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Children's Emotional Responsiveness to Music as Measured by the Continuous Response Digital Interface and Verbal Response

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CHILDREN’S EMOTIONAL RESPONSIVENESS TO MUSIC AS MEASURED BY THE
CONTINUOUS RESPONSE DIGITAL INTERFACE AND VERBAL RESPONSE

By

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ABSTRACT

The purpose of this study was to explore the emotional responsiveness of elementary-aged children to music. Sixty students participated from three intact classes of public school fourth graders. While listening to Rhapsody on a theme of Paganini, Op. 43, Variation 18, by Sergei Rachmaninoff, students indicated their aesthetic reactions by manipulating the dial of the Continuous Response Digital Interface (CRDI). Immediately after the listening exercise, using a highly flexible retrospective interview process to allow for maximum individualized response, subjects’ verbal responses were recorded and later transcribed. The study was also an exploration of the CRDI as a tool for measuring aesthetic response from younger students. The object of the investigation was not to focus on group results as they pertain to prediction of attitude, behavior, or preference but to provide the music educator and therapist with individualized, descriptive information regarding the emotional responses of young children to a musical stimulus. The study did in fact indicate that music elicited deeply emotional responses from these elementary-aged children. As evidenced by their poignant verbal responses, fourth grade students in this investigation were able to make immediate, highly personal, and completely individualized emotional connections after hearing an unfamiliar piece of music one time. The CRDI proved to be an effective, efficient method for gathering aesthetic response data from fourth grade students. Such information would seem to provide a consequential contribution to our understanding of the young child’s emotional interactions with, and reactions to, music and can serve as a tool to enhance our ability to develop those responses.
CHAPTER 1
INTRODUCTION

It appears to be a universally held axiom that most people respond to music. Crickmore (1968) states that “the enjoyment of music may be regarded as a specifically human activity appropriate to various temperaments” (p. 301).

Since the time of Plato and Aristotle, philosophers, psychologists, researchers and teachers, have studied the relationship between humans and music and have postulated numerous ideas and theories. Some have viewed music as a language (Cooke, 1959), but others have countered that music, while embodying and stirring human emotions in a way that language cannot, is not a language, as such, with meaning assigned to each phrase (Langer, 1957).

Descriptions and definitions concerning the human response to music have also been problematic, often fraught with disagreements and discrepancies. In an effort to clarify the inconsistent use of terminology in the field of affective responsiveness, Price (1998) surveyed a representative sample of pertinent sources and proposed the following definition of aesthetic experience: “Intense subjective and personal experience. Feelingful reaction. Requires perception, experience of feelings and reactions, and psychological involvement” (p. 444). Additionally, he defined affective response as a “reaction involving feelings and emotions. [It is] learned behavior resulting from a life history of interactions with musical stimuli; encompassing mood-emotional, preference, and taste responses” (p. 444). Over the past decade, a series of investigations have further illustrated the difficulties concerning terminology associated with feelingful response (Lychner, 1995; Madsen, 1997b; Madsen, Brittin, & Capperella-Sheldon, 1993; Madsen, Byrnes, Capperella-Sheldon, & Brittin, 1993). While these studies have purposefully offered no definition of terminology, they have provided various categories of response, including “aesthetic experience,” “aesthetic response,” “felt emotional response,” “perceived tension,” and “less or more.” Data, involving populations of musicians as well as nonmusicians, have shown no meaningful differences between categories. In spite of numerous
attempts to clarify and articulate specific definitions for terms associated with feelingful responses to music, it appears that definite meanings remain elusive. While Farnsworth (1969) stated that “research in aesthetics can often throw much light on what is taking place in a particular music area, i.e., it has a descriptive function” (p. 9), he was also quick to caution that investigation in this area has revealed no aesthetic absolutes.

Attempts to quantify and measure human responsiveness to music have proven to be an equally divisive issue. Some investigators have searched for empirical data supporting human reaction to music by utilizing sophisticated instruments which measure physiological response (Dainow, 1977), but these studies have produced conflicting results. In addition, Meyer (1956) posited that emotional responsiveness to music was either objective or subjective and took issue with quantifying either response type. He suggested that objective evidence has limited value due to both philosophical and social aspects of a subject’s response. He furthermore contended that subjective response was hampered by the lack of a scientific measuring device and complicated by the fact that verbal “descriptions of emotions felt while listening to music are usually apocryphal and misleading” (p. 8). As a result of these varying and complex issues, a number of investigators have completely resisted the notion of quantifying human responsiveness to music (Csikszentmihalyi, 1997; Regelski, 2002). In contrast, others have systematically searched for reliable methods with which to measure these reactions (Behrens & Green, 1993; Dainow, 1977; Gfeller, Asmus, & Eckert, 1991; Madsen et al., 1993; Nelson, 1985). Many of these researchers have relied on self-report measures, including adjective checklists, questionnaires, rating scales, or semantic differentials (Gabrielsson, 1991; Geringer & Nelson, 1980; Goldstein, 1980; Nielzén & Cesarec, 1981; Sloboda, 1991; Wedin, 1972). While providing a great deal of important data, these methods are, however, in most cases, retrospective and “accurate only to the extent that the listener is able to assess his or her own experience” (Madsen et al., 1993, p. 59). Crozier (1981) summarized the main problem involved with retrospective measures as follows: “One of the difficulties in evaluating the literature on this topic . . . is the interactive nature of aesthetic object and aesthetic responses” (p. 433).

Due to the temporal element involved in emotional responsiveness to music, a number of researchers have investigated measurement methods which would allow subjects to indicate responses concurrently, as they occurred through time (Clynes & Nettheim, 1982; Goldstein, 1980; Namba, Kuwano, Hatoh, & Kato, 1991). This line of research has led to the development
of the Continuous Response Digital Interface (CRDI), a potentiometer interfaced with a computer, which allows the measurement of a response simultaneously with stimulus presentation (Gregory, 1995). The CRDI has been used successfully to measure a number of diverse responses to music with a wide range of subjects, including musicians, nonmusicians, special populations, and children as young as pre-school-aged (Byrnes, 1997; Kantorski & DeNardo, 1996; Lychner, 1995; Madsen, 1998, 1991a), and appears to be an excellent tool for data collection related to human responsiveness to music.

Since the middle of the twentieth century, the development of this human responsiveness to music has frequently served as the philosophical justification for music education in the public schools in this country (Mark, 1986). Numerous leaders in the field of music education have addressed this topic (Elliott, 1983; Leonhard, 1965; Mark, 1982; Reimer, 1970; Schwadron, 1967, 1970), and many have advanced philosophical beliefs similar to the following statement by Bennett Reimer: “Music education is the education of human feeling, through the development of responsiveness to the aesthetic qualities of sound. The deepest value of music education is . . . the enrichment of the quality of people’s lives through enriching their insights into the nature of human feeling.” (1970, p. 39).

Given the importance placed on developing the aesthetic sensitivity of young students involved in music programs throughout the United States (Reese, 1983; Reimer, 1965), it seems an extremely important area for investigation. However, perhaps due in large part to the elusive nature of aesthetic response and also to the diverse opinions and methodologies surrounding its research, a thorough review of the literature has revealed a paucity of studies investigating the affective or emotional responsiveness to music of elementary-aged students. A smattering of studies have focused on mood recognition in music by children and appear to indicate that students as young as 3 years old can recognize mood dimensions in music (Giomo, 1993; Kastner & Crowder, 1990; Kratus, 1993). However, while all music educators seem to “know” that young children respond emotionally to music, the extensive review of literature included in this work reveals a dearth of research attempting to validate that point.

If music educators are being challenged to develop aesthetic responsiveness to music in students, it seems of paramount importance to investigate at least three related areas through systematic study:
1) Are young children indeed capable of emotional responses to music?
2) If so, by what methods are they capable of indicating such response?
3) At what grade levels do these responses exist?

This study focused on the ability of fourth grade public school students to respond emotionally to music. Since current research has shown that the CRDI has been used successfully with elementary-aged students to gather various types of information (Byrnes, 1994; Kantorski & DeNardo, 1996; Parisi, 2002), it was used to gather non-verbal, aesthetic responses. In a further attempt to probe for true emotional response, in contrast to like/dislike labels, students were also asked to discuss and explain their CRDI responses verbally. While earlier studies have shown that younger subjects have difficulty expressing their understandings of musical concepts orally (Hair, 1977a; Schleuter & Schleuter, 1985; Sims, 1986; Van Zee, 1976), a number of recent investigations have found that children are able to successfully discuss their musical experiences with greater detail and insight than previously considered possible (Bundra, 1993; Kerchner, 2000; Rodriguez & Webster, 1997). Consequently, both methods of data collection were utilized in this investigation.
CHAPTER 2

REVIEW OF LITERATURE

Listening Responses

Music is an aural art; consequently, listening is an inherent part of any musical experience - a prerequisite to all other musical pursuits (Madsen, 2001). Since listening is one of the primary modes through which music is appreciated, experienced, and learned (Reese, 1983), developing attentive and knowledgeable music listeners, is an important goal for music education (MENC, 1994) and a standard component of the curriculum. Results from two studies by Moore (1981) and Wagner and Strul (1979) revealed that listening to music made up a minimal portion of the elementary music curriculum, between 1% to 6%. In an investigation with starkly contrasting results, Baldridge (1984) concluded that 49% of total class time consisted of listening to music in the context of either making or hearing music. The wide discrepancy in data could possibly have resulted from varying definitions of the term “music listening.”

In an attempt to develop listeners who “sit still long enough to listen to music” (McDonald, 1993), music educators, therapists, and researchers have consistently attempted to understand and enhance the process by studying music listening from diverse perspectives and populations (Flowers, 1983; Geringer & Nelson, 1980; Montgomery, 1978; Sims, 1999). Investigations utilizing student populations in general music classes have focused mainly on teaching methodologies and their effectiveness (Haack, 1972; Prince, 1972b; Rives, 1970), examining the development of listening skills and responses as they relate to the developmental stages of children (Hair, 1977; C. K. Madsen, Edmondson, & C. H. Madsen, 1969; Schultz, 1981), and utilizing a variety of response indicators to assess listening skills and responses (Andrews & Diehl, 1967; Gardner, 1971; Gilbert, 1983; Jetter, 1977).
Teaching Methodologies

One method of interest to researchers and music educators has been the practice of developing music listening skills through the use of notated themes or visual representations. Data analyses from these studies has tended to suggest that visual representations may be helpful at the middle school level, but there is some question regarding their value at the elementary level (Hedden, 1980). Two early studies by Oberdin (1967) and Bastarache (1972a) compared experimental groups, with whom researchers used notated visual prompts, and control groups, who were only presented with themes. Results indicated no difference between the groups in their ability to recognize the various excerpts. A comparable study, utilizing students in grades four through seven as subjects, was conducted by Peterson (1965). The theme recognition test revealed a significant difference in favor of seventh-grade experimental students but not at the fourth through sixth-grade levels. However, two additional studies (Neidlinger, 1967; Sears, 1977), one which also incorporated seventh-grade subjects, revealed no difference between the scores of experimental and control groups. These conflicting results would appear to indicate the need for additional research concerning the concept of utilizing notated themes and visual representations to teach music listening skills.

Research into another method for development of music listening skills, known as guided listening, has also produced varying results. In an attempt to improve listening skills in middle school subjects (Prince, 1974; Zumbrunn, 1972), sixth graders (Harrison, 1974), fifth graders (Rives, 1970), and fourth graders (Thompson, 1972), researchers investigated a variety of guided music lesson prototypes. Prince (1974) investigated the effects of guided, analytical listening on the musical enjoyment of seventh grade students. Zumbrunn’s (1972) study involved four groups, including an experimental group which received eighteen taped, guided lessons introducing 20th-century music. In order to facilitate better discrimination between major and minor modes, Harrison (1974) provided experimental subjects with supplemental cassette tapes to be used outside of class. Rives (1970) compared traditional and programmed instruction for effectiveness in developing analytical skill, familiarity with standard repertoire, and music memory. Like Zumbrunn (1972), Thompson (1972) also structured four groups, with which he used visual representations and televised verbal descriptors to evaluate their effects on aural perception of melodic and rhythmic aspects of music. Geringer and Nelson (1980) randomly assigned fourth graders to music-guide, music-only, and control groups. While listening, the
music-guide group completed a forced-choice written task. Results from all these studies yielded no significant differences, indicating that none of the varying methods employed were effective in enhancing the specific music listening skills upon which the investigations were focused.

However, three studies, which involved middle school students and utilized research designs and types of programmed instruction similar to those from the five investigations just discussed, yielded positive results. O’Connor (1976), Roach (1971), and Tatarunis (1975) all concluded that the programmed materials employed in their investigations were effective means of teaching music listening skills. Similarly, Rasmussen (1966) concluded that a series of researcher devised programmed tape recordings aimed at developing the skills assessed by Seashore’s *Measures of Musical Talents* (Seashore, Lewis, & Saetveit, 1960) were effective in teaching music listening skills. Standifer (1970) found that while high school students became more proficient in perceiving musical elements, this increased sensitivity did not appear to be associated with the development of greater aesthetic sensitivity or changed attitudes toward music.

Other studies which investigated teaching techniques for improving musical listening skills fall outside the area of notated themes and guided listening. Haack (1969) utilized two methods, an analytical deductive approach and an inductive approach, for development of specific concept discrimination during a music listening activity. Data revealed highly significant gains for both experimental approaches, with gain scores from the inductive method slightly and consistently higher than those of subjects using the deductive approach. Zemke (1973) explored the effects of the Kodály method on the development of listening skill of fourth graders and reported mixed results. An Orff-based approach was used with sixth-grade experimental and control groups (Olson, 1964) but, on a test of melodic sensitivity, produced no differences between the two groups. Taebel (1974b) also found no difference in the listening achievement of kindergarten through second grade subjects due to instructional format. In a study which employed supplemental piano and ukulele activities designed to improve auditory-visual discrimination, Colwell and Rundell (1965) found no significant differences among the three groups used in the investigation. In a similar study, Lyke (1967) sought to improve the listening skills of fifth grade students through participation in a keyboard program. However, unlike Colwell and Rundell (1965), Lyke concluded that the keyboard program was successful in enhancing subjects’ listening skills. Results from several additional studies involving
elementary-aged students appear to support those found in Lyke’s study (1967). Findings from an investigation with fourth graders seemed to suggest that compositional activities could be used to great effect in developing aural acuity (Bradley, 1974). Foley (1975) constructed a protocol to assist second graders with conservation of melody and rhythm and found significant difference in favor of the experimental group. In an experiment which examined the effects of live concert attendance on the listening skills of fifth grade students (Sigurdson, 1971), the researcher again found that the experimental group performed significantly better than the control group. Two later studies which employed intriguing methodologies also resulted in significant differences for the treatment groups. O’Brien (1992) compared the effects of figurative language on music listening instruction. She found that seventh grade students who discussed music examples using a combination of figurative and analytical language showed significant differences in aural discrimination, attitude, and conceptual understanding. In an investigation involving fifth graders, McLean (1999) compared a singing approach to a nonsinging approach in reference to aural thematic recognition and thematic preference. Data analyses revealed that subjects who sang thematic material had a significantly higher rate of aural recall than subjects who did not sing.


Over a number of years, a wide variety of teaching methodologies have been investigated in a myriad of studies. However, there still appears to be a gap between theory and practice, indicating the need for further inquiry by music educators, researchers, and therapists.

Development of Listening Skills and Responses

Several studies attempting to assess the status of certain listening skills at various age levels have often focused on pitch discrimination. Most researchers in this area have concluded that pitch discrimination ability seems to become more developed as age advances. In an early study (Duell & Anderson, 1967), researchers found a steady increase in pitch discrimination between ages six and eight. Size of interval was also a significant factor, with larger intervals
easier to identify. These findings were substantiated in a study which investigated the frequency differences limens of five-, seven-, and nine-year-old subjects (Soderquist & Moore, 1970). Soderquist and Moore found that the size of the difference limen decreased between ages five and seven. Similarly, C. K. Madsen, Edmonson, and C. H. Madsen (1969) studied the modulated frequency discrimination abilities of subjects ages seven, ten, and thirteen and found marked differences in the detection ability of students at various ages. A study by Fullard (1975) also suggested that age is a significant factor contributing to improved pitch discrimination abilities. Andrews and Madeira (1977) concluded that the language in which a pitch discrimination task is couched may affect the ability of young students to answer correctly and suggested that researchers and teachers use the terms same/different not higher/lower.

Researchers have also investigated the success with which young children differentiate varying examples of melodic contour. Van Zee (1976) determined that kindergarten subjects can deal successfully with melodic contour but that their ability to demonstrate their awareness on performance tasks exceed their ability to verbalize about melodic contour. In a study involving first graders, Hair (1977) came to similar conclusions. Olson (1978) tested the effect of three conditions (aural/visual, visual/aural, and aural/aural) on the melodic contour discrimination abilities of first grade subjects. He concluded that first graders performed best on the aural to aural test, with the mean scores from the other two conditions lower but not significantly different from each other. However, data analyses from three additional investigations revealed that students in kindergarten and first grade were unsuccessful in recognizing melodic contour when other musical elements of the excerpt were also altered. Lawes (1971) and Botvin (1974) found that kindergarteners and first graders were unable to discern whether a melody retains its contour when its rhythm is altered. Similarly, King (1972) determined that first grade subjects were unable to conserve a melodic pattern with tempi or timbre alterations. In recent years, researchers (Holahan & Saunders, 1997) have begun using computerized tests to investigate melodic contour discriminations of elementary-aged students.

The development of rhythm, meter, and tempo skills has also been investigated. In one of the earliest studies concerning children’s music listening skills in relation to rhythm, meter, and tempo, Zimmerman and Sechrest (1968) concluded that the performance of students, ranging in age from seven through eleven, on rhythmic tasks consistently improved with grade level. In a replication study that included sixth grade students, Webster and Zimmerman (1983) found a
significant main effect for grade at every level, except between fourth and fifth. There was also a significant main effect for gender, with girls outperforming boys in four of the five grade levels investigated. Data also showed that students performed best with items in duple meter. Lucchetti and associates (Lucchetti, Cacció & De Beni, 1997) investigated the development of rhythmic perception in third through fifth grade students from Italy. Results indicate a significant age-factor influence, with third grade subjects having a significantly poorer performance that those in fourth and fifth grades. Again, no significant gender differences were found over the whole sample. A study by Miller and Eargle (1990) included subjects ages seven to fifteen and investigated the effect of development and music instruction on tempo discrimination. Findings showed marked differences in results as a function of age for the change trials, with older subjects more accurate and musical training relatively unimportant. However, in trials with a constant beat, subjects with musical training were more accurate and age, by itself, had little consequence upon performance.

Investigations have also focused on the ability of preschool through fourth grade students to perceive harmonic and timbre changes. While Bridges (1965) found that harmonic discrimination ability improved with age, data from Hair’s (1973b) study indicated that first graders perceived harmonic changes between isolated pairs of chords with 83 percent accuracy. In a 1994 study (Costa-Giomi, 1994b), five-year-old subjects could discern harmonic changes in a simple chord progression but were unsuccessful when a melody was superimposed over the progression. Four-year-old children could not identify the chord changes of either stimuli. Truax (1971) concluded that fourth graders are sensitive to timbre and observed consensus regarding the choice of adjectival descriptor for various sounds.

The field of stylistic sensitivity has also been investigated with children. Gardner (1973) attempted to discover how sensitivity to musical styles develops and improves. Subjects from five different ages groups (6, 8, 11, 14, and 18-19) were asked to match 16 pairs of musical selections and give reasons for their decisions after pairing the examples. Results showed a broad increase in the ability to identify pairs correctly was equated with advancing age, with the three oldest age groups (11, 14, 18-19) performing at virtually the same level. While Gardner reported that the pairing task was completed with surprising accuracy, results indicated that subjects had greater difficulty verbalizing the reasons for their choices. Castell’s study (1982) is similar to that of Gardner (1973), but she extended the range of musical material to include both
popular and classical music. Analysis of data revealed that nine-year-olds outperformed eleven-year-olds in listening skills associated with style differentiation. Results from a study by Addessi and her colleagues (Addessi, Baroni, Luzzi, & Tafuri, 1995/1996) support those of Gardner (1973), suggesting an increase of musical stylistic competence with age.

Several researchers have suggested that children of varying ages attend to different elements as they listen to a piece of music. McDonald (1974) found that her fourth grade subjects were best able to deal with items concerning loudness. Examples dealing with tempo were more difficult, and those focusing on pitch were the most difficult. These observations were largely supported by data from Laverty’s study (1970). In an investigation concerning the sequential development of certain listening skills, Crews (cited in Hedden, 1981) concluded that: second grade subjects could discern changes in instrument; third graders discriminated alterations in key; fifth grade students detected differences in melody; sixth graders pinpointed changes in rhythm; and seventh grade subjects distinguished variations in tempo. In a similar study involving subjects in first, third, fifth, and seventh grades, Hufstader (1977) determined that timbre skills are developed by first grade, rhythm and melody skills by fifth grade, and harmony skills by seventh grade or later.

Studies have also indicated that environment exerts a profound influence on the acquisition of music listening skills. Data from investigations by Hill (1968), McDonald (1974), Rost (1972), and Swickard (1971) all suggest that students from culturally advantaged backgrounds consistently have significantly higher scores on a majority of tests which examine the development of music listening skills.

While this work focuses on listening research concerning elementary-aged subjects, Haack (1980, 1992) and Hedden (1980, 1981, 1988, 1990; Hedden & Ferguson, 1989) provide several reviews of related literature which include different populations. Haack, however, purports that music listening has been “among the last and least studied aspect of music” (1992, p. 451) and articulates the need for more large-scale, cross-cultural, longitudinal, and socio-functional research on listening. Bundra (1993) further states that meaningful listening opportunities will only be available for students when music educators are “able to draw upon a body of research about how children listen to music and how their listening skills evolve” p. 24.
Indicators of Listening Skills and Responses

Music researchers, educators, and therapists have devised numerous assessment methods for the measurement of children’s listening ability and achievement (Andrews & Diehl, 1967; Seashore, 1960; Utley, 1970). Investigators have considered many complex variables regarding selection or creation of appropriate evaluation instrumentation for specific populations (Colwell, 1969, 1970; Gordon, 1979, 1982). These contingencies have included subjects’ age and achievement levels, motor abilities, reading abilities, and verbal abilities.

Of the traditional assessment methods used to measure the listening skills of children, the most efficient appears to be written tests, which are easily administered to groups of subjects (Andrews & Diehl, 1967; Colwell, 1979; LeBlanc, 1984; Utley, 1970). Young children, however, may not have the essential mental skills to perform effectively on such tests (Hair, 1977b; Van Zee, 1976). Similarly, younger subjects may also not possess the necessary verbal skills with which to express oral responses (Lewis, 1989). Consequently, performance tests, by virtue of their non-verbal nature, would seem to be the obvious answer (Jetter, 1977; Sims, 1986; Zimmerman & Sechrest, 1970). However, there is the possibility that motor skill may act as a confounding variable on achievement during performance tests (Gardner, 1971; Schellekens, Kalverboer, & Scholten, 1984; Schleuter & Schleuter, 1985). Recent research has also added the dimension of musical response via computer technology (Flowers, Wapnick, & Ramsey, 1997; Rodriguez, 1998, 2001).

Another issue of musical response with which researchers have struggled is that of static versus continuous measurement (Fredrickson, 1994b; LeBlanc, 1984; Madsen & Geringer, 1990). Because music moves through time, it would appear that listener responses should be recorded through concurrent as opposed to summative measures. As a result, several researchers have turned to non-traditional, continuous methods when studying listeners’ perceptions and reactions to music (Flowers, 1984; Herberger, 1983; Madsen, 1997a; O’Hearn, 1984; Richardson, 1988).

Performance indicators

A body of research appears to suggest that children may be capable of demonstrating their understanding of music listening tasks through performance responses (Andrews & Diehl, 1967; Hair, 1977b; Jetter, 1977; Zimmerman & Sechrest, 1970). Results from these and several other studies (Hair, 1987a, 2000-2001; Van Zee, 1976; Webster, 1982) indicate that while
children may be inaccurate in responding to listening tasks through written or oral response modes, they may be able to correctly evidence their understanding through nonverbal/performance-based response.

In a 1976 study, Van Zee asked kindergarten students to demonstrate aural discriminations of melodic contour using both verbal and performance measures. Results showed that responses played on a keyboard, indicating ascending or descending passages, produced the highest mean proportion of correct answers. The researcher concluded that kindergarten students’ ability to deal verbally with properties of musical sound does not necessarily emerge concurrently with their ability to perceive and comprehend them.

In a similar study, Hair (1977a) asked first grade students to give written, spoken, gestural, and playing responses to differences in tonal patterns. When data obtained from both the verbal and nonverbal tests were compared, results indicated that subjects had scored significantly higher in the nonverbal response mode (echo-playing aurally perceived ascending and descending tonal patterns on resonator bells).

Webster and Schlentrich (1982) investigated the abilities of 4- and 5-year-old children for discriminating pitch direction using gestural, performance-based, and verbal response modes. Results reinforced the earlier findings of Van Zee (1976) and Hair (1977a) and suggested that nonverbal, performance-based response modes are the most natural way for young children to initially react to pitch direction.

In a study with subject age level expanded to fourth grade, Bennett (1991) asked students to use chinning, tapping, and dotting to demonstrate their perceptions. Data indicated that while chinning was the most frequently preferred response mode, it produced the lowest accuracy scores. Tapping was the least preferred mode but produced the highest scores.

In a 1998 study, Rodriguez investigated kindergarten, second, and fourth grade students’ perceptions, production, and description of musical expression. Subjects first indicated, via computer “touch screen,” which one of three performances of the same musical fragment, performed mechanically or expressively, using the “2 + 1 oddity paradigm,” was different. In the performance phase, students performed their “favorite” excerpt from the perception phase, again using computer software and a MIDI keyboard to add expression. In the perception task, all subjects, including kindergarten students, discriminated between mechanical and expressive musical examples above chance level. In the performance task, kindergarten subjects scored
below the average for the overall scores. Second graders scored above average and fourth grade subjects scored the highest. The researcher concluded that students of this age group appear less able to produce musical expression in their own performance than to perceive it in recordings by others.

In a similar study, Rodriguez (2001) asked second, fourth, and sixth grade subjects to use a computer software program and keyboard to perform “Twinkle, Twinkle, Little Star” expressively. Four days after the administration of the performance task, students were asked to identify their own performances from among three examples. Results indicate that young children can identified their own musical interpretations with striking success (second graders-75%, fourth graders-80%, sixth graders-95%).

A number of additional studies have yielded a myriad of successful nonverbal/performance-based responses to music listening activities. Preschool children in Scott’s (1979) study sorted boxes connected to taped musical examples into positive and negative exemplars of a designated concept. Other examples have included the manipulation of objects such as pitched and nonpitched percussion instruments (McMahon, 1985); asking subjects to point to visual representations or make gestures (Webster & Schlentrich, 1982; Young, 1982); and using movement to demonstrate comprehension of music characteristics (Sims, 1991; Webster & Schlentrich, 1982; Young, 1982). More recent studies have used singing (Sims, 1990, 1991, 1995) and computer software (Flowers et al., 1997) in the performance response mode.

Results from these studies seem to indicate that nonverbal/performance-based response to music listening tasks do appear to illustrate evidence of more advanced conceptual understanding than children’s limited verbal ability might provide (Flowers, 1984; Hair, 1987a). For additional, extensive reviews of related literature, please see Hair (1987a, 2000-2001), Lewis (1989), and Sims (1990).

Written indicators

Few written standardized tests of music listening specifically designed for elementary-aged students exist. Rather, such tests are usually described as measuring music aptitude or achievement. An early music aptitude instrument appeared in 1966 (Bentley, 1966), and two other such instruments, which test tonal memory and rhythmic discrimination, include Gordon’s Primary Measures of Music Audiation (1979) and Intermediate Measures of Music Audiation (1982). Researchers who have published tests measuring music listening achievement for

Several researchers have utilized written responses in their investigations concerning the measurement of musical concepts. Schevill (cited in Hair, 1977a) developed written tests for second graders to identify melodic direction by matching aural stimuli with visual representations of bouncing balls, lines, or windows in a house that indicated up and down. Castell (1982) provided her 9- and 11-year-old subjects with booklets in which to write answers. Results showed that while younger students exhibited surprising sensitivity to stylistic differences, they experienced great difficulty in verbally expressing this awareness. The 11-year-old subjects produced more overall responses and exhibited greater verbal fluency.

Due to young children’s lack of the necessary verbal skills with which to express aural responses, several music researchers have utilized pictographic scales as a written response mode (Brown, 1978; Flowers, 1988; Giomo, 1993; Kratus, 1993; Kuhn, 1980; May, 1985; Peery & Peery, 1986; Sims & Cassidy, 1997; Wagner & Darrow, 1981/82). These scales, which often entail merely circling the smiling, neutral, or frowning cartoon-like face which most accurately reflects their reaction to the listening activity, are useful with this age group because of the ease of interpretation and immediacy of understanding. In addition, students seem to prefer using the pictorial scale to other written measures (LeBlanc et al., 1998; Sims, 1987). In an expansion of the traditional pictographic response, Byrnes (1994, 1997) utilized a smiling face that was presented to the listener in five progressively larger sizes of approval, and LeBlanc encouraged students to draw noses on the pictorial scale (1998).

Two researchers, Hair and Flowers, are well known for their use of written response with elementary-aged children. Both have conducted extensive research in the area of children’s written responses to music listening tasks.

In a 1977 study, Hair used verbal and nonverbal tasks to investigate the ability of first grade children to discriminate tonal direction. Subjects were asked to mark a written word and give a spoken verbal description of patterns they heard; they were also asked to play resonator bells in response to tonal patterns played by the investigator. Results showed significantly higher scores for nonverbal responses and significantly higher scores for written than spoken tests. The researcher concluded that many first graders could detect changes in tonal patterns and could duplicate directional patterns without being able to verbalize the concept of tonal direction using
traditional music terminology. In a second investigation (Hair, 1981), students in grades two through four and college music and elementary education majors were asked to listen to a familiar melody followed by ten alterations. Subjects were instructed to write a word that described the characteristic change in each replaying. When correctly describing music concepts which were altered in the examples, data revealed that participants of all ages used consistent and traditional terminology. In contrast, when inaccurate terms were select, there was little similarity in vocabulary between adults and children. In a replication and extension of the 1981 study, Hair investigated the verbal and visual responses of students in grades K-6. Group written tests were given to subjects in grades 3-6, while students in kindergarten through second grades were tested individually and had their oral responses recorded by the researcher. Findings indicated that higher visual scores on test items that were labeled correctly as well as incorrectly suggested that the use of language, not the ability to correctly discriminate conceptual alterations, remains a central issue in research studies of young children’s musical development. Another investigation into the vocabulary used by students in grades 4 through 7, college students, and university faculty members (Hair, 1987a), showed that the children used more purely descriptive words, and adults tended to give more technical and synonymous terms. Hair (1995/1996) also asked children and university students to write three words describing the mood created by two excerpts from the Western art music tradition. She found subjects across all age groups and with varying degrees of musical training provided similar mood category responses. In addition, Hair has provided an extensive review of related literature (1993/1994).

Much of Flowers’ work in the area of written response to music listening activities has focused on written descriptions of music. In an initial study with nonmusic majors, Flowers (1983) investigated the effect of instruction in vocabulary and listening on descriptions of changes in music. Analysis of written descriptions of changes before and after instruction revealed no significant differences between the three experimental groups and the control group, indicating that neither vocabulary study nor listening with verbalization produced more changes counted as different in any of the groups. In a later examination concerning the effect of instruction in writing about music on descriptions of music excerpts by fifth and sixth grade subjects, Flowers (2000) again found that instruction in writing about music did not enhance students’ abilities to write descriptions that could be matched to musical excerpts beyond those of students who received no instruction. However, she did find a significant grade level
difference, with fifth graders’ descriptions being matched correctly to excerpts with less frequency than those of sixth graders. For her 1984 study, Flowers structured two experiments. First, she analyzed the elements of music described by third and fourth grade students and undergraduate nonmusic majors in reaction to a listening activity. Secondly, she examined the effect of instruction in music vocabulary on children’s subsequent descriptions of music. In overall pattern of descriptions of musical elements, she found that children differed significantly from undergraduates. Younger subjects more frequently referred to timbre, extramusical, and tempo, while college students commonly mentioned extramusical, tempo and pitch/melody. In contrast to findings from two earlier studies (Flowers, 1983, 2000), results from the second experiment indicated that instruction in vocabulary produced a significant increase in attention to designated elements of music by third- and fourth-grade children on the posttest. It was noted, however, that children limited their responses in number of musical elements addressed and less than half of the students used the newly learned terms in their posttest descriptions. In another study comparing the music listening responses of college and elementary students, Flowers (1988) found that the musical elements described were generally the same as subjects had named in previous studies. Tempo and dynamics were the primary areas in which musical discriminations were verbalized by younger subjects. Undergraduates produced more distinct descriptions for the musical selections and seemed to focus on extramusical associations as well as the elements of tempo, dynamics, and instrumentation. In a related study utilizing only undergraduate and graduate music majors (Flowers, 1985), analysis of subjects’ use of extramusical, nontechnical, and technical indicated no significant differences in number of different words used in either category. A 1987 study investigated the effect of written descriptions or listening on the ability of fifth graders and undergraduates to recognize orchestral excerpts. Subjects from both age groups were able to identify whether or not they had heard given pieces significantly beyond chance. Written extramusical descriptions facilitated correct identification of new excerpts better than timbre descriptions or listening-only conditions for all subjects. In a more recent investigation continuing this line of research (Flowers, 1996), elementary and undergraduate students listened to a brief musical excerpt and were then instructed to write a description through which a person could identify the melody without previously having heard it. Results showed that the percent of evaluations that correctly matched description with excerpt increased dramatically with age. While the response of university
students covered several categories, elementary school children’s descriptions were redundant and monolithic.

Data gathered from the previous studies appear to suggest that written tests, with the exception of pictographic scales, are too difficult for younger children and perhaps do not offer a true representation of their perceptions. The results also seem to suggest that instruction in appropriate music vocabulary and descriptors is not easily assimilated and utilized by elementary-aged students. Please see Bundra (1993), Flowers (1996), Kuhn (1980), and Lewis (1989) for additional reviews of literature.

**Oral indicators**

In addition to performance and written response methods, researchers have also utilized the oral response mode to measure and analyze reactions to and comprehension of musical listening activities by preschool and elementary-aged subjects. A substantial number of these studies have attempted to measure the younger child’s ability to perceive and describe properties of musical sound (Buckton, 1982; Costa-Giomi, 1996; Flowers & Costa-Giomi, 1991; Fullard, 1967; Hair, 1993/1994; Taebel, 1974a) and have resulted in conflicting findings.

During the past two decades, investigators have shown increased interest in children’s personal, introspective, and emotional responsiveness to music listening tasks (Terwogt & Van Grinsven, 1991; Trainor & Trehub, 1992). A number of researchers have used the oral response mode to investigate the aesthetic reactions of younger subjects (Barrett, 2000-2001; McMahon, 1987; Sims & Cassidy, 1997).

Several studies have investigated the ability of preschool and kindergarten students to orally verbalize responses to music listening activities. Van Zee (1976) investigated the ability of kindergarten children to give oral responses to aural discriminations. She found that her subjects demonstrated their understanding of rhythm patterns and duration of tones better through performance mode on a simple keyboard instrument than through oral description. Webster and Schlentrich (1982) asked 4- and 5-year-old children to indicate discrimination of pitch direction by saying “going up” or “going down.” Like Van Zee (1976), they concluded that subjects were more successful using a nonverbal, performance-based response mode. In an earlier study which produced results contrasting to those of Van Zee (1976) and Webster and Schlentrich (1982), Fullard (1967) used programed techniques to teach preschool subjects to identify various wind and string instruments and asked them to respond by touching the corresponding picture and
saying the name of the instrument. He found that both responses were not always performed, and that subjects tended to make their identifications by touching the picture alone. However, to receive a correct score, subjects were required to orally name each instrument and since posttest results were higher than those from the pretest, the researcher concluded that learning had taken place. Two investigations involving preschool students (McMahon, 1987; Sims & Cassidy, 1997) asked subjects to give an oral, interpretative, and personal response to music listening activities. Although most reactions were generalized value statements, researchers agreed that such verbalizations did provide important information. In a study comparing responses by English- and Spanish-speaking preschool children, Flowers and Costa-Giomi (1991) asked students to indicate their perception of changes in a familiar melody by either clapping or speaking what had changed into a microphone. Data indicated that both English- and Spanish-speaking subjects were more correct when they responded verbally than when they used clapping as a response. Based on the results of the 1991 investigation (Flowers & Costa-Giomi, 1991), Costa-Giomi (1994b) asked 4- and 5-year-old students to indicate perception of harmonic alterations by using the word “change.” In an investigation with results similar to an earlier study (Flowers & Costa-Giomi, 1991), Costa-Giomi (1996) examined the ability of preschool children to detect mode change in music and to identify major and minor stimuli. She found that subjects performed better on the test when answering orally than when responding nonverbally. When asked to use the words “major” and “minor,” preschoolers identified more mode changes when asked to represent them through movement.

A number of researchers have also used oral report to investigate the conceptual perceptions of students in first and second grades. Results have been more consistent than those from studies with preschool and kindergarten students but have still produced conflicting reports. Taebel (1974b) investigated the development of children’s concepts of duration, pitch, tempo, and volume. Results indicated that first grade subjects performed nearly as well as those in second grade on the music listening tasks but were unable to justify their choice verbally, indicating that age is a significant factor in the ability to correctly verbalize musical perceptions. In a 1973 study, Hair asked first graders to demonstrate harmonic discrimination by saying “same” or “different.” By tabulating these oral reports, the researcher concluded that students in first grade can discriminate harmonic change. In contrast, Hair (1977a) found that first grade children were significantly better at indicating discrimination of tonal direction through
performance and written tasks than through oral tasks. Costa-Giomi (1994a) investigated the effect of register and timbre modifications of musical stimuli on first grade children’s ability to identify chord changes. Subjects, who were given the opportunity to respond to the listening tasks through oral or performance modes, preferred to respond nonverbally. Flowers and Wang (2002) asked sighted and blind students, from kindergarten to upper elementary, to individually listen to six short music excerpts and describe them orally. After the oral descriptions were tape-recorded and transcribed, a panel of musicians was able to match description to excerpt with about the same degree of accuracy for blind and sighted subjects. When compared to two earlier studies (Flowers, 1996, 2000) in which students wrote descriptions rather than verbalizing them aloud, the researchers found that oral description encouraged the use of more words.

Rodriguez (1998) asked kindergarten, second, and fourth graders to perceive and produce expressiveness in music. In an attempt to explore subjects’ descriptions of perceived and performed expression, he then conducted highly flexible interviews with each subject individually. Kindergarteners scored well below average, with second graders above average, and fourth graders receiving the highest scores. Rodriguez concluded that these results were consistent with previous studies which showed that kindergarten children have difficulty giving accurate, detailed verbal response to music. He also determined that while grade 4 students were more adept at applying music terminology, they utilized gestures frequently. The researcher interpreted the frequent use of gestures as an indication that fourth graders preferred to describe music nonverbally. He further hypothesized that while the ability to verbally describe artistic events improves, so does the students’ realization that words are not the most effective method of representing musical responses. Rodriguez found similar results in a later study (Rodriguez, 2001). Data from that investigation showed that second, fourth, and sixth grade subjects were progressively proficient in verbal responses with advancing age.

Investigators using oral report with elementary-aged children have tended to agree that verbal, expressive ability improves with chronological age. There has also been some indication that as the ability to verbally describe reactions to music increases so does the realization that words are inadequate for expressing responses to music.

**Concurrent indicators**

In recent years, researchers have sought ways to record temporal responses *during* the music presentation. Clynes developed a device called the Sentograph, which was designed to
record varying degrees of pressure from subjects’ fingers and used it to measure the expression of emotion in music (Clynes & Nettheim, 1982). A succinct description of the Sentograph is found in a replicate study by de Vries (1991):

> It consists of a small box, from which a button with a diameter of 2.5 cm protrudes; the button can give about 2 mm in all directions when pushed. Through strain gauges on bending strips and some electronic circuitry in the box, a pressure on the button is translated into a voltage that is proportional to this pressure. (p. 47)

In the first “real-time” analysis of subjects’ perception of tension in music, Nielsen developed a set of spring-loaded tongs, which were pressed in accordance with perceived musical tension during the listening process (cited in Fredrickson, 1994b). This allowed responses to be registered continually and compared to the music in a direct relationship (cited in Madsen, 1993).

Since the mid-1980's, Namba and his colleagues have utilized continuous judgments, initially applying the technique to loudness levels (Kuwano & Namba, 1985). In 1991, Namba, Kuwano, Hatoh, and Kato developed a method for assessing subjective impressions of recorded music called “the method of continuous judgment by selected description.” Subjects pressed keys on a standard computer keyboard corresponding to the adjective that described their concurrent feeling about the music. Multidimensional instantaneous judgments (more than one appropriate adjective) were made possible by pressing two keys in a manner similar to playing trills on a piano.

**Continuous Response Digital Interface (CRDI)**

*Description.* The Continuous Response Digital Interface (CRDI), which permits both discreet and/or continuous non-verbal measurements of subjects’ responses to whatever variable or variables the investigator chooses to measure *during* presentation of the music stimulus, was developed in the Center for Music Research at The Florida State University (Gregory, 1989; Madsen, 1996). The development of this device was pioneered by Cotter and later modified by Greer and Kuhn (Madsen, 1984a, 1990).

The CRDI, a potentiometer (a device that allows voltage levels to be gradually raised and lowered) interfaced with a computer, is capable of sampling from one to 10,000 times per second and has dual channel multiplexing capabilities. Various configurations of user interface--dial, lever, or mouse--make it possible to study responsiveness to many aspects of music with users of
all ages (Gregory, 1995). In the initial CRDI study, Robinson (1988) described the “dial” version and its operation as follows:

The CRDI utilized a potentiometer which was enclosed in a protective case and mounted into a 1/4" thick plexiglas square (13" x 13") with only the stem of the potentiometer protruding through the plexiglas. Affixed to the potentiometer stem was a one-inch knob with a specially designed pointer and guide mechanism such that it could be moved left and right on an arc of two hundred fifty degrees. (p. 33)

Figure 1. Continuous Digital Interface Response Dial
In a 1991 study by Standley, which investigated subjects’ level of comfort/discomfort as affected by vibrotactile and auditory stimuli, the “lever” version of the device was described as:

. . . a rectangular box with a projecting potentiometer in the shape of a lever. The lever was moved by the subject as often as desired across color coded tabs on an 11-point scale ranging from +5 to -5 with a 0 in the center. The top of the scale (+5) was labeled, COMFORT, with the bottom (-5) labeled, DISCOMFORT. (p. 125)

The latest CRDI version is a two-dimensional device that uses a mouse and projects \( x \) and \( y \) coordinates (in the shape of an open box) on a computer/TV monitor (Madsen, 1997a). Two independent studies, based on previous work involving Russell’s circumplex model of emotions, led to the development of the two-dimensional CRDI (Madsen, 1997b). One protype was developed in the Center for Music Research at The Florida State University (Tyler, 1996), and a second, slightly different two-dimensional prototype, was developed by Schubert at the University of South Wales, Sydney (Madsen, 1997a).

Madsen (Madsen, 1997a) describes the device as follows:

This line of research uses two separate Osgood-like systematic differentials anchored with opposite descriptors and placed on the television screen with one word placed at the top of the screen and its opposite placed on the bottom. Similarly, another descriptor is placed on one side of the screen and its opposite on the other side of the screen. (p. 63)

The mouse cursor may be moved simultaneously between the two-dimensions to correspond to response during stimuli presentation (Madsen, 1997b).

**Reliability.** A number of studies have assessed reliability across all CRDI devices and have determined it to be very high. In a 1992 investigation, which featured a pretest/posttest design, Capperella (1989) found all correlation coefficients to be high and positive and concluded that the CRDI was a reliable and valid tool for accurate measurement of behavioral information. A second reliability study, comparing overall means from repeated continuous evaluative listenings of choral performances, resulted in a correlation coefficient of .85 (Gregory, 1995). In an overview of related research concerning reliability in individual studies using the CRDI, Gregory (1995) investigated input stability, test-retest reliability, inter-observer reliability, instrumentation comparisons, and graphic versus statistical comparisons. She concluded that reliability measures across a wide variety of applications in many different areas of music research offered support of the CRDI as a reliable measurement device. She noted that visual comparisons of graphic contours provide immediate discrimination of response
similarities and differences across total time spans and of selected samples within time spans and proposed that this may be the CRDI’s singular contribution to music research instrumentation.

However, while acknowledging the CRDI’s attractiveness as a tool to measure and record subjects’ responses to a stimulus as it unfolds in real time, Schmidt (1996) has raised several issues concerning its reliability. He proposes extensive programmatic research that addresses the more fundamental issues of reliability, validity, and the influence of task, stimulus and subject variables on the quality of data obtained.

*Instrumentation Comparisons - Continuous versus Summative Studies.* A series of studies have investigated the reliability between continuous ratings recorded by the CRDI and traditional static measures. The first study in this line of research (Brittin, 1991), which used nonmusician subjects and popular music as the stimulus, showed that subjects using the CRDI responded significantly more positively than did subjects using summative rating scales. In the second investigation (Brittin & Sheldon, 1995), music majors and nonmajors responded to Western art music excerpts. Musicians’ continuous and static responses were similar; however, nonmusicians’ rating-scales preferences were significantly less positive compared to continuous responses.

In a study that compared listeners’ preferences to music from different cultures and utilized subjects with three levels of musical experience, Brittin (1996) again found that listeners using the continuous measurement devices rated selections significantly higher than did listeners using paper and pencil measures. Additionally, there were no significant differences attributable to level of music experience. Brittin and Duke (1997) asked music majors and nonmusic majors to indicate perceived intensity in several Western art music excerpts through continuous and summative measures. Data analyses indicated extremely high levels of internal consistency between the two measurement methods; however, in both within- and between-subject comparison, the continuous response means were lower than the summative responses. These results appear to indicate that subjects’ expressions of overall effect were quite consistent between subjects and between replications, but that arithmetic means of subject response are not equivalent to subjects’ post hoc perceptions of overall effect.

Two additional studies (Goins, 1998; Madsen, 1999b) compared results of subjects’ indicating responses via the CRDI with subjects indicating perception using a pencil and paper.
Results from both investigations revealed no noticeable differences between the use of continuous methods versus summative methods.

The conflicting data from the previous studies would appear to suggest the need for additional investigations. Music educators and researchers should continue to obtain, compare, and evaluate results gathered as continuous measures by the CRDI and more traditional, summative measures.

*Studies Using the CRDI.* Since its inception in 1988 (Robinson, 1988), the CRDI has been used to gather a myriad of musical responses in numerous experimental settings. Researchers have employed a wide range of age groups, populations, experimental designs, and music examples.

*Band and Choral Studies.* In the initial CRDI study, Robinson (1988) used the device to evaluate and adjudicate high school choral performances. Continuing a similar line of research, Johnson investigated adjudication in both concert (1992b) and marching band settings (1991). Additional studies in the band and choral fields have been conducted by Blocher, Greenwood, and Shellahamer (1997), Byo and Brooks (1994), Capperella-Sheldon (1992), Davis (1993), Fredrickson (1994a), Johnson (1996), and Mulder (1997).

*Focus of Attention Studies.* Several studies have utilized the CRDI to record focus of attention to salient musical elements during listening. In 1990, Madsen and Geringer, investigated differential patterns of music listening between musicians and nonmusicians regarding four primary elements of music (rhythm, dynamics, timbre, and melody) and an additional category of “everything.” Results indicated that musicians spend most of their time attending to melody, followed by rhythm, dynamics, and timbre. Nonmusicians focus first on dynamics, then melody, timbre, and the classification “everything.” A 1995/96 study (Geringer & Madsen, 1995/96) partially replicated and extended these findings in that musicians’ patterns of listening differed from those of nonmusicians. Two additional studies used the CRDI to measure only musicians’ focus of attention to musical elements in the first movement from Haydn’s Symphony #104 (Madsen, Geringer, & Fredrickson, 1997) and the last 20 minutes from Act I of Puccini’s *La Boheme* (Madsen, 1997c). Results from the Haydn study showed that no single element was prominent regarding musicians’ focus of attention, while subjects in the Puccini study registered the highest percentage of attention for dynamics.
Rentz (1992) investigated musicians’ and nonmusicians’ perception of orchestral instrument families and results supported findings from the Madsen and Geringer studies (1990, 1995/96) indicating differentiated patterns of perception between the two groups. Musicians selected and focused on strings more frequently than did nonmusicians and indicated attention to three or more families of instruments simultaneously more often than did nonmusicians. Nonmusicians focused on brass and percussion longer than did musicians.

