MUSIC USE IN THE CLASSROOM: COMPARING EFFECTS ON STUDENTS

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I dedicate this work to

my mother Verna,

who showed me music

and to

my son David,

who showed me courage.

Abstract

Recent research on the brain has shown that music can affect the behaviour of students in schools. This study examines the effects of recorded music on classroom climate in a variety of K-12 classrooms. This multiple case study focuses on five classrooms in southern Alberta. Teachers recorded observations in a journal format regarding classroom climate at the beginning of classes each morning for three weeks. During the first week no music was played. During the second two weeks, a selected recording of popular songs with positive lyrical messages was played each day. Teachers kept a daily journal, and were interviewed at the conclusion of the observation period. The observations of the teachers were compared with respect to the different divisions of students. It was found that students at all levels were happier, more co-operative, and better behaved after listening to the music before class. The music seemed to have a more dramatic affect on progressively younger students. Some of the teachers reported being in a more positive state as they began their day with music. Recommendations for possible uses of music to enhance classroom management, transitions, and learning, and for further study are cited.

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Chapter 1: Introduction

"If a man does not keep pace with his companions, perhaps it is because he hears a different drummer. Let him step to the music which he hears, however measured or far away".

Henry David Thoreau, Walden, Conclusion.

Music is literally everywhere we look in the world today. Indeed, the sound of life is the sound of music reflected in virtually all of our activities. Our culture is full of music. Whether it is the Olympic Games, a wedding, a funeral, a movie, a hockey game, or a church service, appropriate music is an integral accompaniment. Music has played a significant role in many cultures: soldiers were drummed into battle to bolster their courage; slaves sang spirituals to endure their plight; and fanfares played in the presence of royalty to mark the import of special occasions. Music enhances our festivities, inspires us, and modulates our moods. It helps us go to sleep at night and wake up in the morning. We cook meals, make love, and exercise in the presence of melodic sounds. Even nature provides us with incredible auditory experiences. Waking up early on a warm summer morning to a crescendo of bird songs, or walking in the solitude of a forest where wind, insects, and wildlife play out a gentle aria are sensory experiences to be cherished.

Music feeds my soul. I have been listening to music my entire life and, consequently, my interest in music has become broad and varied. At the same time, I have become a music maker by learning to play the guitar and by writing songs. Seldom do I drive anywhere without a radio, compact disc, or tape playing. My fascination with music was spawned in my youth and has never ceased to grow. Thus, it seemed only

natural to me that music would be part of my career as an educator. Over time, I have come to grips with the following question: What more could I learn about music that would help my effectiveness as a teacher and educational leader?

My life as a learner, educator, and music lover converged when I was given the opportunity to attend two workshops on *brain compatible learning* (Jensen, 1998, p.vii) that altered my professional life. During the first workshop, I spent a week with Eric Jensen, an expert on the effects of music on the brain and its relationship to learning. This intriguing experience encouraged me to do some further research and explore ideas in my classroom. The second workshop, a year later, was a week with Dr. Rich Allan, a noted expert on presentation skills. Both of these facilitators use brain compatible learning as a fundamental basis of their work. More importantly, both presenters used music extensively and purposefully to enhance the delivery of their respective messages. These experiences, and my natural love of music, piqued my interest and created a need for me to know more, to seek knowledge about the power and potential of music in pedagogy. As a result of these workshops, I was compelled to discover more about the use of music in the classroom. What better platform for inquiry than a Master of Education research project?

A logical beginning point for an inquiry into pedagogy would be to look at our schools. On the one hand, we have schools and classrooms largely devoid of music; while on the other hand, we have a social environment outside the classroom in which music is an integral component. It is paradoxical that such a popular and powerful medium as music would not be found in abundance in schools. Examining how music might be used in learning environments could be invaluable in enhancing learning experiences in

schools. Indeed, the brains that are so profoundly affected by music in department stores, elevators and dentists' chairs are the same brains students bring into schools and universities each day. Understanding how the emotional states of learners are affected by music may allow teachers to more effectively manage learning environments and outcomes.

As educators move out from under the shadow that IQ testing and genetic attributioning have cast over educational practice, and into the light of brain-based learning (Fogarty, 2001), they find themselves at a starting point for a discussion of the use of music in teaching. As they proceed, teachers must be mindful of the fact that they may soon be marching to the beat of a different drummer, yet, at the same time, they must be careful to play close attention to what educators already know to be true about learning. To have value, brain compatible learning theories such as using music must endure, and be more than a passing fancy, or *chart topper* on the hit parade of teaching fads.

My experiences as a teacher have compelled me to investigate using music in the classroom. Even though I may indeed be marching to the beat of a different drummer, music is the subject of my passion and the focus of my inquiry.

Chapter 2: Review of the Literature

"If music be the food of love, play on".

William Shakespeare, Twelfth Night, Act1, Scene 1

Research in neuroscience has provided educators with knowledge that helps them teach in a manner that acknowledges the ways that the brain learns naturally and more efficiently (Wolfe, 2001). This so called *new* method has been dubbed *brain compatible learning* (Jensen, 1998). Proponents such as Jensen (2000a), Sylwester (2000), and Wolfe (2001) have made a strong case for this approach to teaching. At the same time, other theories of learning have emerged which support and strengthen the arguments for brain compatible learning. For example, Goleman (1995) presents emotional intelligence as another important factor in learning, and Gardner's (1983) ground breaking theory of multiple intelligences, and music intelligence in particular, has been practically applied to teaching by Thomas Armstrong (2000), among many others. As educators move into a new century, they find themselves being influenced by an increasing body of knowledge based on improved technology and fascinating research. In this climate of research-based education, increasing numbers of educators find themselves looking at arts such as music, and exploring its effects on learning in today's classrooms.

The significance of music can be seen throughout history as a worldwide phenomenon that dates back to prehistoric times, and that has established an important influence on virtually every human endeavour (Erskine, 2002). An impressive time line traces the history of the use of music and research through the ages (Miles, 1997). Archaeologists excavated bone flutes, rattles and shakers from the Palaeolithic era. Ancient civilizations developed musical repertoires for work, relaxation and spiritual

rituals. In ancient Egypt, the Kahum papyrus referred to healing the sick with songs. In Greek mythology, Apollo's servant Orpheus played a harp with magical healing powers, and Homer recommended music to alleviate anger, sorrow, worry, and fear. According to Miles, the important connection between mathematics and music was established when Pythagoras discovered the physics of musical sound. Confucius, Plato, Aristotle and Cicero all lauded the importance of music to harmonious living. The connection between emotions and music were illustrated in the musical scales called *ragas* in India in the 1500s. Renaissance thinkers described music's influence on breathing, blood pressure, and digestion. Early research in Europe and the United States in the eighteenth and nineteenth centuries examined the relationship between music and mental state. As the twentieth century dawned, research and experimentation intensified, especially in the fields of psychology and medicine. The 1980s saw a proliferation of empirical studies regarding music's clinical applications. Some even contended that listening to Mozart increases intelligence and thus was coined the much-publicized term, *Mozart effect* (Raucher, Shaw, & Ky,1993).

The obvious importance of music throughout history provides a foundation upon which to examine music in educational settings in modern times. A number of discoveries support the notion that music may have positive effects on learning. Newly developed technologies such as Functional Magnetic Imaging (FMRI) and Positron Emission Tomography (PET) have allowed researchers to study live human brains (Jensen, 1998). This recent research has implications for classroom practices of teachers. Sylwester (1997) proposes that recent dramatic developments in brain research and technology suggest that a comprehensive understanding of how the brain works is

imminent, and the ability of educational practitioners should improve dramatically if this new knowledge replaces traditional *folklore* in education (Sylwester, 1997).

A great deal of work has been done in the field of cognitive neuroscience. Out of this work have come the phrases *brain-compatible*, or *brain-based learning*. Simply stated, brain-based learning is an educational theory built on the tenet that brain research can inform the design of learning activities consistent with the way that the brain learns best. A seminal work called *Making Connections: Teaching and the Human Brain*, tied together early research on cognition, behaviour, and brain function, and presented a prescription for educating students (Caine & Caine, 1991). Over the course of the last decade other notable works have further developed the theory and practice of brain compatible learning (Diamond & Hopson, 1998; Jensen, 1998; Sprenger, 2002; Sylwester, 2000). Much of the more current research in the neurosciences focuses on learning and memory (King-Friedricks, 2001). In addition, emotions also have a key role to play in the classroom (Sylwester, 1994). The connection between emotion and learning has become a prime focus for many professionals, particularly neuroscientists.

The human brain, a mere three pounds of water (78%), fat (10%), and protein, is a teeming mass of 100 billion bustling cells called neurons. Neurons communicate through an electro-chemical process across synapses and through dendrite receptors in the presence of neurotransmitters. These *magic* chemicals activate neuro-pathways which control our attention and emotional state (Wolfe, 2001). Examples of emotional states include anticipation, frustration, euphoria, and apathy. All behaviour is state-dependent (Jensen, 1998; Sprenger, 2002). This connection between emotion and learning has been studied by a number of scientists. Foremost among these is neuroscientist Joseph

LeDoux, who proved that emotional experiences are a result of triggering systems of behavioural adaptations (LeDoux, 1997). His work suggests that a horn being associated with the shock, creating the emotion of fear and its accompanying physiology in rats may be the same process as the effects of *feel good* music played to students in class. The influence of music in state management and associated behaviour has been well documented (Jensen, 1995; Wolfe, 2001). In fact, certain songs affect us emotionally and physically. This is partly due to a particular mix of chemicals being released in the brain and body, triggered by the memory connection to those songs.

Goleman (1995) has offered another theory that supports the idea of emotion as a critical element of learning. He suggests that there exists a rational/emotional dichotomy in the brain which operates in tight harmony to guide actions. The ability to motivate oneself, delay gratification, regulate emotion, empathize, and hope is critical to successful living. He calls this ability *emotional intelligence*. He contends that people always feel first and think second, and that a positive emotional state enhances learning (Goleman, 1995). The emotional mind has a state-specific repertoire governed by the emotions of a particular moment. In fact, the ability to react effectively to emotions is of critical importance in learning. This supposition speaks loudly in favour of brain compatible teaching techniques such as playing music to manage states and, thus, enhance learning.

