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THE EFFECT OF MINDFUL LISTENING INSTRUCTION ON LISTENING SENSITIVITY AND ENJOYMENT

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THE EFFECT OF MINDFUL LISTENING INSTRUCTION
ON LISTENING SENSITIVITY AND ENJOYMENT

DISSERTATION

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the College of Fine Arts at the University of Kentucky

By
William Todd Anderson
Lexington, Kentucky

Director: Dr. Cecilia Chu Wang, Professor of Music
Lexington, Kentucky

2012

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THE EFFECT OF MINDFUL LISTENING INSTRUCTION ON LISTENING SENSITIVITY AND ENJOYMENT

The purpose of this study was to examine the effect of Mindful Listening Instruction on Music Listening Sensitivity and Music Listening Enjoyment. The type of mindfulness investigated in this study was of the social-psychological type, which shares both commonalities with and distinctions from meditative mindfulness. Enhanced context awareness, openness to new information, situation in the present, awareness of novel distinctions, and awareness of multiple possible perspectives (cognitive flexibility) are components of social-psychological mindfulness.

A pretest-posttest control group design was used for this study. Two different age groups of students were studied: fourth-grade students (N = 42) and undergraduate non-music major college students (N = 48). The fourth-grade participants in this study were selected from an elementary school in a large city in the Northeastern United States. The college students were selected from a large university in the Southeastern United States. Participants were randomized into either the experimental or control group.

Gordon’s Intermediate Measures of Music Audiation and Advanced Measures of Music Audiation were used as a pretest for fourth-grade students and college students, respectively. The results showed no statistically significant differences between the experimental and control groups. Student demographical information was also collected and reported.

The treatment consisted of 10 lessons for fourth-grade students. Five of the 10 lessons were used with the college students. For each age level, participants in both groups, Mindful Listening and Control, received instruction using listening-map-based and non-listening-map-based lessons from the Share the Music textbook series. Students in the Mindful Listening groups also received listening instructions designed to promote mindful listening.
Music Listening Sensitivity was measured using the phrasing test from the Sensitivity portion of Gordon’s *Music Aptitude Profile* (MAP-P), as well as the researcher-created *Anderson Test of Music Listening Sensitivity* (ATMLS). Music Listening Enjoyment was measured using students’ ratings of their Listening Enjoyment after each lesson on a seven-point Likert-type scale.

Results indicated that Mindful Listening Instruction yielded higher scores, which were statistically significant (at $\alpha = .05$), for Music Listening Sensitivity (as measured by both the ATMLS and the MAP-P) and Music Listening Enjoyment for fourth-grade and college-student participants.

**KEYWORDS:** Listening Enjoyment, Listening Map, Listening Sensitivity, Mindful Listening, Mindfulness

William Todd Anderson

April 11, 2012
THE EFFECT OF MINDFUL LISTENING INSTRUCTION
ON LISTENING SENSITIVITY AND ENJOYMENT

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April 11, 2012
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I would like to acknowledge my special appreciation of Dr. Cecilia Wang, the chair of my committee. When I first met Dr. Wang over a decade ago, I quickly learned that I had met an extraordinary professor. She is one of those rare individuals who, at once, pays attention to detail yet never loses a panoramic perspective. She has been creative in helping design an academic program that has maximized my growth as a scholar. Dr. Wang demonstrates how to conduct research of the highest caliber, how to engage students in complex and creative learning tasks, and how to fulfill the many expectations placed on a professor with poise and cheerfulness. I have benefited greatly from her teaching, guidance, and friendship. Dr. David Sogin has also been an invaluable resource in my academic career. He has inspired my critical thinking and intellectual confidence for many years. Dr. Sogin has demonstrated how to question everything as a scholar without becoming cynical or pompous.

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# TABLE OF CONTENTS

ACKNOWLEDGEMENTS ........................................................................................................ iii

LIST OF TABLES .................................................................................................................. ix

LIST OF FIGURES ................................................................................................................ x

LIST OF FILES ................................................................................................................... xi

CHAPTER 1: INTRODUCTION ............................................................................................ 1

  Rationale of Study ........................................................................................................... 6
  Statement of the Problem ............................................................................................... 10
  Definitions of Terms ...................................................................................................... 10
  Delimitations of the Study ............................................................................................ 12

CHAPTER 2: RELATED LITERATURE ............................................................................. 13

  PART ONE: PARADIGMS IN COGNITIVE APPROACHES TO LISTENING ............. 14
    Theory of Cognitive Constraint .............................................................................. 14
    Temporal Processing of Music .............................................................................. 15
    Auditive Structuring ............................................................................................... 17
    Hearing as Problem Solving ................................................................................... 19
    Student Listening Stories ....................................................................................... 22
    Creative Listening .................................................................................................. 26
    Focus of Attention in Music Listening ................................................................... 27
    Cognitive Development of Music Listening Skills ................................................. 32
    Guided Listening and Listening Map Research ..................................................... 34

  PART TWO: MINDFULNESS RESEARCH ................................................................ 38
    The Construct of Mindfulness ................................................................................. 38
    Mindfulness as a Construct with Multiple Layers of Meaning ............................... 39
    Yeganeh’s Dual Model of Mindfulness .................................................................. 45
    Diaz’s Mindfulness in Music Listening Study ....................................................... 49
    Mindfulness as Defined by Langer .......................................................................... 49
    Applications of Langer’s Construct of Mindfulness to Music and Learning .......... 52
    Music and Music Education ................................................................................... 55
    Summary Regarding Mindfulness Research ............................................................ 58

RESEARCH QUESTIONS ................................................................................................. 61

  Primary Research Questions ......................................................................................... 61
  Secondary Research Question ....................................................................................... 61
LIST OF TABLES

Table 1.1, Dunn’s (1997) Review of Literature on Creative Music Listening .................4
Table 2.1, Focus of Attention Model of Music Listening
   (Madsen & Geringer, 2001) ..................................................................................31
Table 3.1, Fourth-Grade Student Treatment Schedule ..............................................80
Table 3.2, College-Student Treatment Schedule ......................................................81
Table 3.3, Listening Instructions Provided to Treatment Group and Control Group
   for Odd- Numbered Lessons ..............................................................................82
Table 3.5, Discography of Music Used ......................................................................84
Table 4.1, Demographic Descriptive Statistics ..........................................................90
Table 4.2, Means and Standard Deviations of All Groups on All Tests .....................91
Table 4.3, Table of Correlations for Fourth-Grade Posttests ...................................92
Table 4.4, Table of Correlations for College Posttests .............................................92
Table 4.5, Analysis of Variance for Fourth-Grade MAP-P ......................................95
Table 4.7, Analysis of Variance for Fourth-Grade ENJOY .......................................95
Table 4.8, Table of Effect Sizes for Fourth-Grade Participants ...............................96
Table 4.9, Analysis of Variance for College-Student MAP-P .................................98
Table 4.10, Analysis of Variance for College-Student ATMLS ..............................98
Table 4.11, Analysis of Variance for College-Student ENJOY ...............................98
Table 4.12, Table of Effect Sizes for College-Student Participants .......................99
Table 4.13, Difficulty and Discrimination Indexes of the ATMLS .........................102
Table 4.14, Fourth-Grade Analysis of ATMLS Items: First Half vs. Second Half ....105
Table 4.15, College-Student Analysis of ATMLS Items: First Half vs. Second Half ...105
Table 4.16, Fourth-Grade Analysis of ATMLS Items Used vs. Not Used
   in Treatment .......................................................................................................108
Table 4.17, College-Student Analysis of ATMLS Items Used vs. Not Used
   in Treatment .......................................................................................................108
Table 4.18, Analysis of Listening Enjoyment Data for Listening-Map-Based Lessons
   vs. Lessons without Listening Maps ................................................................110
LIST OF FIGURES

Figure 2.1, Karma’s Model of Relationship between Aptitude and Skills.........................18
Figure 2.2, Examples of Bamberger’s Classification of Figural and Formal
   Representations ...........................................................................................21
Figure 2.3, Comparison of Social Psychological Mindfulness and Meditative
   Mindfulness (Yeganeh, 2006, p. 26).............................................................48
Figure 3.1, Fourth-Grade Student Research Design.....................................................78
Figure 3.2, College-Student Research Design ............................................................79
Figure 5.1, Mindful Learning Lesson Rubric ................................................................125
LIST OF FILES

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CHAPTER 1
INTRODUCTION

Listening to music with discriminate ears is a major goal of music classes. A program of sequential development of listening and perceptive skills is necessary for students to appreciate, understand and progress in the field of music. “Listening to, analyzing, and describing music” is the sixth content standard for K-4 music education in the National Standards for Arts Education (MENC, 1994). One of the achievement standards the National Standards lists for this content standard is for students to be able to “identify simple music forms when presented aurally” (MENC, 1994). Another listed achievement standard for this content standard is for students to be able to “demonstrate perceptual skills by moving, by answering questions about, and by describing aural examples…” (MENC, 1994). Investigating a method for fostering student growth in aural perception is the purpose of this research.

Goldberg, Holahan and Saunders (2000) found that the ability to discriminate between tonal patterns is essentially the same in non-musician first-graders and non-musician college students; only response time differed between the groups. However, college student musicians scored higher than both groups. Such findings suggest that aural perception skills may develop only with instruction and do not increase with general maturation. These findings make developing instructional strategies for increasing the perception skills of students very important. This research was echoed by Cassidy (2001), who found that previous musical instruction had an impact on the ability to follow a music listening map amongst college students.
Dunn (1997, p. 42) explains the importance of music listening in the music classroom:

Traditionally, at least in Western music traditions, listening to music has been thought of as a passive activity where the listener’s role is to contemplate and respond to the creativity of both the composer and performer. In the classroom, music listening as an activity is frequently ignored; when it is taught, it is often approached in a way in which students’ responses can be categorized as right or wrong, such as asking students to identify instruments or circle the correct answer. Rather than engaging students in a creative process, such listening activities are more often a drill in deductive reasoning. While certain objective elements of the music are immutable, it is uncertain that these should be the only elements we address if we wish to engage students in creative thinking. Some aspects of what musicians/teachers may think of as immutable in their minds may not be so in the reality of the listening experience – that is, there may be more than one ‘correct’ way to hear a piece of music, despite what analysis of the printed page may indicate.

