour or timbre ($p \leq .001$); While listening to music at slow tempi, however, there was no significant difference among participants' selective attention to melodic contour, or timbre, or rhythm (see Table 17 and Figure 3). A significant effect difference occurs between rhythm and all other music elements on the condition of fast tempi. Whereas, on the condition of fast tempi, when participants exhibit a greater degree of attention to rhythm, participants will exhibit to a lesser degree attention to melodic contour, timbre, and tempo, timbre (see Table 17 and Figure 3). These results establish connections among the results of *Predictors for Rhythm* and *Music Elements as Affected by Temporal Difference.*

Predictors for Tempo and Music Elements as Affected by Temporal Difference

Within the present study, a connection was found among the results regarding *Tempo* and *Music Elements as Affected by Temporal Difference* (ME by TD) (see Tables 16, 34, and Figure 3). Results regarding *Predictors for Tempo* indicate that fast tempi were among the best predictors of sixth-grade participants' selective attention to tempo ($p \leq .001$) (see Table 34). Concurrently, Table 16 displays a significant interaction between timbre and tempo across fast tempi and slow tempi ($p \leq .012$). Interaction effects are apparent between the attention ratings for timbre and tempo across the conditions of fast tempi and slow tempi and between melodic contour and tempo across the conditions of fast tempi and slow tempi. At fast tempi, tempo received a greater degree of attention than did timbre or melodic contour; while at slow tempi, both timbre and melodic contour received greater attention than did tempo (see Figure 3). These results establish connections among the results of *Predictors for Tempo* and *Music Elements as Affected by Temporal Difference.*

Practical Implications of the Results

Implications made from this research should be directly applied to instructional frameworks, standards, and benchmarks for use in music pedagogy, music therapy, and interdisciplinary applications. This study provides further understanding of sixth-grade students' selective attention of music elements (i.e., melodic contour, timbre, rhythm, and tempo), its connections and interactions among variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz), and temporal difference (fast and slow); and demographics (i.e., gender and ethnicity), self-perception (i.e., scholastic

competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth) and music background (i.e., participants' in- and out-of-school music experiences).

Further, Flowers (1983, 1984) found that vocabulary instruction increased verbal usage and verbal attention to specific music elements. Flowers also suggested that children might listen for the many changes that occur in music for additional application to new knowledge instead of application to previously learned information. Therefore, when providing instruction using listening examples to highlight music elements or call attention to various components of music elements, instruction in vocabulary associated with music elements may enhance the students' ability to selectively attend to music elements.

Results of the present study and other investigations provide a foundation and guide for additional research in music education. The researcher also offers the following recommendations for the research model.

1. Promote further understanding and knowledge of the degree of relationships and differences among sixth-grade students' selective attention to music elements.

2. Promote further understanding and knowledge about the degree of differences among sixth-grade students' selective attention to music elements as affected by variables associated with music genre and temporal difference.

3. Promote further understanding and knowledge regarding the degree of relationships among sixth-grade students' selective attention to music elements among variables associated with demographic, self-perception, music background, music genre and temporal difference.

4. Serve as a source of data for the development and implementation of additional instructional strategies in music listening and music instruction.

5. Serve as a catalyst for further research in the areas of music perception, cognition, and sensation and their relationship to adolescent psychology and development.

Music Elements, Music Genre, and Temporal Difference

The mean order of selective attention ratings for music elements was in the following order: rhythm (M =5.15), timbre (M = 4.87), tempo (M = 4.82), and melodic contour (M = 4.74). Rhythm was rated significantly higher ($p \leq .01$) than timbre, tempo, or melodic contour. It is clear that sixth-grade participants selectively attending to rhythm at a higher level than the other music elements. Based on the results of the present study, when using music listening examples to call highlight various music elements, it is clear that rhythm may play a significant role in relation to the music elements of timbre, tempo, and melodic contour. Because sixth-grade students were found to attended to rhythm to a greater degree than to the other music elements, it may be easier for them to identify various rhythm components (beat, meter, rhythm patters, etc.) than components of other music elements. Likewise, when presenting lessons intended to highlight music components other than rhythm, music teachers should prepare to utilize a wide variety of strategies in anticipation of students' comparatively lessened attention to non-rhythm music elements.

The mean order of ratings for variables associated with music genre was in the following order: rhythm and blues music (M = 5.12), rock music (M = 4.98), jazz music (M = 4.83), and classical music (M = 4.66). Sixth-grade participants rated rhythm and blues music significantly higher ($p \leq .05$) than jazz music or classical music, and

participants also rated rock music significantly higher ($p \leq .01$) than classical music. It is clear that sixth-grade participants' rated rhythm and blues higher in comparison to rock music, jazz music, and classical music. Based on the results of the present study, when teaching sixth-grade students to listen to variables associated with music genre, it is clear that rhythm and blues can elicit high levels of attention in relation to rock music, jazz music, and classical music.

The mean order of ratings for variables associated with temporal difference was in the following order: fast tempi ($M = 4.94$) followed by slow tempi ($M = 4.86$). Although sixth-grade students were found to prefer fast tempos above slow tempos, the difference was not statistically significant. Based on the results of the present study, when teaching variables associated with temporal difference, there seems to be no particular advantage to using examples of slow tempi over those of faster tempi, or visa versa.

Music Elements as Affected by Music Genre

Means among music elements as affected by variables associated with music genre indicated that sixth-grade participants' selectively attended to rhythm highest while listening to rhythm and blues music and attended to tempo lowest while listening to classical music. Further, when participants listened to rock music, their attention to rhythm was significantly higher ($p \leq .01$) than timbre, tempo, and melodic contour (respective order). When participants listened to rhythm and blues music, their attention to rhythm was significantly higher ($p \leq .01$) than tempo, timbre, and melodic contour (respective order). When listening to jazz music, participant's attention to rhythm was significantly higher ($p \leq .05$) than timbre, melodic contour, and tempo (respective order).

In addition, all four genres were found to be among the best predictors of sixth-grade participants' selective attention to rhythm.

Based on the results of the present study, when using listening examples to highlight rhythm or call attention to various components of rhythm (beat, meter, etc.) teachers may be particularly successful using examples from rock music, rhythm and blues music, and jazz music. Further, if one's goal is to highlight tempo, rhythm and blues music may prove to be a more successful music genre in which to work than classical music, rock music, or jazz music. If one's goals are to draw attention to melodic contour or to timbre, any of the four music genres seem to work equally well; however, for both melodic contour and timbre, teachers may have to employ a variety of strategies to direct students' attention as none of the music genres provide a particularly fertile environment for raising attention to melodic contour or timbre more so than to any of the other elements.

Music Elements as Affected by Temporal Difference

Means for the selective attention to music elements as affected by variables associated with temporal difference indicated that rhythm was the highest-rated condition when sixth-grade participants listened to excerpts at fast tempi. Two of the lowest-rated conditions occurred when participants selectively attended to melodic contour while listening to excerpts at fast tempi and selectively attended to tempo at slow tempi. When participants listened to music at fast tempi, they selectively attended to rhythm to a significantly greater degree ($p \leq .05$) than to tempo, timbre, or melodic contour (respective order). In addition, music with fast tempi was found to be among the best

predictors of sixth-grade participants' selective attention to rhythm and of sixth-grade participants' selective attention to tempo.