Yet another learning theory emphasizes the importance of emotion in learning. Gardner (1983) contends that, in addition to biological endowments, and cultural and historical background, personal experiences with parents, teachers and peers can awaken or inhibit the development of any of his multiple intelligences (Armstrong, 2000).

According to Armstrong (2000), crystallizing or paralysing experiences are tied to positive or negative emotion moments that ignite or extinguish a particular intelligence. Once again, these references affirm that teachers can plan for and provide positive emotional learning experiences that develop competencies in their students.

Although it is true that many factors affect learning, there can be little doubt that the emotional state of the learner is central (Jensen, 1998). This contention raises issues such as the effects of music on the brain and body on an emotional level, and its relationship to memory, a critical element of learning. There have been few studies investigating the non-contingent use of music in the field of education (Hallam & Price 1998,). Moreover, there were few significant findings on the effects of music on the brain until the early 1990s. At this time, Frances Raucher found that the neural firing patterns are basically the same for music appreciation and abstract reasoning (cited in Jensen, 1998). This was important research because it spoke of a causal relationship between music and learning. Raucher et al. (1993) explained this *Mozart effect* as the brain being warmed up by facilitating complex neuronal patterns similar to those required for complex spatial thinking (Anderson, Marsh, & Harvey, 1999). More importantly, this theory led to much more research being done on the effects of music on the brain (Jensen, 2000b).

While the structure of music may improve mental functioning, there are additional important reasons for its use. For example, it can help create positive learning environments that are free of threats or unproductive behaviour and it can motivate students to engage in planned learning activities. When students are on-task, it seems logical to assume they will perform learning activities better. Several studies have looked

at the effects of music on the behaviour and performance of students. When easy-listening music was played to a fifth grade class, their on-task performance increased (Davidson & Powell, 1986). If calming music was played to nine and ten year old students, math performance improved and rule-breaking behaviours decreased (Hallam & Price, 1998). Playing background music of the students' choice for five minutes after recess also had a positive effect on the behaviour of first and second grade students (Giles, 1991). Savan (1999) played music to 11 and 12 year old boys with special needs, and then measured specific physiological responses including heart rate, blood pressure, and body temperature. She concluded that the music had a marked calming effect. Chalmers, Olson and Zurkowski (1999) measured the decibel level and behavioural interventions in a lunchroom when classical, popular and no music were played. The noise level dropped 7% with classical music, and 12% with popular music when compared with the noise level with no music. Behavioural intervention dropped 65%. The authors suggested that the music may have affected the supervisors as well as the students. It was also noted that the vast majority of students preferred the popular music. Among the authors' tips for using music was the suggestion that background music be played as a pleasant beginning to a school day.

Simply playing background music has been shown to have an effect on students in educational settings. Why might this be so? Sylwester (2000) contends that because our neural system processes basic elements of music such as tone, melody, harmony, and rhythm, an emotional overtone is given to our language. Further, he suggests that social contacts, like positive comments from others and music, elevate endorphin levels that modulate our pain-pleasure continuum in a positive way (Sylwester, 1994). Sprenger

(2002) concurs, describing an experiment by Jourdain in which endorphin blockers were given to an experimental group. When their favourite music was played, participants stated they did not get the same good feelings they normally experienced. Indeed, it has been well established that the emotional brain is modulated moment to moment by a particular *cocktail* of neurotransmitter chemicals that combine to create a given emotional state (Jensen, 2000a). If learners are under stress or threat, cortisol is released, but if learners are relaxed and feel positive and alert, seretonin and dopamine are produced (Jensen, 2000a). To understand further what is going on in the body, one only has to think of a powerful piece of music such as the pulsating theme from the movie *Jaws*, a favourite love song, or a national anthem, and consider the actual physical sensation produced. Neurotransmitters bind memory to emotions, and that is why we can hear just a few notes to the introduction of a song, and remember the lyrics and events associated with it. Wolfe says the same process is at work with a favourite poem or story if the reader becomes involved on an emotional level. Memory is a key component of learning. Singing the letters of the alphabet helps young children learn and remember it. Moreover, the children of the last three decades have learned to count rhythmically to music while watching Sesame Street. A lot of information that is embedded in music is easier to remember (Wolfe, 2001).

Despite the many advantages of enhancing learning experiences through music, a word of caution must be given. Shaw's (cited in Raucher et al, 1993) experiments have subjects listening to Mozart before, not during, the spatial reasoning test. In fact, Jensen (1995) suggests that music be used no more than 30% of the time to be most effective. This raises the issue of the best uses for music. Teachers want their students to feel

energized and optimistic at school. Equally important, sometimes students need to relax, focus, be creative and enjoy a genuine feeling of wellness. Miles (1997) presents situations, and matches them with purposeful music to enhance life. Notable examples include: completing a tedious task to the accompaniment of fast-paced music; playing uplifting music when sad or depressed, and relieving anger or tension with music the listener finds cathartic. Many of these ideas are applicable for schools. Jensen (2000a, p. 254) recommends that teachers use music for a purpose rather than just for entertainment. Some of its applications may include: socialization, by bringing people together; entrainment, through rhythms and beats; priming, to activate neural pathways; and memory work. Sprenger (2002) uses music to help with classroom management such as cleanup activities and attention cues for movement to energize and motivate through state changes.

Chapter 3: Methodology

"Music hath charms to soothe a savage breast, to soften rocks, or bend a knotted oak."

William Congreve

Postmodernists argue that what is real for teachers is contingent on their experience and beliefs (Creswell, 1994). Everything is relative and relevant only as a function of how a lived experience is perceived (Van Manen, 1990). Similarly, thoughts and feelings that emerge from an experience help people develop a deeper understanding of it. Reflection can be a valuable source of data. The patterns that come to light from a number of lived experiences may lead to a fuller understanding of the phenomena being studied (Van Manen, 1990).

The purpose of a phenomenological study is to examine the discoveries that emerge from within a reflection on a *slice of life* (Van Manen, 1990). This mixed method research project involves a qualitative inquiry (Neuman, 1997) experience, which Merriam (1988) suggests is a most appropriate use of research from which teachers may examine their practice.

Qualitative research methods are designed to help researchers understand people in the social and cultural contexts in which they live. In fact, understanding a phenomenon from the point of view of the participants and its particular social and institutional context is often lost when textual data are quantified. From a philosophical perspective, this study is "interpretive" (Neuman, 1997, p. 68). Interpretive studies generally attempt to understand phenomena through the meanings that people assign to them, and interpretive methods of research in education are important in gaining such

understanding. In other words, the methodological design will help the researcher "see within [the] words and behind [the] actions" of the participants (Sherman & Webb, 1988, p. 65).

The method for this study is informed by a variety of data gathering approaches. (Creswell, 1994; Glesne, 1999; Neuman, 1997; Wolcott, 2001; Yin, 1984, 2003), and is based on case study style. It is actually a "multiple case study" (Yin, 1984, p. 47) because six informants are studied under similar conditions. Yin (1984) defines case study as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, and in which multiple sources of evidence are used" (p. 23). Wolcott (2001) takes a more refined view by describing case study as a "format for reporting" (p. 91), and asserts that this method is not only convenient, but also preferred. The design of this study allows the researcher to look at each case as a unit of analysis from which compared and contrasted experiences can be related to the central research question (Creswell, 1994).

This study is field research that involves participant observation (Glesne, 1999; Neuman, 1997). Glesne describes a continuum for participant observation, which defines varying amounts of participation, and observation. For purposes of this study the researcher was primarily an observer.

Research Question

Can the purposeful use of music enhance teaching practice? To what extent does music influence the affective state of students in ways that complement learning? The purpose of this research is to compare the effects of music on students at different grade levels. The central question in this inquiry is: To what extent and in what ways does the

use of music influence classroom climate?

This study will explore the effect that listening to music before class has on student attitudes, behaviours, and classroom climate as perceived by the teacher. The specific purposes will be to engage teacher colleagues in one brain-compatible learning technique, and examine its influence on the emotional states and behaviour of students. The hypothesis of this research is defined by the following two propositions (Yin, 2003). First, I propose that music has a profound effect on students of all ages. Second, I propose that music affects students of all ages in similar ways, if administered under similar conditions

Sample

The data in this study were gathered through a purposive sample of six classroom teachers. The teachers kept a journal of observations, thoughts, and feelings during the course of the study, and participated in an interview with the researcher at the conclusion of the specified time period. Interviews were videotaped, and transcribed as necessary to complete the analysis of the data. Appendices A and B provide a detailed explanation of the journaling and interviewing processes.

Each of the informants in this study was well known to the researcher, and chosen purposefully to provide a breadth of data across all divisions of schooling. A brief description of each of the teachers and their classroom situation follows.

The Division I teacher taught grade two in a small rural Alberta school. Her class comprised 15 students in a regular program. The two Division II teachers both taught grade six classes. The first was a class of 28 students, in a regular program, at a medium sized school in a semi-urban Alberta community. The second was a class of 23 students

at a school in a large Alberta city. All three elementary classrooms included a variety of special needs students. The two Division III teachers team-taught a grade eight class of 33 students at a middle school in a semi-urban Alberta community. This class included 13 students who were coded for special needs in a program called *Bridges*. Within that same community was a high school, where the Division IV teacher taught three different classes: French 9, with 19 students, French 20, with 14 students and Social Studies 20, with 30 students.

Strategy

Morning routines varied only slightly among the schools and in four out of five cases the music was provided via a portable CD player in the room. The exception was the grade two class, where the music was played to the whole school on the public address system.

The teachers in this study agreed to be in their classrooms at least ten minutes prior to the start of classes at the beginning of the day. They observed the behaviour of the students as well as the general classroom climate, and kept track of their observations in a daily journal. The teachers were also encouraged to recount their feelings in their journals. It was the intent of the researcher not to affect or influence observations by providing specific categories of behaviour, and inadvertently bring bias into the study. Instructions to participating teachers were intended to help them think about the climate in their classroom by observing the students' arrival each day, conversations and actions, the general energy level in the class, and how students related to expectations, routines, or other activities (see appendix A).