Dunn (1997) concisely reviewed the perspectives of various musicians, music educators, and music researchers on the topic of music listening, particularly emphasizing the necessity of creativity in approaching music listening instruction. He often quoted the author being examined and then provided commentary on the author’s explanation of music listening. The quotes, when provided, and Dunn’s commentary, when relevant, are included in table 1.1.

Dunn (1997, p. 43) further explains the role of listening in the philosophy of Reimer:

Reimer (1989) proposed that listening to music should be considered a creative activity. A person who is truly involved in the listening process actively engaged in creating a mental structure (perceptual structuring) of a piece as it unfolds. In this ‘reflection-in-action’ (Reimer, 1992, p. 99), the individual creates her own experience from the expressive possibilities within the music in several ways; by selecting what will be attended and at what level; perceiving what is occurring; reflecting on what has happened; creating expectations of what might follow; examining what actually occurred in light of those expectations; and affectively responding to the musical experience as a whole, mediated in part by past experience. In this sense, the overall experiencing of a piece of music is dependent on the individual listener. For any given piece, the limitless possible interactions in this creative listening process account both for the uniqueness of
individual musical experience and how each repeated listening to a piece can differ in some way for an individual.
<table>
<thead>
<tr>
<th>Author</th>
<th>Quotation from Author</th>
<th>Dunn’s Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blacking</td>
<td>“the importance of creative listening is too often ignored in discussions of musical ability, and yet it is as fundamental to music as it is to language” (p. 10)</td>
<td>“Blacking (1973), when discussing the cognitive processes involved in music making” (p. 42).</td>
</tr>
<tr>
<td>Blacking</td>
<td>“Listening to music, like comprehending verbal language, is as much a creative act as making it” (p. 11).</td>
<td></td>
</tr>
<tr>
<td>Copland</td>
<td>“Music provides the broadest possible vista for the imagination since it is the freest, the most abstract, the least fettered of the arts: no story content, no pictorial representation, no regularity of meter, no strict limitation of frame need hamper the intuitive functioning of the imaginative mind” (p. 7).</td>
<td>“Copland (1939) emphasized the importance of imagination in listening. Ideal listeners combine the subjective and objective in their listening response” (p. 43).</td>
</tr>
<tr>
<td>Zerull</td>
<td>“Zerull (1993)… spoke of creative listening in terms of the imaginative mind in his study of musical imagination and music experience. His framework of musical imagination included six different functions: perception, sensing, memory, synthesizing, judgment, and experiential. The experiential function involved what he termed higher order functions, which included “the creative act of musical listening” and “the creation of new or whole musical experiences” (p. 181)” (p. 43).</td>
<td></td>
</tr>
<tr>
<td>Goodman</td>
<td>“Even the emotions function cognitively: in organizing a world, felt contrasts and kinships, both subtle and salient, are no less important than those seen or heard or inferred” (1984, p. 8).</td>
<td>“Goodman (1984, 1976) suggested that feelings function cognitively in aesthetic experiences, helping us to discriminate, classify, and organize, as we respond to the work in our personal, unique ways” (p. 43).</td>
</tr>
</tbody>
</table>
Table 1.1 (continued): Dunn’s (1997) review of literature on creative music listening

<table>
<thead>
<tr>
<th>Author</th>
<th>Reference</th>
<th>Quotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mursell</td>
<td>(1943, 1956)</td>
<td>“Listening should by no means be considered mere passive reception – not even when the main consideration is the evocation of a mood. The successful listener enters into the music, possesses it, is possessed by it, and so is inspired and enabled to make it for himself” (1943, p. 170).</td>
</tr>
<tr>
<td>Reimer</td>
<td>(1989)</td>
<td>“Since the major interaction most people have with music is as listeners, the task of helping them become creative in this most fundamental of musical behaviors is perhaps the most important in all of music education” (p. 70-71).</td>
</tr>
<tr>
<td>Webster</td>
<td>(1987)</td>
<td>“Webster (1987) incorporated listening as a part of his model of creative thinking under the category of analysis… Webster’s model indicated that the process of creative thinking in music listening is aided through divergent thinking, enabling skills, and enabling conditions that eventually lead to a convergent structuring and verification of the mental structure created” (p. 44).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Mursell (1943, 1956) also indicated that listening to music can be an active creative process… Mursell points out that such musical experience is based on both the objective and subjective associations one makes based on perceptions of the music and her own unique experiences. Extra-musical associations may enhance the musical experience, although they also have the potential to hinder it” (p. 43).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Reimer proposed that learning to be a creative listener is fundamental… The implication is that music educators can have an impact on students’ ability to creatively listen” (p. 43) [emphasis added]</td>
</tr>
</tbody>
</table>
Rationale of Study

Learning to listen well is a fundamental task for music students. Without hearing the many rich details that music presents, there is little chance that a student will be able to appreciate the performance of the music they hear or for the student to emulate those details in their own performance. Therefore, music teachers must find multiple paradigms and strategies for teaching listening skills to students. Though most music teachers include some type of listening activities in their curricula, a more structured approach should be emphasized. Many currently used strategies for teaching listening skills emphasize only the macrostructure of music – such as form and instrumentation – while ignoring microstructure – such as subtle differences in tempo with a phrase, differences in timbre between high and low ranges of a single instrument, and slight rhythmic variations that may be introduced for expressive purposes by performers. Common strategies that currently exist include traditional error detection and dictation exercises, kinesthetic response to hearing as epitomized in the Dalcroze approach (Mead, 1994), and the use of listening maps. Following a review of these common strategies, a new approach to listening will be presented.

Traditional error detection and dictation exercises are important for learning to identify what one hears, but does not address the microstructure of listening – that is, the nuances of music that are neither “correct” nor “incorrect” in terms of error detection, but are instead matters of style and subtlety. In addition, traditional error detection and dictation exercises generally require the student to be fairly fluent in staff notation – a severe limitation for teaching listening skills to young students. For high school students, this method may be very helpful. While training in solfège is helpful for ear training and
listening skills, it does not attract the listener’s ear toward more refined characteristics such as articulation, intensity, timbre, etc.

Training in eurhythmics, as taught by the Dalcroze approach, is good for training listening in a very different way than error detection, dictation exercises, or solfège. The exercises one typically encounters in Dalcroze eurhythmics instruction typically lead the student to respond to music instantaneously with their body (Anderson, 2011a). For example, students might be asked to walk more fluidly in a legato section and more erratically for a staccato section. Quick-response exercises ensure that the student in vigilant in listening for changes in the music. This approach allows student response to both macrostructure and microstructure of listening examples. The approach may be especially good for those students who learn well from kinesthetic activities. These activities are excellent for young children, but may be met with resistance by high school students. However, the musically interested adult or college student may well enjoy participating in such activities. A combination of exercises inspired by the Dalcroze approach and traditional error detection exercises could prove very helpful in training the listening sensitivity of students.

Listening maps can also guide students’ listening. Major sections of music are represented in some type of notation, generally iconic, that is accessible for students who do not read staff notation well. This makes listening maps excellent for encouraging students to listen for formal characteristics of music, as visual patterns are easily transferred to aural patterns for most students. For example, the recurring theme of a rondo could be clearly represented by a single repeating image in the map. Due to the visual nature of listening maps, students who learn well from visually oriented activities
will likely benefit the most. This type of guided listening is excellent for listening for macrostructure, but generally does not address issues of microstructure. Listening maps could be combined with Dalcroze activities for a powerful combination of listening instruction, combining kinesthetic and visual learning modalities.

Other forms of active listening activities found in music textbooks, such as *Share the Music* (1995, 2003), include asking students to show formal design by using different types of movement, and asking students to draw pictures or otherwise write iconographic notations to represent what they hear. For example, formal design can be expressed by students in movement by asking students to show different forms of music for different musical sections, such as locomotor movements for one section and non-locomotor movements for another. Asking students to draw pictures or draw icons to represent what they hear can also be useful. For example, Bamberger (1991, 1994) gained insight into different listening approaches demonstrated by students based on the icons they drew to represent what they heard.

While all of these approaches have merit for inclusion in the music classroom, listening activities that emphasize listening minutely are relatively limited. While the Dalcroze approach does offer opportunities for such a sensitive response to music, it is not suitable for all students, as some students may not have optimum skills for transferring what they hear into movements with their body. Another limitation is that few teachers are well-trained in the Dalcroze approach and lack the necessary skills for leading quick-response activities. Therefore, in order to present a new paradigm for teaching music listening, “mindfulness” theory may prove helpful.
Mindfulness, as defined by Ellen Langer (1989), is basically a process of noticing differences. By noticing differences, one keeps his or her attention situated in the present and notices subtle changes in music. There are many possible approaches to modify or create instruction that encourages mindful listening. One simple way is proposed here. It may be accomplished by playing musical excerpts of the same composition as performed by multiple different performers or multiple ensembles. By asking students to listen to music that is highly similar and asking them to somehow communicate the slight differences they hear, the microstructure of music can be brought to attention in listening instruction. The means of communicating differences will vary with the type of music being used; however, possible ways of expressing the subtle differences between varying performances of the same musical composition include asking students to think of strategies to remember what is different between the two performances so that they can identify the performances a week later. By doing so, students will be faced with finding creative processes to encode and remember subtle differences in music. Such a comparative type of listening could be approached in a game-like manner, asking students to remember which performance is which. One other way to make a game-like activity from such listening instruction would be to simply ask students whether two contiguous performances are exactly the same or slightly different. Asking students to verbalize or otherwise communicate what slight differences they hear could also improve student musical vocabulary.

While these ideas for mindful listening are merely an introduction to the possibilities of such a paradigm, it is important that music teachers devote more time to thinking about new strategies to increase student listening sensitivity. There are other
means of using the construct of mindfulness to create student listening activities to
sensitize students to subtleties. For example, having students listen to music using
strategies that require sustained attention (such as listening for a particular subtle aural
cue) would help students learn to listen with increasing refinement. Without finely
attuned listening facilities, students will not be able to appreciate expressive components
of music or perform music with a high degree of sensitivity.

Statement of the Problem

The present study investigates “mindful listening” as an instructional strategy to
promote aural sensitivity and enjoyment in music.