Based on results of the present study, when using listening examples to highlight rhythm or tempo, teachers may want use music with fast tempi more so than music with slow tempi. Conversely, when using listening examples to highlight melodic contour or timbre, teachers may want use music with slow tempi more so than music with fast tempi.

Music Genre by Temporal Difference

Means among variables associated with music genre by temporal difference indicated that sixth-grade participants' highest-rated condition occurred while listening to rhythm and blues music presented at slow tempi. The lowest-rated condition occurred while participants listened to classical music at fast tempi. When participants' listened to music at fast tempi, they rated rock music significantly higher ($p \leq .05$) than jazz music, rhythm and blues, and classical (respective order). When participants listen to music at fast tempi, jazz music was rated significantly higher ($p \leq .05$) than classical music. When participants' listened to music at slow tempi, rhythm and blues music was rated significantly higher ($p = .000$) than classical music, rock music, and jazz music.

Based on the results of the present study, when teaching sixth grade students musical content using music listening examples at fast tempi, it is clear that they will exhibit a greater degree of attention to rock music than to jazz music, rhythm and blues music, or classical music (respective order). Further, when teaching sixth-grade students musical content using music listening examples at fast tempi, it is clear that they will

exhibit a greater degree of attention to jazz music than to classical music. It also recommended that when teaching sixth-grade students musical content using music listening examples at slow tempi, it is clear that they will exhibit a greater degree of attention to rhythm and blues music than to classical music, jazz music, or rock music (respective order).

Music Elements as Affected by Music Genre by Temporal Difference

Means among selective attention to music elements as affected by variables associated with music genre and by temporal difference indicated that sixth-grade participants' highest-rated condition for melodic contour occurred while listening to rhythm and blues music at slow tempi. Participants' lowest-rated condition for melodic contour occurred while listening to rock music at slow tempi. Participants' highest-rated condition for timbre occurred while listening to rhythm and blues music at slow tempi and the lowest-rated condition occurred while listening to rhythm and blues music at fast tempi. Participants' highest-rated condition for rhythm occurred while listening to rock music at a fast tempo and the lowest-rated condition occurred while listening to classical music at a fast tempo. Participants' highest-rated condition for tempo occurred while listening to rhythm and blues music at slow tempi and the lowest-rated condition for tempo occurred while listening to classical music at slow tempi.

Based on the results of the present study, when teaching sixth-grade students to listen to melodic contour, it is apparent that rhythm and blues music at slow tempi will achieve the highest levels of attention to melodic contour. When teaching sixth-grade students to listen to timbre, it is apparent that rhythm and blues music at slow tempi also

will achieve the highest levels of attention to timbre. It is also recommended that when teaching sixth-grade students to listen to rhythm, it is apparent that rock music at fast tempi will achieve the highest levels of attention to rhythm. When teaching sixth-grade students to listen to tempo, it is apparent that rhythm and blues music at slow tempi will achieve the highest levels of attention to tempo.

Results from sixth-grade participants selective attention to music elements as affected by variables associated with music genre and temporal difference did not yield a significant three-way interaction effects ($p > .05$). These results inform us that when providing the instruction of sixth-grade students, there were no strong relationships among the three-way interactions for selective attentions for music elements as affected by variables associated with genre and temporal difference.

Melodic Contour, Timbre, Rhythm, and Tempo

The results indicated that the best predictors for the extent to which demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to melodic contour were Classical ($p \leq .001$) and Rock ($p \leq .001$). When providing instruction to sixth-grade students, it clear that the classical music and rock music are effective instructional devices when in the process of selective attention to melodic contour.

The results indicated that the best predictor for the extent to which demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to timbre was fast tempi ($p \leq .001$). When providing instruction to sixth-grade students, it is clear that music with

fast tempi music is an effective instructional device in the process of selective attention to timbre.

The results indicated that the best predictors for the extent to which demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to rhythm were rock music ($p \leq .001$), rhythm and blues music ($p \leq .001$), jazz music ($p \leq .001$), classical music ($p = .035$), and fast tempi ($p \leq .001$). When providing instruction to sixth-grade students, it is clear that rock music, rhythm and blues music, jazz music, classical music, and fast tempi are effective instructional devices in the process of selective attention to rhythm.

The results indicated that the best predictors for the extent to which demographic, self-perception, music background, music genre, and temporal difference variables significantly predict sixth-grade participants' selective attention to tempo were fast tempi ($p \leq .001$) and jazz music ($p = .026$). When providing instruction to sixth-grade students, it is clear that music with fast tempi ($p \leq .001$) and jazz music are effective instructional devices in the process of selective attention to tempo.

Recommendations for Future Research

Future research in selective attention to music elements should be expanded to include additional age and grade levels include undergraduate and adult learners. This approach will allow investigators to understand the developmental processes associated with listening to music. These methodologies will likely lead to a better understanding

the various degrees music element identification and recognition associated with listening and to a higher degree sensation, perception, and cognition of music elements.

Future research should also involve test re-test methods and longitudinal studies to enhance researcher understanding regarding consistencies, inconsistencies, and developmental processes among individual selective attention to music elements. Further, future research should also use advance technologies in the data gathering process to enhance the response and management of physiological response. These methodologies will lead to efficient yet adept measures in the assessment and examination process of selective attention.

Future research is also necessary to determine connections among music elements, the acquisition of music knowledge, and the effect of music element perception on the holistic learning experience. Holistic learning experiences that employ synthesis of action, cognition, and emotion facilitate critical thinking (Boardman, 2001). Results of the present study indicate that selective attention to music elements employ synthesis of action, sensation, perception, and cognition. Results from Pflederer (1963, 1964) and Zimmerman and Sechrest (1968) provided evidence that individuals within the stage of formal operations demonstrate not only the ability to perceive music concepts but also formulate hypotheses to carefully make evaluative judgments when applying music concepts. The development of music perception skills among adolescent students is strongly influenced by critical thinking and creativity. Marzano, Brandt, Hughes, Jones, Presseisen, Rankin, and Suhor (1988), stated that it is impossible to think creatively without thinking critically, which is reinforce by Lipman (1991) who affirms that critical

and creative thinking coalesce to form higher order levels of thinking. Results from the present study and other studies provide a foundation for future research into the role of selective attention to music elements and its affect on critical thinking and creativity. Results from these studies may be applied to current and future instructional strategies, instructional frameworks, revision and reinforcement of the *National Standards for Arts Education* (Consortium of National Arts Education Associations, 1994), the development of holistic learning models that are fully inclusive of music. Providing teachers with research results regarding music element sensation, perception, cognition and potential applications to critical and creative thinking, and implication on student learning may result in increased student sensitivity to music elements and promote effective instruction in the perception of music elements.

Researchers should seek to investigate as well as develop, and design models regarding selective attention and variables associated with music listening processes and functions; and academic and sociological processes and functions. Implications regarding these methods will greatly enhance the holistic developmental process associated with each individual.