Preference Studies. In a 1984 study, LeBlanc noted the problematic nature of preference research: “An inclination is one of the most difficult influences upon human behavior to measure” (p. 1). He considered the temporal aspects of preference choices and questioned whether subject responses may be either “a momentary opinion held at the beginning or end of a piece,” or are they “actually an operational mean of all the responses elicited while an excerpt is being played” (p. 11). LeBlanc stated that traditional rating scales might be refined by sampling subject responses throughout the playing of an excerpt. He suggested that this might be accomplished “by giving subjects a ‘preference dial’ to twist while they listen” (p. 11). He posits that “a chart recorder of the type used with time-spent devices could be employed to link subject responses to specific musical events” (p. 11).

Several researchers have asked adults to register their musical preferences using the CRDI. In a series of three studies, Brittin investigated compared preference ratings of music majors and nonmusic majors in terms of overt classification of music on preference (1991), preferential ratings of Western art music, including three substyles (Baroque, Romantic, and 20th-century) and three performance media (strings, keyboard, and winds) (Brittin & Sheldon, 1995), and listeners’ preferences for music of other cultures (1996). The first two studies (Brittin & Sheldon, 1995) resulted in significantly higher preference ratings for musicians, but the third study (Brittin, 1996) showed no significant differences attributable to level of music experience.

A number of researchers have also used the CRDI to gather information on the musical preferences of younger subjects. In a study that included sixth grade, high school, and college students, Gregory (1994a) used two dials to measure preference and knowledge of music excerpts. College music majors, high school musicians enrolled in performance groups, and sixth-grade students listened to brief excerpts of music from popular classics, early contemporary compositions, jazz recordings, and selections in the Silver Burdett/Ginn series. Instrumental biases were found among college and high school musicians preferences for
relatively unfamiliar classical music. In general, high school musicians’ preferences were more “own-instrument-based” than were those of college music majors. The results appear to indicate, however, that there is no predictable connection between the degree to which one “knows” an excerpt and preference for the excerpt. Students at all levels appeared comfortable indicating response manipulating either one or both dials.

In a study investigating preference for traditional instrumentation versus transcribed synthesized settings (Gregory, 1994b), middle school band students and undergraduate music majors listened to three orchestral excerpts (Bach’s Brandenburg Concert #5, Mozart’s Overture from The Magic Flute, and Copland’s Hoe-down from Rodeo). Each excerpt was divided into three intervals, with intervals one and three representing traditional instrumentation and interval two containing the altered version. The second interval for the Bach excerpt presented a synthesized setting while acoustic transcriptions for smaller ensembles were presented in the middle of the Mozart and Copland examples. The CRDI was used to collect preference data, which showed that preference ratings for traditional instrumentation were significantly higher than those for acoustic transcriptions for Copland and Mozart. During the Bach selection, there was no significant change in preference for either group, but the middle school students’ preference mean for the synthesized interval was significantly higher than the mean for music majors.

Byrnes (1994) asked elementary school, middle school, high school, and trainable mentally handicapped (TMH) students to respond to four western art music selections (Puccini La Bohème, Haydn Symphony no. 104, Mozart Vesperae Solennes, and Holst First Suite). Subjects manipulated a CRDI dial while listening to indicate response to music. Younger students & TMH subjects used a happy-face continuum, and older subjects used a positive continuum. Individual graphs were obtained for each subject and indicated that preference ratings for second grade students were higher than those for older students. Preference ratings were higher for students in grades eleven and twelve than for subjects in grades five and eight but not significantly. Results also indicated that some TMH students were unable to indicate their preferences across time, and that instrumental selections rated significantly higher than vocal selections, with the Haydn excerpt preferred overall. These findings from this CRDI study concur with those reported in other music preference research literature.
In a study with preschool children, subjects listened to a variety of “world music” examples and moved the CRDI dial through a happy/sad continuum to indicate their aural discrimination and preferences (Fredrickson, 1994b). Results suggested that preschool children, in a nonverbal manner, could differentiate among the music examples and that they had various individual preferences. Additionally, a videotape of children using the device also indicated they were attentive and appeared to be enjoying the exercise (cited in Madsen, 1990).

In another preschool study (Madsen, Capperella-Sheldon, & Johnson, 1991a), very young handicapped and non-handicapped children were asked to listen to ten age-appropriate musical excerpts. Subjects used the happy/sad face continuum to determine whether they could discriminate listening experiences and demonstrated this awareness with the lever version of the CRDI. Data analysis indicated that seven subjects did make preference discriminations for various musical excerpts and seven did not. Most importantly, there were no differences when comparing preference ratings of handicapped and non-handicapped students. It would appear that the ability to evidence these discriminations is not confined only to non-handicapped subjects.

Perception Studies. Several researchers have asked adult subjects to indicate perception of tempo alterations using the CRDI. In 1991, Sheldon investigated the effects of aural, visual, and motoric cues on tempo modulation discrimination among musicians and nonmusicians. While listening to music during these three conditions, subjects manipulated a CRDI demonstrating perception of tempo alteration. Results indicated that musicians more accurately detected tempo changes than nonmusicians, were better at detecting tempo acceleration, and correctly identified tempo change more often when simply listening. Nonmusicians were better at detecting tempo deceleration and were more accurate during the aural/motoric condition.

A follow-up study in 1997 (Sheldon & Gregory, 1997) investigated the similarities and differences in how listeners, with different levels of educational experience, demonstrate perception of tempo modulation. Musical experience ranged from extensive through minimal. Data indicated that listeners responded more quickly and with greater accuracy to tempo decrease compared to tempo increase. Although all groups demonstrated differing degrees of tempo perception, mainly commensurate with the magnitude of tempo change, perceptions of the more experienced listeners seemed to be somewhat set apart from groups with lesser experience.
In 1998, Crist used the CRDI to measure listeners’ ability to identify variations in tempo and dynamics implemented in four different versions of a short excerpt performed by a trombone soloist. Alterations included changes in tempo only, dynamics only, both tempo and dynamics, and no variations. When assessing the musical examples for expressiveness, subjects’ ratings of the performance with no changes in tempos or dynamics were significantly lower than the other three performances. Alternately, ratings of the excerpt with combined tempo and dynamic alterations were significantly higher than the other examples.

Adult subjects have also utilized the CRDI to indicate perception of the expressive qualities in music, including rubato. Johnson (1992a) assessed the ability of musicians and nonmusicians to perceive rubato in musical performance. Subjects listened to each of four soloists’ performances of an excerpt from the Mozart *Concerto Number 2 in E-flat Major for Horn and Orchestra* and used the CRDI to evaluate the degree of appropriateness/inappropriateness of each performer’s use of rubato. Data indicated significant differences between music majors and nonmusic majors. Musicians’ rubato assessments agreed with expert evaluations while nonmusician scores appeared haphazard. Additionally, when musicians were further separated into two groups, “more/less sophisticated,” the evaluations of “more sophisticated” music majors were in direct agreement with the panel of experts’ evaluations while “less sophisticated” musicians disagreed substantially with the experts.

Johnson and Fredrickson (1996) combined two continuing lines of investigation to examine the extent to which the use of rubato by solo performers can influence listener perceptions of tension in music. Music majors listened to short excerpts of two different performances of the selection used in the previous study (Johnson, 1992a) and recorded their perceptions of tension via the CRDI. Although one of the performances had previously been judged as exceptional in performance quality and the second as quite inferior, results showed that there was very little difference between groups responses to the two excerpts. This appears to indicate that no outstanding differences in perceived tension could be directly paired with ongoing tendencies of rubato usage by these performers.

Other researchers have asked musicians and nonmusicians to indicate perceived tension in a piece of music by manipulating the CRDI. In the first CRDI-tension investigation, Madsen and Fredrickson (1993) replicated a previous study by Nielson. Adult musicians and nonmusicians were asked to track tension in Haydn’s *Symphony no. 104*. These initial efforts
showed marked similarities in the responses of the two populations, particularly in tension onset and release points. Real-time graphic displays of the CRDI data were superimposed over graphs from Nielson’s research. Responses were virtually the same across time.

Fredrickson (1995) made a direct comparison between the populations from the 1993 study (Madsen & Fredrickson, 1993) and similar populations analyzing “aesthetic experience” on the same musical selection. Analysis focused on composite graphs of mean group responses and comparisons from both studies. Data indicated some co-variations between the recorded aesthetic response and perceived tension graphs of subject response from the previous study, primarily in musicians. Overall, tension responses were found to be more variable while aesthetic responses were more consistently positive and somewhat higher. It was felt that in responses from both populations there were enough similarities to speculate that tension might be a component of the aesthetic experience. Interestingly, no specific definition of music tension was given to subjects in either of the two studies (Fredrickson, 2000).

Continuing the same line of research with populations similar to those used in the two previous studies (Fredrickson, 1995; Madsen, 1993), Fredrickson (1997b) utilized a new musical stimulus, Grainger’s *Irish Tune from County Derry*. Correlation was again high ($r = .81$) for directionality of the CRDI graphs, and the points at which they changed direction included many similarities. The primary difference between musicians and nonmusicians was one of magnitude. Nonmusicians consistently recorded their perception of tension as being more intense. Throughout this line of investigation, the pattern that emerged was one in which nonmusicians used a considerably more of the dial but appeared to be perceiving a number of definite tension and release points. Musicians used a smaller area under the dial to register their perceptions but had a high level of agreement on the location of those tension and release points within the musical context. This would seem to suggest that, while a certain level of musical expertise develops a heightened sensitivity to various qualities of music, it is not necessary for a differentiated response.

Using the two-dimensional CRDI, a 1998 Madsen study extended this line of research by simultaneously comparing both tension and aesthetic responses of musicians to the original musical selection, Haydn’s *Symphony no. 104*. Subjects were presented with two dimensions on a computer screen indicating both arousal and affect. The horizontal axis listed “Ugly” on the left side and “Beautiful” on the opposite side; the vertical dimension on the computer screen
listed the words “Exciting” at the top and “Relaxing” at the bottom. Data analysis indicated an inverse relationship between the two dimensions (r = -.58). Graphic analysis of subjects’ responses showed that these two dimensions represent different aspects of perceived listening. The exciting/relaxing dimension appears to represent degrees of arousal that are most often the opposite from subjects’ affective response. In addition, Madsen compared present results to previous tension studies which included both musicians and nonmusicians. The correlation between musicians in this study who tracked their relaxing/exciting dimension with nonmusic subjects who tracked tension in previous studies was .89.

In a two-part study (Fredrickson, 1999), university and high school band students rehearsed and performed Holst’s *First Suite in E-flat*. Within two weeks of the performance date, subjects from both groups listened to the university sound recording of the first movement (“Chaconne”) while registering their perceptions of tension using the CRDI dial. Additionally, students from a university choral ensemble who indicated they had never heard nor performed the musical selection followed the same research protocol. Results from this study indicate that perceptions of tension in individual pieces of music continue to be similar among all groups examined. As in previous studies, tension levels recorded here tended to be slightly higher for less-experienced groups, possibly indicating somewhat less discrimination of the musical stimulus, but tension onset and release points are still highly similar, if not identical.

In a three-part investigation, Fredrickson (2000), again investigated tension onset/release perceptions of musicians versus nonmusicians. Study number one was an unplanned study which compared the tension perception between a highly trained, experienced college-level ensemble conductor and his 7-year-old daughter. While her father completed the actual research project, the youngster was also allowed to participate in the protocol. While watching the computer screen, which showed the CRDI data as it was being recorded, the researcher noticed an interesting phenomenon. Though she could not see, nor was she in physical contact with her father, the responses from the daughter’s perceived tension was quite similar to his (r = .80). These results again appear to indicate that perceptions of the points at which tension and its release are strongest are quite similar across varying populations and age groups. In the second study, musicians from the 1999 research (Fredrickson, 1999) were compared to a group of nonmusicians, using the same recording (Holst’s *First Suite in E-flat*, “Chaconne”). Study number three recorded musician/nonmusician responses to tension in *Festive Overture* by
Shostakovich. Data analysis from both studies were similar to previous research. The magnitude of the response to perceived tension is less in trained musicians, but the onset and release points are nearly identical across populations.

Frego (1999) examined the effects of aural, visual, and combined aural/visual conditions on perceived tension in music and dance. Music majors and non-majors were asked to indicate degrees of perceived artistic tension in three dance excerpts. Data indicated no significant differences in perceived artistic tension between musicians and nonmusicians.

In a 1997 study, Fredrickson included younger subjects in his investigation. As a continuation of the original replication of Nielsen’s work (Madsen, 1993), he examined elementary, middle, and high school student perceptions of tension in music. In order to make comparisons to adult populations used in the 1993 study (Madsen, 1993), the same recording of Haydn’s *Symphony no. 104* was used. Younger subjects, second and fifth graders, were randomly selected from intact music classes in a suburban elementary school. Older students were randomly selected from an eighth grade choir and a high school band. While responses indicate magnitude of response increases as musical sophistication and age decrease, graphs of mean group contained striking similarities. Tension initiation and release points were very consistent, with correlations between groups quite high. The lowest was between second graders and adult musicians ($r = .71$). Very high correlations existed between fifth or eighth graders and nonmusicians ($r = .97$), fifth graders and eighth grade choir members ($r = .98$), as well as eighth grade choir and high school band members ($r = .96$).

Madsen and associates utilized the CRDI to conduct a series of studies that investigated patterns of music listening among music majors regarding accompanied versus unaccompanied intonation and tone quality, as isolated as well as combined entities (Madsen, Geringer, & Heller, 1991b; Madsen, Geringer, Heller, 1993; Madsen, Geringer, & Gregory, 1994). The research sought to determine whether listeners demonstrated consistent listening patterns across musical examples intentionally designed to be perceived as “good” versus “bad.” Data indicated that subjects easily discriminated between the good and bad examples in all three studies. While study number one (Madsen et al. 1991b) revealed a significant difference between accompanied versus unaccompanied excerpts, results from the second study (Madsen et al., 1993) did not indicated a significant difference. Study number three (Madsen et al., 1994) used only accompanied examples.
In a 1995 study, Geringer examined loudness judgments of musicians and nonmusicians in response to dynamic changes within the musical context of ten previously recorded excerpts. Results revealed that nonmusician subjects indicated a significantly larger magnitude of dynamic change than did musicians, and both groups judged crescendos as having a significantly greater magnitude of change than decrescendos.

Several studies utilizing the CRDI with elementary-aged subjects have focused on perception of phrase types and variations. In a 1995 investigation concerning the music cognitive process of transformation, DeNardo and Kantorski asked second and fifth graders to compare phrase types within a four-phrase song based upon altering harmonic, melodic, and rhythmic parameters. Subjects listened to each of 12 four-phrase songs three times and then indicated, via the CRDI dial, if the second, third, and fourth phrases were the same as, similar to, or different from the initial phrase. Results showed that students were significantly more accurate in identifying phrase types that were different, accuracy in identifying phrase types decreased significantly the farther away in time the phrase was from the reference phrase, and there was no significant difference between second and fifth graders in identifying phrase types.

In a similar study, Kantorski and DeNardo (1996) assessed the ability of kindergarten, second, and fourth grade students to discriminate change within the temporal flow of Mozart’s Twelve Variations on Ah, vous dirai-je, Maman (C Major, K. 265). Data analysis indicated that there were no significant differences among populations in the number of students registering a perception of change in the first, third, and fifth seconds of any of the variations. Researchers tentatively speculated that the ability to discern change in age-appropriate theme and variations form is not qualitatively different among students in kindergarten, second, and fourth grades.

A follow-up investigation to the 1995 study (DeNardo & Kantorski, 1998) involved elementary, middle, and high school students. Data indicated that elementary and middle school students recognized phrases predetermined as being identical to the song’s initial phrase a significantly greater percentage of time than they did different or similar phrases. High school students identified different phrases more often than phrases that were the same as or similar to the initial phrase.

**Aesthetic Response Studies.** Numerous studies have used the CRDI to empirically investigate aesthetic response to music. These inquires have used a variety of designs, musical examples, and subjects, including musicians and nonmusicians. Additionally, in order to allow
individuals the opportunity to respond individually and free of technical and musical labels, the term “aesthetic experience” was purposefully not defined in these studies

In an initial study involving musicians, Madsen, Brittin, and Capperella-Sheldon (1993) investigated aesthetic response as personally defined by university school of music faculty members and advanced graduate students. As subjects listened to a 20-minute excerpt from Act I of Puccini’s *La Bohème*, they simultaneously indicated their level of aesthetic responsiveness via the CRDI dial. Data, which were charted graphically to indicate levels of aesthetic response across time, indicated that while all subjects had different reactions throughout the excerpt, aesthetic experience for subjects seemed to cluster at many of the same places in the music. Additionally, all subjects indicated that movement of the CRDI dial roughly approximated their aesthetic experience.

In a 1997 investigation, Madsen compared musicians’ emotional responses to the Puccini selection utilized in the 1993 study (Madsen et al., 1993) to an added arousal aspect via a two-dimensional CRDI interface. Subjects manipulated a mouse icon simultaneously to indicate perception of a relaxing/exciting dimension, in relationship to arousal, and an ugly/beautiful dimension, in relationship to affect. When compared to previous aesthetic responses using this same excerpt, data analyses indicated there was not a significant difference between those results and subjects’ responses to the ugly-beautiful dimension in this study. However, subjects’ arousal responses (exciting/relaxing) did not replicate the ugly-beautiful dimension.

Misenhelter and Lychner (1997) investigated musicians’ aesthetic responsiveness while listening to a recording of either Chopin’s *Ballade No. 3 in A-flat* or Satie’s *Trois Gymnopedies*. Data analyses indicated that responses to the two works, which were chosen for comparison due to their varying styles and clear differences in levels of contrast, were markedly different. Composite graphs of the CRDI data indicated that while responses were generally flat during the *Gymnopedies*, aesthetic experience was recorded with considerable variability throughout the Chopin example. These differences in response patterns seem to indicate that contrasts, as demonstrated by these two stylistically distinctive pieces for solo piano, contribute to individual variance in aesthetic response during listening experiences.

In a study which attempted to ascertain which elements of music were perceived as most prominent in relation to aesthetic experience, (Madsen, 1997c) experienced musicians listened to the last 20 minutes of Act I of Puccini’s *La Bohème*. As they listened throughout the excerpt,
subjects indicated which of five musical elements (dynamics, everything, melody, rhythm, or timbre) commanded their attention. Results from this investigation were then correlated in relation to data from two previous studies (Madsen et al., 1993a; Madsen et al., 1993b). Correlations of emotional responsiveness in relationship to specific elements indicated that melody, followed by dynamics, was most closely related to the previous aesthetic responses.

Several researchers have compared the differences and similarities in self-perception of aesthetic sensitivity between musicians and nonmusicians. In a study using Holst’s *First Suite in Eb for Military Band* as the music stimulus (Capperella-Sheldon, 1992), subjects manipulated the CRDI dial along a positive/negative continuum to demonstrate aesthetic response. Subjects then completed a questionnaire designed to estimate duration, frequency, location, and magnitude of perceived aesthetic experiences. Results indicated no significant differences between the two populations concerning their perception of aesthetic experience.

In a follow-up investigation to the Madsen, Brittin, and Capperella study (1993a) done earlier that same year, Madsen, Byrnes, Capperella-Sheldon, and Brittin (1993b) utilized five separate studies to compare self-defined aesthetic response between music and non-music majors. Music stimuli included the original Puccini excerpt (1993a), the last 13 minutes of Strauss’ *Death and Transfiguration*, Holst’s *First Suite in Eb for Military Band*, Haydn’s *Symphony #104*, and Mozart’s “Laudate Dominum” from *Versperae Solennes de Confessore in C Major*. In all the studies, graphic analyses indicated that neither frequency nor magnitude of perceived aesthetic experiences was different for musicians and nonmusicians. These results appear to indicate that musicians do not differ substantially from nonmusicians in emotional responsiveness.

Adams (1994) compared responses from musicians and nonmusicians to visual only, aural only, and visual/aural stimuli in response to Mahler’s *Symphony No. 2*. Subjects indicated degrees of their felt emotional response by manipulating the CRDI dial during the listening experience. As in previous studies, no significant difference was found between musicians and nonmusicians for the aural only and visual/aural conditions. Results did indicate a significant difference between musicians and nonmusicians for the visual only condition, with musicians demonstrating an ability to focus longer on the task.

Two additional studies extended the music samples used in this line of research beyond that of the Western art music tradition by using excerpts from the jazz idiom. Coggiola (1997)
asked experienced and inexperienced jazz musicians to respond to four jazz examples, which were chosen for various levels of melodic advancement from simple to complex. Only during the most melodically advanced jazz excerpt did the two populations provide a differentiated response, with inexperienced jazz musicians indicating lesser aesthetic interest compared to the experienced group. It seems important to note that this singular jazz excerpt appears to be the only music selection in this entire line of investigation where inexperienced musicians evidenced lower aesthetic sensitivity than did their experienced counterparts. In a study by Goins (1998), which used jazz selections from the music of Pat Metheny as stimuli, no listening differences were evidenced when music majors were compared to nonmusic majors.

Numerous researchers have successfully utilized the CRDI to study continuous perception of various musical elements, indication of preference, and aesthetic response to widely varying styles of music. Across all subjects, with widely varying ages and levels of musical experience, the CRDI has consistently proven to be an accessible and easily manipulated tool for gathering continuous responses to music.

Preference

For decades, music preference has been one of the most frequently studied topics among music researchers (Farnsworth, 1969; LeBlanc, 2001; Sample, 1992; Schmidt & Zdzinski, 1993; Yarbrough, 1984). Many investigators have focused on a myriad of subjects and issues in the area of music preference. An examination of preference studies reveals that all age groups, preschool to mature adulthood, and members of both genders have been investigated (Bowles, 1998; Hargreaves & Castell, 1987; MacGregor, 1968; Moore, 2000-2001; Peery & Peery, 1986). Research topics have been varied, ranging from the effect of various elements of music on the preference of the listener (Fung, 1993; Geringer, 1987; Hedden, 1974; Smith, 1989) to the effect of a variety of listener attributes on preference (Brotons & Pickett-Cooper, 1994; Daniels, 1994; Dollinger, 1993; Moore, 1992).

Several investigators have offered varying but similar definitions of musical preference. Finnäs (1989) defined it as “affective reactions to a piece of music or to a certain style of music that reflect the degree of liking or disliking for that music” and noted that “the usual way of determining preference for a certain music has been to ask participants to estimate the pleasantness of the music or their own liking of the music” (p. 2-3).
LeBlanc (1984) defines preferences as an “operational construct which represents a subject’s demonstrated level of liking specific music stimuli” (p. 1). He also added, “this definition of preference focuses upon a subject’s liking or fondness for a piece of music as opposed to evaluations of that piece’s merit or ultimate worth as art” (p. 1). Similarly, Kuhn (1980) stated that preference “is the act of choosing, esteeming, or giving advantage to one thing over another . . .” (p. 6).

Radocy and Boyle (Radocy, 1979) noted that people vary “in their preferences for any sensory experience in which they have a choice . . . Preferences are not always consistent, and they can be modified” (p. 221). This theory appears to imply that “liking” music could also be described as an emotional reaction which may permit a person “access to the experience of emotions that are somehow already ‘on the agenda’ for that person” (Sloboda, 1992, p. 35).

Several researchers have suggested that music preference is a learned behavior (Broudy, 1958; Brueckner, 1945; De Jager, 1967; Kingsley, 1946; Lundin, 1967; Madsen, 1978; Remmers, 1960). In accordance with that theory, LeBlanc (1980, 1982) developed an Interactive Theory of Music Preference explaining the development of individual music listening preference, which features a hierarchical, eight-level, graphic model illustrating sources of variation in music preference. He proposed that “musical preference decisions are based upon the interaction of input information and the characteristics of the listener, with input information consisting of the musical stimulus and the listener’s cultural environment” (1982, p. 29). According to LeBlanc’s theory, input is processed by the listener, with the integration of many influential variables, ultimately causing a music preference decision leading to observable behavior.

LeBlanc’s model for Sources of Variation in Music Preference (LeBlanc, 1982) includes three primary categories, the music, the environment, and the listener, which are then further subdivided into more specific components. Although many investigations tend to include cross-over components, the following section uses the three major sources of variation as a framework for reporting research findings.

The Music

Many studies in music preferences have focused on the physical properties of music that account for variation in preference. Additional studies have also concentrated on performance characteristics, including media, gender of performer, and humor in music.
**Physical properties**

Hedden (1974) used a factorial analysis of variance to examine preferences among university music and nonmusic majors for tonal stimuli that differed in frequency, intensity, or wave form. While music majors demonstrated a preference for wave form, nonmajors preferred loudness level to wave form. The researcher suggested that music and nonmusic majors be treated as separate populations in regard to tasks similar to the ones used in his study.

Several researchers have studied the relationship between pitch and preference. In a study investigating the interrelationship of trumpet intonation and tone quality, Madsen and Geringer (1976) found that music majors preferred sharp and in-tune playing to tone quality. Subsequent investigations (Geringer, 1976, 1984), within the context of recorded orchestral music, also indicated a propensity for sharpness. However, a study which investigated pitch preferences of fifth grade through college-aged subjects, within the context of current popular music (Geringer, 1987), revealed no significant preference for pitch-increased examples compared to pitch-decreased examples.

In 1960, Berlyne introduced a theory which describes listener interest in terms of an inverted U-shaped curve based on complexity. This hypothesis proposed that as the complexity level increases, so will the level of preference until a peak level has been reached. Following this peak level, as complexity increases, preference will decrease. Subsequent research (Heyduk, 1975; James, 1984; McMullen, 1974) appeared to demonstrate that the complexity of an aural stimuli does indeed influence its rated level of preference. Radocy (1982) found that preference for “classical” music excerpts seemed to be a function of perceived complexity, defined as “how elaborate, fancy, or complicated the music is” (p. 92). Results showed that subjects preferred excerpts of moderate complexity.

Gordon (1991) developed and administered the Instrument Timbre Preference Test. After a two-year study, timbre preference of fourth grade students who elected to enroll in instrumental instruction were compared to those who chose not to participate. Results indicated that overall timbre preferences of students who enrolled in beginning instrumental music are highly similar to those of students at large. Additionally, timbres associated with woodwind instruments were preferred to those associated with brass instruments; however, students appeared to prefer higher rather than lower sounds, regardless of timbre. Interestingly, intercorrelations among the timbre preferences indicated that although students who preferred
the flute timbre tended to have opposite preferences for lower brass timbre, they did not demonstrate strong, if any, timbre preferences for other woodwind instruments. Similar results were obtained from students whose timbre preferences were for other instruments. The researcher concluded that there did not appear to be a clear pattern of related timbre preferences in terms of instrument type or range. This study also did not reveal any important relationships between instrument timbre preference and gender in terms of type or range of instruments.

Webster and Hamilton (1981/1982) studied the effects of violin timbre on the musical preferences of students in fourth through sixth grades. Students listened to classical, rock, folk-country, and jazz excerpts and indicated preference for non-violin selections.

Expressive Variables, namely dynamics, have also been used as the basis for preference studies. Burnsed and Sochinski (1995) used two versions of 10 American folk songs to investigate the effects of expressive variation in dynamics on the musical preferences of middle school music students. Analysis of the results indicated that a significant proportion of the middle school subjects preferred the expressive version of each of the 10 folk songs. Burnsed (1998) duplicated the 1995 (Burnsed & Sochinski, 1995) study with students in first through fifth grades and found that a significant number of students preferred the expressive versions of seven different folksongs.

The third in a continuing series of investigations (Burnsed, 2001) attempted to present a more realistic representation of expressive performance in the original 10 American folk songs by smoothing the dynamic curvatures and reducing the amplitude range by one-third. The revised test was administered to elementary students, middle school music students, and choral and band conductors. Elementary subject results contradicted the findings of the earlier studies in which explicit dynamic variation was used (Burnsed, 1998; Burnsed & Sochinski, 1995). Reliability was virtually nonexistent, which seems to suggest that elementary students did not discern the subtle nuance, lacked the ability to conserve and compare the two versions, or simply did not have a consistent preference for either rendition of the 10 folk songs. Reliability was higher for both middle school students and conductors, possibly suggesting the effect of age and/or musical experience in preference for subtle dynamic nuance.

For almost five decades, researchers have investigated music category and style as factors which influence musical preference. In an early study of children’s musical preferences, Rogers (1957) found an overwhelming preference for popular music at all grade levels,
accompanied by a sharp decrease in preferences for classical music with increasing age, regardless of gender or socioeconomic status. Additionally, students in subsequent grades exhibited a greater tendency to conform more and more to a single pattern of musical preference.

In another early work in which music taste was the central issue (Greer, 1974), students in nursery school through sixth grade used an episodic reinforcement device to indicate nonverbal preference for two music categories, rock and nonrock. The nonrock category was comprised of three types of music, including Broadway show tunes, classical piano, and symphonic. Data indicated no difference in preferences between the two categories of music for nursery school and first grade subjects. However, a growing preference for rock music over nonrock music accompanied advancing grade level, with a critical change observable between third and fourth grades.

In one of his earliest studies, LeBlanc (1979) investigated fifth-graders’ expressed preference for different generic styles of music. Results showed that easy-listening pop music was the most preferred generic style. However, band-march, country and western/bluegrass, dixieland, ragtime, randomly generated electronic stimuli, and rock earned preference ratings that would qualify them as critical competitors for preference. Sacred choral and folk music received the lowest preference ratings.

May (1985) investigated the preference ratings of first through third graders for a variety of styles, including popular, art, and non-Western music. Older students gave lower preference responses across all styles, although this result was less pronounced for popular styles, particularly rock and country, than for other styles. May noted a “convergence of music preference toward popular style” (p. 19) with increased age and also noticed a considerable change in responses from first to second grade. This sudden shift in preference ratings occurred an entire academic year before that reported in the earlier study by Greer, Dorow, and Randall (1974), where critical changes in preference ratings were found between ages 8 and 9. A later work by Brittin (2000), involving second through sixth graders, further corroborated children’s preferences for current popular styles.

In a 1996 investigation, LeBlanc and his colleagues (1996) measured the music preference opinions of listeners, ranging in age from 6 to 91 years, for excerpts of art music, traditional jazz, and rock. Data revealed music preference means for the different styles were comparatively similar across all age levels, and style subtest scores revealed a characteristic
pattern of responding across all subjects. Listeners in first grade exhibited a high level of preference, but preference levels then declined to a low point in sixth grade. From that point, preference steadily rose throughout the high school years and reached its highest ratings with college-age listeners. Preference declined again for adult subjects but was higher than that of any other age group except college and Grade 1.

An investigation of music style preferences of primary and secondary school students in Hong Kong (Fung, Lee, & Chung, 1999/2000) studied subject response to Western art music, jazz, rock, Cantopop, and Jiangnan Sizhu. Results revealed a preference for Cantopop music followed in order by Western art music, rock, and jazz, with Jiangnan Sizhu as the least preferred. As in the 1996 LeBlanc study, student preference tended to decrease as grade level increased.

A long line of research has consistently shown that tempo has a profound influence on music preferences. In an early study, Hornyak (1966) investigated students’ preference for contemporary music performed at a concert and found that students consistently responded more favorably to music with a quick, lively tempo. Getz (1966) found that seventh graders listed fast tempi frequently as a justification for liking particular serious music excerpts. Additional early studies (Drake, 1968; Kuhn, 1974, 1977; Madsen, 1984b; Prince, 1972a; Wapnick, 1980) have also shown that subjects generally demonstrated preferences for faster tempi over slower tempi.

Since the early 1980s, LeBlanc and his colleagues have investigated the effect of tempo on preference ratings. In an initial study (LeBlanc, 1981), fifth grade students listened to 24 musical examples, varying in genre and style, and indicated a slight preference for faster tempi. In a 1983 investigation extending the line of research (LeBlanc & McCrary, 1983), the expressed preference ratings of fifth and sixth grade subjects increased with each faster level of tempo and resulted in a strong positive correlation between tempo increases and higher preference ratings. Additional studies (Flowers, 1988; LeBlanc, Colman, McCrary, Sherrill, & Malin, 1988; LeBlanc & Cote, 1983; Montgomery, 1996), including one involving international subjects (LeBlanc et al., 2000-2001) and another involving preschool children (Sims, 1987), have confirmed and extended the results of the 1983 investigation. Subjects from five countries, ranging in age from preschool through college, have shown a significant preference for increasingly faster tempi at every age level.
On the other hand, Jaret (cited in Byrnes, 1994) found that country music consumers seem to prefer comparatively slower songs, suggesting that the impact of tempo on preference or attitude may depend, at least in part, on musical style. In a two-part study, Byrnes (1994) measured the effect of three different performance tempi on preference ratings of preschoolers, elementary and college students. Results showed that all three age groups preferred the middle tempo. An extensive review of literature involving varying aspects of tempo research may be found in Kuhn and Booth (1988).

It appears that the preferences of music listeners are influenced by a number of the physical properties of music, including a propensity for quicker tempi, pitch-increased selections, and a moderate degree of complexity. Data also seem to indicate a decrease in preference for western art music with increasing age and a preference for pop/rock styles among school-aged subjects.

*Performance characteristics*

Early research in the area of performing medium reported conflicting results. Investigations by Schoen and Gatewood (1927) and Middleton, Fay, Kerr, and Amft (1944) reported a propensity for vocal music. On the other hand, results from studies by Gaston (1951) and Eagle (1971) revealed a proclivity toward instrumental music.

In two studies designed to investigate the performance media preferences of fifth and sixth grade students (LeBlanc, 1981; LeBlanc & Cote, 1983), LeBlanc found a consistent preference for performance in the instrumental medium, especially within the art music and traditional jazz categories. The researcher concluded that teachers introducing new music to listeners in these grades should take advantage of positive entering affect by beginning with fast tempi and the instrumental medium. Summaries of related literature, which are beyond the scope of this work, may be found in Kuhn (1980), Wapnick (1976), and chapters by Abeles (1980), Haack (1980), and McMullen (1980).

Two studies investigated the effect of performer’s sex on the music preference of children. In a study that included vocal solo performance excerpts from the traditional jazz genre, LeBlanc and Cote (1983) specifically isolated the variables of performer and listener sex. While sixth grade male subjects significantly preferred male vocalists, females in the sixth grade had no significant preference for performers of either gender. Conversely, female listeners in the
fifth grade significantly preferred female vocalists but fifth grade males indicated no significant preferences.

LeBlanc and Sherrill (1986) measured the effect of male and female performers on the self-reported music listening preferences of students in grades 4, 5, and 6. Results indicated that listeners from both sexes associated “strong” performances with male rather than female performers. In addition, all subjects significantly preferred male vocalists, although female listeners exhibited a smaller but still significant preference. The researchers also discovered that female and male students in fourth, fifth, and sixth grades showed a statistically significant preference for low amounts of vibrato in singing examples. From this data, it appears that the presentation of vocal selections should begin with preferred fast tempi which feature little to no vibrato.

While gathering data for several preference studies (LeBlanc, 1981; LeBlanc et al., 1988; LeBlanc & Cote, 1983; LeBlanc & McCrary, 1983; LeBlanc & Sherrill, 1986), researchers observed that subjects found certain instrumental and vocal techniques to be humorous. These techniques included the use of distorted voice quality, extreme ranges, scat singing, unusual pronunciations, and wide vibrato. To test the resultant hypothesis that subjects liked these humorous styles, LeBlanc, Sims, Malin, and Sherrill (1992) designed a study to measure the relationship between humor perceived in music and music preference opinions of third, seventh, and eleventh grade students as well as college undergraduates. Results indicated that humor was largely a function of age. While listeners across all age groups significantly associated higher levels of perceived humor with higher levels of preference, the youngest and oldest age groups indicated higher preference opinion ratings for all examples than did the two middle age groups.

Moore and Johnson (2001) investigated the effect of musical experience on the perception of and preference for humor in Western art music. While music majors demonstrated significantly higher levels of liking than did nonmajors for 79% of the examples, results also showed that college-aged musicians and non-musicians were in general agreement on perceiving humorous and non-humorous excerpts.

Research into the influence of performance characteristics on preference seems to indicate that school-aged children prefer instrumental over vocal music in the art music and jazz categories and prefer male vocalists, with little vibrato, over female vocalists. Listeners across all age groups appear to enjoy music that they consider to be humorous.
The Environment

In Level 8 of LeBlanc’s Sources of Variation in Musical Preference (LeBlanc, 1980), the influence of the cultural environment in which the listener lives represents the second class of variables for input into the decision making system. Peer group, family, educators and authority figures, and incidental conditioning are the four indicated components of this class of variables. Research in this area has included varying age groups and styles of music and has yielded conflicting results.

In one of the earliest studies focusing on peer influence as it affects musical preference, Inglefield (Inglefield, 1982) found that ninth grade students exhibited overall conformity behavior in their preferences when exposed to peer leader influences. Other early research on peer influence focused on adult populations (Tanner, 1976) and found that peer approval seemed to be an important influence on music selection behavior among college students listening to radio programming. A later study including college students (Furman & Duke, 1988) also found that both music majors and nonmajors were affected by peer expressions of preference during rating of orchestral music, further demonstrating the influence of contemporaries on individually stated music preference.

Webster and Hamilton (1981/1982) investigated “the effect of group peer opinion on the musical preferences of a carefully matched sample of fourth, fifth, and sixth grade children using the generic styles of classical, rock, folk-country, and jazz” (p. 11). The researchers concluded that, when encouraged to make independent and private decisions about various styles of music, fourth, fifth, and sixth grade students are not easily influenced by peers.

In a study with similar results, Boyle and several fellow researchers (1981) examined self-reported reasons for subjects’ pop music preferences. Students from grades 5, 7, 9, 11, and college were asked to choose three of their favorite pop tunes and rate the degree of importance for eleven possible reasons for their preference. These reasons included such factors as harmony, melody, rhythm, words, and a factor of special interest entitled “Friends like it.” Across all grade levels and dropping systematically lower with each increased level, results revealed that this factor was rated as the lowest reason of importance among the reasons for preference. This finding suggests that if peer influence is a significant factor for preference, subjects may not choose to admit it.
In a study measuring preference and listening behaviors of fifth grade students as influenced by peer approval, Alpert (1982) used 60-second excerpts, for a total of 18 minutes of listening time, featuring classical, country, and rock styles. Interestingly, she found that peer approvals of classical music decreased classical music listening times.

There are numerous studies in the literature that investigate the effect of adult approval and authority figures on music preference. Madsen and Forsythe (1973), C. K. Madsen and C. H. Madsen (1972), Greer, Randall, and Timberlake (1971), Dorow (1977), and Madsen (1981) have all examined the effect of reinforcement on music preference. In a 1973 study, Greer, Dorow, and Hanser found that the most effective variable for determining music selection behavior was contingent use of high teacher approval. Results of another 1973 investigation (Greer, Dorow, Wachhaus, & White, 1973) also revealed that adult approval was a significant factor in music selection behavior. Tanner (1976) concluded that approval of music was similar in effectiveness to approval of students’ behaviors and that disc jockey approval appeared to be a major influence on music selection behaviors among college students listening to radio programming. In contrast, results from Hughes’ study (1980) suggested that approval of the music was a weak treatment and affected music selection only when there were no strong initial preferences in the population.

For his 1976 investigation, Radocy (1976) structured two experiments. First, he studied the effect of bogus information on listeners’ responses to identical performances. Experiment two was based on “differential information regarding alleged composers and imaginary prior listeners’ judgments of paired examples for four style periods” (p. 120). Results indicated that undergraduate music students’ evaluations of identical performances may be biased by authority figures providing bogus information.

In a similar investigation with far-reaching implications for music educators, Baker (1980) examined the effect of appropriate and inappropriate in-class song performance models of lullabies and capstan chanties on performance preferences of third- and fourth-grade students. The researcher concluded that performance preference was affected by the in-class performance models. Findings indicated that the way the children sang the songs in class affected the way they thought the songs should be performed. Performances did not have to be musically appropriate in order for students to consider them “correct.” The students accepted inappropriate renditions as readily as they did the appropriate ones.
Alpert (1982) studied the effect of music teacher and disc jockey approval on the verbal and behavioral music selection and preferences of fifth grade subjects for classical, country, and rock music. Her findings showed that compared to no approvals, approvals directed toward musical excerpts in general influenced verbal preference responses and music selection behavior. Specifically, data showed that music teacher and disc jockey approval increased classical music listening behavior. However, in a study focused on preference among preschool children, Sims (1986) found no relationship between teacher affect during listening and preference for piece.

In a 1988 study, Flowers investigated the effect of music appreciation instruction versus teaching experience on undergraduates’ preference ratings and listening times. Results indicated that both the music appreciation and teaching experience groups increased significantly in their overall verbal preference ratings. Additional analysis revealed that not only did ratings for the members of the teaching experience group increase, but 68% of the subjects in that group also effected a positive change in the posttest preference ratings of children to whom they taught their assigned selections.

Results concerning the environment factors that affect music preference show more conflicting results than do those concerning musical influences. Data appear to show that while authority figures consistently influence preference among a majority of subjects, peer opinion does not always function as a significant factor in preferential choices.

The Listener

A number of researchers have investigated the effects of listener attributes on musical preference. Many of these have focused on the personal characteristics of the respondent and have included studies involving the effects of age, gender, race, and musical training (Finnäs, 1989; Kuhn, 1980; Wapnick, 1976).

A thorough investigation of the music preference literature reveals that all age groups, preschool to mature adulthood, have been studied. While most researchers tend to categorize age as a primary variable in music preference, data have yielded varying results. Some early studies (Fisher, 1951; Keston & Pinto, 1955) found no age-preference relationships. Two investigations (Baumann, 1960; Rogers, 1957) reported an age-preference relationship but presented conflicting results. More recent studies appear to indicate that while young children demonstrate an “open-earedness” (Hargreaves, 1982) to various styles and forms of music, this acceptance declines in adolescence, partially rebounds from adolescence to reach its highest point at the
college level, and again declines with the maturation process (LeBlanc et al., 1988; LeBlanc et al., 1992; LeBlanc et al., 1996).

Several researchers have examined preferences of the elderly. In a 1988 study, Smith investigated the effect of enhanced higher frequencies on the musical preference of older adults. Three studies by Moore, Staum, and Brotons (1992) used live and recorded songs to study the effects of accompaniment, repertoire, tempi, and vocal ranges on the preferences of mature adults, varying in age from 60-110 years. LeBlanc, Sims, Siivola, and Obert (LeBlanc et al., 1996) researched the music style preferences of older adults, with ages ranging to 91 years. In a study involving subjects between 62 and 94 years, Schulten (1987) concluded that older persons viewed their preferences as a “concomitant of their life’s history” (p. 165).

Musical preferences of adult and college-aged subjects have also received attention from researchers. A 1984 study by Hargreaves determined that repeated listening did not effect a significant change in the two populations’ liking rating of avant-garde jazz and easy-listening styles. Data from a 2000-2001 Moore and Killian investigation revealed differences in preferences between adults and university undergraduates in preference for trained boy and girl singers. Geringer and McManus (1979) found that college music students indicated marked verbal preferences for composers in the Western art music tradition. A follow-up study (Geringer, 1982), which investigated the relationship between verbal and operant listening preferences of the same population, found it to be approximately .50.

Investigations by LeBlanc and his colleagues (LeBlanc et al., 1988; LeBlanc et al., 1992) found different preference ratings for tempo and humor between middle school and high school subjects, with high school students indicating higher preference. Additionally, results from a 1994 study (Gregory, 1994a) revealed significant differences between middle school and high school preference ratings for excerpts within the categories of Hindemith, Stravinsky, Mozart, and Eclectic. High school students again demonstrated higher preference ratings. Hargreaves, Comber, and Colley (1995) investigated preferences of 11-12- and 15-16-year-old subjects for serious and popular style categories. In reference to the two age groups included in the study, the main findings with respect to age revealed that the predicted decline in preference for a wide variety of styles in adolescence was clearly evident.

A thorough review of the literature reveals that the musical preferences of elementary children have been investigated empirically far more than those of any other age group. In
numerous studies, various researchers have focused on age as a variable contributing to preferences in characteristics of the performance including: humor perceived in music (LeBlanc et al., 1988; LeBlanc & McCrary, 1983; LeBlanc et al., 1992); performer use of vibrato (LeBlanc & Sherrill, 1986); performer’s gender (LeBlanc & Sherrill, 1986); performing medium (LeBlanc, 1981; LeBlanc & Cote, 1983); and style (Brittin, 2000; Fung et al., 1999/2000; Greer, 1974; LeBlanc, 1979, 1981; May, 1985). Other studies have concentrated on elements of music including dynamic contrasts (Burnsed, 1998, 2001); tempo (LeBlanc, 1981; LeBlanc & Cote, 1983; LeBlanc & McCrary, 1983; Montgomery, 1996) and timbre (Gordon, 1991). Results from all of these studies have been discussed in early portions of this section and a thorough review may be referenced there. As a result, data are briefly summarized here. Elementary-aged students prefer popular styles characterized by fast, instrumental genres. Studies investigating preference for male and female singers yielded conflicting gender results but provided solid data concerning dislike of vibrato. These subjects also indicate higher preferences for humorous music, woodwind timbres and performances featuring obvious dynamic expressiveness.

Musical preference researchers have found that first grade and preschool students often demonstrate different preference ratings than do other young children. In an early study involving preschool-aged and first grade subjects, Greer, Dorow, and Randall (1974) found that these students demonstrated an equal preference for rock and nonrock music. A study by Peery and Peery (1986) supported those results in that preschool children have an equal preference for classical and popular music. Additional studies concerned with young children’s musical preferences for style and tempo (Fung et al., 1999/2000; May, 1985; Montgomery, 1996) have revealed a higher preference level from these subjects and a more positive response to diversity. Bletstein (1983) found that 3-year-old children demonstrated a preference for 20th-century music over pre-20th-century music. Similarly, Hargreaves and Castell (1987) found that 4- and 5-year-old subjects did not appear to distinguish in their liking ratings either between familiar and unfamiliar melodies or between “real” music and statistical approximations to music. In contrast to older students in her study, Sims (1987) found that kindergarteners actually preferred the slow tempo category. These results were all consistent with conclusions reported in LeBlanc’s literature review in preference by maturation (1991). In contrast, first graders in Burnsed’s 1998 investigation showed the noneffect of age on preferences for the use of expressive dynamics in folks songs. She concluded that these results were not surprising,
because dynamics is one of the first elements of music perceived by very young children (Hargreaves & Zimmerman, 1992). In a series of studies investigating the listening patterns of preschool children during free-operant listening time, Sims and her colleagues have determined that most children have internally consistent listening patterns which differ substantially from one subject to another (Sims, 1985; Sims & Cassidy, 1997) and that young children do not discriminate through listening times between pieces or vocal and instrumental (Sims, 1999). A summary of literature related to music listening preference of preschool children may be found in Daniels (1994).

While not as well investigated as age, several researchers have studied race and socioeconomic status as variables in musical preference. In one of the earliest studies, Schuessler (1980) examined the preferences of African-American and white female adolescents and presented data that suggested the importance of the listeners’ race on music preferences. This conclusion was supported by the findings of two additional investigations (Appleton, 1971; Meadows, 1970), which studied the relationships between race, among other variables, and music preferences. Findings from a more recent study by McCrary (1993) revealed that the preference ratings of white listeners were virtually equal for black and white performers. However, black subjects showed statistically significant differences in their music preferences for white and black performers, giving strong preference ratings when they identified the performer’s race as black.