Definitions of Terms

1.) Mindfulness –

   a. (general) – The definition of mindfulness consists of two parts; the first
      component is the “self-regulation of attention so that it is maintained on
      immediate experience, thereby allowing for increased recognition of
      mental events in the present moment,” and the second component is that it
      “involves adopting a particular orientation toward one’s experiences in the
      present moment, an orientation that is characterized by curiosity,
      openness, and acceptance” (Bishop et al, 2004, p. 232).

   b. Meditative mindfulness – Mindfulness as used in meditation practices
      “aimed at the inner experience of the participant and involve[ing] non-
      judgmental observation” (Yeganeh, 2006, p. 24).
c. *Social psychological mindfulness* – Mindfulness which “pursues a learning agenda, can be very goal-oriented and involves the use of mindfulness in enhancing problem solving and other cognitive exercises, which often involves the world outside of the individual” (Yeganeh, 2006, p. 24-25).

2.) *Listening Sensitivity* – the ability to listen for subtle differences in musical elements and make judgments based on these differences

3.) *Listening Enjoyment* – pleasure derived from listening to music, as reported by the listener

4.) *Listening Instructions* – teacher-delivered explanations directing students to listen to music in particular ways

5.) *Subtle Difference* – a small difference in the same basic musical data, with only minor variation, as might be expected between any two distinct performances of the same musical excerpt

6.) *Nuances* – instances of subtle differences

7.) *Perceptual Sensitivity* – the level of speed with which one can process the details of incoming sense stimuli

8.) *Hearing* – the process, function, or power of perceiving sound (*Merriam-Webster's*, 2011)

9.) *Listening* – to hear something with thoughtful attention (*Merriam-Webster's*, 2011)

10.) *Listening Map* – an iconographic representation of a musical excerpt intended to guide students in music listening
11.) *Icon* – a graphic representation of a non-graphic event, such as a musical sound or theme

**Delimitations of the Study**

There are many different forms of mindfulness, and different studies use different definitions. For the purposes of the current study, the definition of mindfulness will be as stated above. Similarly, other terms from the above list of definitions may vary regarding precise meaning in various studies. Hence, the operationalization of these terms for this study is necessarily reductionist. Also, the specific strategies used in this study for designing mindful listening instruction are unique to this study. The results of this study are, consequently, unique to the specific treatment of this study. The current study looks at one possibility, a researcher-designed treatment, among many for using mindful listening instruction. Likewise, this study is limited to the effects of a ten-week and five-week treatment for fourth-grade students and college students, respectively. Therefore, one must exercise caution when generalizing the results of this study beyond the scope of the definitions and treatments presented in this study.
CHAPTER 2
RELATED LITERATURE

Constructs are not physical things, but rather cognitive models for understanding, creating meaning, and predicting results. Any construct is useful only insofar as it allows one to find useful new ways of thinking about a problem that yield constructive results. For example, the construct of flow (Csikszentmihalyi, 1991) is useful in the study of music because it allows one to better explore the nature of human involvement with music, as Elliott expounds in his seminal text *Music Matters* (1995). In the same way, the construct of mindfulness may be useful to the fields of music and music education insofar as it allows useful new ways of thinking about music and music education.

This chapter first reviews literature that examines cognitive approaches to understanding music listening, and then explores the construct of mindfulness, clarifying what precisely is meant by this term in this document, and lastly summarizes research findings relevant to music and learning. Though listening is at the heart of formal and informal music education, as it presents the gateway though which one is able to understand the structures of music that act as core building blocks of meaning, relatively little research exists on how to promote student sensitivity to music listening activities.
PART ONE: PARADIGMS IN COGNITIVE APPROACHES TO LISTENING

Research into the cognitive dimension of music listening in general lacks cohesion. The absence of operational definitions prevents researchers from building substantially on the work of others. Nonetheless, some important insights into the cognitive approach of listening have emerged.

Theory of Cognitive Constraint

Thompson and Schellenberg state that, though music is learned through enculturation, it only does so within the window of our inherent cognitive constraints (both as humans and including individual differences). Some proposed cognitive constraints include: “working memory limitations, sensitivity to sensory consonance and dissonance, the perceptual salience of pitch contours, perceptual grouping as a function of proximity, predispositions that favor simple meters and rhythms, processing biases for intervals with small-integer ratios, and reliable memories for absolute pitch and timbre of frequently encountered auditory stimuli” (p. 481). The difficulty of sorting cognitive constraints on perception from enculturation is difficult, as even our processes of composition have been (perhaps unconsciously) derived with an allowance for cognitive constraints. In discussing this, Thompson and Schellenberg argue that “although extreme versions of cultural determinism have been proposed… the enormous body of evidence for cognitive constraints on music processing is far too compelling to dismiss.” Cognitive constraints must not be considered a negative element; on the contrary, they allow us to understand and appreciate music that is not included in our learned enculturation.
Drake and Bertrand (2003) present preliminary evidence toward an understanding of the basic processes that allow people to hear music in a meaningful way. Music is clearly a temporal phenomenon – strongly dependent on the passage of time – and this presents unique challenges to understanding how human memory serves to retain musical information. At any one point in hearing a piece of music (with the exceptions, arguably, of the first and last moments of a piece), the mind must be able to remember enough information from what it has heard up to that particular moment in order to place the current sound in context of the larger piece. For music to be meaningful and coherent, then, the mind depends on memory space and processing time.

Drake and Bertrand explore what mechanisms of the mind allow us to remember enough of the information in a piece of music to create the meaningful connection between what we have already heard, what we are hearing, and what we will hear next in a selection of music. In particular, they are seeking universals – properties of mind and memory – that are present in humans, regardless of culture (and with little, or highly predictable, correlation with age). They propose five research-supported candidates (a number they say is not meant to be all-encompassing) of potentially universal processes in the temporal processing of music.

The first such candidate they call “segmentation and grouping.” The premise of this potential universal is that “we tend to group into perceptual units events that have similar physical characteristics or that occur close in time” (p. 24). For example, when we hear what we may call an “A section” in music, if we hear a similar and subsequent section of music that is similar, we call encode it mentally as the same as the earlier
section, preventing the mind from having to freshly process material which has already been processed.

The second such candidate they call “predisposition toward regularity.” The premise of this potential universal is that “processing is better for regular than irregular sequences. “We tend to hear as regular sequences that are not really regular” (p. 24). For example, when hearing intervals of a specific duration, and subsequently hearing an interval with a slightly different duration, we may not notice the difference if it is within the “tolerance window” of what we hear. The mind may tend to simplify the processing of such sound as same, longer, or shorter, without having the ability to (consciously) hear subtle nuances due to lack of ability in memory or processing time.

The third such candidate they call “active search for regularity.” The premise of this potential universal is that “we spontaneously search for temporal regularities and organize events around this perceived regularity” (p.26). An example of such a regularity that we supposedly actively search for is the underlying pulse, or beat, of music.

The fourth such candidate they call “temporal zone of optimal processing.” The premise of this potential universal is that “we process information best if it arrives at an intermediate rate”(p. 27). They cite several studies that find “sensitivity to change is highest if events occur about every 600 ms, with a range stretching between about 300 and 800 ms inter-onset interval (IOI)” (p. 27). This means that the mind may seek out important events in music in a regular pattern of time, apparently about every 600 ms. Important events that occur in a quicker time frame may not be noticed.
The fifth such candidate they call “predisposition towards simple duration ratios.” The premise of this potential universal is that “we tend to hear a time interval as twice as long or short as previous intervals” (p. 28). For example, rhythms with ratios of 1:2 are more easily processed than intervals with a ratio of 1:3.

**Auditive Structuring**

Kai Karma has investigated an area he calls “auditive structuring.” Auditive structuring is the ability of a listener to organize fragments of music into meaningful units. Such a paradigm is in alignment with modern educational theory, especially in regard to constructivism, where learners are considered active in constructing and structuring meanings of learning experiences. Karma (1983) defines music aptitude as “the ability to structure acoustic material.” By utilizing such a definition, Karma attempts to understand musical ability as analogous to spatial ability; spatial ability is the ability to comprehend visual figures and thus musical ability is the ability to comprehend acoustical figures. Karma (1982) asserts that much of what has traditionally been measured as primary musical aptitude are actually culture-bound skills that are in fact dependent on primary musical aptitude. In other words, a person’s success in such areas as tonal ability, rhythmic ability, sight-singing ability, playing ability, etc. is not a measure of musical aptitude but a measure of musical achievement based on musical aptitude. Figure 2.1, based on a similar illustration by Karma (1982), visually presents this relationship.
Figure 2.1, Karma’s Model of Relationship between Aptitude and Skills

<table>
<thead>
<tr>
<th>PRIMARY MUSICAL APTITUDE</th>
<th>CULTURE-BOUND SKILLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABILITY TO ORGANIZE SOUND</td>
<td>SENSE OF TONALITY</td>
</tr>
<tr>
<td></td>
<td>SENSE OF RHYTHM</td>
</tr>
<tr>
<td></td>
<td>SIGHT-SINGING</td>
</tr>
<tr>
<td></td>
<td>PLAYING</td>
</tr>
<tr>
<td></td>
<td>ETC.</td>
</tr>
</tbody>
</table>

Karma (1985) classifies different types of cognitive operations involved in the structuring of acoustical material: forming expectations, recognizing, structuring according to gestalts, changing expectations, and analyzing the structures of strong gestalts. *Forming expectations* refers to repetition; after a motif is repeated several times, the listener expects the next repetition of the motif to be exactly the same as the previous repetitions. *Recognition* refers to the ability to identify a motif as having been heard before. *Structuring according to gestalts* refers to how a small motif (perhaps 3-6 notes) is constructed. If the motif is repeated several times, the listener should hear a clear beginning each time the motif is repeated. To create strong gestalts, the first tone of the motif may be stressed or perhaps the last tone of the motif might fade away.

*Changing expectations* refers to when the beginning and ending of the motif is similar; some listeners might think that the end of the motif is the beginning of the next
repetition. Therefore, listeners must change their expectation when the motifs do not conform to their original scheme. Karma identifies this cognitive operation as the most difficult of his taxonomy (1985). *Analyzing the structures of strong gestalts* refers to situations where the grouping of notes into motifs requires the listener to go against the grouping implied by strong gestalts. These are primarily motifs with irregular stresses. The stresses do not coincide with the beginning of the motif. This is the second most difficult of Karma’s taxonomy, second only to *changing expectations*. The ability to correctly group motifs when they go against strong gestalts may be connected with field-independence (1985), which is widely used in intelligence research and refers to ability to change fore and ground to find “hidden figures.” It is interesting to note that Ellis & McCoy (1990) found that field-independence was the single greatest predictive factor (about intelligence and years of musical experience) in the ability of college nonmusic majors to discern musical form.