The results of the study found new questions to be investigated:

1. Are there significant differences ($p \leq .05$) among sixth-grade, ninth-grade, twelfth grade, and college participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo), as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and temporal difference (i.e., fast and slow)?

2. To what extent do the following variables significantly predict ($p \leq .05$) sixth-grade, ninth-grade, twelfth grade, and college participants' selective attention to melodic contour, timbre, rhythm, and tempo:

a. ***Demographic Variables*** – gender and ethnicity,
b. ***Self-Perception Variables*** – scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth,
c. ***Music Background*** – Composite Score from Music Background Questionnaire II,
d. ***Music Genre Variables*** – classical, rock, rhythm and blues, and jazz,
e. ***Temporal Difference Variables*** – fast and slow tempi?

3. Is there a relationship between the results of the Music Element Profile and the Two-Dimensional Continuous Response Digital Interface in the assessment of selective attention to music elements?

4. What are the relationship between selective attention and focused attention to music elements?

5. To what extent do the variables of critical thinking and creativity significantly predict ($p < .05$) sixth-grade, ninth-grade, twelfth grade, and college participants' selective attention to melodic contour, timbre, rhythm, and tempo?

6. Is there a Model that displays sixth-grade, ninth-grade, twelfth grade, and college students' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo), as affected by variables associated with music genre (i.e., classical, rock, rhythm and blues, and jazz) and temporal difference (i.e., fast and slow)?

7. Is there a Model that displays to what extent the following variables significantly predict ($p < .05$) sixth-grade, ninth-grade, twelfth grade, and college participants' selective attention to melodic contour, timbre, rhythm, and tempo:
   a. ***Demographic Variables*** – gender and ethnicity,
   b. ***Self-Perception Variables*** – scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth,
   c. ***Music Background*** – Composite Score from Music Background Questionnaire II,
   d. ***Music Genre Variables*** – classical, rock, rhythm and blues, and jazz,
   e. ***Temporal Difference Variables*** – fast and slow tempi?

Conclusions

The present study is an attempt to build a bridge between the literature and research regarding selective attention to music elements by variables associated with music genre by temporal difference. The present study also attempted to build a bridge between the literature and research regarding selective attention to music elements and variables of demographics, self-perception, and music background. Consequently, the results of the present study are very interesting because they represent an initial investigation into the effects among specific variable groups of music elements by music genre by temporal difference and predictors of selective attention to music elements. One major goal of the present study was to build bridges among research, teaching, and learning. Therefore, connections are employed among the results and practical implications are made for applications within the classroom and future research.

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APPENDIX A

LETTERS REQUESTING PERMISSION TO CONDUCT STUDY

Mr. _____
Principal
_____ Middle School
_____, Georgia

Dear Mr. _____:

I am requesting permission to conduct a research study using 90 sixth-grade students at _____ Middle School. I am researching the relationships and differences that my exist among sixth-grade students selective attention for the music elements of melody, rhythm, tempo, and timbre. I am also researching for relationships among demographics, self-perception, music background, music genre, temporal differences, and sixth-grade students' selective attention for music elements. Results from this investigation will be published in my doctoral dissertation. However, confidentiality will be maintained with the omission of information related to the identification of the students and school.

The study would begin on _____ and involve four one-hour sessions. During the study, students would listen to musical excerpts identifying which music elements have the highest magnitude of perception then complete a self-perception profile and music background questionnaire. Prior to the study, all students will be asked to obtain written parental consent to participate in this study. No monetary expense would be incurred by students, parents, and school as a result of this study.

I am confident that this experience would benefit your students and enhance the excellent educational opportunities your school currently provides. Thank you for your time, assistance, and careful consideration of my request. I look forward to hearing from you soon. If you have any further questions, please feel free to contact using the information provided below.

Sincerely,

James A. Warner

APPENDIX B

PARENTAL LETTER, CONSENT, AND ASSENT FORMS

THE UNIVERSITY OF NORTH CAROLINA GREENSBORO

CONSENT TO ACT AS A HUMAN PARTICIPANT

Project Title: LISTENING TO MELODIC CONTOUR, RHYTHM, TEMPO, AND TIMBRE: A STUDY OF SELECTIVE ATTENTION BY ADOLESCENTS AND ITS RELATIONSHIP TO THEIR SELF-PERCEPTION

Project Director: Mr. James A. Warner

Participant's Name: _____

DESCRIPTION AND EXPLANATION OF PROCEDURES:

I am conducting a research study using sixth, ninth, and twelfth grade students at _____ Middle and _____ High Schools. I am requesting your child's participation in a research project that investigates relationships and differences among sixth-grade students' selective attention for the music elements of melodic contour, timbre, rhythm, and tempo. This research project will also investigate the relationships that exist among demographics, self-perception, music background, music genre, temporal differences, and among sixth-grade students' selective attention for the music elements. Results from this investigation will be published in my doctoral dissertation. However, confidentiality will be maintained with the omission of information related to the identification of the students and school.

The study would begin on _____ and involve four one-hour sessions. During the study, students will listen to musical excerpts identifying which music elements have the highest magnitude of perception then complete a self-perception profile and music background questionnaire. Prior to the study, all students will be asked to obtain written parental consent to participate in this study. No monetary expense would be incurred by students, parents, and school as a result of this study.

All data from this research project will be stored in a safe with the office of the researcher. The office is a secured environment within the school building and has a door that locks. This office is located within the school building that serves as the site for this investigation. The researcher will be the only individual with access to the confidential data. All data will be stored for 10 years. At the end of the 10-year period, all confidential data will be destroyed using a conventional paper shredder.

I am confident that this experience will benefit your child and enhance the excellent educational opportunities your school currently provides. Thank you for your time, assistance, and careful consideration of my request. I look forward to hearing from you soon. If you have any further questions, please feel free to contact James A. Warner using the information provided below.

RISKS AND DISCOMFORTS:

No risks or discomforts are associated with the procedure outlined within this research project.

POTENTIAL BENEFITS:

Benefits to individual participants within the research study will include the opportunities to complete the Music Background Questionnaire and Self-Perception Profile for Adolescents. Individual participants will also receive instruction on the use and application of the Two-Dimensional Continuous Response Digital Interface with additional instruction in the perception and cognition of melodic contour, rhythm, tempo, and timbre.

Findings from this research project will give musicians and music educators further information regarding the ability of adolescents to perceive and recognize music elements. Educators will also have additional knowledge regarding the relationship between sixth grade students' listening habits, demographics, and how sixth-grade students perceive themselves in society.

CONSENT:

By signing this consent form, you agree that you understand the procedures, risks, and benefits involved with your child's participation in this research project. You are free to refuse to have your child participate or to withdraw your consent for your child's participate in this research at any time without penalty or prejudice. Your child's participation in this research project is entirely voluntary. Your child's privacy will be protected because he or she will not be identified by name as a participant in this project.

The research project and this consent form have been approved by the University of North Carolina at Greensboro Institutional Review Board, which insures that research involving people follows federal regulations. Questions regarding your child's rights as a participant in this project can be answered by calling Mr. Eric Allen at (336) 334-5878. Questions regarding the research itself will be answered by James A. Warner by calling (770) 650-4230 extension 185. Any new information that develops during the project will be provided to you if the information might affect your child's willingness to continue his or her participation in this research project.