The effects of race on the music preferences of middle school students were studied by C. K. Madsen and C. H. Madsen (1975) and Killian (1990). The initial study (C. K. Madsen & C. H. Madsen, 1975) found that black listeners’ selection for “soul” music over candy as a contingent was more frequent than the white listeners’. Killian’s study (1990) showed that black students’ overall preference selection was for black performers, but the white listeners selected many of the black performers as well. McCrary’s 1993 work included preference ratings for middle school students, with findings mirroring those results indicated by college-aged subjects. In a study with contrasting results (Morrison, 1998), white and African-American students in grades six, seven, and eight were presented musical excerpts according to three conditions: music only, music coupled with a photograph of the performers, and music combined with a photograph of different performers representing a different ethnicity. Analyses revealed that white students preferred examples by white performers across all presentation conditions. When
presented with music alone, African-American students preferred examples by white performers but under the musical/visual conditions, preferred examples believed to be by African-American performers.

Studies with elementary students have revealed more uniform results. May’s (1985) investigation involving first-, second-, and third-grade students revealed findings indicating black students preferred musical excerpts featuring black singers or text about the African-American culture, while excerpts with white cultural identities were preferred by white subjects. In a 1986 investigation (LeBlanc & Sherrill, 1986), behaviors demonstrated by students in grades four, five, and six led researchers to conclude that participants seemed to especially enjoy the musical styles most closely identified with their own ethnic group. In the second of two studies investigating the music preferences and social encounters of majority/minority status students (McCrary, 2000), the interactions and affective responses of third- and fifth-grade children were observed while they listened to and discussed various musical styles and genres. Musical preference ratings confirmed previous findings of the effects of ethnic identity on listeners. The results also presented disturbing findings with regard to classroom ethnic majority/minority and girls, showing that classroom status affected girls’ interactions and preferences much more negatively than boys’.

Investigations focusing on socioeconomic status as a variable influencing musical preferences have produced conflicting results. In studies that included adults as well as high school and elementary students, Baumann (1960), Meadows (1970), Hicken (1991), and Rogers (1957) concluded that socioeconomic status was a statistically significant factor in determining preferences for some kinds of music. However, studies by Zumbrunn (1972) and Williams (1972) showed no significant difference among junior high or college students’ musical preferences as related to socioeconomic standing.

The music preferences of all age groups have been investigated. Findings relevant to this work suggest that while younger subjects demonstrate an “open-earedness” toward most music, elementary-aged students have begun to develop specific preferences, which appear to focus on pop/rock styles. Results relating to the influence of race on musical preference have been conflicting but tend to suggest an affinity for performers of the same race as the subject. Similarly, research into the effect of socioeconomic status has also been contradictory, and as a result, provides no conclusive data concerning its influence on musical preference.
Researchers have found great variability in studies investigating the relationship between gender and music preference. Several early investigations (Farnsworth, 1949; Fay & Middleton, 1941; Wapnick, 1976) found that college men and school-aged boys rated classical music lower than did females of equivalent ages. Others (Keston & Pinto, 1955; Wapnick, 1976) however revealed no such differences, and Rogers (1957) found that seventh- and ninth-grade girls preferred popular music to a much greater degree than seventh- and ninth-grade boys, but such differences did not exist at the 12th-grade level.

In studies where gender differences have been demonstrated (Abeles, 1980; Finnäs, 1989; Hicken, 1991; Skipper, 1975), males have been found to have lower preferences than females for music in the Western art tradition, while the opposite has often been true for popular music, especially in the hard rock genres and sometimes for jazz music. Gender also proved to be a significant factor in Denski’s (1990) analyses of preference for contemporary popular music.

Results from several studies appear to indicate that females demonstrate more positive attitudes toward music and music activities than do males. Crowther and Durkin (1982) reported a questionnaire study of 12- to 18-year-old respondents in which males consistently expressed less positive attitudes toward music than females, and this difference between genders was significant at the younger ages. A 1987 study by Moore revealed that girls were significantly more attentive than boys in elementary school music classes, especially during singing activities and instruction periods. Results from a 1996 Montgomery study, which examined the effect of tempo on music preferences of elementary and middle school students, corroborated findings by Crowther and Durkin (1982) and demonstrated that mean preference ratings across all test scores were significantly higher for girls. LeBlanc and Sherrill (1986) found that female listeners were more favorable toward high amounts of vibrato and female performers than were male subjects.

More recent investigations involving younger students have also yielded contrasting findings. While studies into the preferences of junior high band students (Teachout, 1993) indicated no significant differences between male and female subjects, several studies involving elementary-aged subjects have yielded opposite results. In a study investigating the musical style preferences of first-, second-, and third-grade students, May (1985) found significant gender main effects. Females preferred excerpts that were child-oriented, generally slower in tempo, less dynamic, and mostly legato. Conversely, males preferred excerpts with more dynamism, heavier accents, louder volumes, and faster in tempo. Data from a study by LeBlanc and
associates (LeBlanc et al., 1992) indicated that listener gender was strongly associated with the lyric variable, with female listeners mentioning lyrics much more frequently than did male listeners. In an interesting interaction of gender and age variables, female subjects in the third grade indicated a strong preference for humorous songs, but the preference of high school and college undergraduate females shifted away from humorous songs and toward songs whose lyrics focused on love or peace. Hargreaves, Comber, and Colley (1995) concluded that 11- and 12-year-old girls expressed liking for a wider range of styles than boys, especially “serious” ones, but also cautioned that this “preference” might just as well be expressed as a lower level of disliking. In a study investigating music listening preferences of young listeners from Greece, Korea, and the United States (LeBlanc et al., 1999), researchers again found that gender exerted a significant influence on the subjects’ listening preference.

Investigations into the impact of gender on musical preference has consistently yielded contrasting results. It appears that additional studies are needed in this area of music preference research.

Some type of musical training or instruction is frequently the independent variable in research studies concerning musical preference. As with many other areas concerning the development of musical preference, analyses of data offer conflicting results. In an initial study of the effect of musical training involving an adult population (Rubin-Rabson, 1940), the researcher concluded that greater musical training was associated with higher preference for modern classical music, however the relationship was not consistent for earlier stylistic periods in classical music. Two additional early investigations (Baumann, 1960; Keston & Pinto, 1955) demonstrated that increased musical training was associated with higher preference ratings for classical music. A study by Kelly (1961) showed that subjects who studied musical instruments, and showed a preference for classical music over other styles of music, were more likely to have parents with instrumental training. In a study comparing musicians and nonmusicians, Hornyak (1966) found that while musicians expressed a greater preference for music as a whole than did nonmusicians, untrained as well as trained subjects attending a concert were able to appropriately describe characteristics of the music performed to an equivalent degree. In an examination of the effect of providing no information, information in expressive terms, and information in technical-formal language, (Jensen, 1970) data indicated that providing no information concerning two 20th-century compositions resulted in a negative attitude toward the
music and that, in general, the expressive description was the most effective in forming a positive response. Williams (1972) concluded that instruction tended to influence attitudes toward serious vocal and current popular music but had no significant influence on attitudes toward folk, serious chamber, and serious symphonic music. Bartlett (1973) found a relationship between increased awareness of musical structure and positive affective response in a Schubert composition, but the relationship was non-significant for a Brahms piece. The author concluded that the Romantic music of the Brahms excerpt was closer to the subjects’ musical tastes and consequently did not require discernment of musical structure to produce a positive affective response. More recent studies (Carlin, 1997; Crowther & Durkin, 1982; Geringer, 1982, 1979; Hargreaves, 1995, 1980; Price, 1987) have found that persons with musical training have a marked preference for serious and a lower preference for popular music.

In contrast, several studies, involving both adults and elementary-aged children, have concluded that instruction has no effect on musical preference. In a 1990 study, Price and Swanson examined the effects of a prescribed course of study on the music preference ratings of undergraduate students enrolled in a college music appreciation class. Pre-/posttest comparisons revealed no significant differences of preference occurred. Flowers (1988) studied the effects of high positive music appreciation instruction or teaching presentation on preference ratings and listening behaviors of college elementary education majors and elementary-aged students. She concluded that both children and undergraduates tended to give higher ratings, both on the pretest and posttest, to fast tempi and found no relationship between the taught selection and listening time, for either the music appreciation group or the teaching experience group. Two studies that examined the effect of televised instruction on musical preference corroborated these results. Shehan (1979) used the television show, MUSIC, to introduce sixth-grade students to music concepts and expose them to a wide variety of musical styles. Data indicated that, despite being exposed to various musical styles throughout the ten-program series designed particularly for this purpose, students did not evidence a preference change from rock music. Likewise, Brown (1978) investigated the effects of televised instruction on student attitudes, music selection, and skills. The lack of posttest change in regard to music selection led the researcher to conclude that perhaps “knowing is not valuing” (p. 445).

Zajonc (1968) found that frequent exposure to a stimulus object was a sufficient condition of attitude enhancement. In the study of musical preference, the effects of repeated
exposure to a musical stimulus are frequently investigated. An early investigation that included college-aged students (Mull, 1957) concluded that repeated listening to contemporary music by this age group resulted in a positive attitude change toward the stimuli. In an early study involving seventh grade subjects, Getz (1966) researched the effects of familiarity, based on repetition of previously unfamiliar Western art music selections, on the degree of musical preference. Results showed that familiarity through repetition was the reason most often given for students’ preference. A later study utilizing seventh-grade subjects (Bradley, 1971) determined that repetition was not only an important factor in increasing positive attitudes toward music, especially unfamiliar music, but was also an critical pedagogical routine in any serious listening program. Several other investigators have researched some aspect of familiarity on preference responses and generally found that familiarity, at least partially, increased positive attitudes (Edmonston, 1969; Hargreaves, 1988; Russell, 1986; Sluckin, Hargreaves, & Colman, 1982; Trehub, Morrongiello, & Thorpe, 1985; Verveer, Barry, & Bousfield, 1933).

The influence of repetition on preferences of elementary and preschool students has also received attention from researchers. In an early study with preschool children, Schuckert and McDonald (1968) exposed subjects to less preferred music in four play situations and found that they were able to modify their musical preferences. Results from a 1986 study (Peery & Peery, 1986) involving preschool subjects showed that the experimental group, which received weekly 45-minute music classes for 10 months, showed significant preference to the classical selections when compared to the control group, which did not experience anything unusual in the way of music study. The researchers concluded that exposure and repetition can effect musical preference. In a study that included both fourth graders and college students (Heingartner & Hall, 1974), data analyses indicated that repeated exposure to auditory stimuli has a significant positive relationship to liking for subjects from both age groups. A more recent study involving only fourth graders (Moskovitz, 1992) found that repetition has a positive effect on children’s preferences for slow music. Moskovitz purported that repetition can be an important pedagogical device in overcoming preconceived value judgments that are possibly influenced by tempo and asserted that aesthetic attitudes can be developed by repeated exposure.

In two studies dealing with students’ preferences for ethnic music styles (Shehan, 1981/1982, 1985), Shehan presented results conflicting with those previously mentioned here. In her first study (Shehan, 1981/1982), she concluded that the study of non-Western musical styles
at the elementary and middle school levels may not be effecting enthusiastic response from children. Similarly, in an attempt to investigate transfer of preference from taught to untaught pieces of non-Western music genres, Shehan (1985) found that instruction of unfamiliar, non-Western music genres increased sixth-grade preferences for those particular pieces but that preference did not transfer to untaught pieces of the same genre.

Other studies have indicated the repeated exposure, paired with instruction and training, tends to increase the positive attitudes toward musical selections (Baker, 1980; Bastarache, 1972b; Bradley, 1972; Larson, 1971; Price, 1988; Prince, 1974). An additional review of literature concerning the effects of familiarity and musical training on music preference may be found in Finnäs (1989) and Wapnick (1976).

Data concerning the effect of training on musical preference offer conflicting results. In studies involving both adults and children and various styles of music, several researchers have found that musical instruction positively affects preference. Others, however, have concluded that training has no influence on musical preference.

Emotional Responsiveness

Much has been written concerning the relationship between humans and music. Since the fourth century BC, philosophers, psychologists, musicians, researchers, and teachers have discussed and proposed numerous theories to explain human responses to music (Aristotle, 1997, 1999; Cooke, 1959; Langer, 1957; Madsen, 1978; Meyer, 1956; Plato, 1928; Radocy & Boyle, 1979; Reimer, 1970; Seashore, 1938).

While the ancient Greek philosophers Plato (1928) and Aristotle (1997, 1999) held very different views on the role of music in society, they did, however, share ideas conveyed by the doctrine of ethos. “Applied to music, this doctrine is the belief that music can powerfully affect human character and behavior” (Seaton, 1991, p. 2).

Some philosophers have viewed music as a language, purporting that musical events can represent specific emotions (Cooke, 1959). The early Greeks, including Plato and Aristotle, believed that melody and poetry were practically synonymous and suggested the close union of the two art forms was based on their shared elements, including melody, form, and rhythm (Grout, 1980). When speaking to the judgment of signification, Francès (1988) maintained that music is regarded as a language through the establishment of a relationship between the message or sign, and the thing signified, which is music in this case. In contrast, Langer (1957), a
philosopher who has had a profound impact on the area of aesthetics, defined music as an unconsummated symbol, embodying feelings through structures analogous to human emotions. Still others have focused on the purely artistic, intellectual nature of music, denying the possibility of any connection between music and feelingful response (Hanslick, 1957).

In his book, *The perception of music*, Francès (1988) states: “for the psychologist there is perhaps no problem more difficult to pose and to resolve than that of expressions and meaning in music” (p. 225). Most of the philosophical debates fall into one of three categories, which Abeles, Hoffer, and Klotman (1994) labeled as “Expressionism,” “Formalism,” and “Referentialism.”

The Expressionists’ theory concentrates on feelings that music evokes in the listener. These feelings are described as the personal reactions of the listener, not specific emotions that have been predetermined as “correct” responses. Dewey (Archambault, 1964), Langer (1993), and Meyer (1956) write from this point of view. These philosophers propose that music reflects the qualities and patterns of life; consequently, when we learn about music, we learn about life. Characteristics common to both music and life include gravitation/deviation, movement/rest, stability/instability, and tension/release. “Because music exists in time and space and is created by humans existing in time and space, it provides an analog of these life processes. Through music we are able to gain new insights into ourselves, new perspectives that are seemingly impossible . . .” (Tait & Haack, 1984, pp. 38-39).

Music, from the Formalists’ point of view, is in large part an intellectual experience. This theory is clearly enunciated through a quote from Bell found in Reimer (1970):

. . . he who contemplates a work of art, inhabit(s) a world with an intense and peculiar significance of its own; that significance is unrelated to the significance of life. In this world the emotions of life find no place. It is a world with emotions of its own (p. 21).

While the Formalists admit that many works of art contain external references, they insist that all such connections are completely irrelevant to the meaning and focus entirely on the inherent properties or qualities of music. Consequently, the music itself is more important than any personal reactions to the music. This idea is summarized by the 19th-century aesthetician Edward Hanslick (1957) as follows:

. . . no one who has a real understanding of the art of painting attaches any importance to what we call the subject of a picture--what is represented . . . all depends on how it is presented, nothing on what (p. 308).
According to Referentialists, the meaning and value of music exists in nonmusical ideas found outside the work itself. In order to find the meaning in music, one must go find the attitudes, emotions, events, and ideas to which the piece refers you in the outside world. The sounds serve as clues or reminders of something extramusical, and music is considered successful only in the degree to which it is able to provide a nonmusical reference or experience. In his book, *The language of music*, Cooke (1959), an early proponent of this theory, provided an analysis of various intervals and patterns in music and specifies correlations to specific emotions and feelings. Throughout the ages, political and religious movements have employed the referential viewpoint to further their own causes.

*Inquiry Into Aesthetic Response*

*Structural Elements*

Since early in the 20th century, philosophers, psychologists, researchers, teachers, and therapists have studied feelingful response to music through analysis of structural elements (Birkoff, 1933; Crozier, 1981; Henken, 1955; Kamenetsky, Hill, & Trehub, 1997; Rigg, 1940; Valentine, 1955). In a series of six seminal studies which isolated the variables of harmony, melody, mode, pitch, rhythm, and tempo, Hevner (1935, 1936, 1937) became one of the earliest researchers to study the effects of various musical elements on emotional response to music. Additionally, the development and refinement of the Hevner adjective list, containing eight clusters of “mood terms,” throughout the course of these studies was a ground-breaking contribution to the systematic study of human emotional responsiveness to musical experiences. Other investigators have studied the emotional effects of articulation (Wedin, 1972) and dynamics (Geringer, 1975) as well as various other isolated elements and numerous combinations.

A number of researchers have studied the effects of articulation on emotional response to music. In a 1972 investigation, Wedin found that staccato articulation is perceived as agitated, energetic, and lively. In contrast, results from the study indicated that legato articulation is seen as dreamy, gentle, peaceful, or soft. Gabrielsson and Juslin (1996) found while that staccato articulation was connotative of fear, legato articulation denoted sadness. Studies by Moreno (1980) and Scherer and Oshinsky (1977) have also reported emotional response due to articulation.
Results from early studies concerning the role of dynamics in musical expression found that soft music tends to be perceived as delicate or peaceful while loud music is more often viewed as happy or lively (Gundlach, 1935; Watson, 1942). In a later study designed to investigate the role of dynamics in aesthetic response, Geringer and Breen (1975) asked nonmusic-majors to listen to both rock and roll and classical music examples. Analysis of data indicated that dynamic range is more important as an expressive element in classical music than in rock and roll. Findings also revealed that the effectiveness of dynamic range in classical music appears to be a function of its relationship to the composer’s intent. A secondary finding of seemingly great importance to music teachers and therapists was that the nonmusicians who served as subjects in this study appeared to have the ability to respond differentially to the optimal dynamic-contextual relationships present in the classical music examples. Kamenetsky, Hill, and Trehub (1997) altered the dynamics and tempi of four musical examples and asked nonmusician adults to rate the excerpts for likeability and emotional expressiveness. Results indicated that varying dynamics resulted in higher ratings, while variations in tempo showed no such effect. This finding was in direct contrast to the results of Hevner’s 1937 study, which concluded that tempo was the single most important factor in determining responses to music. Additional studies concerning the salience of dynamics in musical expressiveness may be found in Fay (1947), Gordon (1960), Farnsworth (Farnsworth, 1969), and Gabrielsson and Juslin (1996).

Harmony, as an isolated element influencing musical response, was first studied by Hevner in her 1936 investigation. Results revealed mixed findings with simple harmony evoking happy and serene feelings, while complex harmony was experienced as exciting, vigorous, and sad. Findings from Eagle’s (1971) investigation also revealed emotional response due to harmonic structure.

Valentine (1955) studied the effect of consonant and dissonant intervals on the aesthetic response of university students and children to age 13. He found that elementary subjects showed no preference for consonant intervals before the average age of nine. After this age, data revealed that subjects appeared to consider dissonance as increasingly unpleasant; consequently, 12- and 13-year-old subjects indicated responses remarkably like those of adults. Valentine concluded that the major third was the interval most preferred by adults, followed by the minor third, octave, and major and minor sixth. Further results indicated that the major third and sixth
were described as sad by adults twice as often as the minor third and sixth, lending support for Heinlein’s theory (1928) that the effects of minor intervals are determined by association.

In two consecutive studies (Hevner, 1936) (Hevner, 1937), Hevner investigated the effects of melody and pitch on subjects’ aesthetic response to music. In a 1936 study, she isolated melody as a variable impacting emotional response to music. Findings indicated no clear-cut and consistent relationship between ascending and descending melody and aesthetic response. One of the two investigations included in her 1937 study studied the effect of pitch on the feelingful responses of university subjects. Results indicated that after tempo, pitch is the musical element most closely associated with aesthetic response to music.

Several researchers have investigated the relationship between mode and emotional responsiveness to music. According to Crowder (1984), Heinlein (1928) made the first systematic study of the emotional connotations of modes in music. He presented 48 isolated major and minor chords to subjects who chose a single adjective from a list to describe their affective response. Heinlein’s results showed that the conventional associations of major and minor did not apply to isolated chords. However, Crowder (1984) reanalyzed the subject-by-subject findings Heinlein (1928) provided and concluded there was overwhelming support that both trained and untrained listeners indicated connotative judgments in accord with the conventional happy/sad implications.

In her 1935 study, Hevner attempted to determine if college students were able to ascertain the “traditional” characteristics associated with the major and minor modes and to what extent this recognition was affected by intelligence, talent, or training in music. In contrast to the single chords used in Heinlein’s study (1928), Hevner used short musical compositions. During and immediately after hearing an example, subjects used a word list to check all the adjectives which seemed to describe the music. One list of adjectives was arranged in groups of opposites and another with words of similar meanings listed together. Results showed a substantial majority of students indicated characteristics historically associated with the modes—the minor was associated with sadness and gloom, while the major was described as happy, bright, and joyous. Findings also indicated that neither musical training, intelligence, nor musical ability had a significant effect on ability to discriminate the mood effects of the two modes.

In two later studies, Hoshino (1996) asked Japanese college students and adults to choose appropriate adjectives and to use a synaesthetic bias to describe the mood of melodies from the
Western art music tradition and the Japanese modes. Findings indicated that subjects made a clear distinction in affective response to melodies employing the diatonic scale but provided vague and equivocal reports to melodies in the Japanese pentatonic scale. He also found that participants were able to translate certain portions of the auditory stimuli into visual sensory content.

Subjects in several studies investigating the effect of mode on aesthetic response have generally associated anger, sadness, or negative emotions with the minor mode and happiness or positive feelings with the major mode (Crowder, 1985; Hevner, 1935; Hill, Kamenetsky, & Trehub, 1996; Scherer & Oshinsky, 1977). However, some researchers believe these responses are arbitrary or highly enculturated rather than having an intrinsic basis within the modes themselves (Davies, 1994; Kivy, 1980).

Several researchers have studied the relationship between tempo/rhythm and emotional interpretations of music (Gundlach, 1935; Hevner, 1936; Scherer & Oshinsky, 1977). In general, results have shown that pieces with quick tempi tend to be interpreted as cheerful and pleasing (Gundlach, 1935; Scherer & Oshinsky, 1977; Swanwick, 1973; Watson, 1942; Wedin, 1972), while pieces with slower tempi are more likely to be described as serious or sad (Hevner, 1937; Rigg, 1940). Additionally, musical examples with uneven-valued rhythms were interpreted as happy or playful compared with even-valued rhythms, which were perceived as sacred or serious (Gundlach, 1935; Hevner, 1936). One of two experiments that Hevner structured for her 1937 study investigated the effect of tempo on emotional response. As in her two previous studies (Hevner, 1935, 1936), university subjects again utilized the adjective list to indicate their responses. Combined results from these studies and the other four in this series (Hevner, 1935, 1936) indicated that pitch and tempo are the elements most associated with expressiveness in music, with tempo as the most salient. In a later investigation, Holbrook and Anand (1990) focused on the effects of tempo on the listeners’ perceptions and affect. Results supported the hypothesized psychophysical relationship between tempo and perceived activity, revealed a peak tempo preference of about 108 beats per minute and showed an increase in preference due to an increase in tempo.

In contrast to the studies in the previous section, which isolated single structural elements associated with emotional response, several researchers have suggested that composers use combinations of structural elements together with each other in order to create expression in
music. For Wedin’s (1972) multidimensional study of the perceptual-emotional qualities in music, university students were asked to subjectively judge 40 musical examples by choosing 5 to 10 of the most appropriate attributes from a list of 125 adjectives. From the responses, Wedin extracted three dimensions, which he called Intensity-Softness, Pleasantness-Unpleasantness, and Solemnity-Triviality. These dimensions were then related to combined structural elements such as tempo, pitch, modality, etc. For instance, high pitch, major modality, and staccato were associated with Solemnity (characterized as dignified, majestic, and solemn), while melody and intensity produced the Triviality dimension (described by adjectives such as commonplace, merry, popular, relaxed, etc.).

In two studies, Nielzén and Cesarec (1981, 1982) used Osgood’s semantic differential (Osgood, 1957) to investigate structural contributions to the emotional experience of music. From the first study (Nielzén & Cesarec, 1981), three factors of aesthetic experience emerged, which the researchers concluded agreed closely with those found by other investigators in similar research work (Osgood, 1957; Wedin, 1972). Factor I was interpreted as Tension-Relaxation; Factor II as Gaiety-Gloom; and Factor III as Attraction-Repulsion. The second study (Nielzén & Cesarec, 1982) used the same procedure to investigate the musico-technical content as well as the emotional experience. Three factors again evolved, which Nielzén and Cesarec labeled Simple-Sophisticated, Vivid-Placid, and Dark-Light. The investigators purported that composers systematically use several single structural elements simultaneously in order to create expression in music. Additionally, they concluded that musical expression appeared to be uniformly interpreted by the adults subjects, which consequently appeared to indicate that music is an efficient stimulus in transferring emotional messages.

Other researchers have been concerned with the effect of deliberate alterations in global musical structures on perceived expressiveness. Tillman and Bigand (1996) segmented three pieces, one atonal and two tonal, into short musical chunks. One experimental group heard the chunks linked in a forward order (original version); a second experimental situation heard them linked in a backward order (inverted version), which completely destroyed the formal, global structure of the pieces but maintained the local structures inside the chunks as well as the superficial characteristics. Results indicated a strong effect of musical pieces on expressiveness ratings but did not support a strong effect due to version. The excerpts by Bach and Mozart showed no significant changes in expressiveness ratings due to inverted versions. Ratings for the
Schönberg piece, the least structured of all the examples, indicated some significant effect of the version played, but the effect was weak, and researchers concluded that it accounted for a very small portion of the experimental variance. The study failed to support a positive link between perceived musical expressiveness and large formal structure for non-musically trained participants.

Sloboda (1991) investigated the effect of specific musical structures on a range of physical reactions. Subjects, ranging in experience from professional musicians to non-performers, completed a questionnaire indicating frequency of specific physical responses to music. They also listed pieces in which they could remember experiencing one or more of the physical reactions within the previous five years and were asked to specify, as precisely as possible, the musical event with which the response coincided. Structural analysis of the specified passages indicated that shivers were most commonly evoked by passages containing new or unexpected harmonies, while tears were most frequently associated with excerpts containing appoggiaturas and sequences.

Three studies have investigated the aesthetic responses of children to various musical elements. Desroches (1997) investigated the emotional reaction of 3- and 4-year-old children to the musical structures of dynamics, mode, and tempo. Data was gathered by observing behavioral and gestural responses, observer attribution of subject’s emotional state, and selections of pictographic representations. Findings indicated tempo and dynamics influenced the behavioral and emotional states of both age groups but only affected the facial selection response of the 4-year-olds. Mode was only a factor in the behavioral responses of the older subjects and then only marginally. Three- and 4-year-old children appeared to respond to quiet dynamics and slow tempi with sad behavior in contrast to fast tempi and louder dynamics, which tended to produce happy or angry responses.

Kratus (1993) utilized subjects aged 6 to 12 years old to investigate which musical elements contributed to children’s interpretations of emotion in music. Students listened to 30 musical examples and indicated happy-sad or excited-calm moods by circling pictographic faces. Data suggested that happy-sad distinctions were based largely on the articulation and rhythmic activity of the excerpts and that excited-calm responses were based on rhythmic activity and meter.
In an attempt to study the effect of major and minor modes on the emotional responsiveness of subjects between the ages of 3 and 12, Kastner and Crowder (1990) asked subjects to point to one of four schematic faces symbolizing angry, contented, happy, and sad facial expressions. Results showed that even the youngest subjects could reliably differentiate and register culturally accepted emotional responses to major and minor modes. The researchers attributed these findings to having “short-circuited the verbal-analytic system with our task” (p. 1980).

Physiological Response

In his book, *The social psychology of music*, Farnsworth (1969) stated, “It may be categorically stated that music can markedly affect the bodily processes” (p. 210-211). Since the middle of the 18th century, researchers have been studying physiological response to music. Investigations have addressed a wide area of interests, ranging in scope from the patellar (knee-jerk) reflex and the pilomotor response (movement of the hairs on the skin) to the effects of music on the activity of the stomach and incontinency (Dainow, 1977). Music therapists have also studied the use of music to control emotions and reduce anxiety and stress (Standley, 1986).

While some of these studies, including those conducted by music therapists, have examined the effect of music on physiological response through utilizing devices specifically designed to measure blood pressure, heart rate, galvanic skin response (GSR), muscle tension/motor response, and respiration rate (Hanser, 1985; Iwanaga, 1999), others have relied on subjective self-reports (Hanser, 1985; Hodges, 1980; Standley, 1986). The resultant data has indicated varying results. Early studies claimed the effects of music produced significant physiological changes, but later studies have shown inconsistencies (Hanser, 1985), with investigations, utilizing physiological as well as self-report measures, indicating no significant changes related to music listening (Biller, Olson, & Breen, 1974; Fisher & Greenberg, 1972; Hanser, 1985; Jellison, 1975; Rohner & Miller, 1980). Interestingly, data from several studies (Logan & Roberts, 1984; Smith, 1976; Smith & Morris, 1977) showed actual increases in anxiety and arousal when either stimulative or sedative music was played. Additionally, Taylor (1973) found that subjects did not display a consensus concerning prelabeled stimulative and sedative music. Such results have led several researchers to conclude that physiological response to music appears to be linked to music preference, with little correlation between stimulative and sedative music and resultant arousal and relaxation (Davis & Thaut, 1989; Iwanaga, Ikeda, &
Iwaki, 1996; Stratton, 1984; Thaut & Davis, 1993). Consequently, conflicting data and a general lack of correlation between measurements have resulted in inconclusive findings concerning physiological response to music stimuli (Hanser, 1985; Iwanaga, 1999).

Two recent investigations have studied the effect of music on blood pressure. Presurgical patients in a 1996 study (Miluk-Kolasa, Matejek & Stupnicki, 1996) exhibited lower systolic blood pressure in response to an individually designed music program. In an investigation to examine the effect of music type and preference on physiological responses, Iwanga and Moroki (1999) concluded that blood pressure increased significantly during excitative music stimuli conditions.

According to Dainow (1977), heart rate is the most commonly studied physiological parameter, yet research in this area has yielded inconclusive results. While results from several studies indicated that heart rate would increase with stimulative music (DeJong, van Mourik, & Schellekens, 1973; Iwanaga, 1999) and decrease with slower music (Iwanaga & Moroki, 1999; Lowell & Morgan, 1942), other investigations have reported that any music will increase heart rate (Ellis & Brighouse, 1952). Additional research has indicated no effect on heart rate due to musical stimuli (Zimny & Weidenfeller, 1962). In a summary of research concerning the effect of sedative music on heart rate, Hodges (1980) included inconclusive and contradictory data indicating: (a) increased heart rate due to both stimulative and sedative music, (b) heart rate decrease during sedative music with increase during excitative music, (c) excitative and sedative music influenced heart rate but with unpredictable results, and (d) music had no effect on heart rate. In contrast, Iwanaga and Moroki (1999) found that heart rate was significantly higher during stimulative music than during sedative music.

Investigators have related GSR to dissonant versus consonant sounds, emotional response to music, response to sedative and stimulative music, and introversion-extroversion (Dainow, 1977; Ries, 1969). While increased skin resistance has been associated in response to hearing calming music (Weidenfeller & Zimny, 1962), decreased skin resistance has been linked with listening to exciting music (Weidenfeller & Zimny, 1962; Wilson & Aiken, 1977; Zimny & Weidenfeller, 1963; Zimny & Weidenfeller, 1962). Still, Dainow (1977) reports that GSR research has been even more inconclusive and incomplete than that related to heart and respiration rate.
Despite the fact that several investigators have categorized muscular tension as a significant indicator of the emotional state, there is a paucity of studies devoted to the effects of music on music tension. Dainow (1977) reported only three studies utilizing electromyography (EMG) recordings to directly measure tension in relation to a music stimuli. Data from two of these investigations indicated that music could predictably alter tension and a third reported greater EMG responses for trained musicians than for nonmusicians.

Although researchers have classified motor response to music as “the most basic, earliest, and most lasting reaction to music” (Van de Wall, cited in Dainow, 1977, p. 215), two factors limit the possibility of measuring this reaction. First, artifact-free EMG recordings are difficult to obtain during free motor response to music, and secondly, it appears that subjects frequently suppress motor response in an experimental setting (Dainow, 1977). Data from the few studies in this area have revealed more response in the hands than in the feet, more in the right side than the left, and less intense response in triple meters than in duple meters. Clynes (cited in Dainow, 1977) used finger movements to register a voluntary beat response on a highly sensitive pressure transducer. Results showed that each composer had characteristic pulse forms and that specific emotions produced similar shapes across different subjects.

Researchers have given less attention to respiration rate, and the investigations that have been reported have been difficult to summarize. Some studies have related emotional excitement to respiration effect, while others have analyzed the attention of the listener to the tempo of the music (Wilson & Aiken, 1977). However, findings are inconclusive concerning the effect of musical tempo on respiration (DeJong et al., 1973; Iwanaga & Moroki, 1999; Lowell & Morgan, 1942; Ries, 1969).

Investigators have studied the effects of music therapy techniques on reduction of pre-surgical anxiety (Miluk-Kolasa et al., 1996), dental stress (Hanser, 1985), and apprehension in expectant mothers during labor (Hanser, Larson, & O'Connell, 1983). Additional researchers have investigated using music to modulate effects in a stressful situation (Jellison, 1975; Thayer & Levenson, 1983), decrease anxiety during test taking (Hanser, 1985), and positively affect heart rate, oxygen saturation levels, and respiratory rate in premature infants in the NICU (Cassidy & Standley, 1995). Additional reviews of related information may be found in Hanser (1985), Hodges (1980), and Standley (1986).
Several researchers have used subjective, self-reports to investigate the effect of music on various physiological responses in subjects from differing populations. As with physiological measurements, data from subjective evaluations of physiological response to music have also been inconclusive and contradictory. Results of an Iwanaga and Moroki study (1999) indicated that while sedative music eased tension, excitative music aroused feelings of tension and vigor in university students. Thaut (1989) studied the effects of music therapy interventions on self-perceived changes in affect, relaxation, and thoughts about one’s self and life in mentally ill prisoner-patients. Results indicated a significant change in self-reported ratings from before versus after music therapy across all three music therapy techniques. Wilson and Aiken (1977) found that even though physiological responses suggested a general arousal-attention state during attention to the rock music stimuli, subjective responses differentiated individual music examples and were linked with varying patterns of mood adjectives as a function of the intensity levels of the music examples. In a study involving third trimester adolescent pregnancy, Liebman and MacLaren (1971) found that sedative music reduced subjective anxiety. In contrast, Rohner and Miller (1980) reported that highly anxious subjects showed little reduction of apprehension while listening to sedative music. Additionally, findings in a Logan and Roberts study (1984) indicated that subjective tension decreased in a no-music condition but increased in a sedative music condition. Both Hanser (1985) and Thaut (1989) provide a further review of related research.

Mood in Music

While the topic of emotion in music has been the focus of a large body of research, relatively little consideration has been given to the more transient and subjective aspect of emotion commonly referred to as mood (Stratton & Zalanowski, 1989). As a result, the meaning of the word mood is not always clearly defined but is generally considered by researchers to refer to “sustained general states, such as sadness and contentment, that may or may not be considered emotions depending on the theoretical and definitional conventions” (Lazarus, 1984, p. 125). Consequently, investigators have tended to consider mood to induce less intense physiological responses than does emotion and have considered it to be better reflected through subjective responses, cognition, and behavior (Stratton & Zalanowski, 1989).

However, LeBlanc (1980) considers current affective state, which he described as “the respondent’s current mood,” (p. 32) to be a primary source of variation in musical taste. He
proposes that mood functions as a filter, exerting influence upon further processing of input information. Some researchers have studied musical mood management through investigating the music young people choose for the expression of emotion-related ideas (Zillmann & Gan, 1997), and others have suggested that younger listeners may not appreciate western art music because they believe it is incapable of expressing the emotions or moods that they experience in life (Woody & Burns, 2001).

Much of the research concerning music and mood has fallen into two categories of investigation: recognition of moodstates in music (Dolgin & Adelson, 1990; Giomo, 1993; Hevner, 1935, 1936, 1937; Zimmerman, 1983) and examinations of the specific effect of music on mood (Goins, 1998, 2001; Pignatiello, Camp, & Rasar, 1986; Stratton & Zalanowski, 1989). While investigators have used varying populations as subjects, thorough research has revealed a relatively small number of studies involving young children and recognition of mood in music.

Recognition of Moodstates

Hevner (1935, 1936, 1937) conducted some of the earliest investigations concerning the perception of mood in music. During these series of studies, she developed an adjective scale containing eight clusters of emotion words and asked subjects to choose the adjectives that seemed most appropriate for the music. Other researchers (Farnsworth, 1954-55; Wedin, 1972) have further utilized and refined the adjective scale. For a thorough review of literature concerning musical elements and mood association, please refer to the section, Structural Elements.

Behrens and Green (1993) investigated the ability of undergraduate students to identify the mood of solo improvisations. The improvisations, which represented anger, fear, and sadness, were performed by timpanists, trumpeters, violinists, and vocalists. While all subjects were more precise when identifying fear in improvisations on the violin than on other instruments, participants with higher levels of musicianship also demonstrated greater accuracy in associating mood with trumpet improvisations. In two studies that focused on the relationship between performer and listener, Kendall and Carterette (1990) and Senju and Ohgushi (1987) found that nonmusicians as well as musicians could accurately identify differing categories of expressive intent on clarinet, oboe, piano, trumpet, and violin. In a series of studies focusing on the performer's intention and the listener's experience, Gabrielson and associates (1995, 1996) asked musicians to perform, on various instruments, pieces using predetermined moodstates.
Results showed that listeners were generally successful in decoding the performer’s intended mood, and that certain emotions (angry, happy, sad) appeared easier to both communicate and perceive than others. In a study investigating the effects of a music therapy program on the awareness of mood in music (Henderson, 1983), data showed that hospitalized adolescent psychiatric patients showed a significant increase between pre- and posttests designed to measure choices of adjectives chosen to describe musical examples. Gregory and Varney (1996) studied the effects of cultural background on the ability of subjects of Asian and European descent to recognize mood in music from various traditions. The researchers determined that differences in affective responses were determined more by cultural tradition than by the inherent qualities of the musical selections.

Researchers investigating children’s ability to recognize mood in music have generally found that subjects as young as four years old can successfully discern intended mood in music. Zimmerman (1983) compared the musical mood responses of emotionally disturbed and normal children, ranging in age from seven to thirteen. Four basic moods (devotional, happy, mysterious, and sad) were represented in 32 musical excerpts and for the non-verbal response measure, subjects were instructed to point to black and white photographs portraying the stipulated moods. No significant differences were found between the mood responses of the two populations except in the “happy” category. Zimmerman concluded that these findings supported that part of the description of emotionally disturbed children which describes them as characterized by a general pervasive mood of depression or unhappiness.

In a 1988 investigation, Cunningham and Sterling asked subjects, aged 4, 5, 6, and 18 to 24 years, to label 24 orchestral excerpts as sounding afraid, angry, happy, or sad. The examples had been previously determined by adults to be clearly expressive of these moods. While some age differences were found, the children’s responses agreed with adults’ at above-chance levels for all but 4-year-olds’ angry and sad responses and 5-year-olds’ afraid responses.

Dolgin and Adelson (1990) attempted to determine the ages at which children begin to recognize affective qualities (angry, frightened, happy, and sad) in melodies sung by a soprano and played by a viola. Four-, 7-, and 9-year-olds and college students listened to 16 original monophonic melodies and indicated the depicted emotion by pointing to the correct picture (4-year-olds) or by circling the choices (older children and adults). Additionally, subjects were asked to tell the researchers some event that might cause a person to experience the specified
emotion. All age groups were able to correctly identify the mood in the melodies at rates significantly above chance, with the exception of the 4-year-olds’ identification of frightened and angry melodies played by the viola. Data also showed a significant improvement with age, with 9-year-olds as successful as adults when identifying happy melodies but less effective distinguishing other emotions. Additionally, results suggested that all moods were not equally identifiable, with happy, sad, angry, and finally frightened-sounding comprising ease of identification order.

Using procedures similar to the two previous studies (Cunningham & Sterling, 1988; Dolgin & Adelson, 1990), Terwogt and van Grinsven (1991) asked 5-year-olds, 10-year-olds, and adults to match the emotion in eight orchestral excerpts with line drawings of facial expressions to indicate anger, fear, happiness, and sadness. While the 5-year-old group was less able than the others to match the music with the correct moodstate, results revealed that the consensus of choices was considerable and increased with age. When the researchers asked the subjects to explain their choices, they found that 10-year-olds were similar to adults in total number of informative statements as well as reasons provided. Additionally, findings supported data from Dolgin and Adelson (1990) which indicated that fear and anger were harder to identify in music.

In a developmental study of children’s interpretation of emotion in music, Kratus (1993) asked subjects, ages 6 to 12 years old, to interpret the emotion present in 30 recorded musical examples. On one measure, students responded by circling either happy or sad faces, and on another measure, subjects circled excited or calm faces. Results indicated that subjects of all age groups were highly consistent in their interpretations.

In a similar study comparing 5- and 9-year-old subjects, Giomo (1993) explored the ability of younger children to perceive mood in music. Subjects listened to 12 complete pieces and indicated their mood distinctions using schematic faces arranged in a semantic differential format. Only three pieces showed significant differences between the two age groups; in most cases, both age groups performed at better-than-chance levels. Examination of an additional variable revealed that subjects with no musical instrument at home, and no parent or sibling with musical instruction, received significantly higher total scores than those students who had some sort of musical instruction at home. Significant main effects were also shown for gender at both grade levels and socio-economic status among 9-year-olds.
Hair (1995/1996) investigated the mood categories of colors, lines, music, and words. She asked children and musician and nonmusicians university students to listen to two orchestral pieces and match them to lines and colors signifying similar mood. All subjects were then instructed to write three words to describe each of the excerpts, and adults were asked to choose one category from Hevner’s adjective list (1936) that best described the music. Findings revealed that subjects from the same culture, with different ages and degrees of musical training, specified similar mood category responses across colors, lines, and words.

*Tests for Measurement of Affective Response*

Over the years, a number of investigators have sought to measure aesthetic response through researcher-designed tests. According to Asmus (1985), a majority of these devices have employed descriptive terms as the foundation for obtaining aesthetic response. He further states that three broad categories of measurement devices can be identified: the adjective check list (Farnsworth, 1954-55; Hevner, 1936, 1937), the semantic differential (Osgood, Suci, & Tannenbaum, 1957), and rating scales (Gabrielsson, 1973).

Early work in devices which measured aesthetic response was done by Hevner (1930, 1931). She designed tests for the appreciation of music which asked university musician and nonmusician subjects to rank, from four renditions of the same musical excerpt, which examples were “best” and which were “second.” She found that nonmusicians preferred a simplified version of the original excerpt, while musicians preferred an elaborated version enhanced with passing and auxiliary tones. She followed this work by studies concerning the effect of structural elements on emotional response (1935, 1936, 1937) and developed the descriptive check list, to which researchers frequently refer as the Hevner Adjective List (Asmus, 1985; Bullock, 1973).

In a 1961 investigation, Lifton (1961) developed the Music Reaction Test (MRT) to measure the affective and empathic sensitivity of student teachers in music education. Subjects heard four pieces of western art music and wrote personal reactions after each listening. Students listened to one of the selections a second time and very instructed to write specifically about feelings and emotions evoked through the music. The researcher concluded that the MRT was a viable instrument by which to measure empathy and emotional responsiveness among its intended population.

Hedden (1973) hypothesized that while each person certainly responds to music in an idiosyncratic manner, there were also similarities in the reaction profiles of music listeners. He
further hypothesized that those likenesses could be identified by various autochthonous and experiential characteristics of the listener, including gender, musical background, musicality, personality factors, and socioeconomic level. Because of dissatisfaction with existing devices in this area, Hedden designed a music listening reaction scale (MLRS) as the measurement tool for his study. Nonmusician university students used the MLRS to indicate how they reacted when they listened to orchestral music. Results revealed five major reaction categories (associative, cognitive, physical, involvement, enjoyment) and indicated that while many listeners do not respond to music in only one way, similarities in response profiles of music listeners exist and can be identified.

The need for a multidimensional tool to measure affective response to music led Asmus (1985) to develop the 9-Affective Dimensions (9-AD). Junior and high school students as well as university students listened to three varying pieces of music and rated 99 adjectives according to correlation with emotional response to the musical excerpts. From this sample, Asmus identified nine dimensions of affect which occurred in 75 per cent or more of the analyses: evil, sensual, potency, humor, pastoral, longing, depression, sedative, activity. He reduced the list of adjectives to forty-one of the most salient and organized them, within the nine dimensions, into a measurement instrument for the assessment of musical affect. Asmus concluded that the 9-AD was a viable device by which researchers might measure feeling, emotional responses.

Bartel (1992) was interested in measuring both cognitive and affective response to music. The researcher-designed Cognitve-Affective Response Test - Music (CART-M) consists of 18 semantic differential scales representing two dimensions of response, with nine scales associated with each dimension. After three pilot studies and six replicate studies, the researcher determined that the distinction in meaning between adjectives classified as cognitive and those classified as affective had been adequately demonstrated and concluded that the CART-M was a valid device for measuring a person’s affective and cognitive reaction to music.

However, not all researchers who design tests to study musical reaction are interested in measuring affective response. In a 1971 investigation, Zimmerman developed the Music Description Test to determine whether the “development of verbal-descriptive skills with regard to aural musical stimuli was related to particular types of music experiences” (p. 422). He did not, however, attempt to study sensory or sensuous response types, “since sensory gratification [did] not seem . . . to be the principal objective of music education” (p. 423).
Bullock (1973) provides an additional review of devices used to measure musico-aesthetic attitude. However, a thorough review of these sources as well as additional investigations did not reveal a measurement of aesthetic response designed for younger subjects nor did any studies suggest adaptions for age-appropriate measures.

Aesthetic Responses With Children

Over the past several decades, researchers in the fields of psychology and art and music education have investigated the development of affective responses in children and have subsequently proposed developmental theories of aesthetic development (Gardner, 1981; Giblin, 1981; Nelson, 1983; Parsons, 1975-76; Rodriguez & Webster, 1997). While a thorough review of the literature failed to reveal a comprehensive theory of aesthetic development in the field of music education, developmental theories from psychology and arts education literature frequently serve as a basis for understanding similar growth in music (Bundra, 1993; Rodriguez & Webster, 1997). This generalization is perhaps the result of philosophies similar to Langer, who stated: “All art is the creation of perceptible forms expressive of human feeling” (1957, p. 80). Consequently, it appears that many theorists consider the arts to be similar at the most fundamental level and as such apply the term “aesthetic development” to include all of the arts. However, in a summary of findings from Harvard’s Project Zero, Gardner disputes this idea by stating: “... each artistic area exhibits its own characteristic developmental paths, [and] such development cannot simply be applied to other artistic systems” (Gardner & Perkins, 1988, p. 159).

During the second half of the twentieth century, several researchers began systematically investigating the development of aesthetic response in children. Much of the effort has been concerned with the areas of visual or multiple art forms and has been defined by the work of Gardner, Broudy, Parsons, Giblin, Ross, and Housen.

Theories of Aesthetic Development in Children

For over thirty years, Howard Gardner and his colleagues associated with Harvard’s Project Zero, have made a substantial contribution to the study of aesthetic development (Gardner, 1970; Howard, 1971; Rosenstiel, Morison, Silverman, & Gardner, 1978). Though primarily based in the visual arts, many investigators believe the theoretical basis developed by these researchers is beneficial to understanding the affective responses to music by children of varying ages (Nelson, 1985). Through a series of proposals and empirical studies concerning the
aesthetic development of children (Gardner, 1970, 1973, 1981, 1975; Rosenstiel et al., 1978; Winner, Rosenblatt, Wiondmueller, Davidson, & Gardner, 1986), Gardner and his associates developed five “stages of aesthetic perception,” which he defined as follows in a 1981 publication:

- Infant perception: Ages 0-2
- The cognition of symbols: Ages 2-7
- The heights of literalism: Ages 7-9
- The breakdown of literalism and the emergence of aesthetic sensitivity: Ages 9-13
- The crisis of aesthetic involvement: Ages 13-20

Broudy (1976) explored the origin of aesthetic experience and developed a theory that encompasses both “artistic impression,” the awareness of images perceived to be reflections of human feelings, and “artistic expression,” the accomplishments necessary to create such representations. While he outlined three stages of artistic development, he does not claim that the order is sequential or even necessary: the innocent ear, eye, or hand; the conventional or stereotyped ear, eye, or hand; and the cultivated ear, eye, or hand (p. 90).