After one week of routine starts to each day, the teachers had music playing in their classroom for ten minutes before the beginning of class. The music was a pre-recorded selection of age-appropriate popular songs with an upbeat tempo and positive lyrical message (see Appendixes C and D). All the classes were exposed to one of two CD recordings compiled by the researcher. One CD was designed for grades one to six, and one for grades seven to twelve. Teachers observed their classes and wrote journals as before for a period of two weeks.

Data Gathering

The teachers' journal texts provided an initial set of data from which a variety of themes could emerge. These journals provided a detailed look at what transpired, and how the teacher felt about the events as they happened. This journaling design is consistent with the method described by Neuman (1997). Through the use of videotaped interviews, after the completion of the observations, the researcher explored each teacher's understanding and experience, with respect to the application of music in the classroom. These interviews provided another angle from which to view the data (Glesne, 1999, p. 92). The interviews were semi-structured, with a few guiding questions, but remained open to allow the researcher "to follow unexpected leads that ar[o]se" (Glesne, 1999, p. 93) in the course of the discussion (see Appendix B). Glesne further describes this pursuit as "depth-probing" (ibid). The close interaction afforded by the interview process allowed the interviewer to observe important personal reactions such as body language and vocal tone. This enhanced the richness of the data.

In summary, the researcher consciously followed three principles of data collection: using multiple sources of evidence, creating a case study data base, and

maintaining a chain of evidence (Yin, 2003). It was the author's intention to ensure the validity and reliability of the study by following a method that was credible in its design and application.

Analysis

Beginning the task of analysing the data from journals and interviews is like opening the *catch-all* drawer in the kitchen and trying to organize it in some useful way. The researcher must take everything that has been collected and ask questions such as who, what, how, and how much "to generate ideas or ways of looking at the data" (Strauss & Corbin, 1998, p. 91).

The intent of qualitative analysis is to carefully examine empirical information and reach a conclusion (Neuman, 1997). The data in this study were analysed by developing categories and making comparisons and contrasts. This analysis design honours a specified, standardized set of data analysis techniques known as coding. Specifically, *open coding* is used to identify and assign initial themes; *axial coding* is used to cluster themes and look for connections; and *selective coding* is used to compare, contrast and generate a bigger picture (Neuman, 1997).

The internal validity of this study was supported in two ways. First, the participants were used as "member checks" (Creswell, 1994, p. 158); the author confirmed the interpretation of the journals and interviews with each teacher for the accuracy of the themes and patterns. Feedback from the participants was used to further analyse, and deepen the understanding of the data. Second, using a form of "pattern matching"(Yin, 2003, p. 119), the researcher sought to find a convergence or divergence of evidence from the various sources of data that informed this study, and matched those

ideas to a predicted outcome. Comparing the observations of teachers in similar and different grade levels allowed for a more complete understanding of the emerging theory.

Chapter 4: Findings

"Music is the effort we make to explain to ourselves how our brains work. We listen to Bach transfixed because this is listening to a human mind."

Lewis Thomas – The Medusa and the Snail

Baseline Plan

During the first week of this study no music was played. This was quite intentional and, in fact, part of the research design. This provided data that would be compared with later observations when music was played. Having teachers observe their classes and write in a journal format allowed them to consciously attend to the activities that were transpiring in their classrooms, and become keener observers. The grade eleven classroom teacher noted. "It's interesting to see--and I never really observed carefully before--students' pre-class activities". For research analysis purposes, the initial observations in the first week provided a frame of reference for looking at the observations (Neuman, 1997).

The observations of teachers during the first week revealed the routines and organizational structures that were followed in different classrooms. While each class started the school day in a unique manner, there were some common elements. Typically, the national anthem would be played and/or some school wide announcements were either viewed or heard, depending on the state of technology within a given school. These events usually marked the end of the observation time for the study. In addition, there was a general expectation that students would begin to prepare for the start of the teaching day prior to announcements. Routines for the younger classes were more highly

structured than those of the classes in the higher grades. The focus of the analysis involved a process of coding classroom climate.

Open coding (Neuman, 1997) was used to establish the themes that prevailed. The researcher deconstructed the journals and assigned codes for the observations noted in the journals (see Appendix E). The researcher intentionally refrained from listing behaviours to be observed so as to allow the data to speak. The first pass through the data revealed a number of themes as well as a picture of each classroom.

The first week of the study without music showed a number of typical trends within common themes: chatting, asking questions, complaining, arriving early, arriving late, doing school work, following directions, and rough-housing emerged. I soon realized during the data analysis that a particular activity or individual behaviour could influence the climate in different ways. For example, when the grade two class had *wacky hair day*, the room was full of parents and very excited kids who were quite loud and boisterous. While loud behaviour could speak to a negative climate, in this case it was positive. It was at this point that I recognized a need to redefine my own understanding of *classroom climate*. For the many words and phrases written in the journals to be fully understood, and appreciated, more depth of analysis was needed. All the observed behaviours combined, and contributed to the overall climate in the classroom.

Follow-up Plan

The period with music brought new codes into the analysis of the data. It also created a need to understand more fully what the codes meant. Some richness of data is lost if one merely reports, for example, *talking about a song*, or *bopping*. Strauss and Corbin (1998) describe the process of relating categories with their subcategories at a

conceptual level as "axial coding . . . an analytic tool devised to help analysts integrate structure with process" (p.123). Axial coding provided the vehicle for the second pass through the data. In addition, it would lead to a conceptual landscape upon which each of the cases in this study could be mapped.

Axial coding of the data allowed a link between elements of the data within and across the units of analysis of the study. Despite the fact that the week without music provided a context for the study of the effect of music on different classes, further contextualization was needed. "Answering the questions of who, when, where, why, how, and with what consequences" (Strauss & Corbin, 1998, p.127) provided a density and clarity of ideas. After looking at each case individually, I saw the need to link ideas, events and actions across the cases, once the music was introduced. Trends were beginning to develop and codes could be clustered around bigger ideas. These emerging understandings led to a deeper discussion of the data.

The major themes or categories that the journals revealed were energy, emotion, engagement, and co-operation. The data showed that all of the classes reacted physically and psychologically to the music. One immediate difficulty lay in comparing seven year olds with seventeen year olds, and those in between. Nonetheless, it was possible to see effects that were cast across the cases. Regardless of whether students were doing a brain-gym exercise, putting the final touch on an assignment, or getting out an agenda, they were engaged in purposeful, productive work. For example, arriving early, helping a classmate tie shoes, and leaning back-to-back reading books, were all seen as signs of cooperation. Expressing a like or dislike of a song, dancing, and singing, were seen as signs of emotion. Smiles, swaying, and tapping, were evidence of certain kinds of energy.

By recategorising the original coded observations, I was able to see physical and psychological behaviour in a new light.

Two major themes, *tone* and *tenor*, emerged around the research question and its propositions. Tone and tenor, I felt were excellent metaphors for a music study. Tone can be defined as a generalization for the relatively positive or negative feeling produced by actions and concepts. Tenor refers to the general character, purpose, and meaning of an idea, or concept.

Analyzing the data at multiple levels through coding, classifying, and counting allowed me to get a clear picture of the climate in each of the classrooms. The following descriptions tell the story of each classroom starting the day with no music.

Week 1 – No Music

The high school students appeared to really enjoy the classes they were attending. There was little mention of tardiness or negative behaviour that affected the climate of the class. Often students would spend the unstructured time before class near, but not actually in, the classroom. Usually, a few students would congregate in the room, and this number would grow as time for the start of class approached. Typical behaviours included chatting with classmates, preparing work, or discussing assignments with the teacher. Occasionally, conversations with the teacher were playful and humorous. Emerging themes became more obvious and were summarized in her journaling of the final day without music. "Their actions seem to consist of arriving as late as possible, verifying assignments, if necessary, commenting on their state of mind, complaining about school, chatting, and waiting for things to start. Maybe there is no reason to come early". The coding of this division is illustrated in Table 1.

Table 1

Coded Events With No Music Division-IV

Code	Event	Day 1	Day 2	Day 3	Day 4	Day 5	Total
		Number of Occurrences					
AE	Students Arrive early	1					1
AL	Students arrive late	1					1
C	Complaining		1		1		2
CH	Chatting	1	2		1	1	5
CHA	Checking assignment	1			1		2
CW	Cooperative Work		1				1
HM	Happy mood		1				1
ITP	Interact with teacher - positive	1		3	1		5
SOT	Students on task	1	2	1			4

The middle school classroom reflected well the nature of this level of student. These are students balanced precariously between the innocence of youth and the anticipated actuality of high school, and adulthood. The classroom that was studied bustled with pre-class activities, many of which were similar to those observed in the high school, but with more defined expectations and structures. During this time, students handed in homework, chatted among themselves, and interacted easily with the teaching team. Most of the students were in the classroom before the day began. Table 2 summarizes this grade eight classroom with no music.

Table 2

Coded Events With No Music Division-III

Code	Event	Day 1	Day 2	Day 3	Day 4	Day 5	Total
		Number of Occurrences					
C	Complaining	2		1			3
CH	Chatting	1	1				2
CHA	Check assignment	1					1
FW	Focused work					1	1
HEN	High energy – negative			1	1		2
ITP	Interact with teacher – positive	1			1		2
L	Listening		1				1
LE	Low energy	1				1	2
NN	Noisy – negative	1		1	1		3
NP	Noisy – positive		1				1
QA	Quiet atmosphere		1			1	2
RH	Rough housing			1			1

The two grade six classrooms provided lessons in similarity and contrast. Both classes had even more students present in class prior to start-up, and both displayed a somewhat higher energy level than the older classes in the study.

The class from the urban school was struggling with expectations that the new teaching staff were in the process of establishing. At one point, early in the study, the teacher noted, "The students earned some missed time at recess because they came down the hall like hooligans and started playing a game of throwing around other students' agendas". This class had undergone some changes in its profile, and was in a period of adjustment. The observations are summarized in Table 3.