Your child, _____, is a minor and unable give informed consent. By affixing your signature below, you are giving your child permission to participate in the research study being conducted by James A. Warner.

_____ _____
Parent Signature Date

_____ _____
Custodial Parent/Guardian Signature Date

THE UNIVERSITY OF NORTH CAROLINA GREENSBORO

CONSENT TO ACT AS A HUMAN PARTICIPANT

Project Title: LISTENING TO MELODIC CONTOUR, RHYTHM, TEMPO, AND TIMBRE: A STUDY OF SELECTIVE ATTENTION BY ADOLESCENTS AND ITS RELATIONSHIP TO THEIR SELF-PERCEPTION

Project Director: Mr. James A. Warner

Participant's Name: _____

DESCRIPTION AND EXPLANATION OF PROCEDURES:

We are doing a study to try to learn how adolescents listen to music and how they feel about themselves. We are asking you to help because we do not know very much about adolescents and how they listen to music. We would also like to know how listening to music relates to how you feel about yourself.

If you agree to be in this study, we are going to ask you some questions about you and your relationship to your friends and family. We will want to know how you, your friends, and family members listen to music. We also ask you how you feel about yourself, your friends, and family. We would also like to know what you are listening to when you listen to music. For example, when you listen to music are you listening only to the melody or the rhythm?

You can ask questions at any time that you might have a question about this study. Also, if you decide at any time not to finish or continue to participate in this study, you may stop whenever you want. Remember, these questions are only about what you think. There are no right or wrong answers because this is not a test.

I am confident that this experience would benefit you and enhance the excellent educational opportunities your school currently provides. Thank you for your time, assistance, and careful understanding of this request.

ASSENT:

Signing this paper means that you have read this or had it read to you and that you want to be in this study. If you do not want to be in the study, do not sign this paper. Remember, being in the study is up to you, and no one will be mad if you do not sign this paper or even if you change your mind.

_____ _____

Participant Signature Date

APPENDIX C

MUSIC BACKGROUND QUESTIONNAIRE II

IDENTIFICATION NUMBER _____

MUSIC BACKGROUND QUESTIONNAIRE

INSTRUCTIONS: Select one the following items from each category.

GENDER: Female ____ Male ____

ETHNICITY: African American ____ Asian American ____ American Indian ____

Hispanic or Latino ____ White ____ Other _____ (List)

INSTRUCTIONS: DO NOT write your name or identifiable information on the following pages. Please give an honest answer to the following questions by filling in the blanks or circling the correct response.

1. Do you play an instrument? YES NO

2. Have you played an instrument? YES NO

If you circled YES on one of the previous questions, please check all instrument(s) you play or have played. Indicate how many years of private lessons you have had and how long you have played each instrument. If you circled NO for both questions proceed to question number 3.

I play or played	Years of private lessons	Number of years played
____ Piano	_____	_____
____ Trumpet	_____	_____
____ Clarinet	_____	_____
____ Flute	_____	_____
____ Trombone	_____	_____
____ Drums	_____	_____
____ Saxophone	_____	_____
____ Violin	_____	_____

(Continued on the following page)

____ Viola _____ _____
____ Cello _____ _____
____ Bass _____ _____
____ Guitar _____ _____
____ Other _____ _____ _____
____ Other _____ _____ _____

3. How often do you listen to music at home?

   0-2 hours daily ____ 3-5 hours daily ____ 6 hours or more daily ____

4. How often do your parents listen to music at home?

   0-2 hours daily ____ 3-5 hours daily ____ 6 hours or more daily ____

5. How often does your close friend listen to music?

   0-2 hours daily ____ 3-5 hours daily ____ 6 hours or more daily ____

6. Do you have your own

   CD player? YES NO MP3 player? YES NO

   Tape player? YES NO Computer? YES NO

7. Do your parents have a

   CD player? YES NO MP3 player? YES NO

   Tape player? YES NO Computer? YES NO

8. Do your close friends' have a

   CD player? YES NO MP3 player? YES NO

   Tape player? YES NO Computer? YES NO

9. Have you ever sung or played in a musical group like a choir or band?

YES NO

10. Do you sing or play in a musical group now?

YES NO

11. Have your parents ever sung or played in a musical group like a choir or band?

YES NO

12. Do your parents sing or play in a musical group now?

YES NO

13. Do members of your family sing at home?

YES NO

14. Have your close friends ever sung or played in a musical group like a choir or band?

YES NO

15. Do your close friends sing or play in a musical group now?

YES NO

16. Which of the following describes how you feel about music?
(CIRCLE ONE LETTER ONLY)

a. Music is not important in my life
b. Music is somewhat important in my life
c. Music is important in my life
d. Music is very important in my life

17. Which of the following describes how your parents feel about music?
(CIRCLE ONE LETTER ONLY)

a. Music is not important in their lives
b. Music is somewhat important in their lives
c. Music is important in their lives
d. Music is very important in their lives

18. Which of the following describes how your close friends feel about music? (CIRCLE ONE LETTER ONLY)

    a. Music is not important in their lives
    b. Music is somewhat important their lives
    c. Music is important in their lives
    d. Music is very important in their lives

19. How many CDs and/or tapes have you bought or been given in the past year?

    0-10 11-20 21 or more

20. How many CDs and tapes have your parents bought or been given in the past year?

    0-10 11-20 21 or more

21. How many CDs and tapes have your close friends bought or been given in the past year?

    0-10 11-20 21 or more

22. How many music files have you downloaded and listened to in the past year?

    0-10 11-20 21 or more

23. How many music files have your parents downloaded and listened to in the past year?

    0-10 11-20 21 or more

24. How many music files have your close friends downloaded and listened to in the past year?

    0-10 11-20 21 or more

APPENDIX D

MUSIC ELEMENT PROFILE

IDENTIFICATION NUMBER _____

MUSIC ELEMENT PROFILE

Instructions: DO NOT write your name or identifiable information on the following pages. Following each music excerpt, please select your overall level of attention for each music element that was used during the listening activity. On the scale of 1 to 7, circle the number that best describes your level of attention for each music element. One is considered the lowest level of attention and 7 is considered the highest level of attention.

Music Examples

Example Excerpt 1

Melodic Contour:	1	2	3	4	5	6	7
Rhythm:	1	2	3	4	5	6	7
Timbre:	1	2	3	4	5	6	7
Tempo:	1	2	3	4	5	6	7
	Low			Medium			High

Example Excerpt 2

Melodic Contour:	1	2	3	4	5	6	7
Rhythm:	1	2	3	4	5	6	7
Timbre:	1	2	3	4	5	6	7
Tempo:	1	2	3	4	5	6	7
	Low			Medium			High

THE MUSIC ELEMENT PROFILE

Instructions: DO NOT write your name or identifiable information on the following pages. Following each music excerpt, please select your overall level of attention for each music element that was used during the listening activity. On the scale of 1 to 7, circle the number that best describes your level of attention for each music element. One is considered the lowest level of attention and 7 is considered the highest level of attention.