The initial stage is characterized by the innocence of childhood and is “marked by spontaneity and . . . unhampered by knowledge or social inhibitions” (p. 90). In the second stage, students begin to “standardize the images of feeling” (p. 91), and aesthetic awareness is largely governed by culture and stereotypes. Broudy contends that these conventions are as “automatic and pervasive in their influence as the syntax of spoken language. We use them long before we study them, and we use them without thinking about them. They are the aesthetic mores of an age” (p. 91). The final stage is the recovery of the innocence of childhood through the cultivating efforts of aesthetic education. Broudy purports that the recovery of “the innocent eye, ear, and hand once childhood is past requires effort and help” (p. 93). He further asserts that the recovery of innocence can only occur when children are taught how to suspend “practical and cognitive concerns long enough to be impressed fully by the work of art” (p. 93).

The central question guiding Parsons’ work (1975-76, 1987) was: How do people understand paintings? Consequently, his research explored the kinds of responses that subjects of all ages had to paintings. Over a ten year period, Parsons and his associates interviewed more than three hundred people, from art professors to preschool children. The investigators used an informal methodology to gather data that included semi-structured interviews based on seven standard questions, from which the researchers used “probes” to clarify comments or encourage conversation. From the findings, Parsons proposed five stages of aesthetic development, not
closely associated with age, but through which Parsons purports that people must pass sequentially.

Parsons’ proposed stages of aesthetic development and their general characteristics are as follows:

Stage 1: Favoritism - intuitive delight
Stage 2: Beauty and Realism - representational of the world
Stage 3: Expressiveness - awareness of thought and feelings of others; realization that works of art are a means to “express aspects of experience, states of mind, meanings, emotions, subjective things” (p. 70)
Stage 4: Style and Form - art work is now part of a tradition
Stage 5: Autonomy - the perceiver is now able to “transcend the point of view of the culture” (p. 26) and form a personal, independent opinion

Several investigators have applied Parsons’ model to research studies (Bundra, 1993), including Stubley (Stubley, 1989, cited in Bundra) who asked middle school students and adults to verbally describe six musical selections. When comparing her study to Parsons’ work, Stubley found that there were “important differences . . . between the music responses and the conceptions defining Parsons’ stages of aesthetic understanding in the visual arts” (p. 127). She theorized that the reason for the contrasts was “a product of differences in the essential character of the musical experience” (p. 127).

Giblin (1981) offers a theoretical model for the affective domain that parallels the cognitive developmental theories advanced by Piaget and Inhelder (1956). Giblin’s model differentiates between simple feelings (reactions to immediately perceived stimuli) and emotions (more highly structured responses to sophisticated conceptual comprehension). According to the researcher, the described differences between the “initial aesthetic response” of feelings and the more highly structured affective reaction of emotions reflect the developmental sequence of affective growth in the child, a development that parallels perceptual-conceptual growth in the cognitive domain. Giblin theorizes five periods of affective development and categorizes the first two as feelings and the final three as emotions:

Period One (0-8 months): Reflexive responses, immediate feelings, circular reactions
Period Two (9-24 months): Organized feelings, initial representational skills
Period Three (2-6 years): Development of emotions, development of empathy
Period Four (7-12 years): Emotions derived from social comparisons
Period Five (13-older): Emotions derived from internal comparisons; emotional states
According to Ross (1984), affective development is a composite of “many different developments, psychological, mental, emotional, and cultural . . .” (p. 122). While he proposed the following three levels of aesthetic growth, he stressed that they are not progressive and that children are able to operate at all three stages simultaneously: level 1 - pragmatic attention; level 2 - disinterested attention; and level 3 - tacit attention. The first stage is characterized by perception and discrimination. Level 2 is marked by uniqueness and the ability to recognize art that “counts,” is authentic or has honesty and integrity. The final phase is symbolized by an understanding of the metaphorical qualities of art. It is also the stage at which empathy and the ability of the perceiver to identify personally with the work of art develop.

Ross further purported that “art meets human needs . . .” (p. 124) and concluded that artistic involvement is motivated by rewards. He consequently applied this theory of rewards to developmental diagrams in art, drama, and music and proposed a model of musical affective development based on four stages: Displacement (0-2 years) - pure sensuous engagement; Improvisation (3-7 years) - many unconscious conventional assimilations, musical memory develops; Convention (8-13 years) - concern for conventions of creating and hearing the right sounds, music as a referential sign predominates; Composition (14-older) - perception of music as a form of communication and personal expression.

In her 1983 study, Housen (cited in Bundra, 1993) proposed a model for measuring aesthetic development in adolescents and adults. The model included five stages of affective understanding: accountive, constructive, classifying, interpretive, and creative reconstructive.

In stage 1, the subject attends to more concrete and obvious aspects of the work of art. At this level, the “paintings are rich sources for associations, thought, and feelings” (p. 119). At the constructive stage, moves beyond the personal world and makes comparisons between the work and the outside world. Level three involves a greater interest in the artist’s role, observing details of the art work, and attempts to place it in the correct period, style, or school. In stage IV, the observer moves beyond the literal approach and, in to search of a “more meaningful message from the work of art,” becomes free to explore this thoughts and feelings (p. 119). During the final stage, the subject is able to view the work from multiple perspectives with each new encounter. This level involves the use of all emotions, faculties, senses, and thoughts.
Concurrent Indicators with Children

Within the past two decades, music researchers have begun to develop methods of measuring ongoing response to musical listening tasks. Studies involving varied populations have included the use of concurrent nonverbal (Montgomery, 1978; O'Hearn, 1984), written (Herberger, 1983) and oral responses (Bundra, 1993; Kerchner, 2000; Richardson, 1988; Rodriguez & Webster, 1997; Stubley, 1989).

However, music researchers, teachers, and therapists have continued to address the issues concerning the complexity of the relationship between actual music listening behavior and verbal reports (Brittin & Duke, 1997; Brittin & Sheldon, 1995; Geringer, 1982; Herberger, 1983; LeBlanc, 1984). These concerns, coupled with the advancement of technology, led investigators to seek additional ways to record temporal responses during the music presentation (Clynes & Nettheim, 1982; Gregory, 1989; Kuwano & Namba, 1985; Madsen, 1984a, 1996).

In an early investigation employing concurrent responses to music listening activities with children, Montgomery (1978) sought to determine if third grade students could distinguish and demonstrate perceptions of change in music. Students listened to an excerpt from Mahler’s Symphony No. 4 and indicated awareness of changes in music by tapping a microphone. The researcher concluded that third graders could perceive and indicate changes in music, and that their continuous responses were measurable empirically.

In a similar study, O’Hearn (1984) investigated the extent to which subjects in first, third, and fifth grades could perceive alterations of selected parameters within the flow of music and the effect of familiarity on their response to change. Students listened to a familiar melody, with variations composed by the researcher, and then to an unfamiliar melody, also with variations. To demonstrate their perception of changes in the melodies, participants were instructed to press a switch, which produced a response tone that was recorded simultaneously with the stimulus. Data indicated that children could detect changes within the flow of music and showed that responses increased across grades, with fifth graders sensing changes in timbre, dynamics, key/register, texture, and mode. O’Hearn concluded that subjects most accurately perceived changes in timbre, then dynamics, followed by pitch, and finally duration. Harmony was the weakest element perceived by subjects. The effect of familiarity was significant only for recognition of pitch changes. While the research methodology employed by O’Hearn (1984) was
useful in acquiring developmental data, perhaps follow-up interviews would have helped to clarify what the students were actually thinking or feeling when they pressed the switch.

In a 1983 study conducted in Germany, Herberger (1983) utilized “a procedure which makes it possible to analyse the mental and emotional processes of the listeners during the complete performance of a composition” (p. 41). He asked 13-year-old students to “write down their observations, their subjective impressions, their evaluations, or anything else they became aware of” (p. 41) while listening to Beethoven’s *Egmont Overture*. During timed intervals, as the music played, subjects were instructed to notate their reactions in response to two varying control figures which appeared on a board. “Obligatory” conditions indicated significant portions of the music, and students were required to respond. During “optional” conditions, students were not required to answer and were allowed time to make additional observations in needed.

In his investigation, Herberger (1983) addressed the limitations of this research method. “The information for analysis is influenced by the students’ linguistic abilities and writing skills. Moreover, the depth of the students’ emotional experience is surely reduced at times during the observation” (p. 43). By listening to music, formulating their thoughts, and articulating them in writing, subjects in Herberger’s study were simultaneously attending to a varied number of activities which competed for their focus of attention (Madsen, 1997c). Atterbury (1991) noted the difficulty of involving reading and writing skills when evaluating children’s musical responses: “What music researchers (and educators) often do not realize is that for many children, particularly young children, the task of reading and writing is incredibly difficult” (p. 42). In spite of the challenges inherent in the process, Herberger (1983) successfully explored a new methodology of investigating the moment-to-moment listening responses of younger subjects.

Stubley (1989) utilized both retrospective and concurrent reports to explore the musical response of middle school students, graduate music majors, and adult community members. As subjects listened to six examples from three musical style periods, they were instructed to write a simultaneous descriptive account of their listening responses. One week after the group response task, Stubley conducted follow-up interviews with a sample of the participants. Data revealed few similarities between the concurrent and reflective descriptions offered by participants, and Stubley concluded: “Descriptive and reflective verbal responses must be interpreted within the
context of the particular selection stimulating the response in so far as each selection shapes its own musical world” (p. 249).

In a 1988 investigation on musical thinking, Richardson incorporated an oral, concurrent method for gathering data. During a concert, a music critic was seated in a sound-proof listening booth. The critic’s “stream-of-consciousness,” verbal narrative was recorded and consequently compared to written samples of other critics’ statements, from which a proposed paradigm for the thought process involved in the formulation of music criticism has been developed. While the critic often did not verbalize in complete sentences, Richardson found evidence supporting the paradigm in the stream-of-consciousness narrative.

Richardson’s investigation demonstrated that gathering verbal response during a music listening activity is a viable research method with adults. The clear advantage of this process is the possibility of gathering insight into responses as they occur in time. As opposed to traditional methods used for listening response activities, which provide subjects with limited choices or ask them to respond to specific elements, it also allows for open-ended, free response through which to express thoughts and feelings. The researcher summarized what she considered to be the greatest benefit of this methodology as follows: “While the verbalized record did not reflect an exact record of the critic’s thought process, it was the most accurate replication available for scrutiny and served as evidence of process” (p. 15).

Using a procedure similar to Richardson (1988), Bundra (1993) investigated the listening process of students in grades 2, 5, 8, and 11. While listening to six different musical excerpts, subjects were asked to provide concurrent, free-form verbal responses. Bundra used standardized questions to explore the students’ verbal protocols and consequently organized these statements into category clusters of response. Her analyses showed both quantitative and qualitative differences provided by students across age levels; not only did older students provide more responses, but they also contributed more comprehensive and sophisticated responses than younger subjects. The data also suggested that the students’ musical background affected both how they listened and described their music listening experience.

Students in all grades were comfortable with the task of verbal reporting. To prompt shy or self-conscious students as well as to encourage all subjects to continue talking while listening, Bundra developed scripted prompts. She concluded that the task of listening and reporting concurrently did not appear to be distracting or difficult for the subjects.
Kerchner (2000) studied the cognitive processes that emerged from concurrent verbal, visual, and kinesthetic reactions of second and fifth grade students in response to music listening tasks. Subjects received repeated listenings of Bach’s *Brandenburg Concerto No. 2* and responded concurrently with verbal protocol, followed by simultaneous visual representation, and a final response providing concurrent kinesthetic descriptions. After completing the visual and kinesthetic response tasks, the students were interviewed by the researcher to offer verbal explanations of those nonverbal reactions.

Kerchner found that the verbal response mode provided the foundation for all subjects’ visual and kinesthetic responses. Fifth graders discussed more diverse topics than did second graders and used more sophisticated thinking strategies. They also provided more responses, oral, visual, and kinesthetic, indicative of affective response. Most fifth grade subjects indicated that their responses were guided by the music, which the researcher interpreted as an indication of aesthetic response to the musical stimuli.

Retrospective Indicators with Children

The current review offers a varied and lengthy examination of the literature utilizing the summative mode in response to children’s music listening tasks. Numerous studies employing the oral, performance, and written categories of response have based their findings on the more traditional static, “after the fact,” reports. Investigations by Gardner, Winner and Kircher (1975), Bickel (1991) and Rodriguez and Webster (1997) are of particular interest for the present study.

In recent years, researchers have begun to use oral reports to explore the interpretative, personal, and emotional responses of young children to music listening activities. Two such investigations involved preschool students (McMahon, 1987; Sims & Cassidy, 1997). In an exploration of the aesthetic awareness in children ages 3- to 5-years-old (McMahon, 1987), subjects listened to four musical excerpts and answered questions orally, including preferential and associative responses. Similarly, preschool subjects in a Sims and Cassidy investigation (1997) listened to four pieces of music and following the listening activities were asked “What did you think of this music?” and “What did you like about it?” (p. 240). Although researchers found that most oral responses from preschool children tended to be generalized value statements, they concluded that such verbalizations did provide important information.

In a study investigating the development of referential meaning in music, Trainor and Trehub (1992) asked 4- to 6-year-old subjects to listen to excerpts from Prokofiev’s *Peter and
the Wolf and Saint-Saëns’ Carnival of the Animals and match them to pictorial representations. Subjects were then asked to provide oral explanations for particular choices, which were recorded for later analysis. Data indicated that the preschoolers’ justifications for most picture choices were informal, but researchers found their oral responses to be highly imaginative, informative, interesting, and characterized by a liberal use of attributional and emotional associations.

Barrett (2000-2001) asked first graders to make aesthetic decisions about their own compositions and those of adults. Subjects first completed a range of composition projects and subsequent to completion of these tasks, participated in listening experiences consisting of repeated hearings of the child’s own compositions and of two movements from Saint-Saëns’ Carnival of the Animals. The researcher then conducted a semi-structured, open-ended individual interview, and results showed that 7-year-old children were not only able to attribute a feeling to music but could also proffer reasons for this attribution. She concluded that first grade students could describe and reflect on their experiences as listeners to their own and adult works and could make aesthetic judgements about these pieces.

In a study involving subjects ranging in age from 5 to 10 years old, Hair (1993/1994) instructed students to draw a familiar melody. She then asked parents to observe their children while drawing and write down any oral comments the children made. Initial examinations of the students’ drawings and representations did not appear to reveal many musical connotations. However, the researcher found that the oral descriptions of their drawings provided a wealth of information, including explanations for what they drew in music terms as well as why they had chosen specific icons to represent music ideas and concepts.

Terwogt and van Grinsven (1991) used children, ages 5 and 10 years, and adults to investigate musical expression of moodstates. Subjects listened to eight musical excerpts, and chose one of four schematically presented facial expressions to indicate the mood expressed by the music. The researchers, who conducted the experiment individually with the younger subjects, then asked participants to orally provide three reasons they felt the music had that particular character. While the data showed that all of the subjects made a fairly systematic distinction between positive and negative emotion in music, findings also revealed that oral mood-choice justifications appear to be extremely difficult. Interestingly, while the average number of oral responses was lowest for the youngest group, it was higher for the 10-year-olds
than for the adult listeners. However, a large number of the responses were uninformative and often only provided general qualifications. The investigators noted that while 5-year-olds often appeared to be satisfied with such answers, the older children and adults indicated no such satisfaction, perhaps signifying their awareness of the inexpressible.

Through a series of open-ended questions, Gardner, Winner and Kircher (1975) investigated what children know and do not know about music, poetry, and visual art. After hearing a recorded musical excerpt, seeing a work of art, or being read a poem, 4- to 16-year-old students were asked what they had heard or seen. The interviewer followed up their responses with a variety of questions such as “Did you like it?”, “Where did it come from?”, and “What else might you call it?”

Results indicated that children’s responses can be grouped into three stages: immature responses by four- to seven-year-olds, intermediate/traditional responses by eight-to-twelve-year old subjects, and mature responses by 15- to 16-year-olds. Immature responses were characterized by concrete, mechanistic replies. At the second stage, subjects gave a mixture of immature and mature views, which tended to interpret art in literal, realistic terms without generalizing past the here-and-now. The older students were less rigid and capable of giving a more complex and cognitive view of art.

A 1991 study (Bickel, 1991) utilized retrospective oral accounts to investigate the cognitive components of seventh and eight grade subjects’ responses to a repeated musical listening experience. After each hearing, students reflected on their enjoyments, expectations, feelings, thinking process, and the music itself; in addition, they also provided evaluative statements for each musical excerpt.

Bickel found that subjects frequently described the music in terms of visual images and stories that described their personal life experiences. They also demonstrated considerable word confusion, oftentimes creating non-musical vocabulary in an attempt to explain what they had experienced. Bickel concluded that “these musical insights demonstrated a ‘constructive’ learning process making the music listening experience meaningful and understandable” (p. 178).

Rodriguez and Webster (1997) sought to analyze the development of children’s verbal responses to numerous hearings of a musical excerpt when asked systematically-designed questions that encouraged interpretative responses. Kindergarten through fifth grade students
listened to a 48-second excerpt from the second movement of Hindemith’s *Mathis Der Maler* three times. After the first hearing, students were asked, “What were you thinking when you listened to this music?” Following the second listening, researchers asked, “If you were going to make music like this, how would you start?” Two questions, which were intended to function as a pair, followed the third and final hearing: “How does this music make you feel?” and “What in the music makes you feel that way?”

The investigators found that Question 1 elicited musical/technical/specific responses in kindergarten through second graders, while fourth and fifth graders made many nonmusical/affective/emotion responses of varying specificity. This appears to indicate a gradual trend for children’s responses to become increasingly global and reflective of emotional sensitivity with age. Question 2 produced many musical/participant/action-based reports by fourth and fifth grade students. Questions 3 and 4 elicited primarily single-emotion responses, but they were more common in the lower grades. Although multiple-emotion reports occurred more frequently in the upper grades, researchers found fifth-grade responses to be uniformly less concrete than those given by younger subjects. They reached the following conclusion:

This is a most critical finding, as one would assume that the older children’s improved verbal abilities would allow more accurate reflections of experienced emotions. It appears that a strong counterpull to improved verbal ability is an emerging realization that the feelings evoked in musical experiences are not simply “happy” or “sad” or even both, but increasingly beyond the realm of discourse (p. 24).

### Need For The Study

The values of and justifications for music education have long served as topics for debate and much has been written concerning the issue (Madsen, 1999a; Mark, 1982, 1986; Reimer, 1970). Noted benefits have included a wide basis for extramusical as well as musical rationales and have encompassed cognitive and affective rewards throughout all stages of the educational spectrum.

Music educators and researchers have consistently investigated many of these issues as they relate specifically to elementary-aged students. Categories with notable contributions include concept development and assessment (Addessi, Baroni, Luzzi, & Tafur, 1995/1996; Apfelstadt, 1986; Costa-Giomi, 1994a; Holahan, & Saunders, 1997; Petzold, 1998), preference (LeBlanc et al., 2000-2001; LeBlanc et al., 1996; McCrary, 2000), performance (Geringer, 1998; Green, 1994; Klinger, Campbell, & Goolsby, 1998), and development of listening skills
(McLean, 1999; Kerchner, 2000; Moore, 1999; Rodriguez & Webster, 1997). Other areas that have been investigated include composition and improvisation (Auh, 1997; Baldi, 2000-2001; Kratus, 2001; Wilson, 1995), methods of instruction (Hookey, 1997; Robbins, 1994/1995; Whitaker, 1996), special learners (Atterbury, 1987; Jellison, 1998; Shields, 2001), and even cross-curricular implications such as incorporating language and reading into the elementary general music classroom (Ammon, 2000; Fisher, 2001; Jalongo & Stamp, 1997).

There appears, however, to be a dearth of studies dealing with the affective or emotional responsiveness of elementary-aged students to music. The broad review of the literature in this work reveals numerous studies by researchers as well as music educators and therapists that investigate a wide spectrum relating to responsiveness to music, including developing listening indicators, exploring response modes, investigating musical preferences, and analyzing physiological responses. However, a wide percentage of these studies have utilized older subjects. The few researchers who have investigated children’s abilities to respond emotionally to music have done so through studying their recognition of mood in music or initiating a singular question within a wider scope of study. There appears to be no study that attempts to investigate, in depth, the ability of elementary-aged students to respond emotionally to music.

In addition, despite evidence that the CRDI is a simple yet reliable method of collecting empirical data concerning aesthetic responsiveness to music, there seems to be a paucity of attempts to use it to measure the felt-emotional responses of young children to music.

As a result, the three following questions were addressed by this study:

1) Do young children experience emotional responses to music?;
2) If so, by what methods are they capable of indicating such responses?;
3) At what grade levels do these responses exist?

This investigation, which focused on the emotional responsiveness to music of students in three intact 4th-grade public school classes, sought to determine if 4th-grade students are capable of demonstrating emotional response to music and if so, in which modes do they feel most comfortable reacting? Since aesthetic responsiveness is often used as a main component to justify the place of music in our educational system, it seems of upmost importance to know if young children do, in fact, respond emotionally to music and if so, to determine the ages at which such reactions occur. It seems of equal salience to investigate methods with which they
can easily and systematically report their responses. It appears that such knowledge can assist
music educators and therapists in developing the aesthetic responsiveness of students and clients.
CHAPTER 3
METHOD

This purpose of this study was to explore the emotional responsiveness of fourth grade public school students to music using both the Continuous Response Digital Interface (CRDI) and retrospective, highly flexible interviews to obtain data. To verify that this population was a representative cross-section of public school fourth graders and for additional future analyses beyond the scope of this study, demographic information concerning age, gender, musical experience, and student developmental status and conditions was also collected.

Since its development, the CRDI has been used extensively to gather data concerning aesthetic responsiveness to music (Madsen, 1990, 1997b; Madsen et al., 1993). However, to this point, all investigations utilizing the CRDI to study emotional response have focused on adult subjects (Madsen, 1997a; Madsen et al., 1993). While the CRDI has not been used broadly with children, several studies have shown it to be an uncomplicated and effective method for gathering various responses from younger subjects (Byrnes, 1997; DeNardo, 1995; DeNardo & Kantorski, 1998; Fredrickson, 2000; Parisi, 2002). This study proposes to explore the aesthetic responses of elementary-aged students through use of the CRDI.

Although early studies seemed to suggest that younger subjects had difficulty with verbal tasks related to music (Hair, 1977a, 1987a; Van Zee, 1976; Webster, 1982), a number of recent investigators have reported success when asking children to discuss varying responses to music (Barrett, 2000-2001; Gardner, 1975; Rodriguez, 1998; Sims & Cassidy, 1997; Trainor & Trehub, 1992). Several of these researchers have studied children’s abilities to perceive expressiveness in music (Rodriguez, 1998), describe music excerpts (Flowers & Wang, 2002), and understand referential meaning in music (Trainor & Trehub, 1992). Many have used a series of highly flexible interviews and open-ended questions (Barrett, 2000-2001; Gardner, 1975; Rodriguez, 1998; Sims & Cassidy, 1997), have reported that children’s verbalizations about music are highly imaginative, interesting, and informative, and have concluded that such insight provides
valuable information. Though most investigators report that verbalization skills increase with age (Gardner, 1975; Rodriguez & Webster, 1997; Terwogt & Van Grinsven, 1991), it has been shown that children as young as seven years old can attribute a feeling to music and offer reasons for this attribution (Barrett, 2000-2001). In addition to collecting CRDI data indicating aesthetic response, this investigation also proposes to use a series of highly flexible interviews to gather children’s verbalizations of emotional responsiveness.

**Pilot Study 1**

Before implementation of the present investigation, a pilot study was conducted to ascertain the feasibility of the study. Areas investigated included: 1) At which grade levels, fourth or fifth, can students best utilize the CRDI to indicate aesthetic response to music? 2) Are fourth and fifth grade students capable of using words to describe their emotional responses to music? 3) If so, will students openly discuss feelingful reactions with a researcher with whom they may only interact during the experimental process? 4) Could an unstructured interview process, with only a common introductory question, enable the researcher to “follow the student’s lead” and ask unscripted, probing follow-up questions to ensure a more feelingful response from each individual subject? 5) Was the stimulus recording an effective tool for eliciting emotional response from fourth and fifth grade students?

Subjects (N = 12), six normally developing 4th- and six normally developing 5th-graders from a public elementary school, listened to *Rhapsody on a theme of Paganini*, Op. 43, Variation 18, by Sergei Rachmaninoff. Using a Sony D-EJ925 CD Walkman portable compact disc player and Sony Professional MDR-7509 sound monitor, stereo headphones, students listened individually in a quiet, private room inside the school library. While listening, students were asked to simulate the CRDI movement using a pencil at the edge of the table located in the room. Immediately following each listening experience, the students were individually interviewed, and tape recordings of their interviews were later transcribed for analysis.

Although the researcher used the opening question, “Please tell me how this music makes you feel,” no formalized questions were structured prior to the interviews. It had been decided previously to get the students talking, guide them with open-ended questions toward conversation concerning their feelingful responses to the music, and simply see “where it would go from there.”
The following conclusions were drawn from the pilot study: 1) With limited directions, students in both grades could easily simulate the CRDI task; 2.) Fifth graders were much more capable of orally verbalizing their emotional responses than were fourth graders, and consequently, the researcher decided to use fifth grade students for the study; 3) While most students used their “own” words, few used technical musical terminology, their interviews revealed significant feelingful interactions with the music as well as a willingness to attempt verbalization of those reactions; 4) The unstructured interview process did allow for flexibility with individually specific follow-up questions; 5) The stimulus recording appeared to be an effective tool for eliciting the emotional responsiveness of fourth and fifth grade subjects.

In addition, the pilot study showed that students expressed widely varied emotional responses to this piece of music, ranging from great joy to intense sadness. However, there was considerable similarity in the CRDI simulations, among fourth as well as fifth graders.

**Pilot Study 2**

Several reasons precipitated a second pilot study: 1) Due to a number of variables, five months elapsed between the first pilot study and the initiation of the experiment. As a result, the researcher was interested in comparing fourth grade oral verbalizations after five months of academic and chronological growth. 2) It was felt that fourth and fifth grade students should pilot utilizing the CRDI with the music stimulus. 3) No current CRDI overlays seemed appropriate for the study, and the researcher wanted to investigate overlays suggested by the students themselves.

Different subjects (N = 14), seven normally developing 4th- and seven normally developing 5th-graders, from the public elementary school used in the first pilot study listened to *Rhapsody on a theme of Paganini*, Op. 43, Variation 18, by Sergei Rachmaninoff. Using a Sony D-EJ925 CD Walkman portable compact disc player and Sony Professional MDR-7509 sound monitor, stereo headphones, students listened individually in a quiet, private room inside the school library. While listening, students were asked manipulate the CRDI dial to indicate feelingful response to the music. Immediately following each listening experience, the students were individually interviewed, and tape recordings of their interviews were later transcribed for analysis.

The researcher again used the opening question, “Please tell me how this music makes you feel.” In addition, results from the first pilot study had shown that several students related
the feelings from the music to a life event. In an attempt to probe that personal connection to the
music, the following question was added to the second pilot interviews: “Can you think of a time
in your life when this music would have matched or maybe changed the way you were feeling?”

From the second pilot study, it was determined that: 1) Fourth grade oral verbalizations
had developed significantly throughout the course of the academic year. Considering this fact
and the school schedule where the research was to occur, it was determined that fourth graders,
not fifth graders, would serve as subjects for the study; 2) The CRDI proved to be an easily
manipulated, reliable tool for collecting aesthetic response data from both fourth and fifth
graders. No students exhibited or expressed any confusion or misunderstanding when using the
CRDI dial; 3) Students also unanimously recommended an overlay that consisted of numbers 1-
255, matching the data-gathering range of the CRDI. On the basis of findings from these pilot
studies, the following final design was structured.

Subjects

Subjects for this study were all fourth grade students (N=75) enrolled at The Florida
State University School (FSUS). FSUS is a K-12 public school established as a school district
under Florida Statute (229.591 f.s.), a university-chartered school (228.056 f.s.), and a
developmental research school (228.053 f.s.). Students are computer-selected to
demographically represent the State of Florida in terms of academic ability, ethnicity, gender,

All students who returned consent forms and who were available during all scheduled
sessions were included in the study (N=60). Subjects included 31 girls and 29 boys, with a mean
age of 9.85. All students regularly received 45 minutes of music instruction, twice weekly, from
a certified music specialist. In addition, 42% of students reported receiving additional music
lessons, however no attempt was made to verify statements concerning lessons or length of time
taken. Percentages of student developmental status and conditions, as diagnosed by
school-related officials, are as follow: ADHD - 3.3%; Asperger Syndrome - 1.7%; ESOL - 5%;
Gifted - 16.7%; Normally developing -58.3%; SLD - 11.7%; Title 1 - 6.7%; and Tourette’s
Syndrome - 5%.
Table 1

Summary of Demographic Data

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>Musical Experience</th>
<th>Developmental Status and Conditions</th>
</tr>
</thead>
</table>
| 9.85 | Girls - 31 Boys - 29 | 42% | ADHD - 3.3%  
Asperger Syndrome - 1.7%  
ESOL - 5%  
Gifted - 16.7%  
Normally developing - 58.3%  
SLD - 11.7%  
Title 1 - 6.7%  
Tourette’s Syndrome - 5% |

*Stimulus Recording*

The musical stimulus used in the study was a presentation of the “18th Variation” from *Rhapsody on a Theme of Paganini*, Op. 43 by Sergei Rachmaninoff. The stimulus, which was created from a commercially released Red Seal RCD1-4934 1984 remastering of a 1956 recording, featured Artur Rubinstein as piano soloist, with the Chicago Symphony Orchestra, conducted by Fritz Reiner.

This music, which was written in 1934 for solo piano and orchestra, has become one of the standards of the piano repertoire (Martyn, 1993). Seroff (1950) describes the *Rhapsody* as one of the most important works Rachmaninoff wrote after leaving Russia. With the work, Rachmaninoff began a new style of writing, which precluded any songlike Russian themes. Similarly, Martyn (1990) writes that the *Rhapsody* shows the composer at the “height of his powers” (p. 332).

The “18th Variation” (*Andante cantabile*) is one of the most familiar melodies in all of Romantic music (Plantinga, 1984) and is described by Norris (1976) as “a piece of such exquisite lyricism” (p. 127). It is in the key of D-flat major and begins with 13 measures of solo piano, which crescendo from pianissimo in the first measure to forte in measure 12. A textural change occurs in measure 14, as the orchestra joins the piano, restates and then embellishes the theme. The orchestral dynamic marking begins with mezzo forte in measure 14, starts a crescendo to forte in measure 20, which is reached in measure 24, then diminuendos to piano...
from measures 27 through 35. During measures 14 through 27, the piano plays chordal accompaniment, which is heavily accented in measures 24 through 27 to match the orchestra’s *forte* dynamic. In measure 28, the piano again takes over the melody line and continues through the end of the variation, diminishing in both volume and tempo. The final seven measures are again solo piano. Three-hundred-and-fifty-one CRDI data samples were collected at a rate of two samples per second.

This particular stimulus was chosen for several reasons: (1) the experimenter’s past experience with it as a listening example, (2) it is a “complete” piece of music; (3) at 3 minutes and 38 seconds, it required a short focus of attention; and (4) successful usage during the pilot testing phase.

The stimulus recording was created on the Apple iPod, using Creative’s Sound Blaster Audigy 2 and the PC media player MUSICMATCH Jukebox 7.10. Subjects listened individually to the stimulus using Sony Professional MDR-7509 sound monitor, stereo headphones.

*Laboratory Conditions*

The sessions were conducted in an office, 12 x 14 feet, located in an isolated section of the administrative wing of the school. Windows in the room were covered with blinds, which remained closed throughout the duration of each session, and a single row of ceiling lights were utilized. The office was equipped with an individual temperature control panel, which was consistently set at 74 degrees.

The single CRDI station was set up on a square, 36 x 48 inch conference table, which was already available in the office. The CRDI dial was placed in the 36 inch side of the table, with the student’s back toward the window. A Panasonic Standard Cassette Transcriber, RR-830, which was used to record the student’s comments as well as transcribe the interview tapes, was placed to the immediate left of the CRDI dial. The other research equipment, including the CRDI potentiometer, a Dell Inspiron 8100 laptop computer, Sony headphones, and iPod were situated on the 48 inch side of the table, to the left of the student and in front of the researcher.

*Procedure*

The classroom aide escorted groups of four subjects to the experimental area. As a group, the students were taken into the experimental laboratory and introduced to the investigation with the following instructions:
Hello everyone. My name is Mrs. Paul. I need your help with a project I am doing. I am very interested in how fourth grade students feel inside when they listen to music. In a minute, I am going to ask you to listen to a piece of music. I will ask you to show me and tell me how the music made you feel. When I ask you to listen and respond, there will only be the two of us in the room. But right now, let’s become familiar with the equipment and talk through the entire process as a group.

This piece of equipment is called a Continuous Response Digital Interface, or the CRDI. When you turn the dial, the CRDI registers how you are feeling as you listen to a piece of music. (The researcher demonstrated turning the dial and allowed each student to experiment.) Do you see the numbers 0-255? Zero means that the music doesn’t give you any feeling inside. Two hundred and fifty-five means that the music gives you the best feeling it possibly can.

Show me where you would put the dial if the music gave you a fantastic feeling. Show me where you would put the pointer if the music gave you no feeling inside. Show me where you would put the dial if the music gave you an “okay” feeling inside.

In the beginning, the dial will be placed in the extreme left position of zero. As you listen to the music, you will either move the pointer toward the right, or 255, indicating that the music gives you a great feeling or toward the left, indicating that the feeling is not as good. Please feel free to utilize the entire face of the dial, from zero all the way to 255. Does anyone have any questions? (Students were given a chance to move the dial from zero to 255 several times.)

After you listen to the music and indicate your response with the CRDI, I will ask you to talk to me about how the music made you feel. There are no right or wrong answers, so please say whatever comes into your mind. When we are finished discussing how the music made you feel, you will be free to go back to your classroom. Do you have any questions? Thank you for helping me with this study.

After all students indicated an understanding of the task, one student remained in the experimental lab, and the other three went into a hallway outside the room to await their turns. Once the student was comfortably seated in front of the CRDI, he/she put on the headphones, and the researcher began the stimulus tape and the CRDI computer program by simultaneously depressing the appropriate mechanisms.

Once the student had registered his/her CRDI response and the headphones were removed and laid on the table, the researcher began the interview portion of the experiment by asking each student, “Tell me what you were feeling while you were listening to the music.” From there, the researcher attempted to ask questions to keep the student talking and explore his/her individual reactions. A second standardized question attempted to make a personal connection between the feelings generated by the music and the student’s life. All students were also asked: “Can you think of a time in your life when this music would have matched or maybe changed the way you were feeling?”
In an effort to ascertain the response mode with which subjects felt most comfortable, all students were asked to respond to the following question: “If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, which would you choose?”

2nd Listening

All students completed the listening activity a second time, manipulating the CRDI dial and responding to the following question: “Tell me about your feelings this time.” Follow-up questions were again unstructured to allow for optimum individualization with each student. Five days was the shortest period of elapsed time between first and second listening, and seven days was the longest.
CHAPTER 4
RESULTS

The purpose of this study was to investigate young children’s emotional responsiveness to music. Three main questions were addressed: 1) Do young children experience emotional responses to music?; 2) If so, by what methods are they capable of indicating such response?; 3) At what grade levels do these responses exist?

Subjects were all fourth grade students attending the Florida State University School. This school is intended to represent a cross-section of Florida’s population in terms of cultural diversity, developmental status and conditions, gender, and socio-economic status. (booklet, 2003-2004). Consequently, from a “sampling” point of view, it is representative of the heterogeneity one would find across the fourth grade level of public school students within the larger geographic area.

Students listened to Rhapsody on a theme of Paganini, Op. 43, Variation 18, by Sergei Rachmaninoff and indicated their emotional responses by manipulating the dial of the Continuous Response Digital Interface (CRDI). Following the listening experience, subjects also participated in personal interviews, which were recorded and later transcribed. A second listening exercise, observing the same structure, followed within five to seven days and included a similar individual interview.

This study was designed as an initial attempt to provide music educators and therapists with young children’s individualized, descriptive emotional responses to a musical stimulus. Consequently, it was determined that individual CRDI response graphs and personal interviews would be included in their entirety. Results are presented for each youngster without regard to any categorization. It was determined that this format would “capture” best the individual reactions of the students. All interview transcriptions are verbatim responses. Demographic data are presented for each subject, with the exception of individual names, which have been omitted to protect anonymity.
CRDI Graphs and Interview Transcriptions

Subject 1
Age 10
Boy
Musical Experience: Piano, 4 years; Violin, 6 years
Developmental Status and Conditions: Normally Developing

![Graph of Subject 1's Responses Over Time](image)

**Figure 2.** Graph of Subject 1’s Responses Over Time

**1st Listening Interview:**

[Tell me what you were feeling while you were listening to the music.] Well, first, um, it was kinda like a music, like, I would say, it kinda calms you down like when you stress, stress you out or something like that, and um, kinda just makes you feel good. Just relaxes your body. [So is that why you turned the dial way over (indicating dial movement to the right), because it made you feel relaxed?] Yeah. [Did you do that because you liked the relaxed feeling the music gave you?] Mm-hmm. [Ok, and so in the middle section of the music, when the orchestra was playing, you turned the dial back toward the left.] Yeah. [Tell me about that.] Well it was kinda like just, booms just came out. [Did it make you feel the same, worse, or better than when the piano was playing alone?] I kinda like the softer parts a bit better. [Is that why, when the orchestra faded out and the piano came back alone, you turned the dial back toward 255 again?]
Yeah. [How did the piano, playing alone the second time, make you feel?] The same as in the
beginning. [Relaxed?] Mm-hmm. Yeah, kind of.

[Why do you think the music made you feel that way? What was it about the music?] It
was just . . . had special notes that just, just came out and bring this, um, what’s the word, it was
just - inspiring part. [Can you think of a time in your life when this music would have matched or
maybe changed your feeling?] Mm, when somebody dies or something. [Do you think it would
make you feel better or would it match the feeling that you had then?] (long pause) Mm, kinda
both, kinda. That um, second part, I think it kinda makes you feel better but the first part is like
when somebody dies. That makes you feel kind of bad.

[How do you think the composer was feeling when he wrote this music?] He was feeling
pretty good. I think he was feeling good. [What kind of feeling do you think he wanted listeners
to get from this music?] I don’t think he wanted it to be a sad. I think he just wanted it to just be
wonderful and help you, or relax you or whatever. [So do you think he was successful?] Mm-hmm. [Do you want to tell me anything else about the way the music made you feel?] Well
the music was (pauses) - I didn’t like the, um, second part that happened but just the first part - it
was good.

2nd Listening Interview:

[Tell me about your feelings this time.] I was thinking and feeling, well, um, I think it was
. . . it wasn’t as good as I heard it the first time - it was ok, but I like . . . I liked when I heard it
the first time. [Can you explain why?] Well, it was because it was just, not as exciting, or, I think,
it was, like, when you hear the music, it has to be at a time, like, you’re in a mood that . . . you
are, kind of . . . are relaxed, but it just relaxes you a little more; but if you’re not already relaxed,
like, it just . . . just, you just hear the music and . . . [So, were you already relaxed when you
listened today?] Yeah. [And did the music relax you more?] Not really. I don’t think. I think I was
already relaxed enough. [You turned the dial pretty high during the orchestral section . . .] Yeah, I
liked that. [How did it make you feel inside?] It just, because it feels . . . makes . . . it makes me
feel like, um . . . makes you feel like you can do anything you want to or something like that.

[If you could choose the CRDI, talking, or a combination of the two to express the way
you feel about a piece of music, which would you choose?] Combination of the two. [Do you
think the CRDI dial shows how you feel fairly accurately without talking?] Mm-hmm.
Subject 2
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 3. Graph of Subject 2's Responses Over Time

1st Listening Interview:

[Tell me what you were feeling while you were listening to the music.] Good. [All the way through, or in certain sections?] No, just some of it. [So, tell me how the different parts of the music made you feel.] Well, towards the end, when it kinda got loud and when . . . that’s the part I didn’t kinda like. [Why?] Well, ‘cause it just, it just got really loud, and then it just changed, and completely . . . [How did it make you feel inside when it was "really loud"]? Kind of so-so. [Can you tell me why?] It reminded me of . . . school. [Was the volume was too loud?] No, it wasn’t because the volume was - it was . . . it was just, when it changed, the music kind of changed, and when it changed I didn’t like how . . . [How did it make you feel?] Not good. [So, then what happened?] Then, basically through the rest it was good. And, towards the end when it kept going, like, stopping, that’s another part I didn’t like - ‘cause it kept: dunnnnh . . . (student singing) [And . . .] And I’m like, "Okay!" Dunnnnh . . . (student singing), I didn’t like that. [Why? How did it make you feel inside that you didn’t like it?] It was . . . I didn’t really like it,
because I kept thinking like, "The music’s over, ok, I need to take it off," (referring to the CRDI dial) and then I kept thinking, "Oh! -it’s not over." Well, I didn’t like that, so I took it (dial placement) over a notch. [But you didn’t go too far back toward the left at the very end of the piece.] No. [Is that because you liked the ending until you got to the part you thought kept stopping and starting?] Right. [What kind of feelings did this music give you?] Good feelings. [Can you think of another word to describe how it made you feel?] It, it just, well . . . maybe peaceful. [Did you like that peaceful feeling?] Yeah, yeah.

[How do you think the composer was feeling when he wrote this music?] I think he was thinking of, kind of, kind of an ocean or, just thinking, it, all the parts seemed really different, like he’s thinking of, about a whole lot of stuff - just a whole lot of stuff.

[Can you think of a time in your life when this music would have matched the way you were feeling or maybe even changed the way you were feeling?] It matched the way I felt when I was, when I learned how to ride a bike. [Really?] Yeah. [How did that feel?] Good - sort of open.

2\textsuperscript{nd} \textbf{Listening Interview:}

Subject 2’s 2\textsuperscript{nd} listening interview was mistakenly not taped.

\textbf{Subject 3}
\begin{itemize}
  \item \textbf{Age 10}
  \item \textbf{Boy}
  \item \textbf{Musical Experience: Percussion, 2 years}
  \item \textbf{Developmental Status and Conditions: Normally Developing}
\end{itemize}

\begin{figure}[h]
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\includegraphics[width=\textwidth]{Figure4.png}
\caption{Graph of Subject 3’s Responses Over Time}
\end{figure}
1st Listening:

[Tell me what you were feeling while you were listening to the music.] Well, um, I was thinking that I was like, running, kind of, and um, when like, it slowed down, when it slowed down I fell. And then, like, my mom came and she picked me back up, and I started running again when the music came higher. [So, how did that make you feel?] Um, it made me feel happy when it was like, high, and sad when I was . . . it was low. [When the orchestra was playing, you turned the dial all the way to 255 and stayed pretty high for a while.] Um-hmm. [what were you feeling then?] Happy. [But then you turn the dial way over toward the left. Why?] ‘Cause, see, um, I kinda felt sad and low when it was like, soft and like . . . [And you didn’t like the music or the feeling?] Feeling. [You don’t like to feel sad?] No. [Did the music make you think of things you didn’t like to think about, or you just didn’t like the feeling it gave you?] I just didn’t like the feeling.

[Can you think of a time in your life when this music would either match the way you were feeling or maybe change the way you were feeling?] Um, maybe when I’m older, like, an adult, it could make me happier. [All of it or just sections of it?] The - when the orchestra plays.

[How do you think the composer was feeling when he wrote this music?] Well, I think he was trying to make the music sad when um, he played like, really low. Because, see, it’s like happy, and then sad, and then happy, and so . . . [Do you think that he was actually sad himself?] Um, no. I think he just wanted it to be that way.

[When you were listening to this music, did it actually make you feel happy and sad or just remind you of something happy and sad?] Made me feel that way. [And which feeling do you like best - happy or sad?] Happy. [And that’s why you turned the CRDI dial up and down when you did?] Yeah.

2nd Listening:

[Tell me about your feelings this time.] Well, I was thinking I was playing on the beach, and um . . . and when I got out of the water, it felt real cold; and that’s when the music got, like, low. [Is that a feeling that you liked?] No. [So, it that why you turned the dial back toward the left and zero] Yeah. [How were you feeling when the orchestra was playing?] That’s when I was playing at the beach. It makes me feel happy and not bored - playing.

[When you were listening to the music this time, was it better, worse, or the same as listening to it last time?] Um, between this time and the last time I came? [Yes.] The same.
[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, talking about it. [Do you think it’s easier to talk about how the music makes you feel than show it using the CRDI?] Um-hmm. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah. [It works well, but you still prefer talking?] Yeah.

Subject 4  
Age 9  
Girl  
Musical Experience: None  
Developmental Status and Conditions: Normally Developing

Figure 5. Graph of Subject 4’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] I, like, um, I went up a lot right here (indicating dial movement), because, um, I liked it when the orchestra and the piano were together, but I didn’t like that, it that much when the piano was just by itself. [What do you mean when you say, “You didn’t like it? How did it make you feel?”] Sad. [How did it make you feel when the orchestra and piano were playing together?] It made me feel better, ‘cause it . . . it’s like, it’s not just by itself; it’s like about, um, a lot of more instruments, and it
[2nd Listening:

Tell me about your feelings this time.] Um, it wasn’t . . . it was pretty much the same because, um, it made me feel sad; and when, when more instruments played or when it got louder, it made me feel better. [Are those the same feelings that you remember from before?] Mm-hmm. [When the music made you feel sad, and you turned the dial toward zero, did you think the music was ugly?] No, not, not ugly. [Did you just not like the feeling that you got from it?] No. [What feeling didn’t you like?] Sad. [And is that why you turned the dial down to zero - because you didn’t like the feelings the music gave you?] Mm-hmm.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, talk about and use the CRDI. [Why?] Because I would want to talk about and listen to it. [Why do you think it’s important to talk about it?] Um, ‘cause then other people would know how it made us feel. [So, you think it’s important to express it with words as well as with the CRDI?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Not as good as talking about it. [But you would still want to use the CRDI was part of showing how the music made you feel?] Yeah.
Subject 5
Age 9
Girl
Musical Experience: None
Developmental Status and Conditions: Normally Developing

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Well, when it played the piano it made me feel, um, kind of like, exciting, someone excited or something, and then when it started to go low, at the viol... in the piano, it sounded kind of sad, so I put it down (indicating dial movement). [So, why did you move the dial down? You didn’t like the feeling of sadness?] Un-unh. [You just didn’t like the feeling the music gave you?] Yeah. [Did you like the feeling it gave you when the orchestra was playing?] Mm-hmm. [Can you tell me how you felt inside when the orchestra was playing?] Well, I kind of felt - it made me feel happy, because it was kinda exciting; it’s just, uh, well, how can I put this... well, it really just, um, like it just like... it explodes at the end; it sounded good. [And that gave you a good feeling?] Mm-hmm. [But then you didn’t like the way you felt...] When the piano was playing by itself. [Was it necessarily that you didn’t like the music?] No, I liked the music. [Then, you just didn’t like the

Figure 6. Graph of Subject 5’s Responses Over Time
way it made you feel?] Not the way, the way I . . . that it made me feel, because it felt like it was all alone. [And you didn’t like that feeling?] No. [So, when you felt really good inside, what did you do with the dial?] Went up. [What did you do when you didn’t feel good inside?] Went down.

[How do you think the composer was feeling when he wrote this music?] Well, a little bit happy, a little bit sad. Mmm, just a little - sometimes.

[Can you think of a time in your life when this music would have matched the way you felt or maybe changed the way you felt?] Well, I’m not sure, I’d have to think about that. (Pause) Um, maybe when I was like, happy, and then something went wrong, and I was like, sad. [If you were feeling sad, do you think you could listening to the part of this music that made you happy could make you feel happy again?] Mm-hmm. [Did this music change your feelings today?] 