Table 3

Coded Events With No Music Division-II Urban

Code	Event	Day 1	Day 2	Day 3	Day 4	Day 5	Total
		Number of Occurrences					
BNC	Bouncing	1					1
C	Complaining				1		1
HEN	High energy – negative	1		2			3
ITN	Interacting with teacher – negative		1	2			3
NB	Negative behaviour				1		1
QA	Quiet atmosphere		1				1
TRN	Teacher reaction – negative	1		1			2
TRP	Teacher reaction – positive		1			1	2
W	Wired	1					1

The second grade six class operated in a room with an experienced teacher who had established expectations. The teacher expressed her feelings about the nature of grade six students on the second day of the study. "More energy this morning was nice! I wonder if it will be directed energy, though--some days are better than others." The teacher appeared able to deal effectively with her class, but did express frustration on the final day with no music. "It bothers me that sometimes when I speak--the kids just talk right through me--I don't think they're doing it 'to me'--in terms of purposefully being rude to me--and I know I am not the only one who sometimes deals with these things--but it's tough." Table 4 summarizes the events in this classroom.

Table 4

Coded Events With No Music Division-II Semi-Urban

Code	Event	Day 1	Day 2	Day 3	Day 4	Day 5	Total
		Number of Occurrences					
CH	Chatting	2					2
CHA	Check assignments			1			1
CW	Cooperative work			1	1	1	3
HEN	High energy – negative			1	1	1	3
HEP	High energy – positive		1				1
HM	Happy mood		1			1	2
ITN	Interact with teacher – negative		1		1		2
ITP	Interact with teacher – positive				1		1
LE	Low energy	1					1
NB	Negative behaviour					1	1
QA	Quiet atmosphere	2			1		3
SOT	Students on-task					1	1
TRN	Teacher reaction – negative			1		3	4
TRP	Teacher reaction – positive		1		1		2

The Division I class was a group of generally well-behaved students who showed a positive disposition toward schooling. Most students came to class well in advance of the morning bell, and participated in a structured pre-class routine that the teacher called *the morning note*. Socialization experiences were a common part of most days as these students learned positive behaviour strategies. The purposeful support and guidance of the teacher was very evident in her journal. An example that typifies many journal entries follows. "I called both girls over . . . These two girls have a history of problems getting along and there are many things that go on that are subtle but are disrespectful. After we discussed the situation, the girls went back to their desks but were not very happy." On another day she reported not being able to observe very well because she was helping a

student through a difficult time. "Curtis came up right away with tears in his eyes to tell me his great grandma had died. He was very emotional so we talked for awhile." The teacher reported mediating arguments and other minor conflicts, and talking with students about the wide variety of items that they would bring to school, including pictures, lost teeth, and art materials. Most often, children would be chatting and interacting as they put on their indoor shoes, pulled out their agendas and began working on the *brain gym* activities in the morning note. Table 5 illustrates the data collected in the grade two classroom.

Table 5

Coded Events With No Music Division-I

Code	Event	Day 1	Day 2	Day 3	Day 4	Day 5	Total
		Number of Occurrences					
AE	Arrive early	1					1
BNC	Bouncing	1					1
CH	Chatting	1	1				2
CHA	Checking assignments	1					1
CON	Conflict			3		1	4
CW	Cooperative work			1			1
E	Excitement		1				1
FW	Focused work	1		1	1	1	4
HEN	High energy – negative	1		1			2
HEP	High energy – positive	1				3	4
HM	Happy mood	1	1		1		3
ITN	Interact with teacher – negative		1	1			2
ITP	Interact with teacher – positive				1		1
NB	Negative behaviour	3	1	1	1	1	7
QA	Quiet atmosphere	1	1		1		3
RA	Running around	1		1			2
RH	Rough housing		1				1
SOT	Students on-task			1			1
TRP	Teacher reaction – positive			2			2
W	Wired		1	1		1	3

Teachers made comments regarding their anticipation of weeks ahead when music would be played. "I am looking forward to tomorrow when the dull morning routine will presumably change. I am filled with ennui. What reaction will it produce, I wonder, which will change the humdrum beginning to each and every day?" (High school teacher). "I am looking forward to seeing how they react to the music" (Grade six teacher). "I wonder if music will change how this routine will work" (Grade eight teacher). Such common elements as these led to open coding of the journal data from the days where music was played.

Weeks 2 & 3 – With Music

Mornings when music was played contributed new themes to the established patterns from the baseline week. This change was to be expected, as any new stimuli would logically cause some kind of reaction. The music was familiar to the students, with an upbeat tempo, and a positive lyrical message (see Appendices C & D). Each class's reaction to the addition of music to their morning routines told a unique and interesting story.

The high school teacher played the music to a number of different classes, but was worried that there might not be effective data if each class were not exposed on a daily basis. However, some behaviours emerged, and valuable data was garnered. Sometimes, the teacher knew that the students could hear the music, but seemed to ignore it. Her second journal entry with music illustrated this well. "Well, they did notice the music right away. Of course, being high school students, they like their own music, and automatically suspect someone else's." Also, on the following day she noted. "Well, they noticed it, but did not appear to appreciate it." A similar example, on the second last day

of the study reinforced the idea that students were not always affected by the music. The teacher noted, "There was no reaction to the music, whatsoever. No reaction whatsoever to anything whatsoever. In fact, they came in like automatons, sat motionless, listened to the announcements, and waited for me to light the fire of learning. Today I feel like I have wet matches." On other days, a reaction was noted. Asking questions, expressing opinions about the music, chanting, and singing were evident. It should be noted that reference was often made to a quiet atmosphere when music was playing. In another instance, a class discussion that stemmed from the music being played led to a debate about several other songs, and away from the lesson. At one point the teacher expressed frustration in this regard. "Does music have to *replace* the work at hand? Why can't it merely motivate and complement?"

As in many schools, events sometimes disrupted normal class activities. A very dramatic event - a bomb threat, and school evacuation - happened at the high school during the course of this study. Classes eventually got started later in the morning, but no one could concentrate. A powerful reaction was recounted by the teacher in her journal. "[W]e decided to play French versions of popular board games . . . the students quickly requested the CD, wanting to listen while playing their games. I think for them, it had a calming influence after a rather tumultuous, confusing, and perhaps, alarming, morning." The teacher also noted her feeling about her use of music as teaching strategy as an aside in one of her journals. "It is so gratifying, yet so rare at a high school level to see a lesson that ignites them. And today, I was even more pleased to realize that it was the *music* that had made such an impression. Nothing else I could have presented would have driven home the point as dramatically as that song. . . ." She was referring to Billy Joel's *We*

Didn't Start the Fire. Her passionate response continued, "Rarely, it seems, does a teacher have them clambering for more, but this particular song, for some intriguing reason, *started a fire* (pun intended!). I intend to find out why." Another incident in her grade eleven class added a rich dimension to the observation. "Jesse unexpectedly and expertly zips through all the songs until he finds his pick, '*Heaven*'. The dramatic, instrumental beginning knifes through the class. Immediately, there is a palpable change in the air. My aide, [name] feels it, too. We look at each other, wide-eyed and grinning. The class becomes alert; their posture stiffens; and the heads begin to sway in time to the beat. They almost become mesmerized by the music; they want to dance. I can feel it. I can see it. I can sense it. How cool! An obvious and visible lesson about the tremendous power of music." Table 6 contains the coded events in the high school classes when music was played.

Table 6

Coded Events With Music Division IV

Code	Event	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Total
		Number of Occurrences										
AE	Arrive early				1		1					2
CH	Chatting						1					1
CHA	Check assignment		1									1
CHNT	Chanting	1										1
D	Dancing										1	1
HM	Happy mood	1			1							2
ITN	Interact with teacher – negative			1								1
ITP	Interact with teacher - positive			2			1		1			4
L	Listening	2									1	3
LE	Low energy				1			1				2
NB	Negative behaviour		1								1	2
NR	No reaction		1						1			2
QA	Quiet Atmosphere						1		1	1		3
S	Singing	1								1		2
SOT	Students on-task				1		1					2
SW	Swaying										1	1
TMN	Talking about the music – negative	1								1		2
TMP	Talking about the music – positive	3	1	5	1					2	2	14
TRN	Teacher reaction – negative										1	1
TRP	Teacher reaction – positive				2					1	2	5

The grade eight class was inquisitive about the music being played. On the first day with music the teacher noted, "Many questions were asked about it--[they] said they really enjoyed the music." Observed student behaviours included singing, dancing, humming, and tapping. One of the teachers in the class made reference to the children being *revved up*, and at one point, stated, "The term 'wild' could be used today." The music seemed to have a negative effect on the routines of the morning. References to the general energy level of these older students describe a noticeably quieter atmosphere than younger classes, at times, mixed with other times when the energy level was extremely

high. After a particularly raucous beginning on day seven one of the teachers noted, "I wonder if music has the power to really wake them up and make them think it is party time!" The majority of the comments about the songs being played were positive. At one point the teacher made note of her personal reaction to the music, saying, "I think that the music helped increase my patience level today". She expressed similar feelings a few days later when she stated, "It helps me not to feel so rushed and busy. . . . I have also realized that because my professional life and personal life is so busy--that the music break seems to be my 'time out'--even though I am still attending to business or chatting with students." This comment was descriptive of the teachers general reaction when the music played. Reference was also made to an increase in on-task behaviour. The journal data for the grade eight class is illustrated in Table 7.

Table 7

Coded Events With Music Division-III

Code	Event	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Total
		Number of Occurrences										
CH	Chatting									2	1	3
CON	Conflict										1	1
D	Dancing						1					1
FD	Following directions				1							1
H	Humming	1			1						1	3
HEN	High energy – negative		1					1				2
HEP	High energy - positive				1					1	1	3
L	Listening	1										1
LE	Low energy	1							1			2
NN	Noisy – negative		1									1
QA	Quiet atmosphere				1		1					2
RA	Running around		1									1
S	Singing				1						2	3
SOT	Students on-task						1				1	2
TMN	Talking about music – negative							1				1
TMP	Talking about music – positive	2			3		1		1			7
TRN	Teacher reaction – negative							1				1
TRP	Teacher reaction – positive	1			1	2	1	1				6

The grade six class that was struggling with expectations acted with surprise, at first, when they found music being played as they entered to begin their routines. As the weeks progressed, the teacher noted that students seemed to come into the class more quickly than usual, and many of them reacted to the music. Observable behaviours included smiling, singing, bobbing, bopping, and bouncing. Part of the teacher's journal on the ninth day of the study illustrated the effect that the music was having. "They came in happy and smiling. The song that greeted them was '*The Lion Sleeps Tonight.*' Today they started bouncing to the music. Larry said, 'Man this sounds like party music!' which

surprised me since he is so heavily into rap. Today they also requested songs, 'What happened to that *Rugrats* song?' This was a very good start to the day. A few of the kids got carried away in the next class, but kids will be kids." Conversations often centred on the song that was playing. One student was quoted as saying, "I hate this song! It drives me mental!" The emotional state of students was apparent in both their physical and verbal reactions. The teacher noted one student's reaction: "It doesn't feel like school right now." In addition, students began to request that they be able to bring music to play in class, have a lip-synch, and wear Discmans. The teacher was working to establish a positive climate by providing incentives and rewards. Interestingly, the students considered the music a reward even though it was never used as such during the course of the study. The teacher's observations are summarized in Table 8.