Karma has developed a musical aptitude test based on the ability to recognize differences in a motif after it has been played several times in a row with no breaks. He has organized motifs to directly measure one of his cognitive structuring strategies. Karma’s main argument is that these structuring strategies are the primary component of musical aptitude. He emphasizes that his test strategy minimizes the effect of other intelligences on musical aptitude, are appropriate for testing young children, and correlate highly with teachers’ estimates of student musical aptitude (Boyle 255).

**Hearing as Problem Solving**

Bamberger explores “the relationship between the description of music and the perception of music.” She largely focuses on “hearing,” defined here as “a performance;
what the hearer seems simply to find in the music is actually a process of instant perceptual problem solving – an active process of sense making…” (1994). Basically, she is referring to how hearing music is an active process where one has to problem-solve or somehow organize what they hear in order to make meaning out of the music. The ways people hear, then, depend upon how they organize. In this context, Bamberger refers to multiple “hearings.”

Bamberger’s main argument is about how people can hear the same music in different ways, as indicated by how they might use their own notation to record rhythm. Bamberger states “…these ineluctable hearings, like drawings of them, differ with respect to the features one chooses or is able to attend to, then to make a hearing other than one’s own, may require a shift, perhaps even a fundamental restructuring of one’s focus of attention – giving priority to different features, regrouping, making new boundaries that carve out new entities, and liberating from the meld features that were previously unnoticed, even inaccessible” (p. 137).

For someone to be able to hear a single piece in multiple ways (or “multiple hearings”), Bamberger states that first one must “become aware of their own hearings” even of simplistic materials. In an unusual format, Bamberger uses a scripted sample dialogue between herself and two college students who hear a very simple rhythm pattern differently (one metrically and one motivically). Though the process of the dialogue each person is able to understand the other person’s way of hearing the pattern. Bamberger states “with each having access to the preferred features of the other’s hearing, they are able to agree that two events can be both the same and different depending on what you
are paying attention to” (p. 149). This is very similar to the construct of mindfulness as studied in the social sciences.

Bamberger (1991, 1994) describes an experience in rhythmic figural and formal representations of musical knowledge with fourth-grade students. After students had developed a class rhythm, they were asked to graphically represent what they had heard. Bamberger classified drawings into figural and formal representations (1991, p. 24). She presents an example of the difference between these two forms of representation. Using circles, some children represented the music metrically, with quarter notes represented by large circles and eighth notes represented by small circles. However, other children represented the rhythm graphically to show “functional aspects”; that is, they “focused their attention on the grouping of performed events into phrases or figures” (1994, p. 135). The rhythm, along with similitudes of the children’s figural and formal representations, is presented in figure 2.2.

Gruhn (1995/1996) utilizes Bamberger’s concept of musical representation in presenting his own ideas regarding the connectionist framework of learning commonly applied in cognitive psychology and neuroscience.

Figure 2.2, Examples of Bamberger’s Classification of Figural and Formal Representations

<table>
<thead>
<tr>
<th>Rhythm:</th>
<th>Children’s Notations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>🌙 🌙 🌙 🌙 🌙 🌙 🌙</td>
<td>Figural: O Oooo O Oooo</td>
</tr>
<tr>
<td></td>
<td>Formal: O Ooo O OOoo O</td>
</tr>
</tbody>
</table>

21
Student Listening Stories

Gruhn (1995/1996) investigated the effect of asking high-school age listeners ($n = 277$) to observe their listening by creating a “listening story” to accompany what they heard. The musical stimulus was an entire movement of a Western tonal orchestral composition. Data collected consisted of the written narrative of each student. Participants were told the beginning of a story before listening to the music, and then they were asked to complete certain aspects and developments in the story based on what they heard. Gruhn modeled his procedure for guiding students into a narrative musical story after research by Richter (1991).

Gruhn conceptualizes his study in terms of a connectionist approach to mental representation. In connectionist theory, the neural pathways of the brain are seen as systems with complex web of interconnectivity. Each pathway contains multiple associations. Mental representation is the ability of the mind to imagine, or represent, a phenomenon. For example, the mental representation for a table allows a person to think of a table. Likewise, a mental representation for a major chord allows one to internally hear, or audiate, the sound of a major chord. Gruhn’s approach to listening in this study emphasizes that the associations one may have with when listening to music will not use musical terminology and classifications until the appropriate musical representation networks have been developed in the listener. Hence, listening to music (especially in terms of global listening to complete pieces rather than to isolated stimuli consisting of single notes or small patterns) requires association in order to have meaning.

Patel (2007) presents a concept of a representational network that aligns well with Gruhn’s study. Patel makes a convincing case for a shared syntax processing between
language and music, which he calls the Shared Syntactic Integration Research Hypothesis (SSIRH). He argues that music and language share syntactic processing, but each has different representation systems in the brain. He uses the analogy of a factory that makes a part needed for both motorcycles and cars, though each is stored in a separate warehouse. If the factory is damaged, then neither motorcycles nor cars can be produced. However, if a warehouse is damaged, then the factory will still function. Gruhn’s concern is with mental representations, which corresponds to the warehouse of vehicles in Patel’s metaphor.

Gruhn classified the associations of participants into three classifications: verbal associations, musical terms, and aesthetic statements and judgments. The hypothesis was that “the less musical representations are developed, the more listeners need to refer to nonmusical associations. In contrast, the more musical representations are established internally and the more differentiated they are, the more associations and nonmusical features will disappear (because they are no longer needed, but forgotten or repressed)” (p. 90).

Gruhn analyzed the narratives for three types of content: “verbal associations (sensations, imaginations/images, movements, actions); musical observations in musical terms (referring to genre, form, musical character, instruments, single elements); [and] aesthetic statements and judgments (judgments as to taste, value judgments, objective statements)” (p. 91).

Gruhn’s summarizes the results from this study into five points (p. 93-95):

1.) The difference between verbal associations and musical terms increased with age.

However, musical terms (and, therefore, musical representations) remained stable
throughout the age range, with no effect for school instruction in music. Hence, verbal associations increase while musical representations remain relatively stable.

2.) A narrative containing a very high level of musical terms (indicating a high level of musical representations) was highly less likely to have a large amount of verbal associations, supporting the hypothesis that an increase in musical representations decreases the use of nonmusical associations.

3.) Increased time spent in instrumental music lessons correlated with increased musical representations

4.) Participants who had a high level of musical representations, and those who had both a high level of musical representations and a high level of verbal associations, had the highest levels of aesthetc statements and judgments

5.) Participants with no musical representations or verbal associations only provided aesthetics judgments with regard to “taste” (p. 95)

Gruhn also investigated correlations amongst the three types of data gathered from each participant’s narrative. Two of the correlations are particularly noteworthy. Firstly he found a highly significant (p = .00079) correlation between nonmusical associations and identification of musical elements. Secondly, he found a highly significant correlation between verbal representations and objective statements.

Gruhn summarizes his interpretation of the study into six points (p. 97):

1.) Neither age nor exposure to music classes at school seemed to influence musical representations. Gruhn speculates that this may be due to a lack of focus on aural
skills within music classrooms, with teachers instead giving more class time to development of conceptual knowledge.

2.) An increase in mental representations allows one to decrease reliance on verbal associations to express what they hear, supporting the initial hypothesis.

3.) The strong correlation between instrument lessons and mental representations is noteworthy.

4.) Listeners with deficient musical representations tend to convey only an aesthetic statement or judgment without objective musical representations. Hence, unsupported statements that one likes or dislikes the music possibly indicate an underdeveloped system of musical representations.

5.) “Mindful of the… limitations [of the study], one can say that associative and verbal musical representations form an equivalent relation to each other as figural and formal representation.” (p. 97)

6.) “Only if one has had the opportunity to develop figural representations will one be able to develop formal representations… An adequate musical terminology can only be developed if a figural representation is symbolically encoded as a formal structure” (p. 97). Here Gruhn uses “figural” and “formal” as designations for different types of representations in the same manner as Bamberger (1991).

Relevance of Gruhn’s Study to the Present Study

Gruhn’s study provides much support for the practice of instructing students to create associations, such as freely generated “stories,” while listening to music. Most basically, mental associations based on imagery may provide a pathway for students to engage in listening to music without having extensive mental musical representations. It
is necessary to develop instructional strategies that encourage sustained focus of attention during music listening for students who have a limited warehouse of sufficiently sophisticated musical experiences and vocabulary. As students learn to engage in music listening with increased focus of attention, a hermeneutic loop may develop: as students become increasingly able to hear music for longer periods of time, music listening exposure increases and the requisite experiences for developing mental musical representations increases; and, as mental musical representations increase, students will become increasingly able to make meaningful musical sense of what they hear.

Creative Listening

Dunn (1997) investigated whether music listening can be considered to involve creative thinking. “Creative listening appears to be an active process involving unique, individual cognitive and affective response to listening to music that extends beyond listeners’ technical understanding of the music” (p. 42). He presents 10 generalities about music listening as a creative process (p. 44-45):

Creative listening:
1.) Is an active process that involves unique, individual cognitive and affective responses to music.
2.) Allows individuals to find themselves in the music; that is, to become co-creators of the musical experience.
3.) Involves both objective and subjective, including imaginative, response.
4.) Can involve extra-musical reference prompted by the music or affective response to it.
5.) Is directly affected by individual feelings that assist in creating connections and meanings (a) from within the music, and (b) between the music, past experience, and life experiences.
6.) Enables us to create holistic, inner perceptual structures of the music, the creative product of creative listening.
7.) Involves “thinking in sound.”
8.) Involves reflection-in-action – that is, perceiving the music as it happens, creating expectations of what may happen, reflecting on what has happened, and interacting affectively with these perceptions.
9.) Is an authentic, natural process.
10.) Can be influenced by education.