Music Examples

Excerpt 1

Melodic Contour:	1	2	3	4	5	6	7
Rhythm:	1	2	3	4	5	6	7
Timbre:	1	2	3	4	5	6	7
Tempo:	1	2	3	4	5	6	7
	Low			Medium			High

Excerpt 2

Melodic Contour:	1	2	3	4	5	6	7
Rhythm:	1	2	3	4	5	6	7
Timbre:	1	2	3	4	5	6	7
Tempo:	1	2	3	4	5	6	7
	Low			Medium			High

Excerpt 3

Melodic Contour:	1	2	3	4	5	6	7
Rhythm:	1	2	3	4	5	6	7
Timbre:	1	2	3	4	5	6	7
Tempo:	1	2	3	4	5	6	7
	Low			Medium			High

THE MUSIC ELEMENT PROFILE

Instructions: DO NOT write your name or identifiable information on the following pages. Following each music exceprt, please select your overall level of attention for each music element that was used during the listening activity. On the scale of 1 to 7, circle the number that best describes your level of attention for each music element. One is considered the lowest level of attention and 7 is considered the highest level of attention.

Music Examples

Excerpt 4

Melodic Contour:	1	2	3	4	5	6	7
Rhythm:	1	2	3	4	5	6	7
Timbre:	1	2	3	4	5	6	7
Tempo:	1	2	3	4	5	6	7
	Low			Medium			High

Excerpt 5

Melodic Contour:	1	2	3	4	5	6	7
Rhythm:	1	2	3	4	5	6	7
Timbre:	1	2	3	4	5	6	7
Tempo:	1	2	3	4	5	6	7
	Low			Medium			High

Excerpt 6

Melodic Contour:	1	2	3	4	5	6	7
Rhythm:	1	2	3	4	5	6	7
Timbre:	1	2	3	4	5	6	7
Tempo:	1	2	3	4	5	6	7
	Low			Medium			High

THE MUSIC ELEMENT PROFILE

Instructions: DO NOT write your name or identifiable information on the following pages. Following each music excerpt, please select your overall level of attention for each music element that was used during the listening activity. On the scale of 1 to 7, circle the number that best describes your level of attention for each music element. One is considered the lowest level of attention and 7 is considered the highest level of attention.

Music Examples

Excerpt 7

Melodic Contour:	1	2	3	4	5	6	7
Rhythm:	1	2	3	4	5	6	7
Timbre:	1	2	3	4	5	6	7
Tempo:	1	2	3	4	5	6	7
	Low			Medium			High

Excerpt 8

Melodic Contour:	1	2	3	4	5	6	7
Rhythm:	1	2	3	4	5	6	7
Timbre:	1	2	3	4	5	6	7
Tempo:	1	2	3	4	5	6	7
	Low			Medium			High

APPENDIX E

MUSIC EXCERPT LISTENING LIST

MUSIC EXCERPT LISTING

OVERALL DESCRIPTORS		Title	Composer/ Performers	Recording
Genre	Classical	Sing Unto God from Judas Maccabaeus Oratorio, HWV 63	Composer: George Frederic Handel Conductors: Richard P. Condie & Eugene Ormandy Performers: The Mormon Tabernacle Choir accompanied by The Philadelphia Orchestra Time Period: Baroque Form: Oratorio Written: 1746	Title and Label: Jesu, Joy of Man's Desiring - 20 Great Bach & Handel Choruses Format: CD Universal Music Group Recordings, Inc.
Selection #	3			
Temporal Difference	***Fast***			
Length	40 sec			
Category	Vocal/ Instrumental			
MUSIC ELEMENT DESCRIPTORS				
Melodic Contour	Homophonic and Contrapuntal All Voices: Canonical Style with repeated melodic notes (- - - -) followed by melismatic lines that outline an M-shaped melodic contour. Each voice sings the repeated melodic notes and melismatic lines through the music except. Instruments: Play along with and accompany vocal using a canonical style with repeated melodic notes (- - - -) followed by melismatic lines that outline an M-shaped melodic contour. Upper instrumental parts perform decant lines that are melimatic and outline M-Shaped melodic contours.			
Timbre	Vocals: soprano, alto, tenor Instruments: oboes, flutes, clarinets, flute, bassoons, trumpets, horns, trombones, baritones, tubas, violins, violas, cellos, basses			
Rhythm	Upper Voices: sixteenth, eighth, and quarter notes; recurrent melismas Low Voices: quarter, half, and whole notes Meter: 4/4			
Tempo	(MM = 104) Allegro – Fast			

OVERALL DESCRIPTORS		Title	Composer/ Performers	Recording
Genre	Classical	Concerto In C Major, Op. 7 No. 5 For Oboe, Strings And Basso Continuo #2 (Adagio)	Composer: Tomasi Albinoni Conductor: Alexander Van Wijnkoop Soloist: Heinz Holliger (Oboe) Ensemble: Orchestra - Camerata Bern Time Period: Baroque Form: Concerto Written: 1722	**Title: Tomaso Albinoni - Adagio & Concerti** Label: Eloquence, Deutsche Grammophon Format: CD, Compilation Universal Music Group Recordings, Inc.
Selection #	2			
Temporal Difference	***Slow***			
Length	53 sec			
Category	Instrumental			
MUSIC ELEMENT DESCRIPTORS				
Melodic Contour	Counterpoint Upper Voices: Inverted V (∧) melodic lines with descending melodic lines Lower Voice: long tones (_) with ascending (/) and descending (\) melodic lines; two inverted V (∧) melodic lines			
Timbre	Oboe, Bassoon, Violin, Viola			
Rhythm	Upper Voices: sixteenth, eighth, and quarter notes; recurrent melismas Low Voices: quarter, half, and whole notes Meter: 4/4			
Tempo	(MM = 60) Adagio – Slow; Rubato - a fluctuation of tempo within a musical phrase often against a rhythmically steady accompaniment			

OVERALL DESCRIPTORS		Title	Composer/ Performers	Recording
Genre	Rock	Make A Move	Composer: Lost Prophets Performers: Ian Watkins – Vocals & Drum Set, Lee Gaze - Guitar, Mike Lewis - Guitar, Stuart Richardson - Bass, James Oliver – Keyboards, Turntables, Background Vocals, Mike Chiplin - Drums Time Period: Early 21sh Century Form: AABB (Binary) Written: 2004	Title: Start Something Label: Columbia, Visible Noise Format: CD
Selection #	4			
Temporal Difference	***Fast***			
Length	32 sec			
Category	Vocal/ Instrumental			
MUSIC ELEMENTS DESCRIPTORS				
Melodic Contour	Homophonic and Contrapuntal All Voices: Canonical Style (call and response) with ascending and descending melodic notes followed by melismatic lines that outline M -shaped melodic contours. The solo voice sings a phrase with ascending and descending melodic notes and melismatic lines through the music except. Instruments: Play along with and accompany vocal solo (call) using a canonical style with ascending and descending melodic notes (answer). The melismatic lines outline M-shaped melodic contours.			
Timbre	Vocals: Solo Voice (alto) and Accompaniment harmony voices (alto) Instruments: guitar, bass, and drum set			
Rhythm	All Voices: sixteenth, eighth, and quarter notes; recurrent melismas Guitars: In the first section guitar play sixteenth, eighth and quarter whole notes in rhythm with drum set. During the second half of the excerpt the guitar plays power chords using whole notes to support the solo voice. Drum Set: In the first section, the drum set plays a recurrent pattern of dotted eighth-note followed by long tones then sixteenth note rhythms followed by long tones on the snare drum. In the second section, the drum set plays a recurrent pattern of dotted eighth-note followed by sixteenth note fills. Meter: 4/4			
Tempo	(MM = 120) Allegro – Fast			