Table 8

Coded Events With Music Division-II Urban

Code	Event	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Total
		Number of Occurrences										
AE	Arrive early								1			1
B	Bopping						1					1
BNC	Bouncing				1							1
HEN	High energy – negative				1					1		2
HM	Happy mood				1							1
ITP	Interact with teacher – positive	1	1				1	1				4
L	Listening		1									1
LE	Low energy										1	1
NB	Negative behaviour			1								1
NR	No reaction	1										1
QA	Quiet atmosphere		1				1					2
S	Singing							1		1		2
SM	Smiling				1							1
SOT	Students on-task								1			1
TMN	Talking about music – negative								1			1
TMP	Talking about music – positive	2	1		2			3	1		2	11
TRN	Teacher reaction – negative						1	1		1		3
TRP	Teacher reaction – positive								1		1	2

The grade six class that had set routines showed a similar reaction to the music. They, too, reacted positively for the most part. Reactions included smiles, singing, bopping, and dancing. On day eight of the study the teacher wrote, "The classroom climate this morning was quite neat." Later in the same entry she added, "Seeing the kids excited about the music and smiling was a wonderful way to start the day. I wasn't sure how I was going to handle getting the girls focused again, but it didn't take very long for them to settle once I asked them to." The students commented favourably about the songs as well. Most of the songs were very familiar to the students. It was evident that this

teacher was thinking about the effect that the music might be having on the students when she wrote, "Do the words tend to add a 'familiar' feel that the students are interpreting as 'radio'-ish? I wonder if they are continuing to talk and almost letting the music move into the background because it is becoming familiar." Toward the end of the study the teacher noted an incident that captured the nature of her classroom. "Tanner made me laugh this morning. He has some cute dance moves and he was inspired to share them with the group this morning. I thought it was funny--and it provided an opportunity to laugh, which is always valuable in the classroom. I sensed the kids energy this morning--which is good. I think they're starting to get familiar with the songs that are on the CD. Yesterday afternoon, they asked me to play the CD while they were working." At one point, when a song came on, the teacher started singing and dancing to the song. She recounted the experience. "This morning I felt like I had energy and think I also fed off of the kids' energy. Sometimes I get goofy in the classroom and I know that most of the kids are used to that, although sometimes I think I still surprise them. . . . I'm not really sure what the parent thought of my dancing, ☺ but it doesn't matter." She added, "I think the techno feel of that particular song energized the room -- and livened things up. . . ." It was also noted that students came in quickly on most days during the study. Table 9 illustrates the events of this observation.

Table 9

Coded Events With Music Division II Semi-Urban

Code	Event	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Total
		Number of Occurrences										
AE	Arrive early						1	1	1			3
B	Bopping							1			1	2
CH	Chatting	1					1		1			3
CHA	Checking assignments						1					1
CW	Cooperative work	1			1				1			3
D	Dancing								1			1
E	Excitement			1								1
HEN	High energy – negative		1	1								2
HEP	High energy – positive			1	1			1	1		1	5
HM	Happy mood			1				1			1	3
ITN	Interact with teacher – negative						1					1
ITP	Interact with teacher – positive	1						1			1	3
L	Listening				1		1					2
LE	Low energy						1					1
NR	No reaction						1					1
S	Singing								1		1	2
SM	Smiling			2								2
SOT	Students on-task			1	1							2
TMN	Talking about music – negative							1				1
TMP	Talking about music – positive	1		2	2			2			4	11
TRN	Teacher reaction – negative		1	1								2
TRP	Teacher reaction – positive			1			1	1	3		1	7
UB	Up beat							1	1			2

The grade two class had a marked reaction to the music. Singing, dancing, toe tapping, smiling, students helping students, and talking about the songs were observed. The teacher often remarked on the personal effect the music produced in her, noting such things as "[I] t puts me in an upbeat mood"; "It's a nice feeling for me as a teacher" [seeing children singing], and "I think it calms me and puts me in a good mood, as well." The predominant observed behaviour was singing to, and talking about, the songs. Once

again, the issue of tone was addressed many times by the teacher in her words and phrases. These included terms such as happy, upbeat, good mood, and positive mood. At one point she said, "The climate seems more energetic in a positive way." Near the end of the observation period she noted, "It is like it sets a tone for the morning. I am not sure if there were fewer instances of discipline problems due to the music. I do know that the kids seemed happier when the music was playing. They loved the novelty of it and naming the songs as they came on. It gave them something positive to focus on and talk about right off the bat." Her observations on day eight capture the essence of her classroom listening to, and reacting to, the music. "The music was 'In the Jungle' so it was a very fun song. Jesse-Rae ran up to tell me that her mom has a toy lion that sings the same song. . . . I feel a difference, the kids are happier and there are less social problems to deal with first thing in the morning. . . . One of the kids commented, 'That's a cool song!'" At another point the teacher noted, "What could be better than a room full of happy kids singing a cheery song first thing in the morning?" In addition, there were other references to cooperative, focused work during the morning routines. "The kids got into partners on their own to work on the morning note. Usually it is independent activities, but many of them found a partner to work with. I noticed that some of the stronger readers helped out some of the weaker readers in reading what was on the chalkboard." Another incident emphasized the effect that the music was having. "This morning the first song was '*Stand By Me*'. I was just getting to my door when the kids were in the boot room. There was a parent sitting on the bench bopping her head to the beat of the music. She smiled and commented that 'music is good in the morning'." There were very few references to negative behaviour or discipline issues. The noise

level was quite high at times, but no longer appeared to be an issue with the teacher. Table 10 summarizes these observations.

Table 10

Coded Events With Music Division-I

Code	Event	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Total
		Number of Occurrences										
AE	Arrive early								1			1
B	Bopping					1						1
CON	Conflict			1								1
CW	Cooperative work		1						1			2
D	Dancing								1			1
E	Excitement			1	2							3
FW	Focused work	1	1	3		3	1		1			10
HEN	High energy – negative					1						1
HEP	High energy – positive	2	1									3
HM	Happy mood	4	1	2	1	1		1				10
ITP	Interact with teacher - positive	1	1	1			2					5
L	Listening	1	1									2
RA	Running around						1					1
S	Singing	3	1				1		1			6
T	Tapping				1							1
TMP	Talking about music – positive	4	2	2	2	3	1	1	1			16
TRP	Teacher reaction - positive	1	1				1		1			4
UB	Upbeat	2	1	1								4
W	Wired					1						1

Note. No journal entries were made for day 14 or 15.

Participant Interviews

Videotaped interviews generated another source of data to relate to the research question. This inquiry became more than an experiment bound in time, and while I found that looking at journals over such time was valuable, I felt an increasing need to explore more of the story about music in these classrooms. Delving into a teacher's practices and experiences with music strengthens the discourse suggested by the literature and teacher

journals. The interviews served as a way for these teachers to reflect on the study and tie it to their actual teaching practice. The conversations often led to significant and meaningful connections between music and teaching. The following vignettes provide details that highlight the richness of data gleaned through the interview process.

The high school teacher noted how, even though you are there with the students, "You're not usually paying [close] attention". When she did pay close attention, her impression of high school students was characterized in several comments. "High school students are very clear in what they want," (referring to their taste in music). She explained the nature of her students: "They are very much moody creatures" yet, "[They] play at being unconcerned". Her understanding and perceptiveness of her students came to light in the interview when she spoke of adolescents. "I think they are very individualistic at that age, and want to be their own person, and they are seeking their own identity. And, I think music is part of who you are, and the kind of music that you like reflects who you are, or maybe who you want to be, or maybe who you don't want to be, or the façade you want to put across to other people". I initially interpreted the comments as an explanation for a rather subdued reaction to the music, in general. As the interview continued, however, it became apparent that the students did indeed attend to, and were affected by music in the classroom both within and outside the context of the study. This reaction was very apparent in two specific examples that she recalled. She used the song *We Didn't Start the Fire* by Billy Joel in her Social 20 class as an historical atlas of, and metaphor for, the social and political events of the twentieth century. When asked what surprised her she said, "The Billy Joel song that I had been playing just shocked me. They loved it!" She related in detail how the students wanted to play the

song all the time, and how one student actually made up new words for the song and memorized them. She also recalled one particular song called *Heaven* from the CD. "And, that last period [in the study] when they were really antsy, and I wanted them to work to the bell, and they really weren't keen, and then, once the music played it literally was--I wish I had a video camera then because they just--the atmosphere was totally different. They just settled down, and they were into the music, and their heads were going *rhume, rhume, rhume* like this. It was almost like a drug, almost like a drug! And, you could really see the power of that music. You can't escape the fact that it does something to their bodies, and they automatically start moving".

The grade eight classroom teachers were also very impressed with the reaction that the students had to the music, saying they noticed a *huge* difference. When probed on this point, they talked about the happier environment that music created. Again, reference was made to the nature of the young adolescent being flamboyant and outgoing one minute, and subdued the next. They felt that the music in the morning lent itself to a more unstructured atmosphere. One of the teachers explained, "[I]t was no longer coming in and reading the board--[it was] more like a party room. They were dancing, singing, bobbing, [and] loving the song." At the end of the study the teachers asked the students how they perceived the music, and stated, they "Thought it made them happier; they wanted to follow directions; they were singing. . . . " The teachers commented further on the effects of the music when they said, "[Music] lifts their spirits and energizes them." One of the teachers also noted how the music made her feel, "much more relaxed."