Um . . . [Did your feelings match those you thought you heard in the music while you were listening to it?] Kind of. [And you want to match the parts you called “happy”?] Mm-hmm. [But you didn’t want to match the parts you called “sad”?] No. [Did you want to stay in the “happy” section?] Mm-hmm.

2nd Listening:

[Tell me about your feelings this time.] Uh, well when the, um . . . when the music went up, I went um, over (indicating dial movement), ‘cause it . . . it made me feel good; because it was . . . it puts me, like loud music . . . and when it was, like, um, when it was at the very end, like at the very end, when it went by itself, and I kind of put it low (indicating dial placement). [Can you explain what you mean by ”low”?] Like, a sad feeling. [Is that why you turned the dial back toward the left and zero?] Mm-hmm. [Did you not like the sad feeling?] Mm-hmm. [Did you not like the sad feeling?] No. [Do you think the music is ugly or you just don’t like the feeling that it gives you?] I don’t like the feeling. [Do you think the music is ugly?] Un-uh; it’s nice. [So, did you turn the dial back toward the left because you didn’t like the feeling the music gave you?] Yeah.

[Was listening to the music better this time, worse, or the same as the first time you heard it?] Um, I don’t know . . . um, kind of better or the same.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] The CRDI. [Without any talking?] Without any talking. [Why?] Because, I like to, um . . . I don’t like to answer questions about, about music. I like to just hear it. [Do you think it’s hard to express how music makes you feel?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.
Figure 7. Graph of Subject 6’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] At the beginning, when it’s just the piano, it sounds very sad - like you could just fall asleep to the music. And, then it gets kind of angry - and that will really wake you up, especially when the orchestra comes in; but then, when it gets to the end, it winds down, and it gets sad again and makes you want to go to sleep. [You said the music sounded “angry.” How did the music make you feel inside during that part?] Like something bad was happening when the person wrote the music. It sounds like the person that wrote the music - something was happening in their life that had to do with it and made them feel angry, and they just wrote music to go along with their feelings. [Did the music actually make you feel sad and angry or just make you think of those feelings?] Made me feel like that.

[In the beginning, how do you think the composer was feeling?] Very sad - just tired. [How about at the end?] The same.
[Can you think of a time in your life when this music would have matched your feelings or maybe helped to change them?] Yeah. When my mom’s uncle, which would be my great-uncle, he died, and I think ‘cause he had cancer, and so it felt kind of sad and angry that he took cigarettes and stuff, and that would be a good time to play that music. [Did you think about that while you were listening to the music or only when I asked you?] I thought about it when you asked me. [Anything else you want to tell me about the way the music made you feel?] It just sounded very peaceful, except right in the middle - when it sounded angry.

2nd Listening:

[Tell me about your feelings this time.] In the beginning, it’s in the middle, up here (indicating dial placement). And then once the orchestra comes in, it builds, like confidence, and the dial should go up. [Were you turning the dial up because the music made you feel better inside?] Yeah. It makes you feel better to know, um . . . (long pause) makes you feel more aggressive - you feel powerful. [And then at the end, what?] It gets a lot softer and goes down. [And do you not like the feeling from the music at the end?] When the music’s softer, it feels more sad and tired. [And you don’t like that feeling - is that why you turned the dial down?] Yeah. [Which feeling did you like best - the feeling from the solo piano or the orchestra?] The orchestra. [Would you like to tell me anything else about this music?] It’s weird, because sad and angry don’t really go together sometimes; it’s like they contrast. It’s like getting really softer, and then boom, it gets all powerful and angry.

[How do you think the composer was feeling when he wrote this music?] Feeling sad about something that happened, and how he couldn’t get over it; and how angry he feels.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Just the CRDI. [Why?] ‘Cause it’s easier to use. [Is it hard to talk about the way you feel?] Yeah. [Is it hard to talk about the way music makes you feel?] Not really . . . but you can just, um, turn it (indicating CRDI dial) the way you feel. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah. [And you would rather not have to explain, in words, how music makes you feel?] Yeah.
Subject 7
Age 10
Boy
Musical Experience: Piano, 2 years
Developmental Status and Conditions: Title I

![Graph of Subject 7's Responses Over Time](image-url)

**Figure 8.** Graph of Subject 7's Responses Over Time

**1st Listening:**

[Tell me what you were feeling while you were listening to the music.] Uh, I felt relaxed. [Throughout the entire piece?] Yeah. [Can you tell me why you immediately turned the dial all the way over to 255 and basically left it there during the entire piece?] ‘Cause, um, I like playing the piano; and, um . . . I’m not that good, but I like playing the piano, and I like listening to like, um . . . people play the piano; and, like, when I’m, like, listening to my brother, in . . . in the orchestra, ‘cause sometimes I go to the orchestra room, and um, I hear them playing, I feel relaxed. [So during this entire piece of music, even with the different sections, you basically felt relaxed?] Yeah. [Even when the orchestra was playing, you still felt relaxed even then?] Yeah. [And that relaxed feeling didn’t change when the orchestra dropped out and the piano came back in?] No. [Since you turned the dial so high and left it there, is that your way of saying it was a great feeling?] Really great feeling.

[How do you think the composer was feeling when he wrote this music?] Um . . . um, like, um . . . a relaxed day. [Do you think he was in a particular mood?] No, it just felt like medium,
like, so-so. [Is "so-so" a good feeling?] Yeah. [Nothing about this music gave you a bad feeling?] No. [Before you came in to listen to this music, how were you feeling?] Good. [If you weren’t feeling so great, do you think this music could change that feeling?] Yeah. [How?] Just listening to it.

[Can you think of a time in your life when this music would have matched or maybe changed the way you were feeling?] Uh, yeah. [Can you tell me when?] Uh, on my birthday. [How on your birthday?] ‘Cause I’m relaxed. [And is being relaxed a good feeling?] Yep. ‘Cause, like, when I wake up, I feel relaxed, because it’s my birthday; and I know that I’m going to get so much stuff, so I feel relaxed. [So, basically you had a great feeling about this whole piece of music from beginning to end?] Yep.

2nd Listening:

[Tell me about your feelings this time.] What I was feeling was that I was there with them on the front row. [On the front row of the audience or the orchestra?] Orchestra. [In the very beginning of this piece, you put the CRDI dial all the way over to 255 and never moved it again throughout the whole piece. Why did you do that?] Because I love music. [Were there sections of this particular piece that you loved more than others, or was the feeling the same all the way through?] Everything was just the same all around. [How would you describe how it makes you feel inside?] It makes me feel like I’m in the springtime and like I’m playing outside with all my friends and stuff. [The entire piece of music reminds you of that?] Yep. [So, I’m assuming since you went all the way to 255 and left it there that the music gave you a fantastic feeling?] Yes! Like leaving out of the house and just going anywhere you want to go (student laughs). [And that’s a great feeling?] Yes, that’s a great feeling.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] A combination. [Why?] Well, I like to talk and sometimes I don’t like to talk, so I would like both. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yep. [If you could have gone further than 255 with this dial, how far would you have gone?] Like a thousand.
Subject 8
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 9. Graph of Subject 8's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Okay. Well, I was feeling kinda happy, running around on a big pasture. [During the entire piece or in certain sections?] Certain sections. The part where it died off, I didn’t really feel anything. Because, it . . . it - I didn’t hear that much so it didn’t sound joyful. [Did the rest of the piece sound joyful?] Yeah. [Even in the beginning?] Mm-hmm. [When the piano was playing by itself, did that sound joyful to you?] Yeah, but then, when in the orchestra and the piano were playing, the orchestra was kinda loud, and the piano wasn’t so loud, so it didn’t sound like a good mixture; and it didn’t make me feel that good then. [So, did you have a better feeling when the piano was playing alone?] Mm-hmm. [How were you feeling when the orchestra was playing with the piano?] Like a dog was chasing me. [Is that a good feeling?] No. [So, when did you start to have a good feeling again?] When the orchestra stopped. [I noticed that you turned the dial down when the orchestra was playing. Is that why?] Yeah. [Then, when the piano was playing alone, you turned it back]
toward the right again. Why? What were you feeling then? [Yes - toward the end of the music.] I was feeling like I came to an end. [Was that a good feeling?] Um, sort of.

[How do you think the composer was feeling when he wrote this piece of music?] Let’s see . . . I think he was feeling happy. [Throughout the entire piece?] Yeah. [So, you don’t think there’s anything about this music that feels sad?] Un-uh. [Can you think of another adjective, besides “happy,” to describe how the composer might have been feeling?] Peaceful. [And is that a good feeling?] Yeah.

[Can you think of a time in your life when this music could have matched the way you were feeling or maybe changed the way you were feeling?] When I was playing my Game Boy. That’s when I . . . when I’m in my room on a Friday. I don’t have any homework. No - they, my mom and dad, can’t bother me about doing my homework, ‘cause I don’t have any homework. I’m sitting on my bed, playing the game, watching TV at the same time. [And this music gives you that same feeling?] Yeah. And then I’m laying down, ‘bout to go to sleep sometimes. [Is that a good feeling?] Yeah. [So, this music, has all good feelings?] Un-uh. [Just some sections are better than others?] Yeah.

2nd Listening:

[Tell me about your feelings this time.] Well, it was just about the same thing. [Why did you turn the dial down when the orchestra was playing?] Well, this time when I listened to it, it sounded like it was squeaky. [The orchestral section or all of it, including when the piano was playing?] The orchestra part. [What kind of feeling did that give you?] Not a good one. [Then as soon as the orchestra began to fade away, and the piano began playing alone again, you started turning the dial higher and higher. Can you tell me what you were feeling then?] Well, see, I don’t like the piano as an instrument, but when I hear . . . I like it as music, ‘cause it sounds smoother than the orchestra when it was playing; it made me feel comfortable and relaxed. [How did the orchestral section make you feel?] Um, let’s see . . . how can I describe it . . . off-balance.

[Can you think of a time in your life when this music could have matched or maybe even changed the way you were feeling?] Um, when I was playing baseball. [Which part of it?] When I was pitchin’. [The section of the music with the orchestra or with the piano?] Um, the piano part. [Why?] ‘Cause I was feelin’ good about my pitchin’, so it would have matched the same thing as the piano, since I was feelin’ good about my pitchin’.
[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Combination of the two. [Why?] ‘Cause I like to share my feelings. [Do you think it’s easy to talk about your feelings?] Yes. [Is it easy to talk about the way music makes you feel?] Yes. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yes.

**Subject 9**  
Age 9  
Boy  
Musical Experience: None  
Developmental Status and Conditions: SLD

**Figure 10.** Graph of Subject 9's Responses Over Time

**1st Listening:**

[Tell me what you were feeling while you were listening to the music.] Well, I was feeling like, you know how in those movies when the soldiers come back home? [Yes.] It felt like that at the end. [So what kind of feeling was that?] Mm, good. [Okay. Why do you think it felt like that at the end?] Because, usually when the um, soldiers are coming home, they usually play that - when they came from the war and stuff. [Why does that give you a good feeling?] They’re comin’ home - they’re okay. [Do you have somebody in your family who’s going to
Well, um, no. [No, but this music made you think about that and how it made you feel?] Mm-hmm.

[You said the end made you feel like the soldiers were coming home. Why do you think the piano playing by itself make you think of that, and not the section in the music where the orchestra is playing? Tell me about that.] Um, the piano was like when they came home, and they were home, and they were doing stuff with their kids, so the piano... but when there was an orchestra - that’s when I thought they were coming home. [Okay. What were you feeling when the piano played alone at the very beginning?] Well, they’re just on their boat going to war. [And what about the middle part?] They’re in war. [And so what in the music at the end made you think the war was over and they were home and playing with their kids?] Because when the piano... that’s when they’re like driving tractors and planting the corn with their kids - it would have them to play with each other. [What kind of feeling do you get from the music to make you think of those things?] Good.

[Can you think of a time in your life where this music would have matched or maybe changed your feeling?] Um, probably change my feeling. [For better or for worse?] Better. [How do you feel now?] Um, I feel the same but calm. [Did you have a good feeling before you started listening to the music?] Mm-hmm. [Can you think of anything else you want to tell me about the way this music makes you feel?] Um, no.

2\textsuperscript{nd} Listening:

[Tell me about your feelings this time.] Uh, not that bad. [Can you explain what that means?] I don’t know. [Talk to me about your dial movement. Why did you leave it almost all the way to 255 at the end of the piece?] Uh, because... [How were you feeling inside?] I’m not sure. [And you were moving the dial pretty high when the orchestra was playing. How did that make you feel?] Um, alright about it. [Does it give you any sort of feeling inside?] No. [Did it make you think of anything or remind you of anything?] No.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, CRDI. [Why?] Because all you gotta do is twist it and stuff. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah. [Is it hard to talk about your feelings?] Yeah, a little bit. [So, you are completely happy with the graph to show how you felt about this piece of music?] Yeah.
Subject 10
Age 9
Boy
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 11. Graph of Subject 10’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] It was really, really good. [How did it make you feel inside?] Um, good. [In which sections - the sections with solo piano or the section where the orchestra plays?] In the whole thing. [Why do you think the entire piece made you feel so good?] Um, ‘cause everything . . . the rhythm - everything was so good. [Can you think of another adjective besides good?] Um . . . [Can you describe the feeling in a different way?] It was happy. [The entire piece was happy?] Mm-hmm. [You didn’t think anything about this piece of music was sad?] Nope. [Even when the piano was playing by alone, and the music was softer and slower, it didn’t give you feeling of sadness?] No.

[How do you think the composer was feeling when he was writing this music?] Um, really, um, happy. [Throughout the entire piece?] Kind of relaxed and stuff. [So, do you think he had a good feeling?] Mm-hmm. [Is that why you just kept turning the dial back toward the right side and 255?] Yeah. [Every once in a while you would turn the dial back toward the left. Tell me}
about that.] Um, ‘cause every part started to get better and better. Then, it started to get a little bit um . . . bad, and then it started to get better. [So basically, you left the dial pretty far toward the right, even when the music was slow, and soft. Why?] Um, because I just liked it. [It gave you a good feeling inside?] Mm-hmm. [You said that it started to get "bad," but you didn’t ever really turn the dial back toward the left and zero too far.] Nope. [Why?] It was way better than bad.

[Has there ever been a time in your life when you think this music could have matched the way you felt or maybe even changed the way you felt?] Um, probably yes. [Can you tell me when?] Um, I don’t know. [As you were listening to this music today, did it actually change the way you were feeling?] No. [When you came in how were you feeling?] I was already in a good mood anyway. [If you were not in such a good mood and listened to this music - what do you think would happen?] This would make my mood better.

2nd Listening:

[Tell me about your feelings this time.] Good. [Can you explain that a little more. When you were listening, how did you feel inside?] Uh, from the loudest part . . . like in the middle . . . from there to the end, it made me feel good. [Can you think of any other words besides “good”?] Uh, it was, um . . . kinda happy and exciting. [How did the first section, with the solo piano make you feel?] Um, kinda negative and stuff. [Did the music actually make you feel that way, or did it just give you that idea?] Just gave me that idea. [It didn’t make you feel negative inside?] No.

[Can you think of a time in your life when this music might have matched or even changed your feelings?] Probably. [When?] Um, I don’t know, but probably.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] CRDI. [With no talking?] No. [Why?] (long pause) [Is it too hard to describe how you feel about the music?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Um-hmm.
Subject 11
Age 10
Boy
Musical Experience: Piano, 5 years
Developmental Status and Conditions: Normally Developing

Figure 12. Graph of Subject 11’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Um, well, I liked it pretty good. [Tell me about how the orchestral section made you feel inside.] Um, it was gradually getting louder. [What does that do to your feelings? You really turned the dial far toward the right for that section.] It’s um, hmm . . . [Can you think of an adjective to describe how it made you feel?] Well, it actually made me calm. [The entire piece of music or just when the orchestra was playing?] Mm . . . when the orchestra was playing. [What were you feeling when the piano was playing alone?] Mm, nice, peaceful. [Did it sound sad at all?] A little. [When music sounds sad, do you like the feeling?] Mm . . . a little.

[How do you think the composer was feeling when he wrote the music?] Like, sad, and peaceful, then, like, something wrong happened; and then, like, he . . . the orchestra came and, like, um . . . made the music louder, and it’s like he was - maybe mad; and when the music, like went down, it was like, sad. [Did the music actually make you feel sad, or did it just give you an idea of sadness?] Idea.
[Can you think of a time in your life when this music could have matched or maybe even
changed the way you were feeling?] Mm, no. [No time you can think of at all?] Well . . . um,
actually, probably not. [If you wanted to change the way you felt, do you think it could?] Mm,
no.

2\textsuperscript{nd} Listening:

[Tell me about your feelings this time.] Um, this time I felt like while the music was
gradually getting louder, I thought that I should turn it (indicating dial placement), because, like,
the sound was gradually getting higher, but it went, like, softer, then I’d turn it back a little bit.
[Why?] Because it was, like, getting softer so I thought that, like, this side was getting lower
(indicating the left side of the CRDI), and this side was being higher (indicating the right side of
the CRDI). [So, did your dial movement have anything at all to do with how the music was
making you feel inside?] Um, not really. [Were you more relating it to the volume of the music?] More volume. [Was the volume also related to how you felt about the music?] Yeah. [Why do
you not feel good when the music is soft?] Um, um, . . . um, like soft, like soft sounds. [Does it
seem sad?] Um, not really. [Is it too calm, too peaceful?] Um, I don’t know. [When you play the
piano, do you enjoy the soft sections?] Um, no, I like usually playing loud. [Have you ever
thought about how it makes you feel inside when you play softly and why you don’t like it?]
Never thought about it. [If you think about it, what do you think?] I don’t really know. I’d have
to think about it a lot.

[If you could choose CRDI, talking, or a combination of the two to express the way you
feel about a piece of music, what would you choose?] Probably the combination. [Why?] Um,
well . . . well . . . um, wow . . . [Do you think the CRDI dial shows how you feel fairly accurately
without talking?] Yeah. [But then in addition to using the CRDI, you think it’s important to try to
explain what you did?] No. [So, you would like to only use the CRDI and not have to talk about
how you feel?] Yeah.
Subject 12
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Normally Developing

![Graph of Subject 12's Responses Over Time](image)

**Figure 13.** Graph of Subject 12's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Well, I kind of saw them play, and um, I really thought of - there wasn’t very much, weren’t very many instruments, but, at the end, and th-there was some, um, happy parts in it, and it kind of makes you feel sad in some parts. [Where did it make you feel happy?] Um, more in the middle it made me feel happy. [Is that why you turned the dial pretty far to the right - because you liked the happy feeling?] Mm-hmm. [Where did it make you feel sad?] At the end, mainly. [Is that why you turned the dial back far to the left - toward zero?] Yeah, ‘cause it was kind of low. I don’t really like low stuff, ‘cause when you think of low, you think of things not really being that happy and stuff. [And you don’t like that feeling?] No. [Do you think that music could make you actually feel the way you like - or don’t really like - if you listened to it long enough?] Um . . . [Could it make you feel happy or sad?] Um, yeah. [When you were listening now, did this music actually make you feel happy and sad, or did it just remind you of happiness and sadness?] It, it was kinda - it was a little bit of both. [Which feeling do you like best - happy or sad?] Happy.
[And you don’t like to feel sad?] No. [Is that why you turned the dial back to the left side toward the end of the music?] Yeah.

[How do you think the composer was feeling when he wrote this music?] I think he was feeling that, um . . . (pause); that’s a hard question. [You said it made you feel both happy and sad.] Yeah. [Do you think the composer was feeling that same way, or do you think he was just writing music?] Feeling that way. Some of it was like, like somebody was about to die or something . . . at the, at the end, ‘cause then he really started to play stuff low; and I was thinking, well, he - why would he play it so low? I mean, something’s gotta be going on at that time.

[Can you think of a time in your life when any part of this music could have either matched your feelings or maybe changed your feelings?] Um, matched my feelings . . . [Can you tell me about that?] Yeah, I’d say on the weekends. You know, I’m happy; I don’t have to worry about anything. [What section of the music?] When a lot of instruments - I guess the orchestra was playing. [What about the ending, have you ever felt like that?] Yeah, when my . . . thinking, thinking that somebody’s or something’s about to die. [How does that feel?] Not good. [Is that the main reason that you turned the dial so far back toward zero?] Mm-hmm.

2nd Listening:

[Tell me about your feelings this time.] Well, related to the other time . . . not - only a few things you know, ‘cause the music got louder, and it got a little brighter, and at times pretty much would feel a little better. Um. [Can you tell me which section was a "little brighter" to you?] When the orchestra was playing. [So, when the piano was playing alone, it didn’t seem so "bright" to you?] No. [When the music is not "bright," how does it make you feel inside?] It kinda makes me feel - you know . . . it kinda starts to make me think of like a war, you know. So . . . [Is that why you turned the dial far back toward the left and zero?] Yeah. [It wasn’t a good feeling?] Mm-hmm. Yeah, it’s just . . . it’s just not my type. [When the orchestra was playing and the music sounded "brighter," did it take your mind off of "war" and give you a different feeling?] Um, yeah, it . . . it just slowly took it off. [What were you feeling when you were listening to the orchestra?] Um . . . I was, at the beginning, I was starting to feel . . . starting to forget about the war; it was kinda, going up, you know, letting it kinda make you feel a little bright, little better; and, um . . . [Did it actually make you feel that way, or did it just give you the idea of feeling better?] It . . . it . . . it was kind of, like, half of both, you know. [At the end of the piece, you turned the dial all the way back to zero and stayed there for a little while; but then, you
started going back up just a little. Why did you do that?] Well, you know, ‘cause it got just really, really quiet, and then a little, something was not . . . something was not good. [You thought the music was telling you something wasn’t good, or you felt that something wasn’t good.] I guess it was half of both.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, I’d choose to talk about it. [Without using the CRDI?] No. [Why would you choose to only talk about your feelings?] I just . . . I don’t like moving that little knob. I like moving my mouth.[Do think it’s easy to talk about how you feel?] Yes. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah - but it doesn’t . . . it’s not as good as talking, ‘cause you don’t get your real thing. It’s just you get a feeling from it.

Subject 13
Age 10
Girl
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 14. Graph of Subject 13's Responses Over Time
1st Listening:

[Tell me what you were feeling while you were listening to the music.] Um, at that one part where he was doing it all loud, it sounded like he was banging on a piano - like Beethoven. [How did that make you feel?] It made me feel like he was mad at somebody or something. [Is that why you turned the dial down?] I had it like right here (indicating where dial was during the first solo piano section). I like it when it’s kinda soft music. [Why? How does it make you feel inside when you “like it?”] Um, makes me feel like . . . calm, peaceful. My mom and brothers and sisters are always loud and yelling, and I always wish I could find a still place. That music made me feel like that - still. [So, why did you turn down the dial during the orchestral section?] Um, it reminded me of noise and loud. [How does that make you feel?] Like I want to run away and find a quite place.

[How do you think the composer was feeling while he was writing this music?] Um, calm, and then he got real mad, but then he got calm again. [Do you want to tell me anything else about the way you feel?] Nope.

2nd Listening:

[Tell me about your feelings this time.] (laughing) I liked it better. [Which time?] This time. [Why?] I don’t know; I liked the music better. [Did it make you feel better inside?] I don’t know. When it was, like, really low, I kept it around there (indicating dial placement), but when it got a little higher, like in the middle, I put it over here (indicating dial placement). [Why?] Because I like it when it’s kinda in the middle. I don’t want it too loud, and I don’t want it too soft. [Why don’t you want it too loud?] I don’t like loud music. [Does it have anything to do with how it makes you feel inside?] Um-huh. [What?] Like, I can’t understand why people want to hear music that’s so loud and stuff. [So did you turn the dial down because of the volume of the sound?] Yeah. [Does the loudness make the music sound ugly to you?] It doesn’t make it ugly, I just don’t like the feeling. [So, why did you bring the dial down at the end when the music was getting softer?] Um, I had a hard time hearing it, and I like to hear it.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] CRDI. [Why?] It’s easier than talking. [So, do you think it’s difficult to describe how music makes you feel?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Um-huh.
Subject 14
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 15. Graph of Subject 14’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] It sounded like the person who was playing it - sounded like he was sad. [Did it make you feel sad?] Yeah; but then whenever it had the orchestra, it sounded like something really good happened; and then he got happy. [Did the music make you feel happy then?] Um-hm. And then um . . . it, like, started playing really loud, well, not really loud but louder than it was, and then it, like, made me feel happier. [And then at the end, when the piano came back, and the orchestra wasn’t playing, how did that make you feel?] Yeah. It sounded really, really sad, when it was quiet, and it made me feel really sad. [And you don’t like that feeling?] No. [Did you think it was terrible music, or did you just not like the way it made you feel?] I didn’t really like the way it made me feel at the end, when it made me feel sad. [Did you like the way you felt in the middle where the orchestra was playing better?] Yeah. [But you didn’t turn the dial to the right very much, even during the orchestral section.] I know. [Can you tell me why?] I wasn’t even thinking about the dial that much. [Does that mean that you really don’t like the feelings the music gave you?] No. I was just
sort of . . . listening. [Do you think you would say you were kind of lost in the sound of the music?] Yeah, I guess. [In general, how did the music make you feel?] Um, normally it made me feel happy, but like, when it was like, low and like . . . quiet kind of - it made me feel like, sad. [And you don’t like that sad feeling?] I don’t like that feeling.

[How do you think the composer was feeling when he wrote the music?] Mm, sad - but whenever the orchestra came in, I think he felt happier. [How do you think he was feeling at the end of the piece?] I think he felt sad again.

[Can you think of a time in your life when this music would have matched your feelings or maybe changed your feelings?] Um-hmm. [Can you tell me when?] When my parents got divorced. [The entire piece?] No [Which sections?] Just the, like, at the end. [Not the beginning, necessarily?] No. [What about the orchestral section? Does that section match any of your feelings?] Um, on my birthday. [So, is that a good feeling?] Yeah. [But you weren’t thinking about moving the dial to show us that feeling?] No.

2nd Listening:

[Tell me about your feelings this time.] Well, at the end it made me feel, like, like he was, well, the person who was playing it - it made me feel like he was lonely, ‘cause, like, it was, like, really soft and quiet, like he was sad or something; um, but before that the orchestra came in, and um, it felt, sounded like he had a lot of friends playing with him. [So was it a good feeling?] Yeah. [But you didn’t move the dial very far. Why?] (long pause) [It’s okay that you didn’t move it very much, but I would like for you to tell me why, if you can.] I was just thinking about the music. [Were you not thinking about moving the dial?] No, not really. [If you were thinking about moving the dial now, after you finished listening, would you move it higher than you did or would you leave it the same?] Yeah. [Where would you move it?] Probably from where it was at least up to about there (indicating dial placement). [Where do you have it now?] Up around 200. [Was it a really good feeling when the orchestra was playing?] Um-hmm. [When you say it sounded like the pianist was lonely, did the music actually make you feel lonely?] Yeah.

[Can you think of a time in your life when this music either matched the way you felt or maybe could have changed the way you felt?] Um, at the end whenever I found out my parents, like, were divorced. [That’s certainly not a good feeling, and I understand why you would turn the dial down.] ‘Cause I . . . they got divorced on a Wednesday, and I found out, like, on a
Thursday, the next Thursday - not the Thursday after the Wednesday. [A week after they were divorced?] Yeah. [I completely understand why you kept the CRDI dial so low.]

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] The CRDI. [Why?] I don’t really like to talk about my feelings that much. [Is it just too hard?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] If I remember to turn it.

Subject 15
Age 10
Girl
Musical Experience: Piano, 1 year (maybe)
Developmental Status and Conditions: Normally Developing

Figure 16. Graph of Subject 15's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Um, I liked it. [Why?] ‘Cause I like the piano. [How did the music make you feel inside?] Um, really good, because it’s not sad, and it’s not really, like, powerful. So, I liked it. [So, the sections with solo piano didn’t make you feel sad?] No. [How did they make you feel?] Calm . . . peaceful. [How did the orchestral section make you feel inside?] Um, really good. Um, like, sort of, um . . . it came in sort of fast and everything and . . . [What does it make you feel inside when that
happens?] Um . . . makes me feel powerful, sort of. [At the end of the piece, when the piano was playing by itself again, you kept turning the dial further to the right - toward 255. Can you tell me why?] Um, 'cause um, it was really, um . . . light and didn’t give me much of a feeling. [So, if it "didn’t give you much of a feeling," why didn’t you turn the dial back toward zero?] Because it was a good feeling. [So, which feeling do you like best - the "powerful" feeling or the "light" feeling?] Um, they’re sort of the same . . . but I kinda like the powerful one better.

[How do you think the composer was feeling when he wrote the music?] I think he, it was a happy time for him, and he was feeling really good. [Throughout the entire piece?] Mm, in, where the orchestra came in, a little more powerful, but I think he still felt really, um . . . happy and good. [All the way through?] Well, when the orchestra was coming in . . . I think it’s sort of, um, sort of like, sad, um . . . but it still is, um . . . it’s not really sad, it’s just powerful. [So of the different sections - the solo piano or the piano with the orchestra by itself - which one of those made you feel the best?] Um, piano and orchestra. [Together?] Mm-hmm.

[Has there ever been a time in your life when this music would have matched or maybe changed the way you were feeling?] Yes. [Will you tell me when?] Um . . . whenever, um . . . maybe, I was at, um, summer camp, and um . . . um . . . we were just, um, playing around, and then I tripped and fell, and it was sort of fast happening; and that’s sort of what it made me feel like when it came to the orchestra and the piano.

2nd Listening:

[Tell me about your feelings this time.] Um, I was . . . well, I liked the part where it got really loud; um, but the slow part, I don’t know, but I didn’t really like it. [How does the part that you said “got really loud” make you feel inside?] Um . . . (long pause) powerful, I guess, I don’t know. [Is it hard to describe how music makes you feel?] Um, sort of. [So, when you say you didn’t like the “slow part,” how did that make you feel?] Well, makes me feel really sleepy, but, um, down, not like all powerful and everything, but, um, sort of . . . I don’t really think it’s sad, but happy, but really soft. [Do you like that feeling?] I like it, but not as much as I like powerful. [Tell me why you left the dial on zero for a long time in the beginning of the music. Does that mean that you didn’t like the feeling?] Yes. [Does this music remind you of anything or any time in your life?] Not really.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, the CRDI and talking. [Why?] Um,
‘cause . . . um, I like, um, hearing the music and everything and then talking about it. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Um-hmm. [Do you think it’s hard to talk about feelings?] Not very hard . . . it’s sort of hard to put into words. [Do you mind when people ask you to talk about your feelings?] No, but I don’t always know what to say . . . I don’t always know what to say.

Subject 16
Age 9
Girl
Musical Experience: Piano, 1 year
Developmental Status and Conditions: Normally Developing

Figure 17. Graph of Subject 16’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Well, I, um, I liked it, when it, when it, um, did the . . . booming part. [Why? How did it make you feel inside that the other sections didn’t?] ‘Cause, um, it felt like it was happier. [Did it actually make you feel happier or you just thought the music sounded happier?] It made me feel happier. [Tell me how the other sections of the music made you feel.] Well, they were kind of low, but I still liked them. [Look where you left your dial at the end - that’s pretty high, at the very lowest section of the music. How were you feeling that made you do that?] Because, umm, it was really interesting,
and you don’t get to see that - they don’t really have that anymore, that kind of music any more, and um, [So how did it make you feel that you left the dial way over there? How were you feeling inside?] Mmm . . . (Long pause.) [You can’t describe it, or you just don’t feel comfortable sharing?] I can’t describe it. [That’s okay. Was it a good feeling? Is that why you left the dial so far over to the right?] Yes. [Can you describe how the "booming part" made you feel?] Well, I don’t know how to describe that either. [Was it an okay feeling, a great feeling, a good feeling?] Great feeling. [And it was still a great feeling at the end of the music too?] Yeah. [Even though it was "lower"?] Mm-hmm. [Was it a different kind of good feeling, or the same?] Um, a little different. [Can you explain how?] Not really. [But you left the dial over to the right because you really, really liked the feeling?] Yeah.

[How do you think the composer was feeling when he wrote this music?] He was sad. [For the entire piece?] No. [When was he not sad?] The middle. [Where do you think he was sad?] At the end. [What about the beginning?] Mmm, maybe differently then.

[Can you think of a time in your life when this music would have matched the way you felt or maybe changed the way you felt?] (Long pause) I can’t think of it. [How did this piece of music make you feel inside?] Good. [Throughout the entire piece?] Yes.

2\textsuperscript{nd} Listening:

[Tell me about your feelings this time.] Um, ok. Hmm, when I was listening, I re . . . um, it reminded me um . . . um, like, um, the play. Like someone’s . . . like, a non-talking play, like, ballet. Something like that. And I used to do ballet, so . . . [How did it make you feel inside?] Uh, medium. [Is that why you didn’t turn the dial very far toward the right and 255?] It wasn’t as, well . . . loud, as the other. [So does loud music give you a better feeling inside?] Well, I just like it to like . . . sound like it’s booming. [Does music that’s "booming" make you feel better inside, is that why you like it?] Yeah. [This music was softer and slower at the end, and that’s where you left the dial the highest. Can you tell me why?] Well, I like it when it ends, um, soft, but, in the middle and stuff, um, I like it to be . . . [The middle of this piece gets pretty loud and "booming," but were you using the dial to say it just wasn’t enough to give you that great feeling?] Right. [Why do you like music to end slow and softly?] ‘Cause it gives it a, um . . . [How does it make you feel when it does that?] It makes it feel like, um . . . I don’t know how to explain. [That’s okay.]
[Was listening to the music this time better, worse, or the same as listening to it the first time?] I’d say it was . . . mm, the same - kind of; but the music, I mean the . . . um, it was . . . it had um . . . it had the same feeling, but just kind of, a little bit different. [Was it a better or worse feeling this time?] Mm, I don’t know.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] The dial. (Student laughs) [Why?] It’s just hard to talk about it. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

Subject 17
Age 10
Girl
Musical Experience: Voice, 2 years
Developmental Status and Conditions: Normally Developing

Figure 18. Graph of Subject 17's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Oh, I loved it and um, it made me feel secure and safe, and um . . . well, I got to say anything, like, I was really comforting. [Why do you think it made you feel "secure and safe"?] Because of the sound and the way it . . . the . . . what it was like; it said something to me. [What did it say?] It didn’t . . . it
didn’t say, like . . . but it made me feel like I was meeting my Romeo, and I was Juliet. [Did the entire piece give you feeling or just certain sections?] The whole thing. [Even when the piano was playing by itself?] Yeah. [At the end of the piece, you left the dial really far to the right toward 255. Were you showing me that you had a good feeling during that section?] Yes. [Was the feeling better when the orchestra played with the piano than when the piano played alone?] Orchestra - yea, a little. [Is that why you turned the dial a little higher during the orchestral section?] Yeah. [But you also left it very high at the end of the piece.] Um, it well . . . it . . . it all felt the same. [So, to you, it didn’t matter if the piano was playing slow and soft or the orchestra was loud or fast - it all gave you a good feeling?] It didn’t matter. [Did you think this music was sad at all?] Un-uh.

[How do you think the composer was feeling when he wrote the music?] Well, like, in a love mood. I guess. [Throughout the entire piece?] Uh-huh. [Was he sad ever?] No.

[Can you think of a time in your life when this music could match your feelings or possibly even change them?] Uh-huh. [Can you tell me when?] Um, when I . . . I’m alone. I feel like I . . . I can just express my own feelings with myself. [And this music made you feel like that?] Uh-huh. [Do you like that feeling when you’re alone?] Yeah, sometimes.

2nd Listening:

[Tell me about your feelings this time.] Good. [Can you explain a little more?] Um, well, I really like it, um, I feel the same, really, um . . . [Remind me how you felt.] I felt like, um, I was in my own world, like I . . . it was peaceful, and like I was by myself in a world like, um, Mary Poppins, or something. [Throughout the entire piece of music?] The entire piece of music. I was like (student singing la, la, la, la, la, la), and, um I really loved it. [Even though the music was slow and dying away at the end, you left the dial all the way to 255. Can you tell me why you did that?] Because, um, it felt like my peacefulness was ending, and I was erupting when I was like uneruptable, and so, it’s like I had more energy at the end. [So the dial shows us that this piece gave you a fantastic feeling?] Yes, I can’t say it enough times.

[Can you think of a time in your life when this music might match or maybe even change the way you feel?] Yes. [When?] Uh, I don’t know. Like, when I’m by myself, I guess.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] A combination. [Why?] Because, um, then I . . . then I would be able to do the CRDI and express my feelings how I felt. [Do think it’s
important to be able to talk about your feelings?] Yes. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yes.

Subject 18
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 19. Graph of Subject 18's Responses Over Time

1st Listening:
[Tell me what you were feeling while you were listening to the music.] Well, at first it seem . . . seemed kind of sad; and then it got really, I, uh, I liked it re-really, when it was in the middle, when the orchestra . . . yeah. That was uh . . . that was real fun; and I liked that, and the um, last - the last part was real nice; it wasn’t as sad as the very beginning, though. [So, is that why you left the dial over toward the right side during the last section with the piano?] Yeah. [Did you think the music in the beginning was ugly music or did it just give you a sad feeling?] Mm . . . neither really, it wa-it was more . . . it was - I didn’t have a sad feeling, it just - it, it didn’t feel sad, it sounded sad. It, yeah, it’s . . . it was like, y’know, some, someone has, someone else had a really sad feeling, and I was sad for them. [Do you like that sad feeling?] No, not really. [So, how was the feeling different when the orchestra played?] It was, uh, kind of like a, a
celebration, like, the sad thing wasn’t really sad. They . . . it was just . . . they didn’t know that it was gonna be good, and then it was real happy and stuff. And then it was like, okay, the celebration’s ended, y’know, at the very end, and, "I think I’m gonna go to bed" and then, y’know . . . [And how did that make you feel?] Mm, I guess happy, still. [At the end of the entire piece?] Yeah. [Is that why you left the dial pretty far to the right, even with the solo piano at the end.] Yeah.

[How do you think the composer was feeling when he wrote the music?] Um, I think he . . . I think he was in kind of a good mood, but he was still sad about something and trying to make himself feel better. [Do you think he was successful at making himself feel better?] Yeah.

[Can you think of a time in your life when this music could have matched your feeling or maybe changed the way your were feeeling?] Mm, yeah. [When?] I don’t know exactly. Mm, it’s happened more than once, probably. It was - I can’t exactly say when, I . . . I mean . . . I kind of felt this, that way this morning. [Sad? Or happy and excited?] Uh, at first I was sad ‘cause I didn’t, y’know, I didn’t have any hot water for my shower; and then, and then I thought . . . I thought I had lost part of my book, ‘cause it’s old and a page may, might have came out; but then wh-when my dad found it, I was real happy again; and then I . . . I just stayed happy. [So, how are you feeling now?] Good.

2nd Listening:

[Tell me about your feelings this time.] Well, I guess . . . the beginning . . . like I said before, the beginning was kind of sad, and during the middle, it seemed like it got a lot, you know, better. It sounded a lot better. [Did the music actually make you feel sad, or did it just give you the idea of sadness?] It gave me the idea of sadness more than make me feel sad. [Tell me about the middle section.] The middle, it was kind of, like, um, it made me feel, you know, like whoever composed this was real happy during the middle time. [Did it make you feel happy?] Kinda, yeah. [More than the other section made you feel sad?] Um, I guess so. [What about the end?] The end wasn’t really sad or happy. It was more like in the middle, so . . . [Can you tell me why you left the dial pretty high at the end?] It was about as soft, you know - it wasn’t real lively or anything, as the beginning, but I just for some reason liked it a little better than the very beginning, because it didn’t seem quite as sad. [When music sounds sad, is that why you don’t like it?] Hm, yeah, kind of. [Is it because you don’t want to feel sad or think sad thoughts?] Hm, I don’t like to, but I guess sometimes I have to. [But if you’re listening to music, and it sounds slow
and sad, would you just as soon not listen to it?] No, not really. I like music a lot, and even if it is kinda sad, I’d like to listen to it sometimes.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, probably a combination. [Why?] Um, because sometimes I like to be able to express my thoughts, you know, with the voice instead of, um, um, you know, my movements. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah, yeah, yeah. [Do you want to tell me anything else about this music?] No, there’s not much else.

**Subject 19**
Age 10
Girl
Musical Experience: None
Developmental Status and Conditions: SLD

![Figure 20. Graph of Subject 19's Responses Over Time](image)

**1st Listening:**

[Tell me what you were feeling while you were listening to the music.] I just, I like the music; it just keeps on going back and forth, and back and forth, you know. [How does that make you feel inside?] It makes me feel good. [Why, do you think?] ‘Cause I like how the music’s played, maybe. [Tell me why you just kept going up, and up, and up, and up with the dial. How...
Well . . . (pause) I, I just like the way it’s played, and when I heard the music, it made me think of my, um, grandma, in her backyard with planting the flowers or something like that. [And that’s a good feeling?] Really good. [Do you plant flowers with her?] Sometimes.

[How do you think the composer was feeling when he wrote the music?] Like, good feelings or something like that.

[Can you think of a time in your life besides what you’ve already shared with me about planting flowers with your grandma when this music would match the way you were feeling or maybe change the way you were feeling?] Sometimes, I’m in my room . . . well, uh, sometimes when my cousins argue a lot, and it just makes me feel bad, and I think this might cheer me up or something.

2nd Listening:

[Tell me about your feelings this time.] Well, the music was a little, um . . . [Keep going.] Uh . . . I didn’t like it as much. [As the time before?] Yeah. [Can you tell me why?] Um . . . [Did it give you a different feeling?] Sort of. [Can you explain why?] I don’t know. It just . . . the music playing, or something . . . [How did it make you feel?] I don’t know . . . [Can you think of an adjective to describe the feeling?] Distress. [Throughout the entire piece?] Well, in the beginning I liked it - and in the end. The middle of the music was what I didn’t like. [Can you explain why?] It was like . . . like . . . someone playing the piano. [Why did that make you feel "distressed"]? I don’t know. [Is that why you turned the CRDI dial down during the orchestral section?] Yeah. [Because it made you feel "distressed," and you didn’t like that feeling?] Mm-hmm. [During the last, piano section, you did turn the dial farther toward the right. Was that showing me that it gave you a better feeling?] Yeah. [How did you feel in that section?] Good. [Can you think of another adjective?] Peaceful. [And "peaceful" is a good feeling?] Yeah. [Did you think this music sounded sad?] Yeah. Especially in the beginning. [Is that why you kept the dial so far toward the left and zero during that section?] Yeah. [Did you think it sounded sad at the end?] No. Not as much - just peaceful.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, both. [Why?] Well, it’s important to, um, to try to explain why I moved it (indicating dial placement). [Is it hard to talk about the
way music makes you feel?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

Subject 20  
Age 10  
Girl  
Musical Experience: Piano, 3.5 years; Voice, 3.5 years  
Developmental Status and Conditions: Normally Developing

![Graph of Subject 20's Responses Over Time](image)

**Figure 21.** Graph of Subject 20's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] I was feeling that that was supposed to be like a sad and like a good kind of music; and it was like . . . it was good. [It was good?] Yeah. [It was good all the way through?] Yeah. [Did it make you feel good all the way through?] Um, no. [Tell me why you moved the dial back toward zero at the end.] That, um, the way I did that is that when I went, when I was toward zero, that means that I felt kinda sad with it; but when I went to the right, that means I felt like we had a really joyful kinda, type of music. [Did you not like the sad feeling?] No. [Is that why you turned the dial back toward zero?] Yeah. [Did the music actually make you feel sad inside, or did it just remind you of something sad?] Yeah, a little bit - when they got low. [The music really made you have a feeling of sadness?] Yeah. [And is that why you turned the dial back to zero, because you didn’t like it?]
No, it was because I was feeling kind of sad, and I didn’t like the feeling. [But did you like the music?] Yeah. [But you didn’t like the feeling of sadness it gave you?] No.

[You mentioned that the music made you feel joyful. When you turned the dial all the way over to the right, is that how you indicated you were having a joyful feeling?] Yeah. [And you like feeling that way?] Yeah. [And that’s why you turned the dial way over to the right?] Yeah. [Toward the end of the music, when the piano was playing alone, I noticed that, you brought the dial back to zero and mostly left it there.] Yeah. [Why?] It got sad again. [And you don’t like to feel sad?] Yeah.

[How do you think the composer was feeling when he wrote this music?] Sad. [Throughout the entire piece?] Well, when he was sad, then he felt like he should be joyful again, and like, make that happen. So he could be happy again.

[Can you think of a time in your life when this music would have either matched the way you were feeling or changed the way you were feeling?] When my grandpa, my great-grandfather died, and then when we knew - something else had happened and, and I felt good again when I had, like when my grandma had came, and she cheered me up, that’s when I . . . so that’s sorta like this music - sad and happy.

2nd Listening:

[Tell me about your feelings this time.] I was feeling sad when it, like, went down; and then when it went up, I felt happy. [When you say "it went down," do you mean when the piano was playing by itself?] Yeah. [Did the music actually give you a sad feeling, or did it just reminded you of something sad?] It made me feel sad. [Is that why you turned the dial down toward zero during those sections?] Yeah. [When you say "it went up," do you mean the section of the music where the orchestra came in and played with the piano?] Um-hmm. [And that section of the music made you feel happy?] Yeah. [And is that why you turned the dial up toward 255?] Yeah. [At the end of the piece, you turned the dial back to zero and basically left it there. Why?] Because it went down and felt kind of sad. [Do you like the sad feeling?] No. [Even though it made you feel sad, do you think the music is ugly?] No. [So, did you turn the dial down because you didn’t like the sad feeling - not because you thought it was ugly?] Yeah.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] CRDI. [So, you wouldn’t want to talk about the way the music made you feel?] No. [Why?] Because . . . because, um, when I listen to
music, I can’t really respond to it out loud. [Do you think it’s hard to describe how music makes you feel?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

Subject 21
Age 10
Girl
Musical Experience: Piano, 2 years
Developmental Status and Conditions: Normally Developing

Figure 22. Graph of Subject 21's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Um, well, I was kinda, like - like why, like how? [How and why, is that what you’re saying?] No, well no, like - what do you mean? [How did the music make you feel inside while you were listening to it?] Well, it was, it sounded like - really familiar, and it sounded like it was kind of sad, or it was expressing feelings and stuff. [And so, what feeling did it express to you?] Hmmm . . . well, like in the orchestra, when it came in, it felt . . . I thought it was like - like other people’s feelings, just expressing; but when it was like the piano by itself, that was like my feeling. [Can you explain that a little more?] Well the piano, you know, was kinda like by itself, and there was more like in the middle, not like really deep, and it was not really high. So it was kind of, it was kind of like
you’re . . . you’re by yourself, you’re . . . that’s all you think about; but when the orchestra . . . it feels like more people are there. [So, which was the better feeling?] The orchestra. [How did the orchestra section make you feel?] Not so lonely. [What feeling did the piano give you?] More of a sad. [I noticed that you left the dial pretty high - even during the ending piano section; so was the sad feeling not a particularly bad feeling?] No, actually, I liked it. [Did the music actually make you feel sad or just give you the idea of sadness?] Made me feel that way.

[How do you think the composer feeling when he wrote the music?] Probably he was, probably thinking about him . . . himself - just getting away and being by himself and feeling kind of down. [Throughout the entire piece?] No. [In which part or parts do you think he was feeling "kind of down"]? With the piano. [How do you think he was feeling during the orchestral section?] More of happiness, and kind of looking on the bright side, so . . .

[Do you think this music can change the way you feel, or does it just give you an idea of the feeling?] Maybe change it a little bit, you know, not being so down on yourself. [Can you think of a time in your life when this music would have matched the way you were feeling or maybe even changed the way you were feeling?] Mm . . . maybe, when I’m, like, in my room. My sister gets really mad at me a lot of times, and I just really have to be by myself for a couple of minutes to think it over. [So, which section of the music would you like to listen to then?] Probably, the piano; and then go on to the orchestra. [So even thought the piano alone gave you a sad feeling, that was okay?] Mm-hmm. [Is that why you left the dial pretty far to the right, even during that last piano section?] Yeah. [You were okay with a sad feeling, and you meant to leave the dial that high?] Yeah.