The last point, that creative listening can be influenced by education, is of most importance to music educators. How that can best be achieved is not certain. Internal structuring of music allows listeners to capture some essences of the musical experience in a mental representation.

Focus of Attention in Music Listening

Greer, Dorow, and Randall (1974) found that music attention span increased uniformly and predictably with higher grade levels of nursery through sixth-grade students. Attention span was measured by calculating the time that the student depressed a key to continue the playback of the music. They also found that the third-grade to fourth-grade transition marks an important development in the musical taste of students, specifically with regard to preference for “rock” or “nonrock” music. As grade level increased, preference for “rock” music over “nonrock” music increased.

Several studies by Flowers and others have investigated student self-awareness of distraction during music listening (Abril& Flowers, 2007; Flowers, 2001; Flowers & O’Neill, 2005). In these studies, students were asked to touch a computer touchpad when they realized they had become distracted and returned their attention to the listening task. Hence, students tapped the touchpad to indicate a return of attention after a period of inattentiveness or distraction. The studies indicated about one to five distractions per minute for middle school students. Student distraction frequency varied highly between
individual students, but the researchers found the distraction frequency for individual students to be relatively stable. Flowers (2011) reviewed listening literature related to K-12 school-age students and notes that human responsiveness to music “may crystallize with the growth of language skills allowing verbal description to serve as a means of focusing attention in listening, communicating about what one hears, and sharing personal experience” (p. 4). The plausibility of using student linguistic skills and student verbal descriptions as a means of focusing attention is an important point.

Madsen and others have studied focus of attention in music listening in depth (Geringer & Madsen, 1995/1996; Madsen, 1997; Madsen, Geringer, & Fredrickson, 1997; Madsen & Geringer, 2008). Madsen and Geringer (2001) note that Montgomery (1978) found that third-grade students can aurally discriminate changes in music as well as adult professional musicians, though third-graders lacked the terminology to express the changes. In Montgomery’s study, participants were asked to indicate particular changes in the music they heard through tapping on a microphone; Montgomery used this procedure to control for lack of musical terminology in the third-grade students. On the basis of this, Madsen and Geringer (2001, p. 106) state:

If students can already differentiate various sounds (even if they do not know the appropriate terminology), then perhaps differences in novices compared to sophisticated listeners might be primarily those relating to long-term attentiveness: Focus of attention over time might well be the most important variable in all music listening.

Madsen and Geringer (2001, p. 106) quote from a study by Madsen, Britten, and Capperella-Sheldon (1993) about the importance of attention for “peak experience” in music:
“… in order to have ‘peak experience’ of which some musicians speak… it is speculated that one must spend several minutes in highly concentrated focus of attention, especially the 30-45 seconds immediately proceeding [sic] the peak experience. If concentration is broken (especially by a competing over experience such as talking), the listening, while pleasant, does not seem to evoke an intense aesthetic response” (p. 66).

Madsen and Geringer (2001) investigated the role of attention in music listening. They note the importance of music listening and aural discrimination to all other musical learning. Emphasizing the importance of attention, they state that “… focus of attention is perhaps the most important attribute of actively “participating” in meaningful music listening” (p. 103). In the study, participants listened to a music excerpt from Puccini’s opera *La Bohème* and manipulated a Continuous Response Digital Interface (CRDI) dial to indicate their “aesthetic response” to the music; the authors intentionally did not define “aesthetic response.” Participants were asked to indicate which of five musical elements (melody, rhythm, timbre, dynamics, or “everything”) most strongly commanded their attention. The results showed that melody was the strongest element related to aesthetic response, with dynamics and “everything” also showing positive relationships. However, timbre and rhythm may have actually impeded an aesthetic response.

In a related study (Madsen, Geringer, & Fredrickson, 1997) using Haydn’s Symphony #104, First Movement, as a listening stimulus, the results regarding which elements produced an aesthetic response differed; notably, rhythm was found to have a highly positive relationship to aesthetic response. When explaining the difference, Madsen and Geringer (2001) observe that listening to different types of music requires different modes of attentiveness.

Focus of attention differs between adult musicians and adult nonmusicians. Madsen and Geringer (1990) found that when asked to identify, using CRDI, which
music elements of rhythm, dynamics, timbre and melody were most prominent to them in
music listening excerpts, differences between musicians and nonmusicians emerged.
Specifically, musicians spent time attending to, in decreasing order, melody, rhythm,
dynamics, and timbre. In contrast, nonmusicians, spent more time attending to, in
decreasing order, dynamics, melody, timbre, “everything,” and rhythm.

Madsen and Geringer’s Model for Focus of Attention in Music Listening

Madsen and Geringer (2001) present a model for focus of attention in music
listening. The first point of the model concerns whether one is listening to music actively
or, after a brief period (perhaps 5-7 seconds) of listening, whether one attends to stimuli
other than the music while the music continues to play. The authors describe this
process: “the music becomes ‘background’ in their cortical attentiveness” (p. 105).

The second point concerns ways of sustaining attention over time. Teachers or
researchers may accomplish this by asking listeners to engage in activities such as
marking each beat on a piece of paper with a pencil, count the number of times certain
themes are presented, or “anything that keeps them attending to the music” (p. 105).

The third point of the model is that “once a student is engaged in… music further
aural discriminations might be investigated (p. 105). The authors present examples such
as asking students to listen for contrasts and asking students to track formal design (such
as binary, rondo, etc.). A second method of furthering aural discriminations would be to
ask listeners to attend the composite sound but with specific elements to listen for, such
as high/low or fast/slow. One could then progress to more subtle discriminations, such as
the ongoing changes in texture throughout a piece of music. The authors emphasize that
a complete model of music listening must include focus of attention, emotional responsiveness, and discriminative listening. This process is summarized in table 2.1.

Table 2.1, Focus of Attention Model of Music Listening (Madsen & Geringer, 2001)

<table>
<thead>
<tr>
<th>Music Listening Attentiveness</th>
<th>Stage</th>
<th>Potential Task(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point 1</td>
<td>Initial attentiveness</td>
<td>Active listening; ensuring that attention is not in competition with other stimuli</td>
</tr>
<tr>
<td>Point 2</td>
<td>Sustained attentiveness</td>
<td>1.) Marking beats on paper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.) Counting presentation of themes</td>
</tr>
<tr>
<td>Point 3</td>
<td>Aural Discrimination</td>
<td>1.) Tracking of formal design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.) Tracking of elements (high/low, etc.)</td>
</tr>
</tbody>
</table>
Measurement of Focus of Attention in Music Listening

Geringer and Madsen (1995/1996) studied different focus of attention to the music elements of rhythm, dynamics, timbre, melody, or a composite of these. The study used a Likert-type scale for measurement of the focus of attention for the elements. Measurement using the Likert-type scale yielded very similar results to related studies by Madsen and others that used CRDI to measure focus of attention. This finding suggests that Likert-type scales or other means of measurement that are not gathered in real-time with the music can demonstrate high correlation to real-time measurement. In addition, Madsen and Geringer (2008) studied the use of pencil-and-paper for recording students’ aesthetic responses during music listening and found that pencil-and-paper measurement provided nearly as much data as did more sophisticated measuring devices, such as CRDI.

Madsen and Coggiola (2001) found that asking listeners to actively do something, such as manipulate a CRDI dial, while listening strongly promoted them to be more attentive to the music. The authors note that having an active task seems to promote increased attentiveness to the music.

Cognitive Development of Music Listening Skills

Bickel (1991) investigated the ways that seventh- and eighth-grade students “construct” meaning from music. The subjects were 26 students. They were asked to listen to six pieces of music and discuss them during three 45 minute interviews with the researcher. The researcher examined student responses for response patterns. Less than half of the responses referred to “technical dimensions” of the music, but subjects frequently expressed “creative metaphors, unique perspectives on music and the music.
listening experience, personal idiosyncrasies, overall unifiers, and unique examples.”

Bickel concluded that constructive listening should include language for students to share
“internal behaviors of imagining and feeling.”

Johnson (2004) investigated the effect of critical thinking instruction on the
responses of fifth-grade students’ responses to music listening examples as measured by
students’ written responses. The control group and critical thinking instruction group
received instruction in musical terms and concepts; repeated music listening examples;
and responding activities. In addition, the critical thinking instruction group received
“opportunities for critical thinking.” The critical thinking instruction resulted in greater
gains on musical terms, associative, and affective gains. The effect size was not reported;
however, the gains were reported as “dramatic.” Johnson notes that large standard
deviations and departures from normal distribution make generalization difficult.

Hufstader (1977) investigated the music listening skills of first-, third-, fifth-, and
seventh-grade students for the possibility of a learning sequence of musical elements.
The researcher concluded that a learning sequence existed. The sequence of development
for aural sensitivity was timbre, rhythm, melodic pitch patterns, and harmony. Hufstader
devised this sequence by following the rank order of mean scores on the researcher-
designed posttest.

Hedden (1981) reviewed literature on the instruction in music listening skills.
Regarding pitch discrimination, Hedden concluded that pitch discrimination skills
increase throughout elementary and into junior high school. In addition, pitch
discrimination skills increased with music instruction. Interestingly, response format had
an effect on student pitch discrimination response scores: subjects had greater success

33
rates with “same/different” than with “higher/lower” response formats. Regarding melodic contour, Hedden concluded that first-grade students appear to be highly capable of identifying melodic contour; also, visual representations of melodic contour were identified by first-grade students. Regarding harmony, Hedden concluded that first-grade students are sensitive to changes in harmony, with high levels of accuracy in identifying “same/different” harmonic patterns played in isolation. Regarding timbre, Hedden concluded that fourth-grade students are “very much aware of tone color.” In addition, adjectives chosen to describe timbre amongst fourth-grade students exhibited a “fair degree of consensus.” Regarding the sequence of music listening sensitivity, Hedden proposed the following learning sequence: loudness, timbre, melodic/rhythmic aspects, and harmony. Though some minor variations existed, this sequence is basically in agreement with the sequence proposed by Hufstader (1977).

**Guided Listening and Listening Map Research**

Hedden (1980) reviewed literature on the effect of notated themes or visual representations on music listening skill (Oberdin, 1967; Bastarache, 1972; Peterson, 1965; Sears 1977; Neidlinger 1967). He concluded that notated themes or visual representations of music have no effect on student learning in elementary school, though they may have some effect on student learning in junior high school. Hedden explained his conclusion by stating that junior high school students may have greater experience with music notation, which often corresponds with such visual representations.