OVERALL DESCRIPTORS		Title	Composer/ Performers	Recording
Genre	Rock	Blue Berry Hill	Composer: Vincent Rose, Al Lewis, & Larry Stock Performer: Antoine Dominique (Fats Domino) Time Period: Early 20th Century Form: AAB (Blues Form) Written: 1940	Title: Fats Domino: Greatest Hits Label: Electric and Music Industries (EMI) Special Products Format: CD, Compilation EMI Special Markets
Selection #	5			
Temporal Difference	***Slow***			
Length	34 sec			
Category	Vocal/ Instrumental			
MUSIC ELEMENT DESCRIPTORS				
Melodic Contour	Homophonic and Contrapuntal All Voices: Canonical Style (call and response) with ascending and descending melodic notes followed by melismatic lines that outline M -shaped melodic contours. The solo voice sings a phrase with ascending and descending melodic notes and melismatic lines through the music except. Instruments: Play along with and accompany vocal solo (call) using a canonical style with ascending and descending melodic notes (answer). The melismatic lines outline M-shaped melodic contours.			
Timbre	Instruments: piano, saxophone, trumpet, guitar, bass, and drum set			
Rhythm	Upper Voices: sixteenth, eighth, and quarter notes; recurrent melismas Other Instruments: Wind instruments use sixteenth, eighth and quarter whole notes in melismatic line to answer solo voice in the first half of the excerpt. During the second half of the excerpt the guitar and bass uses sixteenth, eighth and quarter whole notes in melismatic line to answer solo voice. Drum Set: Plays a recurrent pattern of eighth-note triplets on the ride cymbal throughout the excerpt. Meter: 4/4			
Tempo	(MM = 76) Andante – Slow (Walking Pace)			

OVERALL DESCRIPTORS		Title	Composer/ Performers	Recording
Genre	Rhythm & Blues	Shout	Composer: The Isley Brothers Performers: The Isley Brothers Ronald Isley – Lead Vocals; O' Kelly Isley and Rudolph Isley – Background vocals, Professor Herman Stephens - Organ Time Period: Late 20th Century Form: AAAA (Strophic - Call and Response) Written: 1959	Title: Shout Label: RCA/Collectables Format: CD
Selection #	1			
Temporal Difference	***Fast***			
Length	32 sec			
Category	Vocal/ Instrumental			
MUSIC ELEMENT DESCRIPTORS				
Melodic Contour	Call and Response and Contrapuntal Voices: Canonical Style (call and response) with ascending and descending melodic notes followed by melismatic lines that outline V-shaped melodic contours. The solo voice sings a phrase with ascending and descending melodic notes and melismatic lines through the music except. In the first section, the background vocals respond on be 1 with a quarter note "Shout." In the second section, the background vocal responses are V-shaped melodic contours. Organ: Holds successive long tones (_) Instruments: Play along with and accompany vocals			
Timbre	Vocals: solo voice with two voice in harmony Instruments: guitar, bass, organ, and tambourine			
Rhythm	Voices: sixteenth, eighth, quarter, and half notes with recurrent melismas. In the first section, the solo voice calls and the background voices answer on beat one. In the second section, the background vocal responses sixteenth, eighth and quarter whole notes in melismatic lines in response to the solo voice. Guitar: plays recurrent eighth rest followed by eight notes for a rhythmic drive. Bass Guitar: plays recurrent quarter notes in a walking bass style. Tambourine: eighth rest followed by eight notes for a rhythmic drive. Every other measure contains a pattern of sixteenth-note as recurrent fills. Meter: 4/4			
Tempo	(MM = 144) Allegro – Fast			

OVERALL DESCRIPTORS		Title	Composer/ Performers	Recording
Genre	Rhythm & Blues	Burn	Composer: Bryan Cox, Paul Michael, Usher Raymond, and Jermaine Dupri Performers: Usher – Vocals Time Period: Early 21sh Century Form: AABB (Binary) Written: 2004	Title: Confessions Label: Arista, LaFace, Jive, Zomba Format: CD
Selection #	6			
Temporal Difference	***Slow***			
Length	36 sec			
Category	Vocal/ Instrumental			
MUSIC ELEMENT DESCRIPTORS				
Melodic Contour	Contrapuntal Voices: Canonical Style with sampling techniques (call and response) with ascending and descending melodic notes followed by melismatic lines that outline M -shaped melodic contours. The solo voice sings a phrase with ascending and descending melodic notes and melismatic lines through the music except. Answer is a sampled voice line with similar M-shaped melodic contours. Instruments: Play along with and accompany vocals (call) using a canonical style with ascending and descending melodic notes (answer). The melismatic lines outline M-shaped melodic contours.			
Timbre	Vocals: Solo Voice with sampling techniques Instruments: synthesized piano, synthesized-drum set			
Rhythm	Voices: sixteenth, eighth, quarter, and half notes; recurrent melismas Synthesized Piano: Initially, the two voices are use with one voice (guitarlike) playing sixteenth, eighth and quarter whole notes in melismatic line to answer and support solo voice. The second voice plays half and whole notes to support the solo voice. Synthesized Drum Set: Bass Drum plays a recurrent quarter note on beat on with syncopated fills throughout the excerpt. The high hat plays a pattern of sixteenth-note with recurrent fills of thirty-second notes. Meter: 4/4 (Half-Time Feel)			
Tempo	(MM = 78) Andante – Slow			

OVERALL DESCRIPTORS		Title	Composer/ Performers	Recording
Genre	Jazz	My Favorite Things	Composers: Richard Rodgers & Oscar Hammerstein II Performers: John Coltrane-Soprano Saxophone, McCoy Tyner-Piano, Steve Davis-Bass, Elvin Jones-Drum Set Time Period: Late 20th Century Form: AAB (Blues Form) Written: 1958	The Very Best of John Coltrane Label: Rhino Atlantic Format: CD, Compilation Atlantic Recording Corporation
Selection #	8			
Temporal Difference	***Fast***			
Length	36 sec			
Category	Instrumental			
MUSIC ELEMENT DESCRIPTORS				
Melodic Contour	Homophonic and Contrapuntal Soprano Saxophone: begins with ascending melodic line followed by melismatic lines that outline an M-shaped melodic contour. Each voice sings the repeated melodic notes and melismatic lines through the music excerpt. Other Instruments: Accompany solo saxophone line with homophonic chordal accompaniment. Piano plays M-shaped melodic contour in improvisational section.			
Timbre	Instruments: soprano saxophone, piano, double bass, and drum set			
Rhythm	Soprano Sax: sixteenth, eighth, and quarter notes; recurrent melismas Accompaniment Voices: straight eight-note rhythms followed by swing eighth-note rhythms Meter: 6/8			
Tempo	(MM = 104) Allegro – Fast			