The teacher of the urban grade six class saw a transition as the study progressed. During the interview she stated, " . . . It's funny because they did begin to look forward to

it, and they would come in and say, 'the music is on! the music is on!' and they'd run back to the door, and tell the other kids the music is on, and they would come in and start listening". She also noted her belief that, "Music can't tame every beast, I don't think". This remark underscored the students who "Pointed out it sounded like party music, almost". She also said, "They really felt it was party mode or go crazy time . . . [A] few of them kept jumping on their desks". It should be noted that the teacher was working with the students to establish behaviour expectations, and the music in the study seemed to detract a bit from the process. At the same time, the teacher pointed out that the music elicited positive reactions citing "finger dancing, conga line [dancing], bopping and head grooving" as ways the students connected to the music. Further, she noted, " . . . The ones they liked you knew right away because right away they would start singing along". She also mentioned "I was surprised that they really asked for it [the CD from the study]." The teacher also related, "I enjoyed the music myself" and spoke of how she played classical music during art class, and popular music during health class.

The grade six teacher from the semi-urban school described her class as a very "social" group that was usually pretty upbeat and sometimes a little hard to settle, the exception being Mondays, when the students seemed rather lethargic. Although the timetable and morning routines sometimes made it difficult to play music as requested, music was played for some time each day during the study. She noted that participating in the study served to confirm many of her beliefs. Two particular statements that she made during the interview stood out. She said, "Music has the power to set the tone in a classroom." For her, the energy level and attention that students gave to their work was clearly affected by the music. She also said, "Music brings them together," and

elaborated by saying, "They come together around the music," noting a heightened sense of community among the students. This teacher is a very sensitive and intuitive person, and uses music masterfully to tap into the emotions of students in positive and productive ways. Music is used extensively in her teaching practice for a number of purposes including entrainment, arousal, calming, memory enhancement, vocabulary building, and as a transition between activities. Her substantial experience using music has shaped her beliefs about the effect that music has on students.

The grade two teacher spoke of her experience during the study with passion and conviction. "They loved it! They absolutely loved it!" When speaking about the specific effects of the music she related, "Depending what kind of music it is, [it can] bring them up or calm them down" and, "They showed a connection to the music." She added, "It's just a feeling in the room . . . they were very focused; they wanted to hear the songs; they wanted to sing along." The teacher also spoke about the behaviour of the students, "I was really pleased with the way they came into the room." "In general, there are undertones [negative behaviour] . . . it changed their focus and conversations." She went on to explain, "Surprisingly, you know, I could hear them in the boot room. They were identifying the songs . . . they came in; they were happy; the minute they walked in, they knew these songs . . . they were thrilled!" She alluded further to their behaviour when she said, "They didn't go into a tailspin over it [the music]; they didn't get wired," and further explained her meaning of *wired* as "off the roadmap, just so excited that they can't do what they need to do . . . they're just exploding." When asked if anything surprised her, she recounted her personal reaction to the music. "It put me a good mood. You can't help but be happy when kids come in the door singing . . . they're not fighting,

and they're not pinching".

Chapter 5: Discussion

"Music is well said to be the speech of angels."

Thomas Carlyle

Before any comparisons were done, I checked with the participants to ensure that the interpretation of the coded evidence constituted a valid representation of what actually happened in their classrooms (Yin, 2003). Having the participants serve as "member checks"(Creswell, 1994, p. 158) allowed me to proceed with confidence in comparing the effects of music within and between each of the classrooms in the study.

Analysing the data by coding allowed for a graphical representation using tone and tenor as major themes, or axes upon which the data could be located. Codes that cluster together axially fit nicely onto a matrix. Moreover, a matrix functions well to illustrate individual cases within this multiple case study.

This graphical representation was not an attempt to quantify the data being analysed but, rather, to illustrate the interpretation of the significance that coded events had in the class. As an example, *bopping* was coded in several of the classrooms. Bopping might be interpreted as a display of a positive emotional state that contributes to a positive tone and productive tenor. As such, it would be part of a cluster of related behaviours that located in the upper right quadrant of the matrix. As codes were clustered and mapped a pattern emerged. If the bopping detracted from tenor, because the student was accomplishing very little, then the cluster might be skewed downward somewhat. Representing clustered data using different colours for different classrooms, and using shading to show when music was and was not present, allowed for comparisons within and across the cases in the study. To fully understand the matrix of tone and tenor as it

relates to classroom climate it may be helpful to consider each of the quadrants within the matrix. Dividing tone and tenor into two parts defines central neutrality and suggests a relatively positive or negative continuum for each theme. The quadrants defined are labelled positive-positive, positive-negative, negative-negative, and negative-positive (see Figure 1).

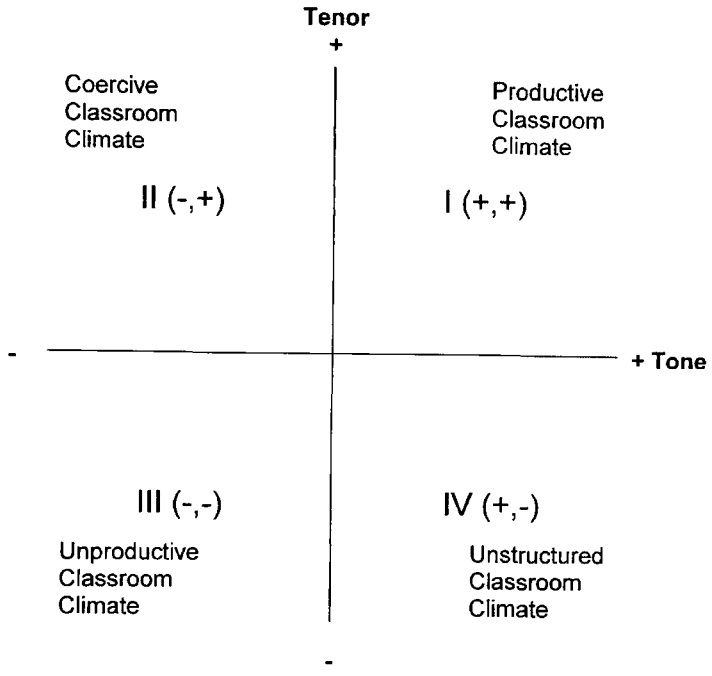

Figure 1. Classroom Climate Matrix.

A positive-positive tone and tenor would suggest happy students working well in a positive environment. This would typify most classroom settings. Events that clustered into other quadrants would illustrate detraction from an ideal classroom climate. A positive-negative tone and tenor would suggest happy students, but less engagement and co-operation. Students who are fooling around instead of following established expectations fall into this area. A negative-negative tone and tenor would see conflict, fear and a negative environment. A negative-positive tone and tenor would see coercion

and compliance.

The high school classes showed the least reaction to the music. The fact that students often showed very little reaction is illustrated by the relatively small size of the clustered data. Nonetheless, music added to a rather positive tone and tenor, at times. Figure 2 shows what the teacher described as the "humdrum beginning of each day" when no music was played, with a somewhat flat cluster to describe a productive, but somewhat subdued, classroom climate. This is contrasted with the shaded area that demonstrates the effect the music had. When music was played, the tone changed slightly for the positive, in general, and dramatically at different times. The dramatic events are shown by the sudden increases in tone.

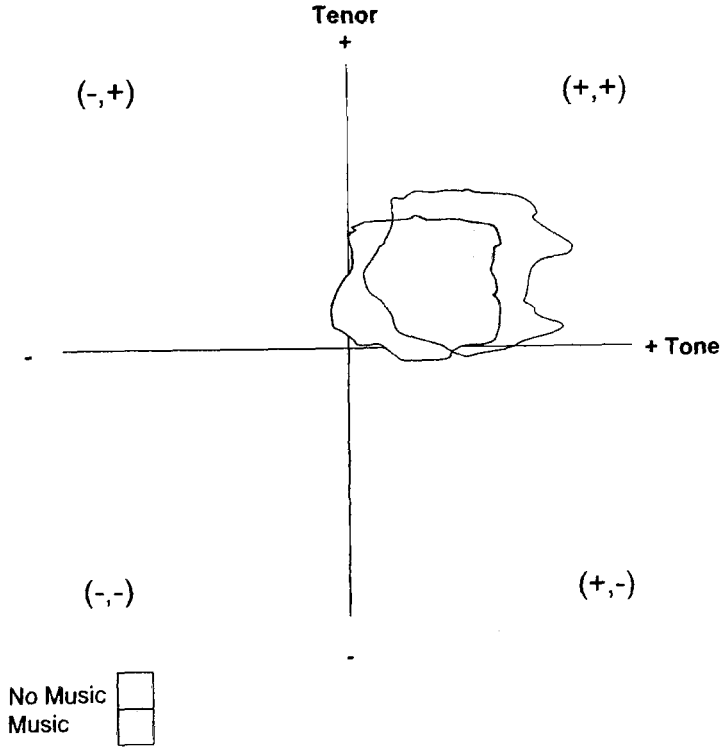

Figure 2. Classroom Climate Matrix Division IV

The middle school classroom displayed a higher energy level and was more inclined to react to the music. Again, the overall tone and tenor was positive, with

occasional exceptions when behaviour verged on the extreme and negatively affected the climate. For example, on day twelve the teacher expressed frustration over the exuberant behaviour of the students. Even though they were very happy, the morning routines were being ignored. Figure 3 depicts a more consistently positive reaction to the music, as well as times when behaviour detracted from an atmosphere that was both positive and conducive to learning. The contrasted shading, which is skewed upward and to the right says that, overall, the climate improved with music. The shaded area in quadrant II (-,+) represents times when climate was such that teachers had to step in to get things under control. Shading in quadrant III (-,-) means the climate turned a bit negative. Examples of this might include rough-housing and other inappropriate behaviour. Shaded areas in quadrant IV (+,-) mean the climate is still positive, but a little wild.