2nd Listening:

[Tell me about your feelings this time.] Well, I kinda felt, like at the beginning with the piano, it’s just one person; they’re very lonely and kinda sad - like your parents divorced or something; and then when it went to the orchestra and everything, it felt like you . . . like you were looking on the bright side; you’re feeling happier; and then when it went back down, it felt like, well maybe it’s not gonna be so good - you’re thinking about . . . you know, you’re like . . . um, kinda made me feel like Cinderella or something, like . . . like, when she felt bad ‘cause she was a slave; and then she was like the ball, and was like, “Man, I’m gonna go,” and then she didn’t go, so she got her hopes back down, like that. [So, is that why you turned the dial back down - the feeling of hopes going back down?] Yeah. [Did the music actually make you feel
that way, or did it just give you the idea of that feeling?] Well, more of an idea, yeah. [If you listened to the music many times, do you think it would actually give you that feeling inside?] Yeah. [Is it a feeling that you like?] No. I like the orchestra when you feel happy and stuff.

[Can you think of a time in your life when any part of this music would have matched or maybe even changed the way you felt?] Yeah, ‘cause . . . we were like . . . my friend’s moving. She’s moving, she’s like moving down to Wakulla, and I’m like, “Man, I’m gonna miss her,” you know, ‘cause I knew her a long time. So, like, I’m gonna miss her, and then I’m like, well, we can visit them, and they can visit us. So, it’s lookin’ more on the bright side.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, probably the combination, or just talking. [Can you explain?] Yeah. I’d use the CRDI but probably more talk - I’d talk about my feelings. [So, you don’t find it difficult to talk about your feelings?] Uh-nn, unless, unless I’m like mad at a person, and I’m like, “Man, I don’t really like that person.” [Do you think it’s hard to describe how you feel about music?] Not really. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

**Subject 22**
Age 9
Girl
Musical Experience: None
Developmental Status and Conditions: Normally Developing

![Graph of Subject 22's Responses Over Time](image)
1st Listening:

[Tell me what you were feeling while you were listening to the music.] Um, like, at the first part, I was, like, thinking it was sort of sad, because it was going like, "Dunnn," (student singing) - like that; and I was thinking of when my brother left, ‘cause he’s off, um, fighting in the war; and I kept thinking of that, like . . . like, um, I . . . I was crying, my br . . ., my mom was crying, his girlfriend was crying - his fiancé, um . . . [So, is that why you left the dial over at zero?] Yeah, for . . . for so long. It wasn’t, like, happy. It didn’t make me mad; it made me feel sort of sad. [Were you using the dial to show that it wasn’t a good feeling.] Yes. [How did you feel when the orchestra began playing?] Um, it made me feel sorta happy, like . . . like, you know, maybe he’s coming back or something, or, you know, someth . . . It made me feel something happy - like, I went away for a long time, and I just got to see my dog for the first time. It made me feel happy. And . . . [But even then you didn’t turn the dial very far to the right. Why?] No. ‘Cause, like, then when it calmed down, it made me feel that . . . that . . . that scene when my brother left replaying in my head, when it was like, real low, and the orchestra was gone, that kept replaying in my head, and that’s why I, like, turned it down, and everything. [‘Cause you just didn’t like that feeling?] No, no. [Do you think the music is an ugly piece of music, or do you just not like the feeling that it gives you inside?] I just don’t like the feeling, really. [Then, you don’t think it’s an ugly piece of music.] No, no. [The feeling is just not good.] No. [Are there good feelings from any of this piece?] Not really. [Just too many negative reminders about your brother and his leaving?] Yeah, I mean - some of it, like the first part and the last part tha . . . that scene just kept replaying in my head and replaying in my head, but, like, in the middle, it made me feel sort of happy, you know. [But it wasn’t happy enough to make you move the dial very far to the right.] No. [Can you tell me why?] It, if it was like, "Bong, ong," (student singing) like that, I probably would’ve turned it up, ‘cause I would’ve . . . ‘cause stuff like that makes me feel like, you know, like, "Whoa!" Some of it makes me feel mad, when it’s like that, you know. [Did this music, during the orchestral section make you feel mad?] No. It made me feel sort of, like, happy and sad. [At the same time?] Mm-hmm. [But it wasn’t a great feeling?] No, it wa . . ., it wasn’t, um, like I said, you know, the middle part sort of made me happy, then when it got back down, it toned down. It made me, that, like, you know, like I said, that scene kept just replaying in my head. Yeah.
[How do you think the composer was feeling when he wrote this piece of music?] Um, he might have been, maybe, like, angry with somebody, or, um, sad about something. [Throughout the entire piece or just in some parts?] No, maybe just through the part where it gets sort of like, "MMM," (student singing) you know. Um, maybe he was . . . he started having, like, angry feelings at somebody, and um, like at the beginning, he might’ve been like, been sad about something. Then, he started feeling mad about it; then he started feeling sad again, you know?

[Can you think of any other time in your life, in addition to when your brother left, that this music could have matched or maybe even changed your feelings?] Um, probably when my mom went away to Orlando, and it was like, um, September 11, like . . . that whole thing, just watching it on TV freaked me out; and then on, like, in November, my mom went away to Orlando, or - not Orlando, but Boston; and she had to fly, and I got scared; and I just kept seeing her, you know, getting on the plane and everything. I mean, her plane didn’t crash or anything; she got back fine; but I . . . I mean, I just had this scene in my head, like her plane was gonna crash or something; and I was so scared, until she called us from the hotel that she was at, and then when she came back, she called us from the airport, and my dad and I came and picked her up. [So, does this music give you those same feelings or help you get away from those feelings?] Um . . . sort of both.

2nd Listening:

[Tell me about your feelings this time.] (Student sighs.) It sorta, once again, made me feel a little sad, but when it started to get the, you know, more like (student sings), that part, it made me feel more like happy - sort of like happy, like, you know . . . like “Oh my gosh, school’s out happy, or like the time that I got my dog happy; and then when it slowed down more, it once again made me feel of my brother leaving, and sad stuff like that . . . like something might happen, and . . . [So, is that why you went back to zero with the dial?] Yeah. [But in the middle section you described with happiness, you didn’t ever go very high with the dial either. Can you explain that?] Because, um, it’s just like music that goes . . . to me it was sorta going slow, and it made me feel, you know, sad, and if . . . probably if it was more, like, um, like, you know, like (sings again - attempting to sing more quickly), it would have made me feel excited or maybe like, um, happy or mad or something; but slow music - it just does something to me - makes me feel sad, like if I’m listening to the radio, like classical music, and something, like, like, you know, like, the piece comes . . . like that piece comes on, it just makes me . . . like, like I said, you know, the last
time - it . . . like the scene of my brother leaving in Jacksonville, like, flashes into my head and keeps, like . . . it keeps like playing over and like that. [Is that why you kept the dial so far down - you don’t like the feeling associated with the music and that scene in your head?] Yeah.

[Do you think this music is ugly?] No! I mean, I wouldn’t consider it, like, my favorite type of music, but it wasn’t bad; I just don’t like the feeling of it. [Even when the orchestra was playing, and you said it was getting more exciting, it just wasn’t enough to overcome the relationship in your mind between the music and your brother leaving?] No. [So, does this entire piece have a feeling of sadness for you?] Yeah, sorta. Not like, not like, um, like it all makes me feel down, like I would keep it like at zero the whole time (indicating dial placement), but some parts just make me feel sad; and I . . . I don’t know . . . some parts, like I said make me feel different, like, emotions and stuff, you know. [Does the music actually make you feel the emotions?] Un-hmm, yeah. [The music doesn’t just give you an idea of the emotions?] No. It makes . . . I mean, like I said, the scene kept flashing in my mind, and then like I could just feel it coming, like the sadness.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] I would chose using the CRDI and the speaking. [Why?] So, um, I could, like, instead of just, um . . . I could like, you know, show it on here (indicating the CRDI dial), but then I could explain why it made me feel that way. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Um-hmm. ‘Cause, like, sometimes I feel like my body, like, I’m tired, or I’m sad, or I’m just like bored, and I feel like totally “blah;” sometimes I’m really, really excited about something, and I’m happy, and I’ll be excited, and I might, like, turn it all the way around.
Subject 23  
Age 10  
Boy  
Musical Experience: None  
Developmental Status and Conditions: Gifted  

Figure 24. Graph of Subject 23's Responses Over Time

1st Listening:  
[Tell me what you were feeling while you were listening to the music.] Well, at the start, it was like a really happy feeling; and then, like, in the middle, it sort of went down some. [Why?] Well, the louder music - there was some soft music and some loud music - and the loud music didn’t, sort of seem that happy. [Tell me about that.] I don’t know. [The "louder" music just didn’t seem happy to you.] Nope. [But the softer music seemed happier?] Mm-hmm. [I watched your dial move more and more toward 255; and then I did notice, in the middle where the music was louder, you moved the dial down, and then you went back up.] Yeah. [At the end when the music was softer again, did you have the same feeling that you had in the beginning, or was it different?] Um, it was sorta different. [How?] Mm, I don’t really know. But, it just didn’t feel like . . . happy. [Is that why you turned the dial down during part of the ending section - because the ending didn’t make you feel as happy as the beginning?] Yeah.
[How do you think the composer was feeling when he wrote this music?] Well, um, I think it was sort of happy. [The whole way through?] Mm, nah, maybe it got a little mad in the middle. [Did you think it sounded like it was mad in the middle?] Well, it sort of. [Is that why you didn’t like the feeling?] Yeah.

[Has there ever been a time in your life when this music could have matched your feelings or maybe even changed your feelings?] Um, not really. I don’t know. [When you listened to this music, do you think it changed your feelings or just made you think of different feelings?] Um, I think it might have changed my feelings.

2nd Listening:

[Tell me about your feelings this time.] Well, I don’t really remember the other time, but . . . [That’s okay. How did it make you feel inside?] Well, I don’t really know, but it was, like, different from the other time; because, like, in the other time, it, like, felt bad; and it went way down here (indicating dial placement), but this time it didn’t have that part. [So, you didn’t have a bad feeling about any of the piece?] No. [Even at the very end when it was soft and slow and dying away?] No. [Look where you left your dial. Were you telling me that the feeling was a good one?] Mm, it was ok. [Did any of the music make you feel sad at all?] Mm, no. [Can you describe how it made you feel?] Mm, I don’t know. [Was it a good feeling, or a bad feeling, or maybe a combination of the two?] Mm, it was ok. [Which section gave you a better feeling - the piano sections or the orchestral section? Or was it basically the same?] Um, the orchestra. [How did that section make you feel?] Well, it just made me feel good. [Can you think of another adjective to describe it?] Um, calm. [Even though the music there was much louder, with more instruments . . .?] Yeah. [But look how far to the right your dial was at the end of the piece, and the music was slow and soft there? Can you explain why you left the dial there?] Well, the piano made . . . well, I don’t know how to say it. [That’s okay. That’s why we use the dial, right?]

[Was listening to the music better, worse, or the same as listening last time?] Mm, better.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Mm, CRDI. [No talking?] No. [Can you tell me why?] It’s too hard to try to describe. [Do you think it’s difficult to talk about your feelings?] Yeah. [Is it also hard to describe how music makes you feel?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.
**Subject 24**  
Age 11  
Boy  
Musical Experience: None  
Developmental Status and Conditions: Title I  

![Graph of Subject 24's Responses Over Time](image)

**Figure 25.** Graph of Subject 24's Responses Over Time

**1st Listening:**

[Tell me what you were feeling while you were listening to the music.] The music reminded me of something. [What?] It was a song that my papa used to always sing to me. [When you say papa, do you mean your grandpa?] Mm-hmm. I can’t remember how it goes, ‘cause he hasn’t sang it to me in a while - even though he’s still alive. [So, was it a good feeling or not?] It was a good feeling. [Throughout the entire piece?] Mm-hmm. When my granny or my papa, when I get like . . . mad or something at somebody, they’ll start singing that song, and it’ll make me feel better.

[How do you think the composer feeling when he wrote this music?] Happy. [All the way through, or just for different parts of it?] Mm-hmm, all the way through. [Is that how it made you feel - happy from the beginning to the end?] Mm-hmm. [Is that why you turned the dial so far over the right and left it there for most of the entire piece - throughout all the different sections?] Mm-hmm. [Did all the different sections, the piano alone and the orchestra, give you a good feeling?] Mm-hmm.
[Can you think of a time in your life, besides the time with your papa, where this music could have matched your feelings or maybe even changed your feelings, if you could have listened to it?] Well, probably, last year since there was a kid in Chaires that’d always make fun of me and stuff. I kept on balling my fists, about to punch him, but then I told myself, "Don’t punch him," because then I’d get a referral. And this would have calmed me down.

2nd Listening:

[Tell me about your feelings this time.] This time, I’m feeling about my grandma, because she’s um . . . passed away. [When?] Last year. [Oh, I’m really sorry to hear that. So, did this music remind you of your grandmother?] Mm-hmm. [How did it make you feel?] It made me feel good. [Is that why you turned the dial pretty far to the right and left it there for most of the piece?] Mm-hmm. [Did the entire piece of music give you a good feeling?] Um, no. [Did you ever have a sad feeling?] In some parts it was. [When you had a sad feeling, did you turn the dial back toward the left?] Mm-hmm. When I went really far down (indicating dial placement), that was when the sad part came; but when it wasn’t that sad, I didn’t go down as far (indicating dial placement); but . . . but when I felt really good, I kept on going on up (indicating dial placement). [So, did the music just remind you of something that was good, or sad, or did it actually make you feel that way?] Um, it reminded me.

[Was listening to the music this time worse, better, or the same as listening to it the first time?] I would say it was the same.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Combination of the two. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Un-uh. [But then you still think you need to talk about it?] No, I don’t think I need to talk about it. [You first said that you would choose a combination of CRDI and talking. Is that not what you meant?] Un-uh. [No?] No. [What would you choose?] CRDI. [Why?] Because I don’t like talking about people that are dead.
Subject 25
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Gifted

Figure 26. Graph of Subject 25’s Responses Over Time

1st Listening:
Subject 25’s 1st listening interview was mistakenly not taped.

2nd Listening:
[Tell me about your feelings this time.] Well, it made me feel good at parts, when it was kinda doing that little (student sang the main melody on “tee.”). [With the piano alone or with the orchestra?] With the orchestra. That kinda made me feel good, but you know at the end how it kinda tuned down and went a bit slower and all, it kinda seemed a bit, you know, sad. [When the orchestral section was playing, did it actually make you feel good inside, or did it just give you the idea of something really good?] It made me feel good inside, because, you know, it just sounded positive. [When the final piano section was dying away, how did that make you feel inside?] Sad. [It actually made you feel sad?] Yeah. [It didn’t just give you the idea of sadness?] No. It made me, because, I mean, it was just goin’ great, and then it just died down.

[How do you think the composer was feeling when he wrote this piece of music?] I don’t really know . . . I think he might have felt happy during it, and then thought of something sad.
[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Probably a combination of the two. [Why?] Well, I like the CRDI, but I like expressing stuff by talking, as well. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

[Does this music remind you of any time in your life?] Um, yeah, actually, just yesterday. Reminds me . . . I remember I was so happy . . . this was a Boy Scout thing . . . I was working towards like this big award, and then Ryan calls me on the phone. He’s already signed off on all the stuff I need for it - not all of it, but a lot of it; and he calls me and tells me that I have to do it all again, except this time with the Scout Master. [So you had both the happy and the sad feelings of this music just yesterday?] Um-hmm, just yesterday.

Subject 26
Age 10
Boy
Musical Experience: 1 year piano (maybe)
Developmental Status and Conditions: Normally Developing

![Graph of Subject 26's Responses Over Time](image)

**Figure 27.** Graph of Subject 26's Responses Over Time

1\textsuperscript{st} Listening:

Subject 26’s 1\textsuperscript{st} listening interview was mistakenly not taped.
2nd Listening:

[Tell me about your feelings this time.] At first, it was, like, going kinda slow, where it felt kinda sad. [Did the music actually make you feel sad, or did it just remind you of something sad?] Yeah, it made me feel sad; and then when the music got real, like, high, it seemed . . . it made me like full of joy and something good had happened. [Tell me about the end.] At the end, it got kinda sad again. [Did you turn the dial back to zero because you don’t like the sad feeling?] Um-hmm. I was turnin’ it down, yeah because . . . just too sad. [Do you not like to have a sad feeling when you listen to music?] No. [Does this music remind you of anything in your life?] Hun-un.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] (long pause) A combination. [Why?] ‘Cause, I would like . . . to like show that I . . . like tell the person that, like, um, like . . . it’s pretty hard. [Is it because you think you need some explanation about why your turned the dial in the way that you did?] Um-hmm. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

Subject 27
Age 10
Girl
Musical Experience: Voice, 2 years
Developmental Status and Conditions: Title I

Figure 28. Graph of Subject 27’s Responses Over Time
1st Listening:

[Tell me what you were feeling while you were listening to the music.] Um, I think it’s about um, I think that was really about, like a slow mood like something. Like a slow type of dance, like somebody who really, um, was sad or something. [Did it make you feel sad?] Um, a little, but then, when it . . . when the orchestra started coming in, I started to get happy again, and then, it was like a little, it was like a "hump-de-hump" thing. [You left the CRDI dial pretty far over to the right. Tell me about that.] Uh, when um, when it was fading, um, I . . . I don’t know what I was thinkin’ on that one. [At that point, how did it make you feel inside?] Really good. I still could - I could still see the song going on. [So, do you think it was not sad at the ending?] Sort of, kind of sad. [And feeling sad didn’t make you want to turn the dial back toward the left side more?] No. [How was the feeling at the end different from the feeling in the middle section?] I had the best feeling when it started to get loud, and the orchestra started coming in, um, that was the best feeling. [But when the orchestra dropped out, you didn’t change the dial position that much. Why?] With the piano by itself my feeling went back down a little bit. [But not very much; look where you left the dial.] It was still a good feeling.

[How do you think the composer was feeling when he wrote this music?] Um, I think he was feeling kind of sad, or, I don’t know - trying to calm himself down and wrote the piece of music. [Did this piece of music could calm you down as you listened to it?] Yes. [Did you like the feeling of calmness that it gave you?] Yes. [Which feeling did you life better, the calmness or the excitement in the middle section?] The excitement.

[Can you think of a time in your life when this music could have changed or matched your feelings?] Um, there was this one time when, um, like at my first perm, and it started to um, burn, and that could have calmed me down. [This music could have calmed you down from a burned perm?] Yeah. (laughs)

2nd Listening:

[Tell me about your feelings this time.] Um . . . um, it made me feel happy. [Throughout the entire piece?] Yes. [Is that why you turned the dial all the way over to the 255 and left it there?] Because . . . what um . . . when I um . . . when I . . . when . . . before I came over here, and before I took my pictures, I had to go to Mr. Bailey’s office, because someone put a restraining order on me. [Yes.] And then I had to put the restraining order back on them, and then . . . I had to um . . . and then . . . it, like, calmed me down; and I was so hyp . . . I’m
like - and everything; and then it made me happy. [So, are you telling me that this music calmed you down, now, as you listened to it?] Yes. [It actually changed the way you were feeling inside?] Yes. [Is that why you turned the dial so far toward the right and left it there throughout most of the piece?] Yes. [Were you using the dial to show how great the music was making you feel?] Yes. [Do you think this music was just the thing you needed at this time, today?] Exactly. [Is there anything else you want to tell me about this music?] Um-hmm. Yeah, I like that song. I heard that song before, and it’s a very good song.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] I choose a combination of both of them. [Why?] Well, because, like, as the music is going by . . . like, some people just . . . do not have a good remembrance, so it would be good to, like, talk as you go, so, like, you can know how you feel, like right then. [Do you think it’s hard to describe how music makes you feel?] No. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah. [But you also think it’s important to talk about how the music makes you feel?] Yes.

Subject 28
Age 10
Boy
Musical Experience: Guitar, 1 year
Developmental Status and Conditions: ADHD, Tourette’s Syndrome

Figure 29. Graph of Subject 28’s Responses Over Time
1st Listening:

[Tell me what you were feeling while you were listening to the music.] Mm, I liked the part where the orchestra was in it. [Why?] ‘Cause it made it sound more lively. [How did it make you feel like inside?] Mm, mm . . . [Can you think of any adjectives to describe it?] Well, live, too, I guess. [Do you like feeling "lively" inside?] Mm-hmm. [Did the music actually make you feel "lively" inside, or did it just remind you of something lively?] Yeah, the orchestra was - well, it made me feel lively inside; but then I didn’t like just the plain piano, so that’s why I was . . . [Go on.] ‘Cause I didn’t . . . it sounded kinda dull. [How did that section make you feel inside?] (Makes noise.) Uh, ugh. [Were those sections, with only piano, lively?] No. Not without . . . not with just piano. It could only be here at the end with the orchestra. [So, if it didn’t feel lively, can you think of an adjective the describe the feeling.] Dull. [Dull inside?] Yeah. [And were you showing with the dial that you didn’t like a "dull" feeling?] Un-hun. [Did those sections of the music, with only the piano, remind you of anything sad?] Nah. [Did they remind you of anything calm?] No, but they reminded me of things that are stupid.

[How do you think the composer was feeling when he wrote this music?] Something calm. He was calm, and then he would sort of fall asleep, and then he got louder. I think it was that person - I studied that person. [Was it a musician?] Yeah. [Can you remember his name?] Um . . . [Was it Haydn and the Surprise Symphony?] Yeah, yeah. That’s it. [This music is not by Haydn; it’s by Rachmaninov, a Russian composer.]

[Can you think of a time in your life when this music would have matched or maybe even changed the way you were feeling?] Usually when there were people around me. [Which feeling - lively or full?] Mm, kind of both. That’s why.

2nd Listening:

[Tell me about your feelings this time.] Um, happy. [Throughout the entire piece of music?] Um-hmm (student laughs). [In the first solo piano section . . .] Um-hmm. [During the orchestral section . . .] Um-hmm. [In the last section with solo piano . . .] Yeah. [Why?] I was paying more attention . . . I was paying more attention. Last time, I was basically falling asleep. [Why do you think you were paying more attention this time?] Um, I was wide awake. [Today, you are wide awake?] Um. [Did you not get any differences in feelings during any of the different sections of the music?] It was just basically happy. [Is that why you left the CRDI dial up all the way to 255 even at the end, when the music is slow and soft?] Um-hmm. [According to how you
moved the dial, this entire piece of music gave you a great feeling pretty much all the way through. Is that correct?] Yep.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] (long pause) Probably the CRDI. [Why?] Um, ‘cause I’m not really good at, um, expressing my feelings through words. [Do you think it’s hard to talk about your feelings?] Um. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah. [Would you be satisfied with the graph that the CRDI gave as your emotional response?] Um-hmm.

Subject 29
Age 10
Boy
Musical Experience: Piano, 2 years; Percussion, 1 year
Developmental Status and Conditions: Gifted

Figure 30. Graph of Subject 29's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Any particular part? [Any place you want to start.] Well, one part, when it was getting a lot of instruments and stuff, it got me excited and like was really energy generating; and, um, then towards the end, it was really, really, really nice, and it was really, like, slow and soft. At that part, it was like, it was
really good. [If it was really good at the end, why did you turn the dial back so far?] It just, it doesn’t, like, get me going, because it’s so slow; it’s just . . . it’s sort of like . . . I don’t know. When it’s fast, it gets me going, and it makes me really excited. And I like the other part, but it was just so slow, and it sort of just . . . made me feel “blah.”

[What do you think the composer was feeling when he was writing this music?] Um, well, like what was he feeling - was he sad or happy? [Answer however you want.] Um, this one’s a really hard question. Um, I have to say he was probably, um . . . this is hard. I don’t really know. [That’s okay.]

[Can you think of a time in your life where this music would have matched or maybe changed your feeling?] Okay, that really helps me. I think he probably felt like he was real lonely. He felt lonely at that time, sort of. I mean, he wasn’t happy and excited; he wasn’t, like, crying sad, just sort of like, sort of like “mopey” or something; not in a bad mood but not in the greatest one either. [Does it make you feel lonely?] Yeah, at little - it makes me feel lonely. [So do you think this music is sad?] No, no. I really think . . . when I got excited that wasn’t sad, but really what amazes me is how different the two parts are. I mean, they’re so . . . they’re so much different. One’s like soft. They sound like two different thoughts. Like, one’s soft and one’s just . . . (made large gestures with hands) . . . you know. [How did you feel in the parts that you call softer?] It was okay. It seemed a little sad, because, I don’t know. It seems like, I mean not always, happy is sort of fast and loud - oh, boy, not really loud - just fast - lots of music and noise. But, you know, it’s sort of sad, like. It sounds like almost like - the last part - like somebody died - that kind of music, like real slow and soft. [Do you want to tell me anything else about the way you feel?] No.

[When in your life could this music have matched or changed your feelings?] Yeah, like, if I’m in a dark room, with just a little light on, at a desk, and maybe I’m doing my homework or working on some kind of project; and my mom’s doin’ something; my dad’s doin’ something; and I’m just there by myself working on my little project. That’s sort of what that makes me feel like. It’s sort of like that kind of loneliness thing. [So, in your case, it’s not a bad loneliness?] No, no, no. It’s like . . . it definitely does not make the think I’m at a party (student laughs). [And that’s okay with you, or do wish it made you feel like you were at a party?] It’s fine. I like different kinds of music. [Do you like the different kinds of feelings that you get from the different kinds of music?] Yeah, yeah.
2nd Listening:

[Tell me about your feelings this time.] Um, it was just about the same, but um, I don’t know, it was a little bit different in how long I felt the excitement of it. It felt a little bit shorter this time. [What do you mean by excitement?] When the orchestra is playing. I mean, I had it to 255 for, I don’t know, 5 seconds. So, but I still think it was about the same, and it was really calming . . . [The whole piece of music was calming? Even when you say the orchestra was exciting?] Yeah, (laughing) that’s so exciting; but most of it was really calming, and it was really nice music. [Does the music actually make you feel calm or does it just give the idea of calmness?] It makes me calm inside. [When the music is exciting, does it make you excited inside?] Makes me excited inside.

[Was the music better, the same, or worse this time?] Maybe a little bit better, because even though there wasn’t as much excitement, I think maybe the first time there was a little bit too much excitement; it wasn’t calm enough. But I still think it was very good.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] CRDI, definitely. [Why?] I don’t know; because I just can’t think of much to say about it, but when I have this, I mean it’s like, without talking I can just move it, and I can show how I feel without having to say it. [Do you think it’s easy to talk about how you feel?] No. For me, it’s really hard to explain how I feel about music. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah. By this, I can try to show it; but if I just try to say it step by step, I’d just be like repeating myself over and over, but this has so many different levels of excitement and you can show it with the dial.
Subject 30
Age 11
Boy
Musical Experience: Piano, 1 year
Developmental Status and Conditions: ESOL

Figure 31. Graph of Subject 30's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Um, um, sometimes, it goes, the music goes up, like, high, and that’s the part that I sort of liked. When it’s going down low, I don’t really get so much in-interested in it. [Why do you think that is?] Because, I like exciting music more. [What does it do inside of you that makes you like it more?] It makes me listen attentively and stuff. [Does it make you feel differently than the music that "goes low"?] Yes. [How?] Um, it, like, get me, ge-it gets me fired up and stuff, like . . . [And the "low" music doesn’t do that?] Not really. [How does music that’s "lower" make you feel?] Um, it’s sort of . . . sometimes it makes me feel sad, so I don’t like to feel sad - sometimes a little bored. [So, you prefer the "fired up" feeling to the sad feeling?] I do.

[Look at where you left your dial. You didn’t turn the dial all the way back to the left at the end, even though the end is what you call "lower" music that you said makes you feel sad.] I left it right there (indicating dial placement). [So, if the music there makes you feel sad, why did you leave the dial that high?] I like, I like endings, but I don’t know why. [Did the music make
you feel sad at the end?] I like to feel sad at the end. [Okay, but you didn't like feeling sad in the beginning?] Yeah. [So was the feeling from the ending better than the feeling in the beginning?] Yes. [Why do you think the feeling at the ending was better?] Because, the beginning sort of came up a little boring and stuff. Well, not really boring, but not so much interesting. [Do you think the feeling you had at the ending was maybe left over from the middle part that you thought was more exciting?] What do you mean? [The feeling from the middle, exciting section of the music maybe carried through to the end?] Yeah, maybe so. I don’t know.

[How do you think the composer was feeling when he wrote this music?] Um, hmm, he might of like, it was, some, some parts, it was sort of sad. So, he might have been thinking of a friend that moved away, in some parts, he thought of positive things, like, "Who cares, I have more friends," and stuff.

[Has there ever been a time in your life when this music would have matched or maybe changed your feelings?] Yeah. [Will you tell me about that?] When I was, um, when my friend got mad at me, and then I said, "It-It’s okay," and then I went to say "I’m sorry" and stuff, and then it ended. [And so that was a good thing?] Yeah, yeah. [What section of the music would have matched that feeling?] All of it, sort of, happy and sad together.

2nd Listening:

[Tell me about your feelings this time.] Well, like I said the last time, I like the . . . um, ending, like, soft. [Why? How does it make you feel like inside?] Well, it makes me feel, like . . . um, well it, I like it. I don’t know why I like it - the ending, but . . . soft, I just like it. It sounds right - like starting a little slow, but not so slow, then going into the exciting, and then go slower and slower. [Does it give you that kind of feeling inside?] Yeah. [How do you feel inside when the orchestra’s playing?] Excited. [How did you feel when the piano plays alone again at the end?] Well, I like that little part, so . . . I like it. [Can you think of an adjective to describe the feeling a little better?] Um, maybe peaceful feelings - calm. [Which section gives you a better feeling - the orchestral section or the piano sections?] Well, that’s hard to say. I like the orchestral part best, but I like the ending, too.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] I might have chosen a combination of the two, because I like music. [Do you think it’s hard to talk about how music makes you feel?] Sort of - like, like lots of . . . like sometimes, it might be the same thing, but at a different time in
the song, and you just like it more that time in the song. [So, even thought it's difficult to talk about feelings and music, you still think it's important to try?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

Subject 31
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 32. Graph of Subject 31's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Um, I was feeling like it, the, in the very beginning of the music, I thought it was kind of ok and kind of not, and then . . . [Why ok and why not?] Because, like, some parts in the beginning, and it had like, low music, and I didn’t, wasn’t really interested. [Why not? What did it make you feel like, to make you not interested?] Like, made me feel kind of dull. And then, and then kinda in, in halfway, halfway between, the music it started getting louder and more interesting and . . . [Why do you think it was more interesting?] Because, like, it had more, had more, um, like, music to it. [How did it make you feel inside when you thought it was interesting?] Uh, it made me feel kind of happy. [Did the other parts not make you feel happy?] Yeah. It was like, it was like I was, um, I
just . . . like it was Christmas, and then uh, I didn’t get like, though like, most of the presents that I didn’t wanted. [In which part of the music made you feel like that?] The beginning. [And then, as you said, “halfway through,” how did you feel?] Happy. [Then what happened?] And then like, at the end, uh, it started slowing down, like, started getting duller and duller, and so I went back (indicating dial movement), and then it made me feel . . . then whenever it started stepping up a little bit, I went up a little bit (indicating dial movement). [Why?] It was just something in the music; it was like, and whenever I went down (indicating dial movement), it’s like it just popped back up. [I noticed that, and I wondered what you were feeling then.] Yeah. And then, uh, like at, towards the very, very end, I didn’t like it too much ‘cause it got really dull. [Can you explain what you mean when you say, “It’s dull?”] How does the music make you feel there? Like, scary something, ‘cause it got, it got like, really lower, and I didn’t like it. [Did you not “like it” more because it was dull, or more because you didn’t like the way it made you feel?] I didn’t like the way it felt, and it was dull.

[Can you think of a time in your life when this music would either have matched your feelings or maybe changed the way you felt?] Um, if like, one time, whenever I was crying ‘cause I didn’t get uh, candy - chocolate chip candy; and then, whenever I hear that music, I go up, and I forget about the chocolate. [What do you think would happen when the music becomes soft again?] Then, when it comes back down again, I start to feel . . . whenever I want the chocolate again. [Do you think that the music actually makes you feel like that?] Uh, yes.

[How do you think the composer was feeling when he writing this music?] I think he was feeling kind of like if, um, if he had a girlfriend or something, they broke up; and he was happy when they were together, and then they broke up. He just went back and started writing kind of lonely music and then, whenever he got it, and he started feeling happier and made some more friends and, and, and then I also think that like, uh I think like, he was on, I think he was drinking and he didn’t like it, and so he felt lonely and then started writing music. But then I thought that, thought that he, like, he stepped it up and made some more friends and quit drinking and stuff.

2nd Listening:

[Tell me about your feelings this time.] Um, I think this one was different. [How?] ‘Cause, um, last time, it started off really, really high; then it got really, really low; but this time, it . . . it started low, but then, it started getting higher and higher; and that’s when I liked it, ‘cause it just wanted to make me like . . . I don’t know . . . just made me feel happy. Then, whenever it got to
the low part, at the beginning, I thought it was at somebody’s, like, somebody’s funeral, or something; and I didn’t like it too much. [Do you not “like it” because you don’t like the feeling it gives you?] Yes. [Do you think the music was ugly or horrible?] Uh, no. I liked it in the, in, kind of in the middle - where it was high pitched, and um, whenever they’re . . . [When the orchestra was all playing?] Yeah; and I liked that, ‘cause it made me feel happy; but in the beginning, whenever it was like, maybe like - kind of dull, I . . . [When it was just the piano by itself?] Yeah, I just didn’t like it too much. [Is it because you think the music was ugly, or you didn’t like the feeling you get from it?] Didn’t like the feeling.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] A combination of the two. [Can you tell me why?] I would choose, um, ‘cause, like, on the first one, it . . . part of it, um, I . . . I would like . . . I would like to do that without talking; but at once, like I get out, and people would, like, ask me, “Well, how . . . what’s the music like;” and then I have to tell them. [Do you think it’s hard to describe how music makes you feel?] Kinda. [But you think it’s important to try?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

**Subject 32**  
Age 10  
Boy  
Musical Experience: None  
Developmental Status and Conditions: ESOL

![Graph of Subject 32's Responses Over Time](image)

**Figure 33.** Graph of Subject 32’s Responses Over Time
1st Listening:

[Tell me what you were feeling while you were listening to the music.] Hmm, I dunno. [When you were listening, how did it make you feel inside?] I dunno. [Did you like the way it made your feel?] Yes. [Which section made you feel the best - the sections with the piano alone or the section with the orchestra?] When the piano . . . [By itself?] Yes. [Not with the orchestra.] No. [Why did you like that part better?] Because I thought, um, when the whole orchestra played, um, it sounded confusing, because I didn’t know who was who. [Was it too loud?] Um, no, not really. [Why did you like the piano by itself more?] Um, it was calmer. [Did you like the calm feeling in the music more than you liked the . . .] Yes. [When you listen, do you usually like the calm feeling more than any others?] Yes.

[How do you think the composer was feeling when he wrote this music?] Happy. [All the way through the entire piece?] No, sometimes sad. [Where do you think he felt happy?] When it was like, a little bit louder than, um . . . [And where do you think he felt sad?] When he was, it was, just, um, down low. [Did it make you feel sad?] No. [Did it just made you think of something sad?] Yes.

[Can you think of a time in your life when this music would have matched your feelings or maybe even changed your feelings?] Yes. [When?] When um, you mean the whole thing when I . . . [Which ever section you want to tell me about.] Well, um, when um, it’s - I got that . . . Because um, I could go somewhere. [In which section of the music?] With the orchestra. [What about the slower part?] Um. [Would that make you excited?] Mm, no. [Can you think of a time in your life where you felt like that the piano section makes you feel?] Sad or um, not, sometimes, not, not very sad. I’ve never felt very sad. But, I felt sad. [Overall, how did the whole piece make you feel?] Good. [All the sections together, slower and faster?] Yeah.

2nd Listening:

[Tell me about your feelings this time.] I dunno. [How did the music make you feel this time?] Well, the same. [The same as before?] Yeah. [Which section made you feel best?] Um, when it was loud. [With the orchestra?] Yeah. The loud part. [So, if the orchestral part gave you such a great feeling, why did you leave it up so far at the end when the piano was playing by itself?] Um, because. [Did it give you the same feeling as when the orchestra was playing?] Yeah. [The piano playing alone at the end gave you the same feeling inside as when the orchestra was playing?] Yeah. [Even though it was softer and much slower?] Yeah. [Do you think the feeling
just carried over from the orchestral section?] No. [The ending piano section gave you a feeling almost as good as the feeling from the orchestral section?] Yeah.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, only the CRDI. [No talking?] No. [Why no talking?] Um . . . (long pause) . . . [Is it too hard to talk about your feelings?] Yeah. [Is it hard to talk about how music makes you feel?] Um-hmm. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

Subject 33
Age 9
Girl
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 34. Graph of Subject 33’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Um, I was thinking about where I used to live, because the music was really, like, familiar. [Can you explain that?] It was, well, when I was at school there, this music was really like the music that they played at school. [At the school attended before this one?] Yeah. [How did it make you feel inside?] Really, really excited, ’cause I like the big, big music; it was like really exciting. [Are you talking about
the section where the orchestra was playing?] Um-hmm. [When the piano was playing by itself, how did the music make you feel?] I was kinda seeing my old friends, you know. [How did the middle, exciting part feel inside?] It felt like I was really hot inside, because it was like (student sucks in breath); and I really liked it.

[At the end of the piece, when the orchestra fades outs and the piano is playing alone again, why did you leave the dial so far to the right?] Because I still felt that excitement inside me. [Even though the orchestra died away, the volume became much softer, and the piano was playing slower, you still felt the excitement from the middle section?] Um-hmm, yeah. [Is that why you didn’t turn the dial back toward the left side?] Um-hmm.

[Can you think of a time in your life, in addition to thinking of your old school, when listening to this music might have matched or even changed the way you were feeling?] Um, if I was with my family. [Any family member in particular?] Maybe my grandma. [Why do you think she might want to listen to it?] When she’s lonely, ‘cause that’ll make her feel happier.

2nd Listening:

[Tell me about your feelings this time.] Um, good. [Throughout the entire piece?] Mm-hmm. [Is that why you turned the dial so far to the right and basically left it there?] Mm-hmm. [Even at the end, when the music was softer and slower, you didn’t turn the dial back too far toward the left side. Can you explain why?] Um, ‘cause the excitement was still inside me when the orchestra came loud. It was really, really, really excited - like hot bubbles going up inside me. [Would you want that to go on for a long time?] Yeah. I’m still excited, getting a little bit more relaxed, the bubbles are going away slowly. [Would you have liked for the “bubbles” to have gone on longer, or are you fine with the music just the way it is?] Fine. [And even when the orchestra stopped playing, and the piano was playing alone again, the excitement was still inside of you?] Mm-hmm.

[Was listening to the music this time better, worse, or the same as listening to it the first time?] The same.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] This one (indicating CRDI). [Why?] Because I don’t like to talk that much. [Is it hard to describe what you feel?] Yes. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yep.
Subject 34
Age 10
Girl
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 35. Graph of Subject 34’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] It reminded me of flowers. [And how did that make you feel inside?] I can’t describe it. [Can you think of any adjectives to describe it?] Calm. [The whole way through?] Like, in the middle. [Do you mean when the orchestra was playing with the piano?] Yeah. It’s different. [How?] Like, it’s more exciting. [When it was exciting, did it still have a calm feeling to it?] Yeah. [So the excitement and volume of the music didn’t affect the calmness in any way?] No. It was just as calm. [Can you tell me a little bit more about that?] (Long pause.) [Was any section of this music not calming to you?] No. [When did you think about flowers?] Um, towards the end. [What were you feeling or thinking about before that?] Birds.

[How do you think the composer was feeling when he wrote the music?] I don’t know. [What kind of mood do you think he was in?] A fairly good mood. [So, does this music make you feel happy or sad?] Happy. [All the way through?] Mm-hmm. [Do you think the composer was happy?] Yeah.
[Can you think of a time in your life where this music would have matched or changed your feelings?] No, not really. [Was there ever a time when you felt calm, and it would just ...] Yes, lots. [Can you tell me about some of them?] Um, I think it was - last year, in May. Mm-hmm, and um - I just can’t . . . [Is it too hard to describe?] Yeah. [Does the music give you a certain feeling, does it enhance your feeling, or do you think it could change your feeling?] Not really. It’s just good to listen to.

2nd Listening:

[Tell me about your feelings this time.] I can’t really describe it. [Was it the same feeling as last time?] Sort of. [Was the feeling better or worse?] Better. [Do you think there is an overall feeling to the entire piece or are there different feelings for different sections?] The same feeling. [Throughout the entire piece?] Yeah. [How would you describe that feeling?] Just a pleasant feeling. [Even when the piano is playing alone?] Well, in the middle, when the whole orchestra was playing, it’s more of an exciting moment. [And you would say the rest of it is pleasant?] Yeah. [Do you think it had a sad feeling at all?] Well, when the piano starts fading away, it gets sadder. [But you didn’t turn the dial back toward the left from there. Why?] Well, yeah, but only a little bit. [Only a little bit of sadness?] Yeah. [Then, was the rest just "pleasant"]? Yeah. It was sort of a mixed . . . but it was more pleasant than sad. [And so you still liked the feeling?] Yeah.

[In the middle section, with the orchestra, you turned the dial far toward the right and 255, then turned it left a little bit, and then you went back toward the right at the end of the piece. Can you tell me why you did that?] Because it’s the different notes. They sound different; like, once, it went . . . it was like . . . it was a good feeling; and then it went a little sad; and then . . . and then it went good. [Did you get lost in the music and just sort of let it take you away for a couple minutes?] Uh-huh. [If you weren’t feeling so great, do you think you could listen to this music and it could make you feel better?] Yeah. [It would help you in that way?] A lot.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Just using the CRDI. [Why?] I don’t know . . . ‘cause I don’t like to talk. [You don’t like to talk about your feelings?] Yeah. [Why?] I don’t know . . . (long pause); it’s too hard. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Um-hmm.
Subject 35
Age 9
Girl
Musical Experience: Piano, 5 years
Developmental Status and Conditions: Normally Developing

![Graph of Subject 35's Responses Over Time](image)

**Figure 36.** Graph of Subject 35's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Um, I felt kind of, towards the beginning - it was really soft, so it like - it almost put me to sleep; but it was in towards, like, the middle part, it started getting louder, and it kind of woke me up; and it, I liked it better when it was louder. [Why? How did it make you feel inside?] Because, um, ‘cause like, the piano . . . where the piano is, starts kind of getting more into the piece. That’s what it sounds like to me. [And so what does it make you feel like inside when that happens?] It makes me feel good, because it . . . (long pause) [Can you think of adjectives to describe it, maybe?] Okay. At the beginning, he was calm, and I’m real calm; but then towards the middle, it started getting, the piano started getting excited in the piece, and that made me feel really good, too. [And was that feeling better?] Yeah. [You like the feeling of excitement better calm.] Yeah, yeah. [Okay. Tell me about the end of the piece. Look where you left the dial at the end, when the piano is playing alone again. You said you like the excited feeling in the "middle" better than you like the calm feeling; but the end, when the piano is playing alone again, is also calm, wouldn’t you say?] Yes.
Well, I like the end more because it was like - I love playing the piano; and I’ll play in pp, um . . . or um, forte or, all of that, and um, it’ll . . . it just makes me feel really good that like - someone else enjoys doing what I enjoy, and . . . [So do you think the feeling you had was influenced by the fact that it was a piano playing at the end?] Probably. [And because you like the way it sounds - the timbre, etc. of the piano, it gives you a good feeling, no matter if it’s slow and soft?] Yeah.

[How do you think the composer was feeling when he wrote this music?] In the beginning and the end, he probably felt . . . well, in the beginning, he probably felt good, because he was like . . . and then in the middle, he might, like . . . in the beginning, he might’ve felt good; and then he stopped for a day’s work; and then in the middle, perhaps he . . . something angered him, and so he went back to his music and started being loud; and then he took a break again; and at the end, he was happy again - maybe because he had done all that work, and . . . [Do you think this music is sad at all?] No. [Does any of it give you a feeling related to sadness?] No, just calmness. [And then excitement in the orchestral section?] Yeah.

[Can you think of a time in your life when this music could have matched your feelings or maybe changed them?] Yes. [Can you tell me when?] When I’m with my brother. [Which section of the music matches your feelings when you’re with your brother?] The middle section. [With the orchestra?] Yeah. [Why does that match your mood when you’re with your brother?] When he makes me mad. [Do you think you could you use the piano sections to change your feelings mood from that?] Yeah. [Do you think they could calm you down?] Mm-hmm.

2nd Listening:

[Tell me about your feelings this time.] Um, at the beginning, it was soft and like, I don’t really like the soft part. [Why? How does it make you feel that you don’t like?] Um . . . [Does it make you think about something that you don’t like to think about?] Um . . . I don’t know. It’s just that I like . . . liked it, um, well, I guess it’s because the pianist isn’t so involved in that part. [What kind of feeling does it give you?] That he’s just like, he or she’s just playing. They’ve played it a hundred times, and they know what to play, and they’re just playing it; but then towards the middle part, it gets louder; and when I play the piano, the soft part I know, ‘cause it’s easy, and then the loud part, I’ll lean down to the piano and play louder. [When you’re doing that, how do you feel inside?] Happier. [When you’re playing the slower part, how do you feel inside?] Easy. I like a challenge. [Why did you leave the dial where you left it at the end?] Because . . .
guess it’s my way of congratulating the pianist for doing, um, for, for, um, play, just, um . . . [So, even at the end, though it was slower and softer than the middle, did the music still give you a good feeling?] Um-hmm, yeah. [Do you think the feeling was still connected in some way to the great feeling you had during the middle section with the orchestra?] Yeah. [Was the feeling different than the one you had in the beginning with the slow, soft piano?] Yes.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Hmm, both. [Why?] Because the CRDI is like, it shows how you feel. [Do you think it does a good job of that?] Yes, and then talking explains how you feel - explains the CRDI, I guess. [Do you think that’s important?] Yes.

Subject 36
Age 10
Boy
Musical Experience: Piano, 3 months
Developmental Status and Conditions: ADHD; Tourette’s Syndrome

![Graph of Subject 36's Responses Over Time](image)

Figure 37. Graph of Subject 36's Responses Over Time

**1st Listening:**

[Tell me what you were feeling while you were listening to the music.] Well, when it was like going to a lower sound, it made me feel like - have you seen um, the movie *Mozart* where he was dying? That’s what it made me feel like. [Do you like that feeling?] I didn’t like it. [In the
sections where you turned the dial back toward the left and zero, is that the feeling you were having?] Mm-hmm. [Did you think the music was ugly?] No. I liked it - just . . . until that part. [Did you have other feelings in different sections of the music?] Yes, ma’am. It felt good, like after that part when it felt . . . and it had like a low . . . I mean, sort of high, but - I don’t know how to explain it. [That’s okay.] Sort of high, sort of low - it made me feel better. [Was the piano playing alone, or was the orchestra playing with the piano?] When the piano was by itself. [Was that at the beginning of the piece or towards the end?] Towards the end. [Tell me about the middle section, when the orchestra was playing.] Well, that made me feel okay. [In the middle part of the middle section, you went way back toward the left side and zero. Can you tell me why?] Because that’s when it made me feel like I was about to die. [So, in that section, were you relating the feeling to the Mozart movie?] No. That’s what it was making me feel, ‘cause . . . [In the middle section when the orchestra was playing?] Yes, ma’am. [Was it too loud?] No. It was perfect. [If you weren’t relating the feeling to the movie, to what were you relating it?] I was thinking that that was me. [Did this music actually affect the way you were feeling inside?] Mm-hmm. [It didn’t just give you an idea, but it made you actually feel like that?] Yes. [And you used the dial to show me that you didn’t like that feeling?] Mm-hmm. [Overall, what do you think about the music?] Um, I think it was nice. [Even though it gave you bad feelings as well as good feelings?] Yes, ma’am.

[How do you think the composer was feeling when he wrote the music?] He was probably in a sad mood. [Throughout the entire piece?] No, just for part of it. [For which section?] Like, when I was sad - when it got really low - when he felt down and stuff.

[Has there ever been a time in your life, besides the Mozart movie, when this music would have matched or maybe changed the way you felt?] Mm, probably not. [Do you think it possibly change your mood?] Probably. [Is that a good thing or a bad thing?] Good.