OVERALL DESCRIPTORS		Title	Composer/ Performers	Recording
Genre	Jazz	Li'l Darlin'	Composer: Neal Hefti Performers: The Count Basie Orchestra Time Period: Late 20th Century Form: AABA (Binary) Written: 1958	Title: The Complete Atomic Basie Label: Roulette Jazz, Blue Note Format: CD, Compilation Capitol Records
Selection #	7			
Temporal Difference	***Slow***			
Length	32 sec			
Category	Instrumental			
MUSIC ELEMENT DESCRIPTORS				
Melodic Contour	Homophonic and Contrapuntal All Voices: V-shaped (∧) melodic lines with long tones (_) to end the first phrase. Two M-shaped melodies follow the first phrase and both end with long tones (_). Throughout the excerpt the vibraphone plays recurrent ascending (/) and descending (\) vibraphone descant lines			
Timbre	Instruments: saxophones, trombones, trumpets, piano, drum set, vibes, guitar, and bass			
Rhythm	All Voices: syncopation with eighth and quarter notes in a slow swing style; recurrent melismas Low Voices: quarter, half, and whole notes Meter: 4/4			
Tempo	(MM = 60) Adagio – Slow			

APPENDIX F

MUSIC TEACHER EXCERPT SURVEY

Date _____

Dear Music Professor or Instructor,

My name is James A. Warner and I am currently a Ph.D. candidate in music education at The University of North Carolina at Greensboro. I am seeking your assistance in the completion of my dissertation proposal. The goal of this study was to examine sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo). Two primary purposes were the foci of this study. The first purpose was to investigate whether significant differences ($p \leq .05$) existed among sixth-grade participants' selective attention to music elements (i.e., melodic contour, timbre, rhythm, and tempo) as affected by music genres (i.e., classical, rock, rhythm and blues, and jazz) and by temporal differences (i.e., fast and slow). The second purpose of the study was to investigate the extent to which variables associated with demographics, self-perception, music background, music genres, and temporal differences significantly predicted ($p \leq .05$) sixth-grade participants' selective attention to music elements. The variables within the second purpose include: demographic variables (i.e., gender and ethnicity), self-perception variables (i.e., scholastic competence, social acceptance, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth); and music background (i.e., participants' in- and out-of-school music experiences).

Attached is a survey about music genres and musical elements that are found within many musical works. Please list three music excerpts or pieces (one slow and one fast; and one vocal, one instrumental and/or vocal with instruments) from each musical

genre (i.e., classical, rock, rhythm and blues, and jazz). Each piece should consistently exemplify a balanced presentation of melody, rhythm, tempo, and timbre. When making your selection, please consider that the selected works must be appropriate listening for a general music class offered to adolescents in sixth grade. If you cannot make a recommendation within a specific genre please leave it blank.

Your assistance with this project is greatly appreciated. I ask that you return the faculty survey by e-mail on or before Wednesday, _____ to the address provided below. If you have any questions or suggestions, please feel free to contact me.

Musically Yours,

James A. Warner

_____

_____

_____

_____

Name: _____ University or School: _____

Position or Grade Level: _____

Genre	Tempo	Vocal - Instrumental	Composer/Performer	Title of Work	Recording
Example	Slow	Vocal __ Inst __ Voc/Inst _X_	Janet Jackson	Together Again	Virgin 4KM 38623
	Fast	Vocal __ Inst _X_ Voc/Inst __	Chis LaBarbara & Classic Jazz Quartet	Flight of the Bumblebee	
Classical	Slow	Vocal __ Inst __ Voc/Inst __			
	Fast	Vocal __ Inst __ Voc/Inst __			
Jazz	Slow	Vocal __ Inst __ Voc/Inst __			
	Fast	Vocal __ Inst __ Voc/Inst __			
Rock	Slow	Vocal __ Inst __ Voc/Inst __			
	Fast	Vocal __ Inst __ Voc/Inst __			
Rhythm & Blues	Slow	Vocal __ Inst __ Voc/Inst __			
	Fast	Vocal __ Inst __ Voc/Inst __			

APPENDIX G

MUSIC ELEMENT TRAINING SESSION WORKSHEETS

IDENTIFICATION NUMBER: _____ STUDENT ANSWER SHEET

Music Element Training Session Worksheets

LESSON ONE: TEMPO

Directions: During all lessons students are to remain in their seats. On your desk are pencils and an answer sheet. The answer sheet contains series of exercises and questions that will be used during this lesson. Your identification number is located on top of the answer sheet. When I ask a question, please listen carefully and follow the directions given for each exercise and question. Circle the answer to the corresponding question in the designated area of the answer sheet (the area marked "Your Answer"). Only answer the question aloud after I have acknowledged or recognized you and asked you to answer the question. Do not change your answer if it is incorrect, simply put the correct answer in the section marked "Correct Answer." If there are no questions, we will begin the lesson.

Example: Was the second tempo faster or slower than the first tempo?

Your Answer: Tempo 1 or 2 Correct Answer: _____

1. Listen to the next two tempi. On your answer sheets, please record the fastest tempo? Please listen carefully.

Your Answer: Tempo 1 or 2 Correct Answer: _____

2. Listen to two more tempi and use your answer sheets to record the fastest tempo. Please listen carefully.

Your Answer: Tempo 1 or 2 Correct Answer: _____

Directions: There will be a total of four different tempi in the following section of this lesson. Please listen as I play examples of all four tempi. I will play three of the tempi will be used in each exercise. You will rate the tempi in their order of speed from fastest to slowest.

3. Listen to the next three tempi. On your answer sheets, rate the tempi in their order of speed from fastest to slowest. Please listen carefully.

Your Answer: 123, 231 or 321 Correct Answer: _____

4. Listen to the next three tempi. On your answer sheets, rate the tempi in their order of speed from fastest to slowest. Please listen carefully.

Your Answer: 123, 231 or 321 Correct Answer: _____

5. Listen to the next three tempi. On your answer sheets, rate the tempi in their order of speed from fastest to slowest. Please listen carefully.
Your Answer: 123, 231 or 321 Correct Answer: _____

LESSON TWO: RHYTHM

Directions: During this lesson all students are to remain in their seats. On your desk are pencils and an answer sheet. The answer sheet contains series of exercises and questions that will be used during this lesson. When I ask a question, please listen carefully and follow the direction given for each exercise and questions. Circle the answer to the corresponding question on the designated area of the answer sheet. Make your selection in the area marked "Your Answer." Then, answer the question aloud only after I acknowledge or recognize you. Do not change your answer if it is incorrect, simply put the correct answer in the section marked "Correct Answer." If there are no questions, we will now begin the lesson.

Directions: During this section, you will hear a series of rhythms for each exercise. Please listen carefully and record on your answer sheets whether both rhythms were the same or different.

Example: Was the second rhythm the same or different when compared to the first rhythms?

Your Answer: Same or Different Correct Answer: _____

1. Listen to the next two rhythms. Please listen carefully and record on your answer sheets whether both rhythms were the same or different.

Your Answer: Same or Different Correct Answer: _____

2. Listen to the next two rhythms. Please listen carefully and record on your answer sheets whether both rhythms were the same or different.