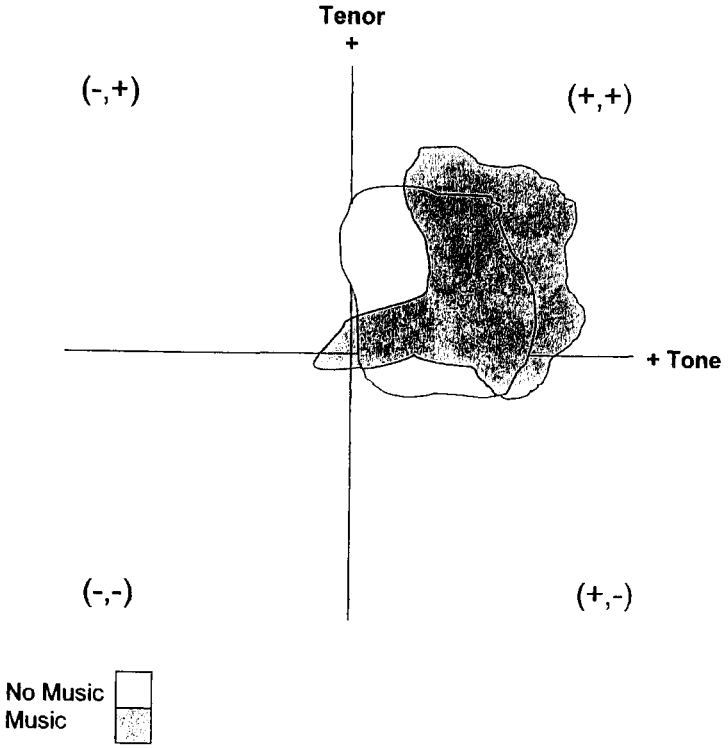

Figure 3. Classroom Climate Matrix – Division III

The urban grade six class shared some attributes with the grade eight class depicted above. Sometimes students were so excited by the music that morning activities were not completed. The teachers of this class were working to build a more positive climate, and music generally helped them accomplish this goal. Figure 4 shows a shift to the right. Again, there were exceptions when music seemed to exacerbate the control problems. The salient point is that the presence of music periods was accompanied with more on-task behaviour, more compliance, and a more positive tone than periods with no music. Furthermore, the music had a more dramatic effect on this case than on either of the two older groups.

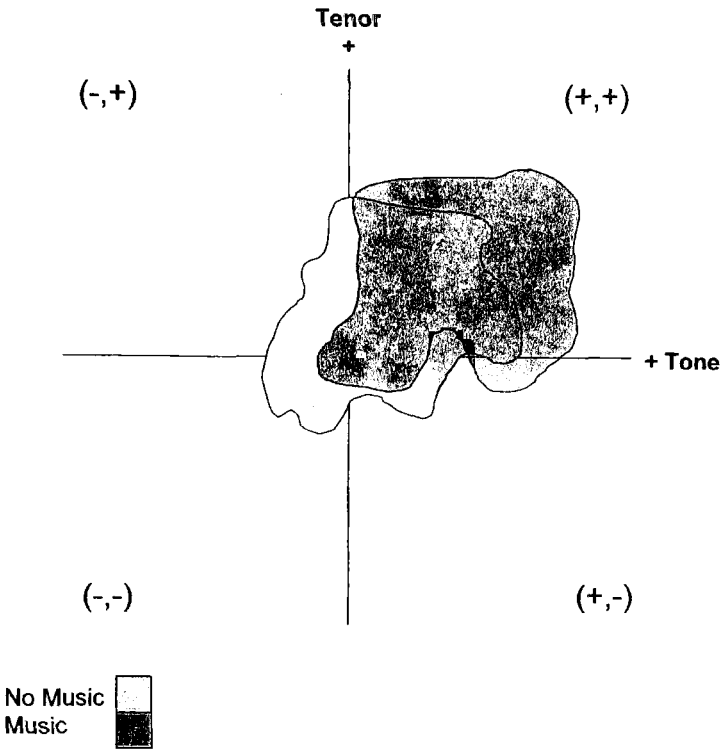

Figure 4. Classroom Climate Matrix Division II, Urban

The semi-urban class showed a similar pattern to that of the urban school. A generally positive reaction to the music produced an improved tone and tenor. While there were still exceptional instances, the overall climate clustered to the right, and upward on the matrix, depicting a very productive climate that improved with the addition of music (see Figure 5). The class appeared to be somewhat less energetic, yet strikingly similar to the other grade six class, as well as to the grade eight class.

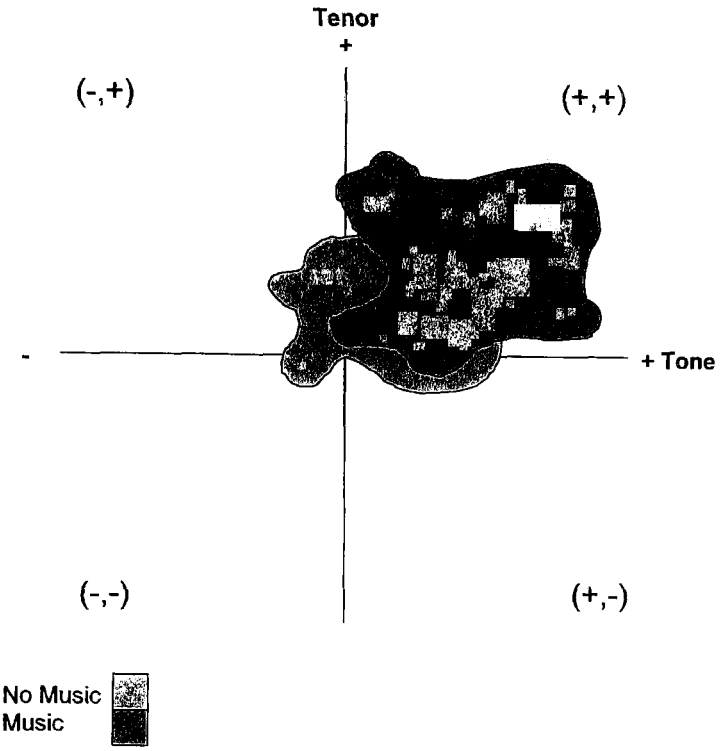

Figure 5. Classroom Climate Matrix Division II, Semi Urban

The grade two class showed the most dramatic reaction to the music (Figure 6). As in all the other classes, music produced a positive shift in tone and tenor. The larger shaded area speaks to more students, displaying more positive behaviour, more often. This class thoroughly enjoyed the time with the music, and there was a clear reduction in negative behaviour.

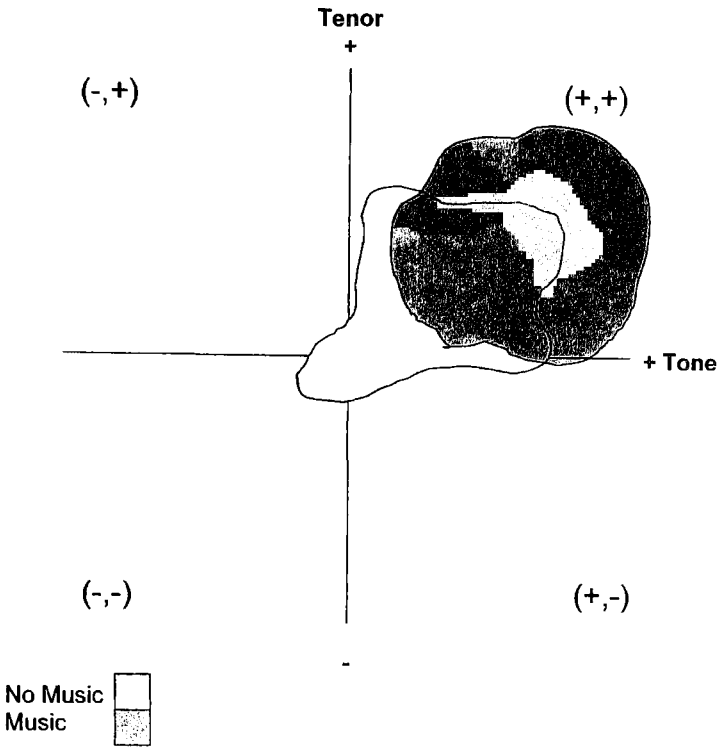

Figure 5.Classroom Climate Matrix – Division I

All the classes appeared to be affected by the music. However, the tone and tenor of each classroom in this study was unique. Each class had a distinctive culture, environment and routines. Yet, significantly similar results emerged when music was played. In all cases the tone in the classroom improved. The same can be said of the tenor with a few noted exceptions. The urban grade six class and the grade eights had moments when the climate was not productive, even though the students were having a good time. A comparison of the patterns also reveals some differences. It appears that the music had its greatest effect on the Division I class, and its least effect on the Division IV classes. Division II and III classes reacted quite similarly. This may be a result of their similar age level. When comparing middle school students with younger and older students from the other divisions a similar pattern is suggested. Younger students responded more to the

music and this resulted in a greater over-all effect in classroom climate. In addition, regardless of the student's age, it appears that the more the students connected with the songs the more effect they seemed to have.

Chapter 6: Conclusions

"Without music, life would be a mistake."

Friedrich Nietzsche

Brain compatible learning has become a catch phrase for people who believe that teachers can use cognitive neuroscience research as a basis for teaching. Music can play an essential role in brain compatible classrooms. It is from within this realm that this inquiry emerged. The research question for this study was based on two propositions: first, that music has a profound effect on students of all ages; second, that music affects students of all ages in similar ways. The results of this study do not prove conclusively either of these propositions. Many studies with more students, in more contexts, over an extended period of time, would be needed before any such conclusions could be drawn. Nonetheless, I can say that this inquiry has allowed for some understandings around the subject of music in the classroom to begin to emerge.

Clearly, teachers in this study believe that music has an important place in the classroom. What that place is should continue to be a subject of investigation involving action research and experimentation. Evidence from the study suggests an emotional connection to the music was made at all grade levels, by both teachers and students. The small sample of teachers in this study represents the full range of classrooms in our education system and, as such, may be typical of classrooms in many parts of Alberta. All the teachers in the study enjoyed using the music. Moreover, they all had used music to some degree in their classes before participating in this study. Their participation in the study brought forward new ideas for each of the teachers. The elementary and middle school teachers all talked about the effect of using popular music that students connected

to. The connection seems to be important, and might explain the difference in reaction between the younger and older students. Music may play more of a major role among students who are in their adolescent years. These students may have more specific likes and dislikes when it comes to music. The high school teacher certainly felt this was so. At the same time, the music did powerfully affect the high school classrooms at different times, just not so obviously most of the time.

Study findings suggest that even though music creates a positive state, the effects of music are transitory. This idea proposes a case for using music at different times during the day to enhance classroom activities. How long the effects of music last, and how music affects learners at different times of the day, are questions worthy of further study.