2nd Listening:

[Tell me about your feelings this time.] I was feeling okay. [Can you explain that a little more?] Well, um, some parts it made me a little nervous and stuff; and other parts it made me feel good. [Where did it make you feel nervous?] Um, when it started to get like, sort of low. [Why do you think that makes you feel nervous?] I don’t know. [Did it make you feel nervous both times when the music was low and soft?] No. [When exactly did it make you feel
nervous - in the beginning or at the end?] Mostly at the end. [When the orchestra was playing, how did the music make you feel?] Made me feel good.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] I’d choose both. [Why?] Because, um, it’s sort of easier; because if you need to talk, and you only pick the CRDI, then you can’t talk; and if you pick just talking, then you can’t do the CRDI. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Um-hmm. It’s really good. [But you also like explaining why you moved the dial as you did?] Yeah.

Subject 37
Age 10
Boy
Musical Experience: Piano, 2 years
Developmental Status and Conditions: Normally Developing

![Figure 38. Graph of Subject 37's Responses Over Time](image)

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Well, it was good. [How did it make you feel inside?] Mm, good. [You turned the dial way up toward 255 and basically left it there through the entire second half of the piece. Can you tell me why?] ‘Cause . . . I just liked it. [The entire piece? The sections with piano solo made you feel as good
as the section where the orchestra was playing?] Yeah. [And that’s why you turned the dial all the way up and just left it there - because the feeling from the music was that good?] Yeah.

[What do you think the composer was feeling when he was wrote this music?] Mm, good. [Can you think of some different adjectives to describe his feelings?] Mm, he was just, excited. [Throughout the entire piece?] Mm, some parts. [With the orchestra, probably.] [What about in other sections?] Mm, um . . . sometimes the music goes down; then it goes up, and down. [Did you feelings change as the music was changing?] No.

[Can you think of a time in your life when this music would have matched your feelings or maybe changed your feelings?] Mm, yeah. [Can you tell me when?] When I feel good. [So, basically this entire piece of music made you feel good inside?] Yeah.

2nd Listening:

[Tell me about your feelings this time.] Um, it was good. [Throughout the entire piece?] Um, yeah. [Were there certain sections that made you feel better than others?] Yeah. [Where?] When the music was loud and stuff. [How did it make you feel inside?] Uh, excited. [At the end of the piece, when the music had gotten softer and slower, can you tell me why you left the dial so far toward the right?] ‘Cause I liked the ending. [How did that make you feel?] Uh, good. [Can you think of another word to describe it besides just “good”?] Um, peaceful. [And peaceful is also a good feeling - like excited?] Yeah.

[Can you think of a time in your life when this music might have matched or even changed the way you were feeling?] Uh . . . uh . . . yeah. [When?] When, I go in my bed, it’s peaceful. [And this music gave you that same feeling?] Um, the feeling at the end.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] A combination. [Why?] Because, uh . . . (long pause). [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah, yeah. [But you still think you should talk about it also?] Yeah. [Why?] So . . . I can’t explain it. [But you do think that you would choose to talk about it?] Oh yeah, because it’s better. [To talk about it than to show it with the CRDI?] Yeah. [Do you think it’s hard to describe how you feel about music?] Yeah. [So is that the way the CRDI helps you?] Yes. [Even though it’s hard to describe, do you mind trying to talk about it? Does it bother you to try?] Uh, sort of.
Subject 38
Age 10
Girl
Musical Experience: None
Developmental Status and Conditions: Gifted

![Graph of Subject 38's Responses Over Time](image)

**Figure 39.** Graph of Subject 38's Responses Over Time

**1st Listening:**

[Tell me what you were feeling while you were listening to the music.] Well, when it was like kind of like, I think it was when the orchestra was playing, that kind of made me happy. I like when things . . . like loud things. I’m not a quiet person, so even though I sort of liked it when it was quiet, but I like it better when it was loud. But when it kinda went down, it made me kind of go - okay, I don’t really feel good about this part. I feel really good when it’s like high, and I didn’t really like the low part when the piano played--I think that’s when it was--because, like, I mean, I like piano and all, but I mean, when it kinda got really low, I really kinda felt like, oh, like this is sleep time; but then when it, the music kinda got higher, and higher, and higher, it made me feel like, “oh, cool; time to get up now and get ready to go play or something.” [Talk to me about how it made you feel inside.] Like, when the music was really, really high, it made me feel like when we first scored our first point in basketball, or if I did a really good serve in volleyball, or if I hit a home run in softball, or something. Like, you know - that little tingle in
your stomach? Like last Saturday I scored my first point in basketball, so it made my stomach kind of like “Whoo.” That’s kind of like how I felt when the music got really high.

[Can you think of a time in your life when this music would have matched or maybe changed your feelings?] Yeah. I think it would like, um, when something really funny has just happened. Like a couple of years ago my brother fell asleep on the toilet, and that was really funny, and like that would be a good time to play the high music. But like when, um, something bad happens, like when I ran into something or I hurt myself or something, then that would be a good time for like the piano, ‘cause it was kinda of low. Then, like usually when you watch movies or something whenever it’s not too active, they usually like this lower music. It’s kind of like you get sad and everything, but like when they play fast music and kind of get you going - you kind of like prop up in your seat, and you’re like - “cool, yeah.”

[How do you think the composer feeling when he wrote this music?] Maybe like at certain times he felt kind of like, “Oh, maybe I’ll write a soft piece, and then maybe bring that up a little bit to just to kind of keep somebody guessing, like after something kind of happens, you switch to something else. And that’s kind of what the piece did. It was kind of like some parts were piano, and then it would be like they start the orchestra, and it could pop back up, and it keeps you guessing what’s gonna happen next. Are they gonna keep playing the piano for a couple of minutes, or are they going to switch to the orchestra?

2nd Listening:

[Tell me about your feelings this time.] Well, I liked it, ‘cause I just like that kind of music; but I liked it more when the music was more like full blast and it wasn’t as quiet. [Why?] Because it makes me sit up and actually want to listen. Like, when it’s like, um, quieter, it’s kinda like it’s no really . . . I like fast music. [How does it make you feel inside that makes you like it?] Like, when I like it, jumpy inside; but when I’m not, kind of like you’re settling down ready to go to sleep. [Does it actually make up feel jumpy inside, or does it just make you think of that feeling?] Both, it reminds me that’s how I feel - good inside; like if you’re going somewhere to hear an orchestra play, you kind of want to enjoy the music not be like, you know, “Oh, this is so boring. I don’t want to listen to it.” [Why do you say it’s boring?] Well, this wasn’t boring, but it was just kind of like quiet. [What feeling did you get?] Like, kind of like settling down. [Did you not want to settle down?] No. [When you wanted to settle down, would
this music give you the right feeling for that?] Yeah. [Was it better, worse, or the same listening this time?] Um, maybe like a range between better and the same, like, in between.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, maybe a combination, depending on how I felt that day. If I felt like talking, then I’d probably choose talking; but if I felt like the CRDI, then I’d probably go with the CRDI. [Do you think it’s easy to talk about how you feel?] NO. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

Subject 39
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Normally Developing

![Graph of Subject 39's Responses Over Time](image)

**Figure 40.** Graph of Subject 39's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Well, it made me feel like when my sister used to play the piano, because it was like, really nice like her, and . . . [How did it make you feel inside?] It made me feel really nice and really soft and relaxed. [And were you using the dial movement to show that it was a nice feeling?] Yeah. [Is that why you went all the way over to 255 and left it?] Yeah. [While I was watching you move the dial, I was
wondering if you had fallen asleep. Did you fall asleep?] Oh, no. [So, you were on-task to the
music the entire time?] Yeah. [It just made you feel so "nice" that you left the dial high
throughout the entire piece?] Yeah. [It made you feel that good inside?] Mm-hmm. [Throughout
all the different sections of music, were there any differences in the way you felt?] Well . . . [Did
any sections make you feel differently inside - the piano, the orchestra, and then piano again?]
Not really. [So, you used the dial to show me that it made you feel really good inside throughout
the entire piece of music?] Mm-hmm. [Did you like the music that much, or did you like the
feeling that the music gave you that much?] Both.

[How do you think the composer was feeling when he wrote that music?] He was
probably thinking, about like, a, I guess . . . I guess he was feeling really happy, ‘cause like all the
soft and relaxing feelings through the thing. [Did you think it was sad at all?] No. [Eeen thought it
was "soft and relaxing" - it didn’t make you feel sad at all?] No.

[Can you think of a time in your life, in addition to when you sister was playing the piano,
when this music would have matched or maybe changed the way you were feeling?] Hmm. [Do
you think this music could change the way you were feeling? For instance, if you were not relaxed
and calm and feeling good, do you think this music could help you feel that way?] Mm-hmm.
[Were you feeling good today, even before you came in to listen?] Yeah. [Do you want to tell me
anything else about his music?] Um . . . not really.

2nd Listening:

[Tell me about your feelings this time.] That time I felt pretty good, and since I was in a
good mood, it made it even better. [Were there different feelings between the different sections of
the music?] Um, probably, it just got better, and better, and better. [Tell me why you left the dial
so high at the very end, when the piano was playing softly and slowly.] Um, I’m not really sure. I
just really like soft and relaxing music. [When you say you “like it,” how does it make you feel
inside?] (long pause) Um, it makes me . . . um, remember about my happiest times. [Does it make
you feel any other way?] Um, if I was like sort of in a bad mood, it might make me feel better,
‘cause it’d be relaxing sounds. [How did the orchestral part make you feel?] It kinda reminded me
of my sister. [And that must have been a good reminder, because you went all the way over to
255?] Yeah, yeah.

[If you could choose the CRDI, talking, or a combination of the two to express the way
you feel about a piece of music, what would you choose?] I would probably pick the CRDI and
talk. [Why?] Uh, (long pause). [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah. [Then why do you also think you would choose to talk?] Because I should probably express my feelings. [Is that hard to do?] Not too bad. [Is it hard to talk about how music makes you feel?] Um, not really. [Do you think the CRDI helps with that?] Yeah.

**Subject 40**
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Gifted; SLD; Tourette’s Syndrome

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**Figure 41.** Graph of Subject 40’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Umm, I was feeling like, um, like, um, a play. Like, um . . . [How did it make you feel inside?] Good. [Why?] Because, like, like, loud music just like, makes me just feel good. [Does it make you feel good or does it just match your feeling?] It makes me feel good. [Do you think the music is actually making you feel good?] Sometimes. [If you weren’t feeling too well, say you were in a bad mood, do you think you could listen to music, maybe this music or music like this, and change the way you feel?] Well, it would calm me down, and yeah, probably change me. [So how did you feel when you came to listen to this music today?] I felt pretty good and now a very good mood since
I just heard this. [Did the music match your feeling or change it to be even better?] Matched and changed it.

[Can you think of a time in your life where this music would have matched or maybe changed your feeling?] I was thinking of, like, um, a ballet show. Um, (pause) actually, like, you know how you go to New York and like, you see like show, ballet shows? Well like, I saw Beauty and the Beast, and that’s what, that’s what I thought about. [So were you actually seeing the characters, or were you just thinking of that?] I was thinking um, ‘cause I, ‘cause like, part of this music was in that. [Oh, ok. What part of the music in Beauty and the Beast made you feel the best?] Umm, when the chorus came in. [Relate that feeling to when the orchestra comes in during this piece we just listened to.] Yeah. I really like that part.

[So, tell me why you left the dial way, way over close to 255 even after the orchestra had finished stopped playing, and the piano was alone by itself again.] Because, a piano can be loud by itself. And, um, usually any kind of inst- instrument that plays loud calms me down. [Now, eventually, toward the very, very end, you started bringing the dial back down just a little bit; but you didn’t bring it down far; look at where you left it. Tell me about that.] Well, one thing is, like, once like the loud music go, goes away, like, like, um, sometimes I go like, back into my normal mood, but like, I’m still real, real happy. [So, is that what happened here - you were still feeling real, real happy?] Yeah. [And so you just left the dial up there because you still felt happy?] Yeah. [Do you want to tell me anything else about the way you feel?] Um, I don’t think so.

2nd Listening:

[Tell me about your feelings this time.] Well, it was the same. [As the last time?] Yeah. [Was it better or worse?] Um, better, a little. [Why?] Because, like . . . like, I said before, like, every time, like, when I hear, like, loud music, it just makes me feel good. [Okay. But the end of the piece is not loud, and you left the dial all the way to 255 at the end. Tell me about that.] Well, like, at the end, it was, like, a, like . . . um, kind of like, you were, like, saying goodbye, and, like, sometimes, like, saying, like . . . a person, if you were staying with a bad person, staying, or I, like . . . that’s what it sounded like, and, like, you would be happy. [Happy to be leaving from a bad person?] Yeah. [Was that a good feeling - to be leaving from a bad person?] Yeah, leaving someone that’s bad - that’s mean. [Did you think the orchestral section sounded like someone was mean? Is that what you were thinking?] Well, like, the orchestra part sounded like it was an
average day, but then, like, my parents died, and then I had to go to an orphanage. [But you left the dial all the way over to 255. Were you doing that to indicate a good feeling?] Yeah. [So, how does going to an orphanage give you a good feeling?] (Long pause.) Well actually, I’m not thinking, like . . . my parents didn’t die. It was, like, kind of like they were about to die, but they didn’t. [So, it’s a good feeling that they didn’t die?] Mm-hmm, oh, yeah. [From the way you moved the dial, it would appear that the entire piece of music gave you a great feeling. Is that true?] Mm-hmm. [Can you think of another, or more, adjectives to describe the feeling?] Um, hmm. I can’t really think of one . . . except . . . maybe, it’s calm.

[Intif you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] CRDI. [With no talking?] No. [Why?] ‘Cause, like . . . sometimes it’s, like, hard for me to talk. [Is it hard to describe how you feel?] Yeah. [Is it hard to describe how music makes you feel?] Um-hmm. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

**Subject 41**
Age 10
Girl
Musical Experience: None
Developmental Status and Conditions: Gifted

![Graph of Subject 41's Responses Over Time](image-url)
1st Listening:

[Tell me what you were feeling while you were listening to the music.] Well, at the beginning, you know it kinda started out, like, slow, well it kinda made me think about, like . . . see I used to have this picture up in my room that was call “Pooh’s Secret Garden,” and whenever I looked up at that picture, that, that would be like the music playing in my head or some similar to that. And then, like, when it got really intense, um, that would remind me of how like, um, how, well I don’t really know how to describe it. It would make me feel really . . . happy and everything. But, um, like, when it kind of got, like to the middle, I don’t know. That kind of sounded like a simple version of like a lullaby or something. [At the end, when the music returned to solo piano, what were you feeling then?] Um, well . . . I would say I felt . . . [Was it the same feeling as in the beginning or was it different?] Um, it was the same. [Did you like the feeling of being in “Pooh’s Garden?”] Yeah. [So, if the feeling was good, why did you leave the dial down so low during that section of the music?] Um, I didn’t know I did; because I guess I couldn’t tell where the dial was really going, because I had my eyes closed. [Would the movement have been different if you had been looking at the dial?] Yeah, I think so. [When we do this again, maybe you should keep your eyes open?] Definitely. [Is there anything else you want to tell me about the way the music made you feel?] No, I don’t think so.

2nd Listening:

[Tell me about your feelings this time.] Um, it made me feel basically just the same as it did last time. [Tell me why you moved the dial higher during the first piano section this time.] Well, um, let’s see . . . the way I was balancing out this time was like how it made me feel - if it made me feel happy, or something. And basically, well, um, it made me feel better there this time than it even did last time. [There wasn’t a lot of difference between the dial movement with the first section with the piano only and when the orchestra came in.] No, because basically they made me feel the same this time.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, just the CRDI. [No talking?] No. [Why?] Um, I’m not very good at putting my words in the way I want people to hear them. So, I feel like it I can do it with my hands, or something where I don’t have to talk, I can express it a lot better. [Is it hard to talk about your feelings?] Sometimes, yeah. [Is it hard to talk about how
music makes you feel?] Yeah, right. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

Subject 42
Age 10
Girl
Musical Experience: Piano, 2 years
Developmental Status and Conditions: SLD

![Graph of Subject 42's Responses Over Time](image)

Figure 43. Graph of Subject 42's Responses Over Time

**1st Listening:**

[Tell me what you were feeling while you were listening to the music.] I don’t know. The first part, I thought it was happy, and then I realized that I heard it in like, in - I went to saw, see a musical once, and it was when somebody was dying, and so I turned the dial back down. [Did it make you feel bad? Is that why you turned it down?] Yeah. [Did the music make you feel bad or just the association with the musical that you had?] Yeah. It was thinking about the musical. [And it didn’t make you feel good inside?] No. [Tell me why you turned the dial so far back toward zero for the ending section?] Because, like in the, mo--., the Broadway show that I saw, like uh, I don’t know - like, the girl was running offstage and everything. [What kind of feeling was that?] Bad.
[How do you think the composer was feeling when he wrote this music?] Something bad had happened to somebody. [Did every part sound like something bad had happened to someone?] Well, um, one part I thought was like, flowers, kind of like, uh, one, um, one part was really bright. So I turned it up (indicating dial movement), and then I realized that it, I thought of the Broadway play. [Is that why you turned the dial down again?] Yeah. [Do you think this music actually affected the way you felt?] Mmm. [Or did it just make you think of something that had affected the way you felt?] I think it was thinking part of it.

[Can you think of a time in your life, besides the musical that you saw, when this music would have matched or maybe even changed your feelings?] Yeah. [When?] Um, when my grandpa - father died. [And that wasn’t a good feeling?] No. [Do you think this music is ugly music?] I definitely don’t think it’s bright music; it doesn’t feel good, but I don’t . . . [It doesn’t make you feel good?] I don’t think it would make anybody feel that very good. [What about the section that reminded you of flowers?] Uh, it just, the volume went up and, the notes went up, um. [And you said it was a little brighter.] Yeah. [But that feeling didn’t last too long for you?] No (student laughs).

2nd Listening:

[Tell me about your feelings this time.] I don’t know. It’s just . . . It’s just really sad music. [Does the music actually make you feel sad inside, or does it just give you an idea of sadness?] Yes. [Is that why you left the dial close to zero for most of the piece?] Yes. [How would you describe this music?] (long pause) It makes you feel sad, but, I mean, it’s not horrible like . . . [Why did you turn the dial up a little during the orchestral section?] Um, because . . . well, first when I started turning it way up high, and I realized that, um, the orchestra didn’t fade, but I mean it’s still . . . even though it got higher and had beautiful sounds, it still sounded like it was sad. [Is that why you started moving the dial down again?] Um-hmm.

[Does this music remind you of anything in your life - maybe a feeling you’ve had about something?] When my grandfather died.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Uh, probably a combination. [Why?] Um, because both of them are a combination of the two, which is good to have. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.
Subject 43
Age 10
Girl
Musical Experience: None
Developmental Status and Conditions: Gifted

Figure 44. Graph of Subject 43’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Well, it was like, really soft, and when it gets really loud, it makes up feel kinda triumphant; but when it gets really soft, it’s . . . it doesn’t sound like the man’s really happy, who’s playing it. When it has all those instruments put together, it makes it sound like he’s really happy, and it made me feel happy, too. [When you were feeling, in response to the music, were you only feeling for yourself, or were you feeling how you thought the composer was feeling?] Both of us. [Why did you go all the way over to 255 during the section where the orchestra was playing?] Well, because it was starting to get really loud, and like I said, it had all the instruments combined, and that made me feel, like, really happy. [Did you actually feel happy inside, or did it just remind you of happiness?] It actually made me feel happy inside. [Can you explain why you turned the dial back toward the left side when all the orchestra wasn’t playing anymore? What were you feeling?] Well, it made me feel really happy when all of ‘em were, like, together; but it didn’t make me feel as happy when there’s maybe, like, one or two instruments playing. [So, did you turn the dial down because you
liked the feeling less?] Yes . . . well, I liked the whole piece, but it’s just there some parts that I felt more happy about than I did others. [Why did you “like” the whole piece? Relate that to how it made you feel.] Well, it was always, like . . . one piece shouldn’t have the same note every time; that’s just really dull. So, it got soft, and then really loud, and then soft, and maybe back loud, and then soft, and a little bit softer, and maybe really loud. It just made me feel really good about it.

[Can you think of a time in your life when this music could have matched or maybe even changed the way you were feeling?] Well, something really nice in my life is when I would graduate, so that’s probably when I would probably listen to this, ‘cause it made me feel really happy and excited. [When you graduate from high school?] College. [Do you want to tell me anything else about this music?] Hm, it was just really soft and loud, and that’s what made me feel so happy about it. I loved it. Can I listen to it again? [Yes, actually, we will.]

2nd Listening:

[Tell me about your feelings this time.] Well, it made me feel happy. [Which section or sections?] Well, when the whole orchestra was playing; and when, like, there was only like two or three instruments playing, it didn’t seem as happy; but when it was, like, the piano and all the, um, other instruments playing, it was . . . made me real happy. [Did the music actually make you feel happy inside, or did it just give you the idea of happiness?] Well, kind of in between. I already feel a little happy, but when I hear it, the word “happy” pops into my mind. [When the piano is playing alone, how do you feel inside?] By itself? [Yes.] I just felt sad, kind of. [Why did you turn the dial down so far toward zero?] Because it didn’t really make me feel that happy. [Did you like the feeling?] I didn’t like the feeling. [Is that why you turned the dial back toward zero?] Yeah. [Do you think this music is ugly?] No! [Is it just that you don’t like the feeling you get from it?] Right. [How would you describe this piece of music?] I’d say that it was kind of like sorrowful. [The entire piece?] Not the entire piece; part of it was, even when it was, like, exciting and adventurous and stuff. [When you listen to slower or softer music, does it usually make you feel sad?] Yeah. [Does that feeling bother you?] Yeah. [It’s not a feeling that you like?] No. [Is that why you turned the dial so far back to the right?] Yeah.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Um, I’d rather use the CRDI. [And not talk?] And not talk. [Why?] Because, I’m not really good at talking; you can ask my mom that. I mean . . . I’m good . . . but I mean, like, I’m not really good at explaining things and just using
something to help me really does help me. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yes. [Do you think it’s hard to talk about your feelings?] Um, kind of - you have so many mixed feelings; it’s kinda hard to explain it.

**Subject 44**
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Title I

![Graph of Subject 44's Responses Over Time](image)

**Figure 45.** Graph of Subject 44’s Responses Over Time

**1st Listening:**

[Tell me what you were feeling while you were listening to the music.] What I was thinking about, um, a flower field and skipping around and stuff. [What part of the music made you feel like that?] Well, in most of it - like when, when it had the little, when it started getting louder. That part. And then when it start, when then, and then when it start gettin’ lower like, I, I was thinking about - someone was leaving; someone that I really knew and liked was leaving. [I noticed that you left the CRDI dial pretty far over to the right. Take a look at where you left the dial. Why did you leave it over that far for so long?] (Long pause) Well, ‘cause, um, I didn’t, after . . . [Did the music make you feel that good?] Yeah. [And even after the orchestral section began to fade and the piano became soft and slow again, you still felt that good?] Yeah. [And
that’s why you left the dial over to the right there?] Um-hmm. [Talk to me about that.] Well, there’s not that much to say, but . . . [You mentioned a flower field and somebody leaving. How did those two things make you feel?] Happy and sad. [Was the sadness over someone leaving at the end of the music?] Yeah. [But you still left the dial over to the right?] Yeah. [Why? Did you like the sad feeling?] ‘Cause I felt like he needed, he or she needed to go. [So, did that make the feeling of sadness okay?] Yeah.

[How do you think the composer was feeling when he wrote this music?] Hmm. I really don’t know. [Was he happy? Was he sad? Was he just trying to make music? Was he . . .?] I can’t explain.

[Can you think of a time in your life when this music would have either matched the way you were feeling or maybe changed the way you were feeling?] Mm, I dunno, uh - a few days ago. [Do you want to tell me about it?] My friend was leaving. [Oh.] But he came back. [So how would the music have matched or changed your feelings?] When he went away, and when he came back.

2
nd
Listening:  

[Tell me about your feelings this time.] Uh, it was kinda like the same with the skipping through the flowers and stuff. Alright, it felt like someone was going away. [And that’s what you said last time, wasn’t it?] Um-hmm. [Is that why you didn’t turn the dial any further to the right?] Yeah. [You only went up about one-half of the way.] I know. [Why?] Alright . . . ‘cause this, um, I can’t explain it, but I’ll kinda try. Well, I didn’t turn it that much up (indicating dial placement), because, uh, the way . . . oh, man . . . I can’t explain this . . . oh, I . . . okay . . . alright. I felt the same way as last time, but it didn’t really make me feel any better. [Was it not a good feeling?] It wasn’t a good feeling and it was; but it mostly wasn’t. [So the whole piece just gave you a kind of . . .] Mushy feeling. [Did the whole piece make you feel that way?] Yeah. [The entire piece - even when the orchestra was playing is the feeling still not happy for you?] Well, I can’t explain if it’s happy or not. It is . . . really it’s both. [But it’s just a really great feeling?] Yeah. I just don’t have a really great feeling about it.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] A combination of the two. [Why?] Because I feel better when I express my feelings? [Do you think it’s hard to talk about your feelings?]
Yeah. [Do you think it’s hard to talk about how you feel about music?] Um, kinda. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yes.

Subject 45
Age 10
Girl
Musical Experience: None
Developmental Status and Conditions: Normally Developing

![Graph of Subject 45's Responses Over Time](image)

**Figure 46.** Graph of Subject 45's Responses Over Time

**1st Listening:**

[Tell me what you were feeling while you were listening to the music.] I felt like, it’s like a funeral song or something or somebody getting killed. I felt horrible at the end and like the beginning, but then it was getting a little better between the middle. It was going up a little positive, and I was feeling a little better - like the person was healing or something; but then he got hurt again, and it seemed really sad then and stuff. [Is that why you turned the dial all the way down to zero and left it there?] Yes. [Did the music actually make you feel sad or just remind you of something sad?] Made me feel sad. [And you didn’t like feeling sad?] Yes. [Was the feeling of sadness intense in those sections?] Yes. [And you turned the dial toward zero, because you didn’t like the sad feelings?] Yes.
How do you think the composer was feeling when he wrote this piece of music? Um, something to do with death. Do you think he was feeling something to do with death in the middle section? Um, how he seen . . . how he . . . how he walked in like, when somebody was getting killed, and um, he was expressing that part when the person was getting killed by somebody else and ranned away, and stuff like that; and he kept picturing it. You must have been making up a little story in your mind was you went along with the music? Yes.

Can you think of a time in your life when this music could have matched your feelings or maybe changed the way you felt? Yeah. Can you tell me about it? When my grandmother died. When she died, did you have all of the feelings that you experienced with this music? I had basically low and just a little bit of high. Did the “high” section of the music make you feel better inside? Not really. You turned the dial up very high. If it wasn’t a good feeling, then how would you describe the feeling? Um, . . . Was it because the feeling was so intense? Yeah.

2nd Listening:
Tell me about your feelings this time. Um, my feelings were like, happy when the music was like, um . . . when I was going to 255, I was very happy. And when I was going to the other side, um, so-so. What in the music was making you feel “so-so?” Because, it was going down low, and I felt kinda like last time - like somebody was getting hurt in some kind of way, or getting killed or something, and I really don’t like that feeling. Does the music actually make you feel that way or does it just make you think of that? Makes me think of that. Can you think of a time in your life when this music would have matched your feelings or changed your feelings? When I was going down - when my grandma died. Is that why you moved the dial back to the right? Yes . . . it’s not a feeling that I like. What do you think the composer was feeling when he wrote this music? Um, at first, he had, um, he was, um, probably on a ocean riding on his boat, and it was going smooth. Then, it got bumpy and stuff and the waves were going over and stuff; and, um, they were, um, going down when I was moving the CRDI down, and when the waves were bigger and bigger, my CRDI was going up and up. Why? Um, it made me feel better inside.

If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose? Um, a combination of the two. Why? Um, because I like to express the way that I feel about music. With words as well as with the CRDI? Yeah. Do you think it’s hard to express how you feel about music? Yeah . . . but I did it
before, so . . . [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

Subject 46
Age 10
Girl
Musical Experience: Piano, 1 year
Developmental Status and Conditions: Normally Developing

![Graph of Subject 46's Responses Over Time](image)

**Figure 47.** Graph of Subject 46's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] When the orchestra came in, it was really emotional. [Why? How did it make you feel?] Um, it had . . . it was very strong music. [What did it do inside of you?] Made me feel hyper and excited. [What did you feel when the music was leading up to the orchestral part - when the piano was playing by itself?] (long pause) I don’t know. [Try to think of an adjective.] It wasn’t that hyper, but it was leading up to the hyper. [Could you actually feel the emotion inside?] Yes, as it was coming. [Tell me about the section when the orchestra begins dying away.] It was draining. [Why did you turn the dial down during that section?] I didn’t want it to be going away. [Were you turning the dial down because you were displeased with the music or the feeling the music was giving you?] Both, I guess. I wanted it to keep going.
[Can you think of a time in your life when this music might have matched or even changed the way you were feeling?] Not really. [Maybe anyone else in your family?] I think my grandmother would, because, um, New Year’s Eve, it was getting really exciting. We had a great dinner, and then it kinda died down later on, and we went to bed. [So you are making the relationship between the music leading to the excitement and then the dying away to calm.] Yes. [And you don’t like the calm?] No, ma’am (laughs). I wanted to stay up all night. [So did you want this music to keep going, too?] Yes. [Why?] (laughs) I don’t know. [Do you think it could be because you wanted to keep the feeling it gave you?] Yes.

2nd Listening:
[Tell me about your feelings this time.] It was basically different. [Why?] I mean basically the same - energetic like last time, when I went to 255; and then it kinda went down. [What do you mean when you say “went down?”] Kinda, the hyperness, I don’t know, wasn’t up to it’s full ability. [How did you feel when it “went down?”] It made me feel sad; it feels like I’m lonely with that music; but then, it feels like I’m with somebody, in a really good movie. [Do you like the feeling the music gives you when it “goes down?”] No. [Is that why you turned the dial down?] Yes, I didn’t want to go there. [Can you think of a time in your life where this music would have matched your mood?] Probably, no, not really.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] I think I would want to do both of them, because I like the idea of the dial, but then it doesn’t express it as much as just talking. [Do you think you need to explain what you did with the dial?] Yes. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yes, ma’am.
Subject 47  
Age 10  
Girl  
Musical Experience: Piano, 3 years  
Developmental Status and Conditions: Normally Developing

Figure 48. Graph of Subject 47's Responses Over Time

1st Listening:
[Tell me what you were feeling while you were listening to the music.] Hm, in the very beginning, where the orchestra and the piano were, yeah, that was probably the part where I went up (indicating dial movement), because it sounded like, you know, happy (student laughs). It didn’t sound like anybody died, or anything. [Did you think the first section of the music sounded like someone died?] Little. [Why?] Because, usually, like in a movie or something, you know bad - well, not bad, but that very loud and kinda low music happens then. [Do you think it has anything to do with the tempo of the music?] Yeah. Probably faster means happiness, too (student laughs). [You made a gradual increase with the dial throughout the entire piece. How were you feeling, in response to the music, that kept you turning up the dial?] Hm, probably, like happy - like, you know, not really sad (student laughs). [When you hear music that’s slow and soft, how do you normally feel?] Sad. [Can you tell me why?] Un-nn. [Why didn’t you ever go all the way to 255?] ‘Cause it didn’t have like . . . it wasn’t really loud (student laughs), and it didn’t sound like, you know, happy enough. [Did you keep hoping for happy?] Hm-mm. [Is that why you kept
going with the dial - did it make you feel happier and happier?] Hm-mm. [So, when the orchestra dropped out, and the piano was playing alone again . . . (student interrupts with a laugh and said, “Yeah, I know.) . . . you didn’t turn the dial back left very far. Why?] ‘Cause it didn’t sound like real . . . it wasn’t very low and like kinda . . . [Did you still have the good feeling left over from the orchestral section?] Um-hmm, yes. [Why did you not turn the dial back toward the left even at the end when the music was very soft and slow and almost stopping at places.] Because, kinda like it was left over, but, um, it never really got sad enough. [So, even after all the slowing down and softening, you still loved the way you felt about the music? Is that what you were showing with your dial?] Um-hmm.

[Can you think of a time in your life when hearing this music might have matched or even changed the way you were feeling?] Um, . . . (long pause) . . . probably a bunch. Um, when . . . it’s hard to think, um . . . I wouldn’t want, but I think probably, maybe when, like something bad happens. [If something bad happened, would this music match the feeling or change the feeling?] The music with the orchestra would change my feeling. [Do you think that would be a good thing?] Um-hmm. [In the beginning section of the music, would it match your feelings?] Um-hmm.

2nd Listening:

[Tell me about your feelings this time.] When the music made me feel happy, it reminded me of moving closer to your birthday. [Where did the music make you feel happy?] When the orchestra came in. [How did the other sections make you feel?] Um, well, it’s just kinda calm; just felt like it was kinda a regular day. [What kind of feeling was that?] It’s okay, but it wasn’t as good as “the day” (referring to her birthday). [Is there anything else you want to say about this music?] Nope.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] I might do a combination of the two. [Can you tell me why?] Because, the dial could show, um, like, the feeling, you know, and then you could talk about what you felt - to sort of explain it. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Um-hmm.
Subject 48
Age 9
Girl
Musical Experience: Violin, 6 months
Developmental Status and Conditions: Normally Developing

Figure 49. Graph of Subject 48's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] I was feeling very, very good. The piano part wasn’t exactly that thrilling, but . . . I still really liked it; but when it got to the orchestra, it really . . . I liked it a lot because it was very loud. [Why do you say you “liked it a lot?” How did it make you feel inside?] I feeling like I was just - I can’t really explain it, but it was like I was being filled up . . . I was just thrilled, because it was so loud, and everything was coming in, and it was flowing; and then when it came down to the piano part, it started going lower and lower; but then when there was a certain instrument, it really . . . I really . . . it really made me feel good, so . . . and then when the piano came, it wasn’t that great, because it was a bit lower and slower and a bit less flowing, but I still liked it . . . it was still good. [So, where did the music make you feel the best inside?] Where the orchestra was playing.

[If this music made you feel so great, why did you not go all the way over to the right side to 255?] Not all the way over, because I didn’t like, just, I couldn’t . . . it’s like . . . um, I didn’t
go all the way over, because it wasn’t like the *best* part, but it was still really, really good. I didn’t go all the way over, because I didn’t fell like it was that type of music. It was more or less in betwe . . . it was, like, right in the middle. It was just good.

[Can you think of a time in your life where this music would have matched or possibly changed the way you were feeling?] Oh, I can’t really say when. Probably, when I can’t go to sleep, this would be a good thing. [Even the orchestral section would be good then?] Yeah. [Why?] Because, sometimes I just can’t go to sleep without listening to something. [Anything else you want to tell me about this music?] It’s a very nice piece; it’s very thrilling but yet soothing.

2nd Listening:

[Tell me about your feelings this time.] Um . . . some part, like, just the piano part, it wasn’t really *that* moving; but when it got to the whole orchestra and the piano, then I *really*, really liked it. [How do the two sections make you feel different inside?] Okay, the orchestra part kind of made me go . . . it, like, something . . . it kind of made me go like (made sound like drawing in breath) . . . like you’re very excited and a little tingly. And then when it got to the piano, when (student hums), it was like . . . um, um. [Look at how far over to the right you left the dial. If the feeling was just “um,” why did you leave the dial so high?] Well, because it was still really g . . .; I still really liked it, but it was like . . . just there. It was . . . [Describe the feeling.] I felt, I felt, I felt so-so. You know, it’s, it’s there, but, um . . . yeah. [So did you not turn the dial down further because the feeling was good, just not as good?] Yeah. [Why do you think it wasn’t as good? What is it about the slower, solo piano sections that gives you a feeling you don’t like?] Um, it’s like, yeah, I’m here . . . it’s too calm. [Do you not want to feel calm?] When I’m listening to music, I’m sort of thinking of, like, I want it calm, but I still want it exciting; and the piano to me, it was like, *calm*, but, like, just this much exciting; but I still liked it.

[Do you think this music can affect your feelings or does it just give you the idea of a feeling?] Um . . . mostly, the way I feel is the way I feel. [Does the music affect that?] It kind of . . . it’s because of the music; like going to bed, if I have my - ‘cause I sleep with something - and just listening to music, this kind of music, would calm me down. [In that situation, what would the orchestral section do for you?] It would just make me feel better; even if I was feeling worried, it would just make me feel better.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] I think a combination. [Why?] Well,
because I like to talk about the music that I hear, because . . . I don’t know. I just . . . I think it’s just a habit. [It’s a habit to talk?] Yeah. [Is it easy to talk about how you feel?] No . . . not really. [Is it easy to talk about how a piece of music makes you feel?] Um, yeah. [And you think it’s important to describe how you feel as well as show how you feel with the CRDI?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Um-hmm. (During the 2nd listening, when the orchestral section began, this student verbalized “Oh, I love this part. . . Yeah.”)

Subject 49
Age 9
Girl
Musical Experience: Piano, 1 year
Developmental Status and Conditions: Normally Developing

Figure 50. Graph of Subject 49’s Responses Over Time

1st Listening:
[Tell me what you were feeling while you were listening to the music.] Well, um, I closed my eyes during it sometimes, and put my fingers inside, and then I was, like, conducting, and I, I saw some pictures you know, in the "doot-doot-doo-doo" and like, it seemed like, really pretty, like a garden was around, but it was all in my head. [And how did all of that make you feel inside?] Happy. [Throughout the entire piece?] Not exactly the whole way through but most of it.
[What part of the music did not make you feel happy?] Well, when it slowed down, it was kind of, like, it was stopping, and then it bounced back up. It like, it like, it went down a notch, so I went down a little (indicating dial movement), and then I went back up (indicating dial movement) once it started back up. So I must have stayed mainly on the right side, because it was really happy, and sometimes I went exactly in the middle because I wasn’t really sure about my feelings of it; an it was, mm, good. [All the way, in all the contrasting parts?] Yeah.

[How do you think the composer was feeling when he wrote the music?] He was feeling, well, like something had just happened in the world, and he was writing it to be happy about it so everybody would cheer up. [Can you describe what might have happened in the world?] Not really.

[Can you think of a time in your life when this music might have matched or maybe changed your feelings?] Well, I’d have to say the one time in second grade. [Can you tell me about that?] Um, it was at the old school - you probably know the old school - I was there, um, second grade, second grade, and um, my first grade teacher and kindergarten teacher, I had her for two years in a row, was leaving, almost at the end of the year, and, so was my second grade teacher at the end of the year, and so, I lost two of my teachers, one was good, and that would have really helped me, ‘cause, you know, it shows some sadness when it slows down and bounces back up to happiness.

2nd Listening:

[Tell me about your feelings this time.] Well, it was a little bit different. [Better or worse?] It was mostly in the middle, but then like last time it was in the middle. Like last time, I stayed mostly near the right, because it was really exciting and stuff and then, I did, like . . . like, when it got completely quiet and then went down to zero, and got really exciting and stuff, I went all the way up. [So, when it was quiet, why did you go all the way to zero?] Because I didn’t really feel anything; because I didn’t have anything to do. [Nothing going on inside you?] Yeah. But mostly, and sometimes I went directly in the middle; and some . . . and sometimes I went on the line between, um the sections; and, I just thought you know, well I could do this, or I could do that; which, this is, you know, would show my real emotions, and then it’s, like, how if you’re really excited go all the way there, and when you’re not very . . . [So which section of the music made you really excited?] Well, when the music got really loud and happy. [Are you talking about the orchestral section?] Yeah. [Does it make you feel happy or just remind you of something happy?]
It makes me feel happy. [Tell me about the solo piano sections. How did they make you feel?] Yeah. Um, piano was like . . . the main focus of the song; and so I . . . like, whenever the piano got really, in the dark spot, not the light, like the slow down part, I got all the way up (indicating dial placement), ‘cause it made me feel excited - you know, and stuff. But when it got a little low, I was right there in the middle (indicating dial placement), yeah. [How did it make you feel inside?] The middle made me feel kind of like, hey I like this; but you know, I’m not really sure if I like it, but I like it; and, I was like - this makes me feel all the way happy; but when I got down here (indicating dial placement) and it was completely quiet, I was like, there’s nothing to really react to here; so I didn’t really do anything, I just stayed down there (indicating dial placement) until the music shot back up.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] I’d choose the CRDI. [And not talk about your feelings?] Yeah. [Why?] ‘Cause . . . I don’t know - just because I . . . [Is it difficult to talk about how music makes you feel?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

Subject 50
Age 10
Girl
Musical Experience: Piano, 1.5 years; Voice, 6 months
Developmental Status and Conditions: Gifted

Figure 51. Graph of Subject 50's Responses Over Time
1st Listening:

[Tell me what you were feeling while you were listening to the music.] Well, it was kinda, sorta - it was a little sad; but it made me feel really excited because, it’s like that moment, when you’re just about to have a huge party, but everything’s really calm, and then you just go crazy. And, um . . . [Why do you think the music was sad? Did it make you feel sad?] No. It just was soft and calm, and . . . [Did you like that feeling?] Uh-huh. [What part of the music made you feel excited?] Well, see, you were excited because, um, it was the moment when everything’s really calm, and it’s like, two minutes before your big party, and then, you’re just sittin’ - sitting there waiting, and thinking about what’s gonna happen; and everything’s just really calm, and you’re looking out the window waiting for your friends to come and then - they’re there. [Is that how you felt when you turned the dial far over toward 255?] Yeah. [So, tell me what you were feeling at the end of the music. You started moving the dial back toward the left, but then you turned it pretty far back to the right.] Well, ‘cause it got really slow, and that felt like you’re . . . you’ve been wait . . . looking out the window, and nothing’s happening, and you’re scared that maybe n-no one shows up, but then - you see a car! And, you just go back up (indicating dial movement). [Overall, what feeling did you have while you listened to this piece of music?] The whole thing? [Yes, if you can narrow it to one.] I guess it was just exciting. [Throughout the entire piece?] Mm-hmm. Even if I was a little worried they wouldn’t come, it was just exciting; ‘cause you’re anxious to see what happens, so it was still . . . [Can you think of a time in your life when this music could have matched or maybe changed your mood?] Yeah. [When?] I just explained it! Yeah. It was at, um, my mom’s birthday party - I planned it; it was a surprise party - and this was . . . last October, yeah - October the 27th; and I invited a whole lot of people; but it . . . I was the hostess, and no one had helped; and so since I was only 10 years old, I didn’t know how it was gonna go; but it ended up really good. [So, did this music give you the same kind of feeling you had about the party?] Pretty much. [Is there anything else?] Well - yeah, I think the excitement was how my mom felt, too - really surprised. When I was listening to this music, I was thinking about that, and um . . . and, oh, yeah, and how it would be like - I was hoping it would be really good, ‘cause my mom was a little stressed; she had a lot of work to do; but it went really good, and my thoughts before it happened, and um - yeah, that felt good, because I had a feeling that it would turn out really good, and um . . .
[How do you think the composer was feeling when he wrote this music?] Hmm . . . maybe - he was sad about something but also excited, because he just didn’t know how it would turn out.

2nd Listening:

[Tell me about your feelings this time.] (Student sighs) (Long pause) Um, well, it was kind of exciting when it was calm but not really . . . just calm - not soft, soft, but calm; and when it got really slow and soft, it felt not as exciting, because just . . . slow; but when it got a little bit louder and calmer, that felt best. [How did it make you feel inside?] Um, the whole song put together? [The entire piece or any certain section - whatever you can describe.] Um, the soft part made me feel lonely, and, um the calm part . . . that made me feel something great was gonna happen, but it wasn’t happening yet. [At the end of the music, when you moved the dial back toward the left side, what were you feeling then?] Just getting back to lonely, because the great thing didn’t happen, and the feeling went away. [How did the loneliness feel?] Not very good. [Do you think the music is ugly?] Oh, no! [Were you using the dial then to express your feelings, not say if the music is beautiful or ugly?] Yes, and most of it was a good feeling . . . [Except the lonely part?] Except the lonely part.

[Can you think of a time in your life when this music would have matched or maybe changed your feelings?] Um, (long pause) I don’t know. (long pause) I don’t really think so, not really, maybe once or a few times, but I don’t think I’ve really felt that lonely - except maybe when my mom’s doing her taxes, and I don’t have anything to do (student laughs).

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Probably a combination. [Why?] I don’t know; because I like to talk about . . . well, I like doing this (indicating CRDI), because it just shows how I feel about the music. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Um-hmm. And talking, you can, like, after you do this, you can tell the person why you feel like this. It just feels like it makes more sense. [Is it hard to talk about your feelings?] Not exactly - no not really. [Is it hard to describe how you feel about music?] It’s not extremely easy, but it’s not hard.
Subject 51
Age 10
Girl
Musical Experience: None
Developmental Status and Conditions: SLD

![Graph of Subject 51's Responses Over Time](image)

**Figure 52.** Graph of Subject 51's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] I was thinking, like I, like I was putting pictures in my mind, like, um, forests and kind of, happy stuff, you know? ‘Cause it was really nice soothing music; it’s kinda like um, it’s soft music, but um, it’s like in between sweet and soft and kinda you know, over in there. [Were you putting images with all the sections or just certain sections?] Just certain sections. [Can you give me an example?] Like, when it got softer and kind of a little bit louder, but, mm, I really don’t like the really loud parts, like . . . [Why not?] They just were making . . . [Did it make you think about something you didn’t like?] I didn’t think about it that much, but, I really just don’t like it that loud. [Was it because of the volume? Was the volume too loud?] I just don’t like it. [Does loud music make you feel some way inside that you don’t like?] Un-unh. [How did the other sections that weren’t so loud make you feel?] Because they were soft, and like, they remind you of sweet stuff, and stuff like that, and . . . [So what does the louder part, with the whole orchestra remind you of?] It kinda reminded me of like, um, well I really don’t know; but it kinda reminded me of stuff like,
it would . . . stuff that gets louder and stuff, and . . . yadda, yadda. [And it doesn’t give you a
good feeling?] No, not really.

[How do you think the composer was feeling when he wrote this?] Mmm, kinda in a
mellow stage, sorta. [For the entire piece?] Yeah.

[Can you think of a time in your life when this music would have matched your feeling or
maybe even changed your feelings?] No. [If you were going to listen to this music again, where
would you want to be?] Asleep (laughs). [Asleep?] Yeah. [Why?] Um . . . it’s calm. [At the
ending of the piece, you left the dial pretty far over. Is that because the feeling was still good?] Mm-hmm.

2nd Listening:

[Tell me about your feelings this time.] It made me feel good. I, um . . . I really don’t
know what to say, uh . . . [Did one section give you a better feeling than another or were they all
the same?] No. [No, they weren’t all the same?] No. [Which section made you feel the best?] Well, like, when it was . . . the violins and the piano just came in together, soft and everything.
[And what kind of feeling does that give you?] It makes me feel happy, okay. [At the end of the
piece, when the piano is playing alone, why did you leave the dial so far toward the right?] Because the ending is softer, and everything just comes together in the song and everything. [Do you think the feeling carried over a little bit from when the orchestra was playing?] Mm-hmm, I
don’t know - maybe. [Was there anything bad or sad feeling about this music?] No.

[If you could choose the CRDI, talking, or a combination of the two to express the way
you feel about a piece of music, what would you choose?] I would choose the combination of the
two. [Why?] Because, like, you can tell - and you can express the way you feel; and plus, like,
then, you have your numbers, and you can have your chart, so you can see how the music made
you feel and when you did it. [Is it hard to talk about how music makes you feel?] Sometimes,
‘cause you just . . . you just don’t have the words to talk about it; and it’s kinda hard to talk about
it then. [But you still think it’s important to try to describe how the music makes you feel?] Yeah.
[Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.
Subject 52
Age 10
Girl
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 53. Graph of Subject 52’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] I always liked instruments, so . . . [You always liked instruments?] Yeah, I always like them playing, so I, I liked it. [How did it make you feel inside? Is that related to “liking it”?] ‘Cause of . . . [What were you feeling or thinking?] I like soft music, I don’t like really, like really loud, and . . . I usually like songs without words. [Why is that?] ‘Cause you can make up your own words. [Did you do that with this music?] Yeah. [So, what were some of your words?] Well I was telling, um, I like mu . . . I like stuff like Mozart, so I just thought of words that he could have done. I can’t remember them. [That’s okay.]