Your Answer: Same or Different Correct Answer: _____

3. Listen to the next two rhythms. Please listen carefully and record on your answer sheets whether both rhythms were the same or different.

Your Answer: Same or Different Correct Answer: _____

4. Listen to the next two rhythms. Please listen carefully and record on your answer sheets whether both rhythms were the same or different.

Your Answer: Same or Different Correct Answer: _____

5. Listen to the next two rhythms. Please listen carefully and record on your answer sheets whether both rhythms were the same or different.

Your Answer: Same or Different Correct Answer: _____

LESSON THREE: MELODIC CONTOUR

Directions: During this lesson all students are to remain in their seats. On your desk are pencils and an answer sheet. The answer sheet contains series of exercises and questions that will be used during this lesson. When I ask a question, please listen carefully and follow the direction given for each exercise and questions. Circle the answer to the corresponding question on the designated area of the answer sheet. Make your selection in the area marked "Your Answer." Then, answer the question aloud only after I acknowledge or recognize you. Do not change your answer if it is incorrect, simply put the correct answer in the section marked "Correct Answer." If there are no questions, we will now begin the lesson.

Directions: During this exercise, you will hear a series of melodic contours and two melodic contours for each exercise. Please listen carefully and record on your answer sheets whether both melodic contours were the same or different.

Example: Was the second example of melodic contour the same or different when compared to the first example of melodic contour?

Your Answer: Same or Different Correct Answer: _____

1. Please listen carefully and record on your answer sheets whether both melodic contours were the same or different.

Your Answer: Same or Different Correct Answer: _____

2. Please listen carefully and record on your answer sheets whether both melodic contours were the same or different.

Your Answer: Same or Different Correct Answer: _____

3. Please listen carefully and record on your answer sheets whether both melodic contours were the same or different.

Your Answer: Same or Different Correct Answer: _____

4. Please listen carefully and record on your answer sheets whether both melodic contours were the same or different.

Your Answer: Same or Different Correct Answer: _____

5. Please listen carefully and record on your answer sheets whether both melodic contours were the same or different.

Your Answer: Same or Different Correct Answer: _____

LESSON FOUR: TIMBRE

Directions: During this lesson all students are to remain in their seats. On your desk are pencils and an answer sheet. The answer sheet contains series of exercises and questions that will be used during this lesson. When I ask a question, please listen carefully and follow the direction given for each exercise and questions. Circle the answer to the corresponding question on the designated area of the answer sheet. Make your selection in the area marked "Your Answer." Then, answer the question aloud only after I acknowledge or recognize you. Do not change your answer if it is incorrect, simply put the correct answer in the section marked "Correct Answer." If there are no questions, we will now begin the lesson.

Directions: You will hear five different timbres and asked to identify which timbre you heard. Each timbre example will be played once. I will identify each instrument sound as it is played.

Timbre Examples: Violin (1) Trumpet (2) Clarinet (3) Bell (4) Piano (5)

During this exercise, you will hear two timbres for each exercise. Please identify whether the two timbres were the same or different.

Example: Please listen carefully and record your answer on your answer sheets. Was the second timbre the same or different when compared to the first timbre?

Your Answer: Same or Different Correct Answer: _____

1. Your Answer: Same or Different Correct Answer: _____

2. Your Answer: Same or Different Correct Answer: _____

3. Your Answer: Same or Different Correct Answer: _____

Directions: Please listen carefully because this portion of the lesson is different from the first portion. Each exercise will contain three timbre examples. You must list each timbre in the order as it was presented during the recording.

Example: Listen carefully to the next three timbres. Following the presentation, record on your answer sheets the presentation order of both timbres.

Your Answer: _____ Correct Answer: _____

4. Listen carefully to the next three timbres. Following the presentation, record on your answer sheets the presentation order of both timbres.

Your Answer: _____ Correct Answer: _____

5. Listen carefully to the next three timbres and record the presentation order of both timbres on your answer sheets.

Your Answer: _____ Correct Answer: _____

APPENDIX H

MUSIC BACKGROUND QUESTIONNAIRE II: INSTRUCTIONAL STATEMENT

MUSIC BACKGROUND QUESTIONNAIRE: INSTRUCTIONAL STATEMENT

The purpose of this activity is to evaluate your music background and experience. Each item in this survey evaluates your individual music listening preferences, styles, instrumental and or vocal music experience, number of years played, and years of private lessons. You will be asked to respond to items relating to your parents' and close friends' music backgrounds, music style preferences, instrumental and or vocal music experiences, number of years played, and number of years taking private lessons. Other items asked will include music listening practices, ensemble participation, musical equipment in the household, and others attitudes toward music. These responses must be from your point of view or perspective.

There are no right and wrong responses because this is a survey not a test. When making your responses, each of you will select something different or similar because you are different from one another.

While completing the survey, you will read each item and select the most appropriate answer. Do you have any questions? If you have no further questions, please proceed with the survey on your own. When you have completed the survey, raise your hand until recognized, and then you may sit quietly.

APPENDIX I

SELF-PERCEPTION PROFILE FOR ADOLESCENTS: INSTRUCTIONAL STATEMENT

SELF-PERCEPTION PROFILE FOR ADOLESCENTS: INSTRUCTIONAL STATEMENT

The purpose of this activity is to evaluate "What you are like." Each item in this survey evaluates what each one of you is like or what kind of person you are like. There are no right and wrong answers because this is a survey not a test. When making your responses, each of you will select something different or similar because you are different from one another. Listen to the sample question and follow along as it is read aloud. This question describes two different people and you must select the choice that is more like you by putting an X in the appropriate box. Now that you have made the decision about which choice is more like you, the next part of the question needs you to decide whether it is sort of true or really true about you. Please put an X in the appropriate box.

While completing the survey, you will read each question and each question has two sentences. You must check only one box for each sentence. Sometimes the question will be on one side of the page, another time the question will be on the other side of the page. You must only make one selection for each sentence. Do you have any questions? If you have no further questions, please proceed with the survey on your own. You have 20 min. to complete all questions. When you have completed the survey, raise your hand until recognized, and then you may sit quietly.

APPENDIX J

MUSIC ELEMENT PROFILE: INSTRUCTIONAL STATEMENT

MUSIC ELEMENTS TRAINING SESSION: INSTRUCTIONAL STATEMENT

The purpose of this activity is to evaluate how you listen to music elements. You will listen to eight music excerpts and select your level of attention to the four music elements of melodic contour, timbre, rhythm, and tempo. While listening to the musical excerpts, you will hear all four of the music elements. As you listen to the music excerpts, you level of attention will change. It is very important that you listen and remember your level of attention to each music element. Again, the music elements are melodic contour, timbre, rhythm, and tempo.

After completing the listening activity for each music excerpt, please locate the Music Element Profile and pencil on the desk in front of you and answer the four items regarding your level of attention to the four music elements of melodic contour, timbre, rhythm, and tempo. Please notate your level of attention for each music element from 1 to 7 on the answer sheet. One means the lowest level of attention to the music element and seven means the highest level of attention to the music element. You will follow this procedure throughout the listening activity. We are about to begin the testing session; do you have any questions before we begin this activity?