Geringer and Nelson (1980) studied the influence of guided listening on student musical achievement and preference. They found that, amongst fourth-grade students, there was no significant difference between guided listening and non-guided listening.
treatments on student scores on a musical achievement test or music preference. The guided listening group completed a forced-choice written task relating to the music while listening.

Price (1974) found no effect of guided, analytical listening on musical enjoyment of junior high school students. Using Baroque and twentieth-century music, the researcher designed 12 lessons. The treatment group received guided, analytical listening lessons while the control group did not. Price cautions teachers that expecting musical enjoyment to change as a result of guided, analytical listening instruction may be misguided.

Listening maps are a common tool used by music textbook publishers and by teachers for structuring experiences in guided listening using visual stimuli. Since this approach is a common one, it is being used in this study as one way that listening experiences are typically organized. Therefore, a brief review of literature regarding listening maps is appropriate here.

Gromko and Russell (2002) studied relationships between children’s aural perception, listening condition and accurate reading of graphic listening maps. Participants were second and third graders. Three levels of listening were used – passive listening, unstructured active listening, and structured active listening. After a single listening, students were asked to follow a listening map while listening the second time. No significant effect was found; however, the results were contaminated by a post-experiment realization that previous musical experience was not considered (a significant number of participants had studied private piano). The researchers recommended that in future studies participants should receive an increased number of listening treatments.
before the final measurement. However, a significant effect was found for student score on the rhythmic and tonal subtests of the *Intermediate Measures of Music Audiation* (IMMA) test by Edwin Gordon. The IMMA measures music aptitude with tonal and rhythmic subtests. Each of the subtests consists of a series of items where students must identify whether two short musical stimuli are the same or different.

Kelly and Tan (2004) found that musically trained college students were more likely to create abstract icons on listening maps indicative of various musical elements while musically untrained college students were more likely to create pictorial markings. Ellis and McCoy (1990) found that cognitive style, that is, field independence versus field dependence, had an impact on ability of college students to perceive form in music. Such findings suggest that visual stimulus may help some students learn to accurately perceive form in music.

Dean and Gromko (1994) investigated differences between third-grade students and college students (music and non-music majors) in ability to discern musical form. Form discernment was measured using a researcher-designed instrument that asked subjects to compare sections of a single Chopin piano composition with other sections and explain the reasoning behind their decisions. The results suggest that adults and children have different reasoning behind their judgments pertaining to discernment of form in music. Fung and Gromko (2001) studied the effect of active versus passive listening on the quality of children’s invented notations. The active listening group listened three times: first, they listened and moved spontaneously to the music, second, they drew the melodic contour in sand, and third, they mapped the music on a piece of paper. The passive listening group listened twice to the music while sitting or lying down
before mapping the music on a piece of paper the third down. Rhythm and phrasing were
significantly more often referenced in the active listening group than in the passive
listening group.

Previous research has found that when subjects are asked to respond to music as
the music is played, that is, in real time, responses differ than when post hoc responses
are collected (Frego, 1999; Colprit and Duke, 2001). Continuous, real time responses
were further studied in relation to phrase comparison and musical cohesiveness by
DeNardo and Kantorski (1998). Gromko and Russell (2002) found that students with
better audition skills read listening maps better, supporting such a use of a listening map.
In this section, research in mindfulness will be discussed. Different researchers have described mindfulness differently. In general, researchers agree that mindfulness is a process of focusing attention and attending to the present moment. However, many different cognitive processes may be considered as “mindful,” and this makes it important to understand clearly the similarities and differences between how various researchers understand the concept. For example, some researchers study mindfulness only in the context of meditation practices, while others study mindfulness in the context of everyday activities.

The Construct of Mindfulness

Mindfulness could be considered a mental preset, and as such the commentary of Rideout in his chapter “The role of mental presets in skill acquisition,” (1992) – presented from a musical skill acquisition perspective – may be a helpful auxiliary in understanding the role of mindfulness in music education. Rideout identifies four steps for “improving attention through focusing…” (1) awareness, (2) will, (3) trust, and (4) letting go (pp. 475-476). Awareness in this context is “being present by paying attention to sight;” alternatively, one could suggest sensory input other than sight, such as sound, as a way to be present. Will in this context is “the ability to define the object to be learned and to focus all desire toward it.” Trust involves believing that the desired outcome of a musical experience or practice can be achieved. Letting go involves “giving oneself over completely to the act of listening, performing, or composing, etc., being fully immersed in the act, ignoring the self as actor” (p. 476). Though this is not
the same as mindfulness as discussed in this paper, it is nonetheless a similar approach, as mindfulness is a mental approach that may improve outcomes in music learning. It is interesting to note that Rideout’s chapter appears in the seminal *Handbook of Research on Music Teaching and Learning* published by MENC in 1992. Nearly twenty years ago, researchers were starting to explore the role of mental presets in musical tasks. However, the construct of mindfulness allows further refinement and a research base upon which one can now extend such exploration.

**Mindfulness as a Construct with Multiple Layers of Meaning**

In this section, the construct of mindfulness will be investigated. The lack of a standard definition of mindfulness amongst researchers has led to a notable yet potentially confusing consequence. Interestingly, the research that exists on mindfulness demonstrates a variety of approaches to understanding mindfulness. Murphy (2011, p. 40) provides a general definition of mindfulness by investigating what it is not:

> Mindfulness can also be defined by what it is not. It’s the opposite of everyday habits – operating on autopilot, multitasking, getting lost in thought, and daydreaming. It is the opposite of having your body in one place and your mind in another… Mindfulness is not aimed at making us feel better, but rather at getting better at noticing our feelings and thoughts.

Potentially confusing is the difficulty of trying to compare the various outcomes of empirical studies of mindfulness when researchers use different definitions. Rothwell notes the increased interest in mindfulness in recent years, describing it as “striking” (2006, p. 79). The first subsection below presents a discussion of mindfulness as defined by Bishop et al. (2004), Brown and Ryan (2004), and Ellen Langer (1989, 1997). The second subsection below presents Sternberg’s (2000) examination of mindfulness as
defined by Ellen Langer. The third subsection below presents data regarding the effect of meditative mindfulness on attentional blink from Slagter et al. (2007).

Three Approaches to Mindfulness: Bishop et al.; Brown and Ryan; and Ellen Langer

Bishop et al. (2004), noting the lack of a consistent definition of mindfulness used by the research community, proposed an operational definition of mindfulness that is two-fold; the first component is the “self-regulation of attention so that it is maintained on immediate experience, thereby allowing for increased recognition of mental events in the present moment,” and the second component “involves adopting a particular orientation toward one’s experiences in the present moment, an orientation that is characterized by curiosity, openness, and acceptance” (p. 232).

Brown and Ryan (2004) summarize the definition proposed by Bishop et al. as “(a) attention and awareness and (b) acceptance” (p. 242). Brown and Ryan notice that Bishop et al. often interchange the use of the words “attention” and “awareness,” and note that these two constructs are not identical. According to Brown and Ryan, “awareness refers to the subjective experience of internal and external phenomena; it is the pure apperception and perception of the field of events that encompass our reality at any given moment,” and “attention is a focusing of awareness to highlight selected parts of that reality” (pp. 242-243). Relating these definitions to Gestalt terminology, Brown and Ryan explain “awareness is the field or ground upon which perceived phenomena are expressed, and attention continually pulls “figures” out of that ground to hold them up for closer examination” (p. 243).
Though the concept of mindfulness is grounded in Buddhist meditation practices, the scientific study of mindfulness is not restricted to forms of meditation. Ellen Langer (1989, 1997) is one psychologist who has studied mindfulness outside of the context of meditation practices. Bishop et al. (2004) describe Langer’s construct of mindfulness as “within the same domain” (p. 235) as their construct, noting that “both constructs involve attentional engagement.” Noting that Langer’s construct “involves the active construction of new categories and meanings when one pays attention to the stimulus properties of primarily external situations,” while their own emphasize “internal stimuli (thoughts, feelings, and sensations),” Bishop et al. distance their construct somewhat from that of Langer. They note the close relationship between Langer’s construct and other similar constructs such as flow (Csikszentmihalyi, 1997) and absorption (Tellegen& Atkinson, 1974).

Brown and Ryan define awareness as “a receptive attention to and awareness of present events and experience” (2007, p. 212). They propose this definition and emphasize the need for congruency between researchers on the precise meaning of the term. The authors also note that the “meaning of mindfulness can be quite nuanced… and is therefore subject to interpretation and a selective high-lighting of one or more aspects over others” (p. 215). Brown and Ryan cite various definitions used by many different researchers, and believe that their definition distills the most salient features of most definitions used by researchers. When specifically addressing the relationship between mindfulness in terms of other research (most of which includes some form of meditation practice) and mindfulness as presented by Langer, Brown and Ryan have interesting comments:
Langer’s… conception of mindfulness as novel distinction-making also bears similarities and differences with the formulation of mindfulness discussed here. Both perspectives emphasize a present-oriented state of mind reflected in an awareness of one’s behavior and the active deployment of attention… However, like the predominant self-awareness theories discussed already, Langer’s formulation of mindfulness emphasizes cognitive processing of sensory input, such as the intentional search for novelty, distinctions, and multiple perspectives on task performance and behavior… Also, Langer’s focus is upon how the individual perceives and organizes behavior and the environment, while the present formulation highlights the importance of attentional receptivity to both inner and external realities as a platform for informed response. Despite these conceptual differences, preliminary evidence suggests that the two forms of mindfulness are related, most strongly on the dimension of present-oriented engagement, and to a lesser extent on novel distinction-seeking and -making (Brown & Ryan, 2003). Further research will be needed to determine whether these two forms of mindfulness represent alternative paths to the same salutary outcomes or whether they show benefits for different domains of experience and behavior. (p. 217)

This commentary by Brown and Ryan highlight the elusiveness of defining mindfulness and is particularly poignant in highlighting the possible connection between the construct of Langer and the construct they propose.