The powerful emotion that music elicits was noted often over the course of the study. By purposefully capitalizing on this emotional connection, teachers can effectively use music to clarify, or add richness to a topic. Memory is enhanced when learning material is related to lyrics and tunes. Music can aid in building a stronger sense of community, where people live happily together, and a culture of caring, where people nurture each other. This was especially evident in the grade two classroom where there was a noticeable increase in cooperation and focused work, and a decrease in conflict.

Another finding of this study was that even when students expressed negative opinions about certain songs, or genres of music, it served as a platform for expressing their personality, or asserting their identity. This was most evident in the high school classes.

Yet another finding was that music sometimes takes students into patterns of

behaviour that are counter-productive. Such is the power of this important medium.

Perhaps the most important finding drawn from this study is that music makes students feel good when they connect to it. The range of emotional connections to music, and the resultant behaviours, are important ideas also worthy of further investigation.

The findings of this limited case study suggest that educators cannot afford to ignore the potential of using music effectively in the classroom. Indeed, recognising the importance of music "could be the beginning of a revolution in understanding how we think, and how we can think more skilfully" (Loring, 2001, p. 335). It also may allow us to teach more skilfully. The craft of teaching is an emotional and creative endeavour. Teachers often use intuition to guide their practice, but perhaps it needs to be more scientifically based (Sylwester, 1997). Teaching is also a social and moral endeavour, and teachers have a responsibility to engage in best practices. Consequently, they must not ignore the work in the sciences that adds to the body of knowledge from which our practice is born. Teachers must become better researchers, and must pay attention to the burgeoning amount of research that relates music to cognition and learning. Neuroscience does have a place in the modern classroom.

This study helps confirm that there is an important teaching connection to music. There is growing evidence of the need to incorporate music across the curriculum to help students better develop aspects of musical intelligence such as intuition, reasoning, memory, imagination and dexterity. It is not exclusively for the emotionally or behaviourally challenged; nor is it only for those with the talent to play instruments. Both formal music programs and informal uses of music have a place of growing importance in our schools.

Music is a carrier of emotion, and emotion mediates our thoughts and actions. It is clear that music affects our physical and intellectual state. All behaviour is state dependent. All learning is state dependent. All memory is state dependent. (Jensen, 1995). Clearly, then, music should be an integral part of every classroom. Many teachers say that there is no better way to present certain material than through a particular piece of music or a song, and they may be correct.

However, the power of music on young people is also a cause for concern and caution. Finding songs that are appropriate for classrooms from the top forty charts can prove to be challenging. Succeeding generations often scorn the music of those that went before in order to stake out their own territory. Unfortunately, however, the lyrics in much of the modern music incorporate violence and disrespect in their messages. This unsuitability flies in the face of the moral code expected in schools. Students are exposed to music on many fronts, and it is important that schools be one of them, but schools have the added responsibility of ensuring that students connect with music in positive ways, thus offering an important balance in shaping the character of our young people.

As teachers continue to learn from each other, and from their own action research, a greater knowledge base is the inevitable result. Research in the fields of education and neuroscience can enhance the teaching strategies that educators employ. This study has only scratched the surface of an important topic for educators. More research and investigation must be done. It is my hope that engaging a group of teachers in such an activity has contributed to knowledge about the vital role that music can play in anyone's classroom. Increasing student happiness, well-being, and motivation might be as simple as putting on a compact disc and pressing *play*.

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Appendix A

Personal Data and Journaling Instructions

Music in the Classroom: A Comparative Study

Personal Data

Name: _____

School Name: _____

Location: _____

1. What is your position in that school?
   Teacher _____ Other _____

2. What grade level do you teach at?

   _____ Division I (ECS – Grade 3)

   _____ Division II (Grades 4 – 6)

   _____ Division III (Grades 7 – 9)

   _____ Division IV (Grades 10 – 12)

   _____ Other: Please Specify.

3. What is your gender? _____ Male _____ Female

4. What is your age?
   _____ 24 – 29
   _____ 30 – 34
   _____ 35 – 39
   _____ 40 – 44
   _____ 45 – 49
   _____ 50 or older

5. How many years of teaching experience do you have?
   _____ None
   _____ One year
   _____ 2 – 3 years
   _____ 4 – 6 years
   _____ 7 – 9 years
   _____ 10 – 14 years
   _____ 15 – 19 years
   _____ 20 or more years

Appendix A (continued)

Reflective Daily Journal

What follows is a format for the journal that I am asking you complete as a major source of data for this study. The purpose of this journal is to help me understand in detail the nature of the climate in your classroom on each day. I am particularly interested in your observations, thoughts and feelings about what is happening in your classroom in the morning before classes begin and during the transition into school activities. It is my intent to have the journal as open ended as possible without specific structure for specific observations.

In order to help you think about the climate in your classroom your writing may include: what the students are doing or saying, how they arrived that day, the general energy level in the class, how students relate to expectations, routines, or any observations that you feel need to be included. I am intentionally omitting categories of specific behaviours because I want to get a picture of a lived experience as you see it.

You do not need to write volumes each day. I only ask that you note what happened and how you felt about it. I will be following up with a personal conversation to find out more about your experience in general.

This is asking a lot from you. I recognize that it is not practical to spend a great deal of time writing down information. Any information you are able to share is valuable and appreciated.

Completion of the journal consists of 15 consecutive school days. The journal page format allows it to be noted if music was used that day. Two general areas are included to describe what happened and how you felt about it. Please take a few minutes each day to record what you feel is relevant. Feel free to make hand written or electronic entries as you find most convenient.

All diaries are viewed as confidential documents. No one other than my committee and myself will have access to the materials. The report on research will omit any information, which may identify individual participants.

Your participation in this study is most appreciated. I will, of course, provide you with a report on the research results.

Questions or comments? Contact

Rob Bennington
At home 652-2730
At school 684-3666
Or email benningtonr@fsd38.ab.ca

Appendix A (continued)

Music Study: Daily Journal Entry

Day _____

Was music played? Yes _____ No _____

Note: Hand written or electronic journals are welcome.

Observations:

Feelings:

Appendix B

Video Taped Interview Questions

1. Tell me your impressions of your classroom climate in general during this study.
2. Did anything happen that surprised you in any way?
3. How did the students respond to the music?
4. Do you have any questions about this study?

Appendix C

Classroom Music - Division I and II

Title	Artist	Author
You Are My Number One	Smashmouth	Neil Diamond
Hakuna Matata	N. Lane, E. Sabella, J. Weaver & J. Williams	Elton John & Tim Rice
Rugrats Theme Song	Blackstreet	Mark Mothersbaugh
I Just Can't Wait to be King	J. Weaver, L. Williams & R. Atkinson	Elton John & Tim Rice
This Little Light of Mine	Raffi	Harry Dixon Loes
Soak up the Sun	Sheryl Crow	Sheryl Crow, Jeff Trott
Candle on the Water	Helen Reddy	Al Kasha & Joel Hirshhorn
The Lion Sleeps Tonight	Techno Remix	Solomon Linda
Drift Away	Uncle Kracker	Dobie Gray
I'm a Believer	Smashmouth	Neil Diamond
Whole New World	P. Bryson & R. Belle	Alan Menken & Tim Rice
Youv'e Got a Friend in Me	Randy Newman	Randy Newman
Dizzy	Bob the Builder	Tommy Roe
House at Pooh Corner	Kenny Loggins	Kenny Loggins
I Wanna Be Like You	Louie Prima	Richard & Robert Sherman
Colors of the Wind	Vanessa Williams	A. Menken & S. Schwartz
Stand By Me	Fugees	Jerry Leiber & Mike Stoller
Circle of Life	Carmen Twillie	Elton John & Tim Rice
Friends	The Rembrandts	Bobby Vinton
Don't Worry Be Happy	Bobby McFerrin	Bobby McFerrin
La Bamba	Alvin & the Chipmunks	Ritchie Valens
Garden Song	Peter, Paul & Mary	David Mallett

Appendix D

Classroom Music - Division III & IV

Title	Artist	Author
I'm a Believer	Smashmouth	Neil Diamond
Drift Away	Uncle Kracker	Mentor Williams
Big Yellow Taxi	Counting Crows	Joni Mitchell
In My Life	Chantal Kreviazuk	John Lennon & Paul McCartney
Hanging By a Moment	Lifehouse	Lifehouse
Kryptonite	Three Doors Down	Three Doors Down
Knocking on Heavens Door	Avril Lavigne	Bob Dylan
Time	Chantal Kreviazuk	Chantal Kreviazuk
Soak Up the Sun	Sheryl Crow	Sheryl Crow, Jeff Trott
Drops of Jupiter	Train	Train
Heaven	D.J. Sammy	Bryan Adams
A Thousand Miles	Vanessa Carlton	Vanessa Carlton
Don't Know Why	Norah Jones	Bonnie Bramlett & Eric Clapton
You Are My Number One	Smashmouth	Smashmouth
One Heart	Celine Dion	J. Shanks & K. DioGuardi
I'm Like a Bird	Nelly Furtado	Nelly Furtado
Wherever You Will Go	The Calling	Aaron Kamin & Alex Band

Appendix E

Open Coding of Journal and Video Taped Data

Code	Definition of Observation	Code	Definition of Observation
AE	Arrive early	L	Listening
AL	Arrive late	LE	Low energy
B	Bopping	NB	Negative behaviour
BNC	Bouncing	NN	Noisy–negative
C	Complaining	NP	Noisy-positive
CH	Chatting	NR	No reaction
CHA	Checking assignments	QA	Quiet atmosphere
CHNT	Chanting	RA	Running around
CON	Conflict	RH	Rough housing
CW	Cooperative work	S	Singing
D	Dancing	SM	Smiling
E	Excitement	SOT	Students on task
FO	Following directions	SW	Swaying
FW	Focused work	T	Tapping
H	Humming	TMN	Talk about the music-negative
HEN	High energy–negative	TMP	Talk about the music-positive
HEP	High energy–positive	TRN	Teacher reaction-negative
HM	Happy mood	TRP	Teacher reaction-positive
ITN	Interact with teacher-negative	UB	Upbeat
ITP	Interact with teacher-positive	W	Wired