[Can you tell me why you turned the dial all the way over to 255 and basically left it there for the entire rest of the piece?] (Student laughed) [Did it make you feel that good?] I like it. I just . . . (gestured out with hands) [And so you just moved the dial and left it over there to indicated how much you liked it?] I love it. I love that kind of music, I don’t . . . [Does it give you a special feeling inside?] Yeah, it gets me in a mood; it reminds me of my grandpa, because
he died on Valentine’s Day. He, he used to listen to that kind of stuff. [Do you think this music gives you a little connection with him?] Yeah.

[How do you think the composer was feeling when he was writing this music?] It sounded kind of sad. It, but, after when the orchestra came in it sounded kind of exciting. [So then, when the orchestra faded out again, how do you think he was feeling?] He got sad again, or he just had different feelings.

[Is there any other time in your life, besides with your grandpa, that this music could have matched or changed the way your were feeling] No. That’s exciting, ‘cause I never felt a mood like that before.

2nd Listening:

[Tell me about your feelings this time.] It didn’t sound like last time. [How did it sound different?] This time, it didn’t make me feel like last time; it made me feel like I was flying. [Really?] Yeah. [Can you explain why?] Because it’s . . . it’s soft. It’s just soft and it . . . [Was it a good feeling or not a good feeling - flying?] It was okay; and, I’ve never had dreams of flying. [So, it wasn’t necessarily a great feeling, then.] No. Last time it was better. [Did the entire piece make you feel like you were flying or just certain sections of the music?] No if . . . you know when the orchestra made me excited just a little bit, and it made me feel like I was looking down and all this stuff, then when it got slow again, I was going - just flying. [At the end of the piece, you left the dial pretty far over to the right, toward 255. Can you tell me why?] Um, it’s still, I . . . I like flying; it’s, I always have dreams about it; but it’s not something that I’d really want to do in real life, so . . . but I still like instruments, I told you that.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Combination of the two. [Why?] Um, ‘cause I think it’s important to . . . to tell you what I did. [Do you mean what you did with the dial?] Yeah. [Do you think it’s hard to talk about the way music makes you feel?] It’s hard to talk about it. [If it’s so hard, why do you want to try to explain?] Because I think it’s important. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] It probably does.
Subject 53
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Normally Developing

![Graph of Subject 53's Responses Over Time](image)

**Figure 54.** Graph of Subject 53’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Mm, the song felt sad... [All the way through?] Yeah. [Does it actually make you feel sad, or did it just gave you the idea it was sad?] Idea. [Even the part where the orchestra was playing, it still gave you the idea that . . .] Yeah, it was a little sad. [Why do you think that is?] Because at the beginning, it felt like the, the music felt a little sad. [What about the music made you feel sad?] The sound of it. [Was it too slow, was it too fast, was it too soft . . .] Too slow and too soft. [So, did you not like the way it made you feel inside?] It was ok, how I felt it. [But it just wasn’t a great feeling to turn the dial higher toward 255.] Yeah. [In the middle, when the orchestra came in, tell me about that.] Um, I didn’t feel that sad anymore, but it was still kind of sad, the beg . . . kind of sad at it. [So you still think the entire piece felt sad.] Yes. [Is that why you didn’t go all the way over with the dial?] Yeah. [Do you not like to feel sad?] Not really.
How do you think composer was feeling when he wrote this music? A sad feeling. [All the way through?] But he tried to make it more happy, because he wanted . . . he didn’t want it to all the way be sad. [Do you think he was successful in not making it sad all the way through?] Yeah, sort of. [He made it little less sad, but then what happened at the end?] He tried to get a little more sad, ‘cause it was repeating from the low in the beginning.

[Do you think listening to this music could actually change your feeling to that sadness?] Yes. [And you didn’t want that to happen.] Yeah. [You didn’t like the way that sadness felt.] Yeah. [Can you think of a time in your life when this music could have matched your feelings or maybe changed your feelings?] Mm, not really. [So, as an entire piece of music, do you think this music was a nice piece of music or an ugly piece of music?] Nice.

2nd Listening:

[Tell me about your feelings this time.] Okay. It’s related, ‘cause it’s kinda sad still. [Do you like the sad feeling?] No. [Where did the music make you feel sad?] Mostly all of it. [Were there sections that made you feel more sad than others?] Yeah. [Where?] The beginning. [Did the beginning make you feel more sad than the ending?] Yeah. [How did the middle section, the orchestral section, make you feel?] It was okay. [Did it give you a better feeling or a worse feeling than the beginning and ending sections?] Better. [Why do you think that is?] Because it sounded more happy than sad. [Do you know what it was about the music that makes it sound that way?] The sound. [Can you explain that more?] More instruments, the orchestra, in the middle than the beginning. [Do you think the volume had anything to do with it?] Mm-hmm, maybe. [What about the tempo or the speed?] Mm, yeah, maybe. [At the end of the piece, you didn’t turn the dial back too far to the left and toward zero. Can you tell me why?] Because it wasn’t that sad as the last one. [What do you mean by "the last one"?] In the beginning. [When the piano was playing by itself in the beginning of the piece?] Yeah.

[Compare your feelings to the last time you listened to the music - were they the same or different?] Mm, same feeling. [Was the feeling better this time or the first time?] Mm, better this time.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Talking. [Talking only, without the CRDI?] Yeah. [Can you tell me why?] Well, I’d choose that one, because I can say it not at the end, but when it’s coming on. [So, you would like to describe your feelings about the music as the
music is playing?] Yeah, as it’s happening. [And you think that’s better than waiting until the end?] Yes. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yes. [But you just prefer not to use it?] Yeah, yeah. [Do you think it’s hard to talk about your feelings?] Sometimes. [Do you think it’s hard to describe the way music makes you feel?] Um, no.

Subject 54
Age 10
Girl
Musical Experience: Clarinet, 6 months
Developmental Status and Conditions: Gifted

![Graph of Subject 54's Responses Over Time](image)

**Figure 55.** Graph of Subject 54’s Responses Over Time

1\textsuperscript{st} Listening:

[Tell me what you were feeling while you were listening to the music.] When I was listening to it, it was just like the big parts were more louder, and there was more sound to it; but you know, it made me move the dial up more. [Why? How did the music make you feel inside?] Like, happier, um, not, not so sad - just more joyful. [In the beginning, did the music seem sad to you?] Um, a little bit, but not very much, just like a small part of it did. [The “small part” that you thought was sad - did it actually make you feel sad or just reminded you of something sad?] Well, I don’t think it was just because it sounded sad; it was kinda like, just one part made you feel a
little bit more sad, and other parts made you feel more happy. So, it’s not just one thing. [Did these “parts” actually make you feel happy and sad?] Yeah, I think so. [Let’s talk about your dial movement just a minute. In the beginning when the piano was playing alone, you barely moved the dial to the right. Then when the orchestra was playing, you moved the dial over toward 255. Then at the end, when the orchestra dropped out, and the piano was playing by itself again, you turned the dial back toward the left some, but you didn’t turn it down nearly as far as in the beginning. Can you explain that to me?] Because, well, I mean . . . it just sounded like it was - I don’t know - was, um, like this little happy melody on the violin, or something, or a little piano, or something . . . [At the end of the music?] Yeah - at the end of it; that’s why I didn’t drop it down all the way. [So does that mean that you felt differently about the ending section than you did about the beginning section?] Yeah. [How?] Um, I don’t know . . . it gave me a happier feeling. [What section or sections of the entire piece made you have the best feelings inside?] About the middle, when I turned the dial the highest. [What was it about the music that gave you those feelings?] Well, because it’s just like this big, powerful music . . . I don’t know, it just sounds . . . [Did it actually affect you inside?] Yeah. [How?] It made me feel a lot happier.

[Can you think of a time in your life when this music would have matched or maybe even changed the way you were feeling?] You mean the whole song? [The whole piece or just parts.] Um, (long pause) like, um . . . one of my dogs had heartworms - it was like, at the beginning, that’s how I felt; and then when he finally recovered from it, that was in the middle; and the end was like the happy ending. [Is he okay now, so that was a happy ending?] Yeah, yeah.

2nd Listening:

[Tell me about your feelings this time.] Well, um, it seemed like, um, different parts, um - can I compare? [Of course.] Well, it seemed, this time, different parts - the end seemed like just not as, you know, soft . . . [As it was the first time you listened?] Yeah. [Why do you think that was?] Um, I think it’s because I’m maybe thinking about it in a different way. [How?] Um, I’m not sure, but it just . . . the music sounded a little bit differently. I guess because I was thinking about it maybe not as hard or maybe harder than I was before. [So, how did the music make you feel this time?] In the middle, it’s still, you know . . . it’s bold; it makes me feel happy. And, hm, it also at the end, I think, after hearing it twice, it seems like I can understand it a little more, so it seems more happy at the end. I, um, was like up here this time (indicating CRDI response), but
last time I was a little lower. So I think it was I heard it again, and I could understand it more, you
know - it didn’t make me feel as sad this time at the end. [Anything else?] Um, no.

[If you could choose the CRDI, talking, or a combination of the two to express the way
you feel about a piece of music, what would you choose?] Um, I would chose, um, the dial - just
the dial. [No talking?] Yeah. [Why?] Well, sometimes, it’s, um, hard to explain - you know, I
mean . . . it’s hard to explain. [Is it hard to talk about how you feel?] Um, not necessarily. It’s just
hard to put it all into words. [Is it hard to talk about how you feel about music?] Not
really . . . it’s just, just hard to describe it. [Do you think the CRDI dial shows how you feel fairly
accurately without talking?] Yes.

Subject 55
Age: 11
Gender: Boy
Musical Experience: None
Developmental Status and Conditions: SLD; Asperger Syndrome

Figure 56. Graph of Subject 55's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] I don’t know.
[When you were moving the dial, what feelings were you having about the music?] I don’t know,
maybe just about what score I should give for each part of the song. [But this is not about a score,
it’s about how you felt inside.] I know, but I usually don’t like to discuss my feelings. [That’s okay. Do you think the dial was a good representation of your feelings?] Yes. [You were showing me your feelings with the dial?] Yeah. [Are you satisfied with what you did with the dial to show your feelings?] Yeah, uh-huh. [When you went way, way over to the right side, way over to 255, and you left it there for a long time, was that your way of telling me that you were feeling good about the music?] Mm, yeah. [And then when you came moved it back toward the left, was that your way of telling me that you weren’t feeling so good about the music?] Mm, yeah.

[How do you think the compose was feeling when he wrote this music?] I do not know. I have no idea.

[Do you just want to let the graph speak for you?] Yes.

2nd Listening:

[Tell me about your feelings this time.] I don’t know. [How did your stuffed monkey feel about the music?] I don’t know.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] CRDI. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yes.

(During the 2nd listening, this student held a stuffed monkey, from which he would not be parted, that he had brought to school that day. He did willingly go with the classroom aid to the experimental room and seemed to be on-task throughout the listening example. While, he listened, he held the monkey still in his left hand and manipulated the dial with his right hand. However, immediately after the listening example, he began playing with the monkey again and wanted to go back to his classroom.)
**Subject 56**
Age 9  
Girl  
Musical Experience: None  
Developmental Status and Conditions: Normally Developing

![Graph of Subject 56's Responses Over Time](image)

**Figure 57.** Graph of Subject 56's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Well, at the beginning, it’s . . . it was sorta sad and a little happy; and when it’s gitting towards the middle, it felt like it’s really exciting; then like, happy and jumpin’; and, um . . . then it got - started to get toward the end, started to get sad and started a little happy again; and it felt like, at the beginning, you could sorta imagine, like, probably a little girl or a little boy who’s really happy, and they found something out that really wants to make them jump and stuff and really play around; and there’s a lot of other stuff, like, um, when it was sort of in the middle and sorta at the end, it started to get a little sad. It sounded like the person was really sad at that part - when you start to get to that part of the music. [Do you mean the composer?] Yeah. [What do you think he was feeling during the middle section?] No, I think he was thinking about how much money he was probably going to make with that music.
[Can you think of a time in your life when this music could have matched or even changed the way you were feeling?] Well, no. ‘Cause usually, um, when I’m sad, I’m sad; and when I’m mad, I’m mad, and when I’m happy, I’m happy, but it’s never really in the middle. [Do you think this piece of music is in the middle?] It’s mixed.

2nd Listening:

[Tell me about your feelings this time.] When I was supposed to do the same thing, it made me feel sad. [It made you sad? The whole piece?] Well, no, the part with the orchestra made me a little happy, but most of it was a little sad. [Is that why you left the dial so far left at the beginning of the piece and turned it all the way back to zero at the end?] Yes. [You don’t like the feeling of sadness that it gives you?] No. [Do you prefer the feeling that you got when the orchestra was playing?] Yes. [Is that why you turned the dial so far right during that section?] Yes.

[How do you think the composer was feeling when he was writing this music?] Maybe a little at points. [At which points?] The beginning and the end. [What about the middle section?] Um, not - I think he started thinking about how much money he was going to get when the orchestra started to play. [And then what happened?] And then he probably figured out, “What if the people don’t like it?” [So, then what?] The sad feeling.

[Do you think this music can actually change the way you feel?] Probably. [Did this music actually change the way you felt?] Yea. [Did you want that to happen?] No. [Why?] I don’t like the sad.

[Can you think of a time in your life when this music would have matched or changed your feelings?] Well, not the happy part but the sad part. [Mm-hmm. Do you want to tell me when?] When my grandpa, when my grandfather was killed. [So this music would have matched your feeling?] Yes. [Which section?] The sad part. [Would the happy part of it--the middle section where the orchestra played--would that have helped you at all if you could have listened to it then?] Not really.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] Talking. [And not using the CRDI?] Yes. [Why?] Well, I don’t know, really. Um . . . [Do you think it’s easy to talk about your feelings?] Um-hmm. [Is it easy to talk about the way music makes you feel?] Not really, ‘cause I don’t listen to too much of it; I’m usually watching the TV. [But you would still prefer to try to}
explain how you feel about music instead of using the CRDI?] Yes. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] No. [Did you not enjoy using the CRDI?] No, not really.

Subject 57
Age 9
Girl
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 58. Graph of Subject 57’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Like at the end, it made me feel sad, because it started to slow down, and it felt like someone was hurt or something. [How did it make you feel in the beginning?] Like I’m back, a long, long time ago. [What about the music makes you feel that way?] It’s slow, and like, this . . . this . . . this age there’s no music like that; it’s just barely hanging on. So like in the old days, this was really, really popular, so it just makes me feel like I’m back there in the old days. [How does that make you feel inside?] I feel pretty good. [Tell me about the orchestral section.] It makes me feel happy, ‘cause it’s like loud and stuff. [How did the ending section make you feel?] It made me feel like I’m back here, and it makes me feel good inside.
[Can you think of a time in your life when this music would have matched or perhaps
touched your feelings?] Yes. [When?] When my brother accidentally pushed me down the stairs.

2nd Listening:

[Tell me about your feelings this time.] Um, well, it was like sort of like flowing. I felt
really, really sad in the beginning, and then I felt like a little bit happy; and, um, when I, um, when I
came in here, I also felt like my heart was in my throat, ‘cause I knew what I was doing, but I
was just sort of, sort of, you know, um, scared and stuff; and, um, and it just made me cool down.
[Tell me about the ending.] It started to go slow and made me feel sad. [Is that why you turned
the dial all the way down? You didn’t want the sad feeling?] Yeah. [You don’t like the music or
you don’t like the feeling you got from the music?] I didn’t like the feeling. [How did it make you
feel when the orchestra was playing?] When the orchestra was playing, it made me, like, it made it
like my heart, like, jump out of my throat, and made it go down in my chest; and it made me
really, really happy.

[What do you think the composer was feeling when he wrote this music?] I think he was
sorta sad and happy. [Why?] Because it’s slow and soft. [What do you think he was trying to
make you feel?] Happy and sad. [All in the same piece of music?] Yes.

[Has there been a time in your life when this music would have matched your feeling or
helped or changed your feeling? Can you think of another time besides today?] No. [Anything else
you want to say about this music?] Um, no.

[If you could choose the CRDI, talking, or a combination of the two to express the way
you feel about a piece of music, what would you choose?] The CRDI. [And not talking?] No.
[Can you tell me why?] Because, I don’t really like to talk that much. [Is it hard to talk about your
feelings?] Yes. [Is it hard to describe how music makes you feel?] Yeah. [Do you think the CRDI
dial shows how you feel fairly accurately without talking?] Yes, yes.
Subject 58
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: Normally Developing

Figure 59. Graph of Subject 58’s Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] Well some parts were sad, and some parts, like . . . like, when the piano was playing, it sort of made me like, feel good inside. [What part do you think was sad?] When the violin was playing, or like . . . [When the orchestra was playing?] Yeah. When the orchestra. [That part made you feel sad?] Mm-hmm. [How did you feel when the piano was playing?] Sort of like . . . good inside. [When the piano was playing by itself?] Mm-hmm. [Why do you think the orchestra made you feel sad?] Well, it just sorta, like . . . made me feel sad on the inside, and stuff in it reminded me of sad things happening. But like . . . ‘cause, it’s just sort of sad. [So, why did you leave the dial up so high at the end of the piece, when the piano was becoming slower and softer?] Because, like, I sort of like the piano playing, and it sort of makes . . . like, when the piano plays, I . . . I like it a lot. Because, like, the piano’s one of my favorite, um instruments. [So it gives you a good feeling inside when the piano’s playing?] Mm-hmm. [And that’s why you left the dial higher at the end?] Yeah. [It didn’t bother you the music was slow and soft and dying away?] No. [Did you
think it was sad because of that?] Un-uh, not really. [So, the only section you thought was sad was the middle section with the orchestra?] Mm-hmm.

[How do you think the composer was feeling when he wrote the music?] Sort of like, excited, and, like... feeling big, like... sad and excited and all. [Where do you think he was excited?] Like, when everything was, like, going on and stuff, and the piano and the orchestra was playing; and then like, when it was like, sort of dying out, he might have started feeling sad. [Did that part, where you think the composer might have been sad, make you feel sad?] No. [But you think maybe he was sad when he was writing it?] Yeah.

[Has there ever been a time in your life when this music would have matched your feelings or maybe even changed them?] Not really. [Not even the piano parts?] No. [Can you think of a time when you might want to listen to this music to match or change your feelings?] Mm, well maybe, like, if I was grounded in my room, and I had like... like if I could only... something like that - like, if I was grounded, I might like... wanna listen to that. [Which you only want to listen to particular sections, or would you want to listen to all of it?] All of it. [Would it make you feel better or would it match your feelings?] It might make me feel better.

2\textsuperscript{nd} Listening:

[Tell me about your feelings this time.] Well, I was sorta feeling, like, sad and stuff. [Is that why you left the CRDI dial down so low?] Yeah, when the quite music started playing, it sort of made me feel sad. [And you don’t like that feeling?] No. [Is it that you don’t like the music or is it that you don’t like the feeling?] I don’t like the feeling. [Do you think this music is ugly?] No, not really. [You just don’t like the feeling it gives you?] No. [And that feeling is why you left the dial so close to zero for almost the entire piece?] Yeah. [Tell me how you felt inside when the orchestra started playing.] Well, I just sorta... I sorta liked it, ‘cause it like... when string instruments play... like big string instruments play, they sorta make me feel good. When small ones play, it sorta makes me feel sad. [What do think the overall feeling of the entire piece is?] Like sadness, or sadness and happiness together. [Why didn’t you move the dial any further toward 255 than you did?] Because that’s as much as it like made me feel happiness. [At the end, when the piano is playing alone, and softly and slowly, you didn’t move the dial all the way back to zero. Can you tell me why?] Well, I sorta liked the piano, ‘cause it sorta makes me feel good. [So, you didn’t think the music was sad at the end?] No. [But you did think it was sad at the beginning?] Yeah.
[Can you think of a time in your life when this music could have matched or maybe even changed the way you were feeling?] Not really.

[If you could choose CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] I’d choose the CRDI. [Why?] Because it’s more easier to express your feelings. [Do you think it’s hard to talk about your feelings?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah. [And you’re completely satisfied that the CRDI graph correctly showed how you felt about this music?] Yeah.

Subject 59
Age 10
Boy
Musical Experience: None
Developmental Status and Conditions: ESOL

Figure 60. Graph of Subject 59’s Responses Over Time

1st Listening:

(Before I could say anything . . .) That was nice. [Tell me what you were feeling while you were listening to the music.] Um, I was thinking about a movie. [How did it make you feel inside?] It felt good, yeah. [What parts of the music felt good? All of it, or just some sections of it?] The low part when it was going, "Mmmmmm." (Student singing.) [Why did that part make
you feel better than the other parts?] Um, let me think. I don’t remember. [That’s okay. Overall, how did this music make you feel?] Pretty good.

[How do you think the composer feeling when he wrote the music?] What’s a composer? [A person who writes music.] I think he was sitting on a chair and playing the music. [How was he feeling?] What do you mean? [What was his mood? How did he feel?] Sad. [Throughout the entire piece?] Not the whole thing. [In which sections of the music do you think he felt sad?] Maybe in the beginning.

[Can you think of a time in your life when this music could have matched your feelings or maybe changed your feelings?] Say that again? [Has there been a time in your life when you felt like you felt while you were listening to this music?] It makes me feel a different way. [Can you tell me about anything specifically?] When I get older. [Overall, how did this music make you feel?] Really good. [Is that why you left the dial so far right at the end?] Yeah, ‘cause it’s soft. [Does softer music make you feel better inside?] Yeah.

2nd Listening:

[Tell me about your feelings this time.] Well, this is different. [How was it different?] Um, can you ask some questions, or stuff about it? [Sure. How did the music make you feel this time.] Mm, happy. [Throughout the entire piece?] No, not for the entire piece. [Can you explain?] Um, when it was loud, when that people went, "Vrrrm;" (student singing) and then it goes low and comes down, I didn’t like that part. [Are you talking about the beginning section or at the end of the piece?] The beginning. [At the end of the piece, you left the dial pretty far to the right. Why?] The end was low, not . . . [Was the feeling different than in the beginning?] Yeah. [You didn’t like the feeling in the beginning?] When it got loud, yeah. [But you didn’t like the feeling when it was soft?] What? [You didn’t like the feeling the softer, slower music gave you?] When it was soft, I liked it; but when it was loud, I didn’t like it. [Okay. You didn’t like the loud?] Un-uh. [Can you tell me why?] ‘Cause it had a little bit of loud, then a little bit of low, then louder again. I didn’t like it. [What did the "loud" section remind you of?] Of those people in the concert playing those things loudly, and that’s all. [And that’s not a good feeling] Un-uh. [Was the music too loud?] Yeah. When they get . . . when the music gets loud, yeah. [You don’t like it?] I like . . . I like . . . the soft parts. [Why do you think that is? How do the soft parts make you feel that you like it better?] Um . . . let’s see. Because, oh, because you, because . . . because I like the soft music; I just like it. [And it makes you feel better inside than the loud music?] Yeah.
[Was the music better or worse than listening to it the first time?] Um, a little bit worse. [Why?] Because, last time if I was . . . most of it was loud; but now . . . now, what, it was louder.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] CRDI. [And no talking?] No talking. [Can you tell me why?] Um . . . [Why do you not like talking about how music makes you feel?] Um, ‘cause I keep on stopping; I can’t talk about it. [Is it hard to explain?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.

Subject 60
Age 10
Girl
Musical Experience: None
Developmental Status and Conditions: SLD

Figure 61. Graph of Subject 60's Responses Over Time

1st Listening:

[Tell me what you were feeling while you were listening to the music.] It made me feel good but also kind of sad. [Can you explain what you mean?] Well, the way the music was playing, it felt like, it felt - well . . . I can’t exactly say it because - it felt like a melody, and then it felt sad, because they played so gently. [What parts of the music made you feel sad - or was it the whole piece?] I don’t think the whole thing was sad. I just think a little bit of it was sad. [You
went pretty far over toward the right side with dial, and then you just basically left it there. Tell me why you did that.] Because, I think I was feeling the gentle side, which was a little sad. [Do you like the sad feeling you got from the music?] Kind of. [Do you like it more than you like the middle section when the orchestra was playing, or just about the same?] Just about the same.

[How do you think the composer was feeling when he wrote this music?] Well, I think he was kind of feeling sad and then happy. [All at the same time, or maybe at different times?] Between the music. [Can you explain what you mean by that?] Between the different parts.

[Can you think of a time in your life where this music would have either matched the way you were feeling or maybe changed the way you were feeling?] I don’t really know. [Okay. Which section of this music made you feel the best?] Um, I think it was the ending. [Can you tell me why?] Because it gave me a gentle feeling at the end. [And you like that "gentle feeling"?] Mm-hmm.

2nd Listening:

[Tell me about your feelings this time.] Well, at the beginning it was, like, real kind of happy; and then at the end, it was kind of sad. [So, why did you leave the dial turned all the way over to 255 at the end?] ‘Cause I guess I liked the sad part. [You did?] Mm-hmm. [Why? How did it make you feel inside?] I don’t know why, I just did. It’s kind of soothing. [Tell me about how the orchestral section made you feel.] I kind of liked it, and then I kind of, didn’t kind of like it. [Why? What happened to give you a feeling that you didn’t like?] It was kind of sad and happy, I guess. [At the same time?] Mm-hmm. [Was it too loud?] No. [You don’t like the feeling of happy and sad together?] Un-uh. [Is there anything else you want to tell me about this music?] No.

[Was listening to it this time the same or different than the first time?] It was different. [Was it better or worse?] Better.

[If you could choose the CRDI, talking, or a combination of the two to express the way you feel about a piece of music, what would you choose?] CRDI. [And not talk?] Un-un. [Why?] I don’t know. [Is it hard to talk about the way you feel?] Um, no. I like to talk about the way I feel, but sometimes, I just don’t want to do it, I guess. [With music, do you think it’s easier to use the CRDI?] Yeah. [Do you think the CRDI dial shows how you feel fairly accurately without talking?] Yeah.
Summary of Results

This study was not intended as an experimental study design to investigate the many variables associative with young students’ listening experiences. Its purpose was to make an initial investigation into the emotional reactions of fourth grade students to music by exploring the following questions:

1) Do young children experience emotional responses to music?;
2) If so, by what methods are they capable of indicating such response?;
3) At what grade levels do these responses exist?

In investigations with adults, researchers have suggested that varying biological and experiential backgrounds may be factors which contribute to differing individual reactions to the same piece of music (Gabrielsson, 1991; Haack, 1990). The preceding interview responses seem to indicate that young children do indeed have deeply felt emotional responses to music, which, like those of adults, appear to be highly individualized and intimately personal.

As the following poignant examples illustrate, student verbal reactions were highly emotional, deeply personal responses which dealt with a plethora of issues. Although fourth graders tended to categorize their feelings as “happy” or “sad”, many issues they discussed in response to the music belied the simplicity of those labels.

Students whose responses were “happy” frequently discussed good times with family members, quiet times, and happy endings.

... Well . . . (pause) I, I just like the way it’s played, and when I heard the music, it made me think of my, um, grandma, in the flow - in her backyard with, planting the flowers or something like that . . . (Do you plant flowers with her?) Sometimes. (Subject 19)

... Well, at the beginning, you know it kinda started out, like, slow, well it kinda made me think about, like . . . see I used to have this picture up in my room that was called “Pooh’s Secret Garden,” and whenever I looked up at that picture, that, that would be like the music playing in my head or some similar to that. And then, like, when it got really intense, um, that would remind me of how like, um, how, well I don’t really know how to describe it. It would make me feel really . . . happy and everything . . . (Subject 41)

... (Can you think of a time in your life when this music would have matched or maybe even changed the way you were feeling?) . . . Um, (long pause) like, um . . . one of
my dogs had heartworms - it was like, at the beginning, that’s how I felt; and then when he finally recovered from it, that was in the middle; and the end was like the happy ending . . . (Subject 54)

Fourth graders for whom the music evoked “sad” responses discussed varying and complex issues, including divorce, death, and personal disappointments.

. . . Um well, um, [this music] would match my feeling because when, um, my mom and dad got divorced. (What part would have matched your feeling?) The part with the piano . . . (When would the section with the orchestra match the way you felt?) Hmm, when my mom and dad were still, um, together, or when I’m happy or glad . . . (Subject 4)

. . . (Can you think of a time in your life when this music would have either matched the way you were feeling or changed the way you were feeling?) When my grandpa, my great-grandfather died, and then when we knew - something else had happened and, and I felt good again when I had, like when my grandma had came, and she cheered me up, that’s when I . . . so that’s sorta like this music - sad and happy. (Subject 20)

. . . (Does this music remind you of any time in your life?) Um, yeah, actually, just yesterday. Reminds me . . . I remember I was so happy . . . this was a Boy Scout thing . . . I was working towards like this big award, and then Ryan calls me on the phone. He’s already signed off on all the stuff I need for it - not all of it, but a lot of it; and he calls me and tells me that I have to do it all again, except this time with the Scout Master. (So you had both the happy and the sad feelings of this music just yesterday?) Um-hmm, just yesterday . . . (Subject 24)

Interestingly, several of these youngsters even appeared to recognize the “therapeutic” benefits of listening to music as well as choosing music to match or alter their moods.

. . . Sometimes, I’m in my room . . . well, sometimes when my cousins argue a lot, and it just makes me feel bad, and I think this might cheer me up or something . . . (Subject 19)

. . . Um . . . um, it made me feel happy . . . because . . . what um . . . when I um . . . when . . . before I came over here, and before I took my pictures, I had to go to Mr. Bailey’s office, because someone put a restraining order on me . . . And then
I had to put the restraining order back on them, and then . . . I had to um . . . and then . . . it, like, calmed me down; and I was so hyp . . . I’m like - and everything; and then it made me happy . . . (Subject 27)

. . . When I, um, when I came in here, I also felt like my heart was in my throat, ‘cause I knew what I was doing, but I was just sort of, sort of, you know, um, scared and stuff; and, um, and it just made me cool down . . . (Subject 57)

In addition, several students expressed experiencing physiological responses to the music. Although physically felt emotional experiences, labeled as “thrills” or “chills,” have been documented with adults (Goldstein, 1980; Panksepp, 1995), no such studies appear to exist with children. The following examples mark an initial attempt to gather data concerning the physically felt emotional responses of young subjects:

. . . Because, um, it felt like my peacefulness was ending, and I was erupting when I was like uneruptable . . . (Subject 17).

. . . It felt like I was really hot inside, because it was like (student sucks in breath) . . . the excitement was still inside me when the orchestra came loud. It was really, really, really excited - like hot bubbles going up inside me . . . I’m still excited, getting a little bit more relaxed, the bubbles are going away slowly . . . (Subject 33).

. . . Like, you know - that little tingle in your stomach . . . it made my stomach kind of like “Whoo.” That’s kind of like how I felt when the music got really high . . . (Subject 38).

. . . Okay, the orchestra part kind of made me go . . . it, like, something . . . it kind of made me go like (made sound like drawing in breath) . . . like you’re very excited and a little tingly . . . (Subject 48).

. . . When the orchestra was playing, it made me, like, it made it like my heart, like, jump out of my throat, and made it go down in my chest; and it made me really, really happy . . . (Subject 57).

As evidenced by the high percentage of subjects, 94%, who successfully manipulated the dial, the CRDI appears to be a viable analog with which fourth grade students can express emotional responsiveness to music. Fifty-nine of the 60 youngsters indicated that movement of the CRDI dial approximated their emotional responses to the music and expressed comfort with the simplicity of its use. Results from this study suggest that the CRDI can be used effectively and
efficiently to record the aesthetic responses of fourth grade students to music. While all of these findings need further investigation, these initial results are encouraging.

The student interviews appear to indicate that subjects in this study used the CRDI continuum to denote happy/sad feelings. In the pre-experiment instructions, fourth graders were asked to indicate how the music made them feel. Graphic analyses and corresponding interviews suggest that music the students determined to be “happy” gave them a better feeling than music they deemed to be “sad.”

. . . I, like, um, I went up a lot right here (indicating dial movement), because, um, I liked it when the orchestra and the piano were together, but I didn’t like that, it that much when the piano was just by itself. (What do you mean when you say, “You didn’t like it?” How did it make you feel?) Sad. (How did it make you feel when the orchestra and piano were playing together?) It made me feel better, ‘cause it . . . it’s like, it’s not just by itself; it’s like about, um, a lot of more instruments, and it makes me feel better, because when the piano was just playing, it was alone, and um, it kind of made me feel sad. (And what do you think about feeling sad?) I don’t like it . . . (Subject 4)

. . . at the end, and th-there was some, um, happy parts in it, and it kind of makes you feel sad in some parts. (Where did it make you feel happy?) Um, more in the middle it made me feel happy. (Is that why you turned the dial pretty far to the right - because you liked the happy feeling?) Mm-hmm. (Where did it make you feel sad?) At the end, mainly. (Is that why you turned the dial back far to the left - toward zero?) Yeah, ‘cause it was kind of low. I don’t really like low stuff, ‘cause when you think of low, you think of things not really being that happy and stuff. . . (Subject 13)

. . . I was feeling that that was supposed to be like a sad and like a good kind of music . . . (Tell me why you moved the dial back toward zero at the end.) That, um, the way I did that is that when I went, when I was toward zero, that means that I felt kinda sad with it; but when I went to the right, that means I felt like we had a really joyful kinda, type of music . . . (Subject 21)

. . . Well, it made me feel good at parts, when it was kinda doing that little (student sang the main melody on "tee."). (With the piano alone or with the orchestra?) With the orchestra. That kinda made me feel good, but you know at the end how it kinda tuned down and went a bit slower and all, it kinda seemed a bit, you know, sad . . . (Subject 26)
An important finding of this study was the willingness of fourth grade students to discuss their feelings in response to a piece of music. Although about 60% of all subjects indicated that verbalizing information concerning emotions in response to music was difficult, the entire group exhibited an unequivocal willingness to attempt all responses and maintained a positive attitude throughout the entire experimental process. This is especially noteworthy considering the relatively short amount of time the students spent with the researcher.

It is also interesting to note that while students were willing to attempt a description of their feelings in response to music, many expressed an understanding that words were perhaps inadequate to convey the experience. This finding is consistent with that of Rodriguez and Webster (1997) who reported: “It appears that a strong counterpull to improved verbal ability is an emerging realization that the feelings evoked in musical experiences are not simply ‘happy’ or ‘sad’ or even both, but increasingly beyond the realm of discourse” (p. 24). The following examples from the present study illustrate this point:

. . . Mmm . . . (long pause) . . . I can’t describe it . . . ‘Cause it gives it a, um . . . It makes it feel like, um . . . I don’t know how to explain . . . (Subject 16).

. . . Well, the piano made . . . well, I don’t know how to say it . . . It’s too hard to try to describe . . . (Subject 23).

. . . For me, it’s really hard to explain how I feel about music . . . (Subject 29).

. . . I can’t really describe it . . . I don’t know . . . (long pause); it’s too hard . . . (Subject 34).

. . . ‘Cause this, um, I can’t explain it, but I’ll kinda try . . . because, un, the way . . . oh, man . . . I can’t explain this . . . (Subject 44).

. . . Well, sometimes, it’s, um, hard to explain - you know, I mean . . . it’s hard to explain . . . It’s just hard to put it all into words . . . it’s just hard - hard to describe (Subject 54).

If given a choice of response modes--CRDI alone, CRDI in combination with discussion, or discussion alone--over 43% of all subjects indicated a preference for using the CRDI alone. In addition, over 48% demonstrated a choice to show response using the dial combined with discussion while less than 7% preferred discussion alone.

This study was designed to present individual, not group, responsiveness from fourth grade students and demographic information was collected for purely heuristic reasons.
However, the following information drawn from that data and analysis of four cumulative CRDI graphs revealed interesting results that seem important to include in this investigation and merit future evaluation.

The composite graphs of both listening experiences (Please see Appendix B) revealed an extremely high correspondence. Reliability for all subjects across both listening experiences was .986. This correspondence provides important information in that children, like adults (Madsen et al., 1993), seem to respond almost identically during the same part(s) of the listening event.

Graphic analysis of emotional response based on gender (Please see Appendix B) revealed no differences between the aesthetic reactions of girls and boys during either listening experience. Reliability between the genders during the first listening event was .976 and during the second listening exercise was .956.

Correspondence between the various categories of developmental status and conditions was more varied (Please see Appendix B). Ninety-four percent of children, including those with special education classifications, completed the listening responses without difficulty. For purposes of analysis, student developmental status and conditions were divided into three sections: Normally developing; Special learners; and Gifted. Correlation for all developmental conditions for the first listening experience was as follows: Normally developing and Special learners, .916; Normally developing and Gifted, .944; Special learners and Gifted, .784. Second listening correlations were slightly lower: Normally developing and Special learners, .567; Normally developing and Gifted, .950; Special learners and Gifted, .358.

As has been shown with adult populations (Capperella-Sheldon, 1992; Madsen et al., 1993; Waterman, 1996), the emotional reactions of fourth grade children with musical training, as demonstrated through verbal responses and in the graphic analyses of CRDI data (Please see Appendix B), did not differ from that of students without musical experience. Correspondence was extremely high between the two populations for both listening exercises, .917 and .982 respectively.

As evidenced from analysis of CRDI graphs and verbal responses, results from this study appear to indicate that students as young as nine and ten years old experience highly emotional, deeply personal responses to music. This is certainly encouraging information for music educators and therapists and offers a plethora of avenues for future investigations.
CHAPTER 5
DISCUSSION

The purpose of the present study was to explore the emotional responsiveness of elementary-aged students to music. Subjects were students from three intact classes of public school fourth graders. While listening to Rhapsody on a theme of Paganini, Op. 43, Variation 18, by Sergei Rachmaninoff, students indicated their aesthetic reactions by manipulating the dial of the Continuous Response Digital Interface (CRDI). Immediately after the listening exercise, using a highly flexible retrospective interview process to allow for maximum individualized response, subjects’ verbal responses were recorded. The study was also an exploration of the CRDI as a tool for measuring aesthetic response from younger subjects.

The object of the study was not to focus on group results as they pertain to prediction of attitude, behavior, or preference but to provide the music educator and therapist with individualized, descriptive information regarding the emotional responses of young children to a musical stimulus. Such data could provide a consequential contribution to our understanding of the young child’s emotional interactions with, and responses to music, and can serve as a tool to enhance our ability to develop our students’ aesthetic reactions.

The most important aspect of this study is the fact that music elicited deeply emotional responses from elementary-aged children. As evidenced by the following examples, fourth grade students in this investigation were able to make immediate, highly personal, and completely individualized emotional connections after hearing an unfamiliar piece of music one time. It seems for many of these children, music sounds the way emotions feel (Pratt, 1931, p. 203). Several examples of the students’ most poignant emotional responses follow:

. . . (Can you think of a time in your life when this music either matched the way you felt or maybe could have changed the way you felt?) Um, at the end whenever I found out my parents, like, were divorced . . . ‘Cause I . . . they got divorced on a Wednesday, and I found out, like, on a Thursday, the next Thursday - not the Thursday
after the Wednesday. (What about the orchestral section? Does that section match any of your feelings?) Um, on my birthday. (So, is that a good feeling?) Yeah. (Subject 14)

. . . Um, like, at the first part, I was, like, thinking it was sort of sad . . . I was thinking of when my brother left, ‘cause he’s off, um, fighting in the war; and I kept thinking of that, like . . . like, um, I . . . I was crying, my br . . ., my mom was crying, his girlfriend was crying - his fiancé, um . . . Um, [the orchestral section] made me feel sorta happy, like . . . like, you know, maybe he’s coming back or something, or, you know, someth . . . It made me feel something happy - like, I went away for a long time, and I just got to see my dog for the first time . . . (Subject 22)

. . . Um, [it] makes me feel like . . . calm, peaceful. My mom and brothers and sisters are always loud and yelling, and I always wish I could find a still place. That music made me feel like that - still. (So, why did you turn down the dial during the orchestral section?) Um, it reminded me of noise and loud. (How does that make you feel?) Like I want to run away and find a quite place . . . (Subject 13)

. . . The music reminded me of something . . . a song that my papa used to always sing to me . . . I can’t remember how it goes, ‘cause he hasn’t sang it to me in a while - even though he’s still alive . . . When my granny or my papa, when I get like . . . mad or something at somebody, they’ll start singing that song, and it’ll make me feel better . . . [And] last year since there was a kid in Chaires that’d always make fun of me and stuff. I kept on balling my fists, about to punch him, but then I told myself, “Don’t punch him,” because then I’d get a referral. And this would have calmed me down . . . (Subject 24)

. . . Well, when it was like going to a lower sound, it made me feel like - have you seen um, the movie Mozart where he was dying? That’s what it made me feel like . . . (Subject 36)

. . . Well, it was kinda, sorta - it was a little sad; but it made me feel really excited because, it’s like that moment, when you’re just about to have a huge party, but everything’s really calm, and then you just go crazy . . . Well, see, you were excited because, um, it was the moment when everything’s really calm, and it’s like, two minutes before your big party, and then, you’re just sittin’ - sitting there waiting, and thinking about what’s gonna happen; and everything’s just really calm, and you’re looking out the window waiting for your friends to come and then - they’re there. (Is that how you felt
when you turned the dial far over toward 255?) Yeah. (So, tell me what you were feeling at the end of the music. You started moving the dial back toward the left, but then you turned it pretty far back to the right.) Well, ‘cause it got really slow, and that felt like you’re . . . you’ve been wait . . . looking out the window, and nothing’s happening, and you’re scared that maybe n-no one shows up, but then - you see a car! And, you just go back up (indicating dial movement) . . . (Subject 50)

. . . I love it. I love that kind of music . . . it gets me in a mood; it reminds me of my grandpa, because he died on Valentine’s Day. He, he used to listen to that kind of stuff . . . (Subject 52)

When the CRDI is used in tandem with verbal response, a wealth of additional data is available to the music educator or therapist. Several examples from the present study illustrate this point.

Subject 22’s listening graphs indicated emotional response that never reached 80 on the CRDI continuum. Without verbal responses, the conclusion might be drawn that the music did not reach her emotionally. Her verbalizations, however, indicate a strong impassioned reaction that was connected to her brother’s departure with the army and therefore explain why the music never “made [her] feel something happy . . . That scene when my brother left [kept] replaying in my head . . . I could just feel it coming, like the sadness . . . and that’s why I, like, turned it down and everything.”

Although the graphic analysis of Subject 42’s first listening experience indicated an aesthetic response level above 200, her second listening graph never reached 60 on the CRDI dial. Her verbal responses reveal that on the first listening, she had associated the music with her grandfather’s death, and as a result, the second listening only reinforced the feeling of sadness. “It’s just really sad music . . . It makes you feel sad . . . Even though it got higher and had beautiful sounds, it still sounded like it was sad . . . I don’t think it would make anybody feel that . . . good.”

Both of Subject 14’s response graphs were below 100 on the CRDI dial. As with Subject 22, this appears to indicate a lack of emotional involvement with the music. However, Subject 14’s verbal responses reveal a deep emotional impact, linked to his parent’s divorce. He was also able to explain that during both listening experiences, he “. . . wasn’t even thinking about the dial that much . . . I was just sort of listening . . . I was just thinking about the music.”
This investigation into the emotional responsiveness of elementary-aged students to music provides a manifold of options for future music education and therapy research. Since the CRDI appears to be a simple and efficient way to collect aesthetic response data from fourth grade students, and has been used effectively to gather differing types of information from populations as young as preschool, it seems imperative to continue this research with both younger and older students. While younger students may be capable of manipulating the CRDI pointer, will their verbalization skills allow for meaningful interviews? Will older students be as open and forthright as younger students, or will they filter their emotional verbal responses?

During the last seven measures of the *Rhapsody*, analyses of the CRDI graphs indicate that more than 48 percent of subjects in this investigation left their dials at the midway point or above. This is interesting data, considering that this particular section of the music decreases in volume from *forte* to *piano*, decreases in tempo, and timbrally returns to solo piano from full orchestra. As preference research has demonstrated that students in this age category prefer fast tempi (LeBlanc, 1981; LeBlanc et al., 1988; LeBlanc & McCrary, 1983), the researcher had anticipated a return to the lower left side of the CRDI dial. Although the researcher did not investigate these results with all students, several students discussed why they left their dials higher, toward the right side of the continuum: “Because, kinda like it was left over . . .” (Subject 47); “Because I still felt that excitement inside me . . .” (Subject 33); “I like it. I just . . .” (student gestured out with hands) . . . I love it . . . I don’t . . .” (Subject 52). Is it possible that these fourth grade students were “caught up” in the emotional impact, or “afterglow,” of the music? Additional research should utilize the verbal responsiveness of this age group to further investigate this intriguing outcome.

Another interesting question raised by this study is that of preference based on feeling. Most students in this study indicated that they “liked” music that made them feel “happy,” and “disliked” music that made them feel “sad.” “Happy” music tended to coincide with the middle, orchestral section, while either the beginning or the end of the piece was frequently labeled as “sad.” Although research has shown that younger students prefer music with quicker tempi (LeBlanc & Cote, 1983; LeBlanc et al., 2000-2001), no studies, to date, have investigated why they prefer faster music. Could it be that quicker music makes them feel “happy” while slower music connotes “sadness” to them? Do they “prefer” feeling “happy” to feeling “sad?”
As evidenced by the subjects’ interviews, students initiated discussions concerning topics such as bullying, death, divorce, family issues, loneliness, and stress. Although the classroom teachers reported that none of these children had ever been serviced by a music therapist, several of them mentioned that listening to this piece of music would have assisted them in dealing with their issues. Could interactions similar to this study offer efficient, candid insight into the lives of elementary-aged students? Could they help identify students for whom music could serve as therapy?

Data from this study indicate no difference in emotional responses between boys and girls. These results add to the conflicting results surrounding research in the area of gender-based aesthetic reactions (Montgomery, 1996; Moore, 1987; Wapnick, 1976). Additional investigation into this intriguing and complex dimension of emotional responsiveness is certainly merited.

An additional important finding for music educators and therapists concerns the differences in responses between students with varying developmental conditions. While the correspondence between normally developing and gifted students was quite high for both listening experiences ($r = .994; .950$), the correlation between normally developing and special learners changed considerably between the two trials ($r = .916; .567$). Correspondence between special learners and gifted students was lower for the first listening episode ($r = .784$) and decreased even more during the second event ($r = .358$). These data warrant further investigation by music therapists as well as music educators. Are special learners less emotionally responsive than are normally developing and gifted students? If so, why? Are gifted students more emotionally responsive to music than special populations or normally developing students? Are these data consistent across age groups?

Results of this study should be considered within the context of its limitations. First, in an attempt to allow for maximum individual emotional response, this investigation used a highly flexible, personalized interview process to encourage verbal aesthetic reactions. Any time a researcher interviews subjects, many questions may arise including those related to leading the discussion, interrupting or cutting off responses, and influencing answers. Second, the stimulus was restricted to one musical selection from the western art music tradition. Additionally, the piece is romantic in style and composition, and music from a different historical period and cultural origin may have produced different responses.
This investigation seems to suggest that young children are indeed capable of experiencing deep emotional responses to music. This knowledge is of utmost importance to music educators and therapists. In a 2001 study involving college-aged students, Woody and Burns (Woody & Burns, 2001) found “. . . provisional support for the theory that young adults do not appreciate classical music because they have not experienced its emotional potential; thus, they believe it cannot express the emotions or moods that they seek in a music listening experience” (p. 70). Several researchers (Lehmann, 1997; Woody & Burns, 2001; Yarbrough, 1985) have suggested that our initial task as music educators and therapists might be to provide opportunities for students to experience the emotional impact of music. This study provides initial support for the notion that such instruction may successfully begin as early as fourth grade.
Appendix A

*Rhapsody on a Theme of Paganini*, Op. 43, Variation 18
VAR. XVIII
Andante cantabile
Appendix B

Cumulative CRDI Response Graphs
Cumulative CRDI Response Graphs

Listening Exercises 1 and 2
Cumulative CRDI Response Graphs

Responses Based on Gender
Cumulative CRDI Response Graphs

Responses Based on Developmental Status and Conditions
Cumulative CRDI Response Graphs

Responses Based on Musical and No Musical Experience
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