Langer (2010, personal communication) characterizes mindfulness meditation as a method for increasing mindfulness outside of the meditation experience (during “post-meditation”), while her construct emphasizes the same basic experience of post-meditation mindfulness without the necessity of meditation. Brown and Ryan (2004) express “conceptual and empirical concerns in binding mindfulness to meditation and to the consciousness of primarily internal phenomena that meditation typically involves” (p. 246). Stating that though they “believe that meditative practices can be an effective route to the enhancement of mindfulness,” they clearly argue that mindfulness is “not merely a product of meditation,” but is “an inherent, natural capacity of the human organism” (p. 246).
Brown and Ryan cite their own research (e.g. Brown & Ryan 2003, Carlson & Brown, 2003; Levesque & Brown, 2003) in presenting mindfulness as a “propensity” that varies considerably in the general population, “most of whom have had no formal meditation experience” (p. 246). They then present a measure developed by Brown: the *Mindful Attention Awareness Scale* (MAAS), which exists in both state (measuring mindfulness of the present moment) and trait (measuring overall disposition toward mindfulness) forms. If mindfulness were dependent upon meditation training, then Brown and Ryan conclude that it would be unlikely for the measure to vary largely amongst those who have not been exposed to meditation practice. Rothwell describes mindfulness, citing the research Bishop et al. (2004), as “a faculty that has significant therapeutic potential and, like memory and attention, it can be improved with practice” (2006, p. 79).

**Sternberg’s Examination of Ellen Langer’s Construct of Mindfulness**

Sternberg (2000) examines the construct of mindfulness as presented by Langer, seeking to find how to understand or characterize the construct within the psychological literature, noting that Langer has not presented her construct of mindfulness as belonging to any particular way of understanding psychological variables. In doing so, he considers the potential of three possibilities for explaining the manifestation of mindfulness: (a) cognitive ability, (b) personality trait, and (c) cognitive style. He concludes that “mindfulness has characteristics of all three but seems closest to being a cognitive style” (p. 11). By understanding mindfulness as a cognitive style, Sternberg explains mindfulness as “a preferred way of thinking.” The classification of Langer’s construct of
mindfulness as primarily a cognitive style is important, as cognitive style may be more easily influenced by learning than cognitive ability or personality trait.

He notes that the mindfulness scale developed by Langer to measure her construct of mindfulness is a “typical-performance one,” meaning that the test-taker self-reports patterns of behavior instead of being observed during the actual performance of mindful behavior. Such scales are typically associated with personality or cognitive styles rather than tests of cognitive ability (p. 21). Sternberg defines cognitive styles as “preferred ways of using one’s cognitive abilities” (p. 22). This is a sensible conclusion: normally-functioning humans exhibit varying levels of awareness, attention and orientation to the present moment in various contexts. Mindfulness, from the perspective of this contextualization, is then a preferred way of using those abilities. “Mindfulness, like cognitive styles, is at the interface between cognition and personality,” according to Sternberg, and it “has characteristics of both a state and of a trait” (p. 24). Though much of the research on cognitive styles in general is no longer in vogue due to an increase in psychometrics of cognitive ability and personality traits, Sternberg – an eminent psychologist at Yale University – argues that mindfulness may in fact be one of the more important facets of cognitive style that is currently entering the attention of researchers and practitioners in multiple disciplines.

**Mindfulness and Attentional Blink**

From a different perspective, Slagter et al. (2007) found in a study examining the effect of an intensive three-month mindfulness meditation program that intensive mindfulness meditation training “can result in increased control over the distribution of limited brain resources” (p. 1228). This conclusion was developed by investigating
“attentional-blink.” Attentional-blink is described: “when two targets… embedded in a rapid stream of events are presented in close temporal proximity, the second target is often not seen.” One example of attention-blink: the subject is asked to notice what the first two numbers are in a series of rapidly changing single numbers or letters on a computer monitor, presented one at a time and lasting only a second or two. The subject will often miss the second number due to the close temporal proximity of the presentation of the second number to the presentation of the first number. In this study, the researchers found that mindfulness meditation training resulted in a greater likelihood of identifying the second number. Functional magnetic resonance imaging (fMRI) and other brain imaging techniques provide additional data (see also Farb et al., 2007, for further information on mindfulness and brain imaging). Though the mindfulness training regimen in this study was quite lengthy and intense, it nonetheless shows that mindfulness – at least in the form of mindfulness meditation – has the potential to allow one to have a greater ability to notice quickly passing stimuli. Since music is a temporal art form, any treatment that could potentially increase the amount of information taken in by the listener deserves further research. Though this is not the type of mindfulness that will be presented and examined most thoroughly in this document, it nevertheless warrants mention here due to the profundity of these results and the similarities between mindfulness meditation and non-meditation based mindfulness.

Yeganeh’s Dual Model of Mindfulness

Yeganeh (2006), in response to the lack of a cohesive definition of mindfulness amongst researchers, classified mindfulness into two distinct but overlapping categories: social psychological mindfulness and meditative mindfulness. This model is very useful
for understanding the different approaches and is a useful summary of the literature on mindfulness research.

Yeganeh cautioned against confusing meditative mindfulness with social psychological mindfulness, noting that there are shared and distinct strengths and weaknesses of the two approaches (p. 24-25):

While there are similarities between the two approaches, distinct differences exist as well. Social psychological interventions usually include the treatment of material external to the individual participants (Baer, 2003; Langer, 1989). It pursues a learning agenda, can be very goal-oriented and involves the use of mindfulness in enhancing problem solving and other cognitive exercises, which often involves the world outside of the individual (Baer, 2003; Langer 1989). The meditative approaches and traditions are usually aimed at the inner experience of the participant and involve non-judgmental observation.

Yeganeh commented on the social psychological approach to mindfulness as presented by Langer and colleagues (p. 25):

Langer and colleagues place less of an emphasis on momentary experience and emphasize continually acquiring many perspectives which can reflect the complex world around us and then being flexible with them in various contexts. An aspect of this may entail living in the moment, but it is not stressed in the same way as in meditative mindfulness literature. Furthermore, a meditative mindful practice aims at reducing the clutter of our thoughts, something that social psychological mindfulness does not discuss.

When discussing the ways in which the constructs of social psychological mindfulness and meditative mindfulness converge, Yeganeh stated the following (pp. 25).

Both approaches to mindfulness stress cognitive flexibility and awareness. Meditative mindfulness stresses being present centered in order to direct attention away from rumination of the past and anxious thoughts of the future. Its approach to flexibility consists of “letting go” of unwanted thoughts through acceptance rather than resistance to them. From the social psychological perspective, one must be aware of biases in order to create novel distinctions and new biases with a value on uncertainty and conditionality in order to be flexible in a changing
environment. Furthermore, both suggest that being purposeful and intentional is part of mindfulness. Finally, both approaches to mindlessness describe an automatic state where one is on autopilot, with rigid biases, and predetermined rules.

Yeganeh’s classification is accurate and presents a useful tool for understanding the different components of mindfulness. It also demonstrates clearly the areas of overlap and of distinction between social psychological mindfulness and meditative mindfulness. Figure 2.3 presents Yeganeh’s model regarding the two constructs of mindfulness as he identifies them.
Figure 2.3, Comparison of Social Psychological Mindfulness and Meditative Mindfulness (Yeganeh, 2006, p. 26)

<table>
<thead>
<tr>
<th>Social Psychological Mindfulness Construct</th>
<th>Meditative Mindfulness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mindfulness</strong></td>
<td><strong>Similarities</strong></td>
</tr>
<tr>
<td>1. Sensitivity to context awareness</td>
<td>1. Awareness</td>
</tr>
<tr>
<td>2. Openness to new information</td>
<td>2. Cognitive Flexibility</td>
</tr>
<tr>
<td>4. Multiple perspectives</td>
<td></td>
</tr>
<tr>
<td>5. Situated in present</td>
<td></td>
</tr>
<tr>
<td><strong>Mindlessness</strong></td>
<td></td>
</tr>
<tr>
<td>1. Autopilot</td>
<td>1. Autopilot</td>
</tr>
<tr>
<td>2. Following predetermined rules</td>
<td>2. Rigid Biases</td>
</tr>
<tr>
<td>3. Engaged in routinized behaviors</td>
<td>3. Predetermined Rules</td>
</tr>
<tr>
<td>4. Rigid perspectives</td>
<td></td>
</tr>
<tr>
<td>5. Without capacity for much variation</td>
<td></td>
</tr>
</tbody>
</table>
Diaz’s Mindfulness in Music Listening Study

Diaz (2010) investigated the effect of a 15 minute meditative mindfulness exercise on music listening of college students. He reported that “the purpose of [his] study was to investigate the effects of a brief mindfulness induction technique on subjective reports of attention, aesthetic response, and flow during music listening…” (p. viii). The type of mindfulness exercise he used would be considered a meditative mindfulness task, not a social psychological mindfulness task. The treatment consisted of a 15 minute body scan intended to bring the participant’s awareness into the present moment. The control group received no such treatment. Both groups then listened to an approximately 10 minute excerpt from Puccini’s opera *La Bohème*.

Diaz then examined the effect of the treatment on “aesthetic response,” “flow,” and “attention.” Measurement of the variables was through a Continuous Response Digital Interface (CRDI) dial and questionnaires. There was no subjective “heightening” of attention attributable to the mindfulness treatment. Differences were found between the CRDI data from the two groups on aesthetic response and flow, though the interpretation of this data is unclear, other than acknowledging that the mindfulness treatment did have some effect.

Mindfulness as Defined by Langer

Having divided the field of mindfulness study into meditation-based and social psychological approaches, the current study will focus on social psychological mindfulness, particularly as presented in the approach of Ellen Langer. Langer is a Harvard University Professor of Psychology and a leading researcher in the nonmeditation-based approach to mindfulness research. Her research and her definition
of mindfulness is useful for music education. It is a model of mindfulness that is not based on meditation, and hence can be more easily implemented in school instruction. Also, some research on Langer’s construct of mindfulness already exists in the field of education. Therefore, a closer examination of Langer’s definition is needed.

Initially, Langer studied what she calls the opposite of mindfulness – mindlessness – which occurs when someone follows a pre-learned pattern of behavior even when the behavior no longer applies to the task at hand (1989, 1997). When engaging in mindless behavior, a person often relies on automatic behaviors. For example, a person may write the wrong year on a document in January after the year has changed due simply to the habit of writing the date without giving it attention. Mindfulness, in this case, would be exemplified by actually being aware and attentive to the actual date rather than the automatic behavior of writing the date. In the same way, once someone has learned to conceptualize his thoughts or sense perceptions into categories, the process of categorization discourages him from paying attention to the subtle nuances and novelty of his thoughts or perceptions. For example, once someone labels spoons as eating utensils, he may not be as open to alternative ways that spoons could be used – such as for music-making. Considering this, the construct of mindfulness may have some overlap with divergent creativity. To express the concept colloquially, mindlessness is behavior which is on “auto-pilot.”

In contrast to mindlessness, Langer’s construct of mindfulness is “a state of conscious awareness characterized by active distinction drawing that leaves the individual open to novelty and sensitive to both context and perspective” (Demick, 2000). One could shorten the definition to “the process of noticing novel distinctions,” and this
is the definition used from hence forth in this paper unless otherwise mentioned. This
definition of mindfulness is expanded upon in closer analysis; in the expanded
explanation, mindfulness is presented as a heterogeneous construct consisting of (1)
openness to novelty, (2) alertness to distinction, (3) sensitivity to different contexts, (4)
implicit, if not explicit, awareness of multiple perspectives, and (5) orientation in the
present (e.g. Langer, 1997; Langer & Moldoveanu, 2000; Sternberg 2000).

Expounding upon this definition and giving some explanation of the relationship
between the simple definition of “the process of drawing novel distinctions,” Langer and
Moldoveanu (2000) present the following:

Mindfulness is not an easy concept to define but can be best understood as the
process of drawing novel distinctions. It does not matter whether what is noticed
is important or trivial, as long as it is new to the viewer. Actively drawing these
distinctions keeps us situated in the present. It also makes us more aware of the
context and perspective of our actions than if we rely upon distinctions and
categories drawn in the past. Under this latter situation, rules and routines are
more likely to govern our behavior. The process of drawing novel distinctions
can lead to a number of diverse consequences, including (1) a greater sensitivity
to one’s environment, (2) more openness to new information, (3) the creation of
new categories for structuring perception, and (4) enhanced awareness of multiple
perspectives in problem solving. The subjective “feel” of mindfulness is that of a
heightened state of involvement and wakefulness or being in the present. This
subjective state is the inherent common thread that ties together the extremely
diverse observable consequences for the viewer. Mindfulness is not a cold
cognitive process. When one is actively drawing novel distinctions, the whole
individual is involved. (pp. 1-2)

Though it may at first seem like this definition of mindfulness contrasts
considerably with more traditional Buddhist definitions of mindfulness, the difference
may not be as great as it initially may seem. For example, most texts which present
Buddhist mindfulness techniques emphasize focusing the attention on the breath and just
noticing the process of breathing (Trungpa, Suzuki, et al.). In placing one’s attention on
the breath – which is a dynamic process that is constantly in a state of flux – one’s attention will notice novel distinctions of in-breath versus out-breath, the sensations of the air as it enters the nostrils or mouth, and the subjective feeling of breathing. While it is beyond the scope of this paper to closely compare and contrast the traditional Buddhist view of mindfulness with the construct of mindfulness as presented by Langer, it is worth mentioning that the constructs do bear similarities as well as distinctions.

Demick compares Langer’s construct and study of mindfulness to the developmental theories of Piaget and Vygotsky, concluding that mindfulness constitutes a “grand theory that advances contemporary developmental theory” (2000, p. 141). He also argues that mindfulness, as presented by Langer, has relevance across multiple domains, including possible or existing applications in “cognitive, educational, organization, [and] clinical” fields.

**Applications of Langer’s Construct of Mindfulness to Music and Learning**

**A New Approach to Learning: Sideways Learning**

Langer (1997, p. 22-23) proposes a new construct of learning, one that she calls “sideways learning.” She contrasts this to the more traditional “top-down” or “bottom-up” approaches, which she admits have importance and merit. In the top-down approach, the basic mode of instruction is lecturing by the teacher. In the bottom-up approach, students apply, through direct experience, systematic and repeated practice to gain new insights into the topic of study.

In sideways learning, the goal is to promote a mindful state in students as they engage in educational activities. Langer asserts that sideways learning occurs when instruction encourages each of the individual components of the heterogeneous construct
of mindfulness (1997, p. 23). Again, these are, (1) openness to novelty; (2), alertness to

distinction; (3) sensitivity to different contexts; (4) implicit, if not explicit, awareness of
multiple perspectives; and (5) orientation in the present.

Langer states (1997):

Mindfulness creates a rich awareness of discriminatory detail. Theories that
suggest that we learn best when we break a task down into discrete parts do not
really make possible the sort of learning that is accomplished through mindful
awareness of distinctions. Getting our experience presliced undermines the
opportunity to reach mindful awareness. Sideways learning, however, involves
attending to multiple ways of carving up the same domain. It not only makes it
possible to create unlimited categories and distinctions to differentiate one task
from another, but it is essential to mobilizing mindfulness. (p. 23-24).

The approach of mindful learning, then, is to allow learners to create their own
categories and ways of organizing experience. For example, when teaching students to
play a passage on a musical instrument, one could instruct the student in such a way that
their practice is not simply rote-learning. Instead, the students could be encouraged to
experiment with various ways of grouping notes (e.g. Bamberger, 1994), categorizing
sensations, etc. Doing so allows students to enter the learning without having a
predetermined mode of understanding. Metaphorically, students are allowed to create
their own “drawing” instead of simply being told to “connect the dots” of the instructions
they have received.

Ritchhart and Perkins, using Langer’s research as an impetus for deriving
instructional approaches, name three potential methods for creating the proper conditions
to promote student mindfulness in the classroom. Their paper presents one empirical
study (with an ingenious design) along with qualitative commentary. They call the three
approaches they distill (1) “looking closely,” (2) “exploring possibilities and
perspectives,” and (3) “introducing ambiguity” (2000, p. 27). In exploring “looking closely,” the authors propose that “openness to new information is principally a matter of cultivating sensitivity rather than ability,” and reference Csikszentmihalyi (1996): “seeing the world in new ways is one of the greatest avenues for creativity and personal engagement with the world.” When discussing “exploring possibilities and perspectives,” the authors cite examples such as asking students to imagine themselves as being inside of a painting looking out, instead of being an outside observer. Looking at various historical points of view, they cite examples of instruction when encourages students to look at historical events from the perspective of various groups other than their own. This is very similar to Bamberger’s approach at introducing various ways of hearing a rhythmic pattern, based on groupings based on a metrical reference point or a motivic reference point (1994). In discussing “introducing ambiguity,” the authors basically discuss conditional language for instruction, discussed in the next section.

**Conditional Language for Instruction**

Langer and Piper designed an empirical study to investigate the effects of language in preventing mindlessness and promoting mindfulness (1987). The paper presents three separate experimental designs, along with the results of each. Some groups were given tasks where unconditional language was used, consisting of absolute statements; for example, “this is an X” or “this is used for the purpose of Y.” Conditional language, on the other hand, presented the same topics but with language such as “this could be an X” or “this might be used for the purpose of Y.” Hence, conditional language leaves more room for students to view the material from alternative perspectives instead of introducing a more rigid way of understanding the material.
apply similar language to music, one could say “this metal bowl is used for gamelan playing,” or “this metal bowl might be used for gamelan playing.” Incidentally, gamelan gongs (some of which resemble metal bowls) have been used for cooking as well as playing (K. H. Han, personal communication). To summarize the findings from the studies by Langer, as well as Langer and Piper, both “conditional” and “unconditional” groups generally performed about equally well on tests of direct comprehension of the material taught. However, only the “conditional” language groups were able to use the materials taught in creative ways to solve problems. Langer (1997, pp. 28-31) gives a summary of a similar experiment with similar results.

**Music and Music Education**

Langer’s observations and research into music and music education are few, but the data she does present is potent. Observing that many master musicians, such as Mozart, Beethoven, Schumann and Glenn Gould each played at least two similar instruments (such as the piano and organ, or violin and viola), Langer suggests that the similar yet distinct techniques necessary for each of the instruments may promote mindfulness of playing technique. She contends that the two similar but different techniques work “against taking one set of basic skills for granted and thereby encourages an alert and mindful state” (1997, pp. 27-28).

**Whitmore, DeMay and Langer’s Mindful Piano Instruction Pilot Study**

To test the effect of instruction emphasizing mindful learning in piano playing, Langer describes a pilot study by Whitmore, DeMay, and Langer (1997, p. 26). To summarize, after recruiting students for piano lessons through flyers advertising a free
lesson, the subjects were randomly assigned to two groups: mindful learning condition or traditional learning condition. The instruction given was the same, with a minor exception. Subjects in the mindful learning group were told the following. “We would like you to try to learn these fingering exercises without relying on rote memorization. Try to keep learning new things about your piano playing. Try to change your style every few minutes, and not lock into one particular pattern. While you practice, attend to the context which may include very subtle variations or any feelings, sensations or thoughts you are having.” They were reminded of this instruction midway through the lesson. The specific lesson was then taught and the subjects practiced it for twenty minutes. The control group was taught in a more traditional style, trying to memorize the exercise through memorization and repetition. Two graduate students in music with an extensive background in keyboard and compositional experience rated the playing of the subjects during the lesson. The subjects in the mindful learning group were rated as more “competent and creative.” Subjects of both groups were also asked how enjoyable the lesson was. The subjects in the mindful learning group reported a higher level of enjoyment.

**Mindfulness in Orchestral Performance Study**

Langer, Russell, and Eisenkraft (2009) report research they carried out regarding orchestral performance in *Psychology of Music*. Two studies were used to investigate the effect of mindfulness on orchestral performance. Members of a university orchestra were used as performance subjects, and members of a community chorus were used as listening review subjects.
Study One

In this study, the instruction for the control conditions was to “think about the finest performance of this piece that you can remember, and try to play it that way.” The authors note that this is an established way to elicit better performance from an orchestra, using a fixed goal (citing Locke & Latham, 1990). However, it is an instruction that encourages the subjects to focus on the past and not be as present to the current experience. Under experimental conditions were told to “play this piece in the finest manner you can, offering subtle new nuances to your performance.” This instruction was designed to keep performers more focused on the present and find new and novel elements in the score and their performance, making the goal of the performance less fixed than in the control conditions. The musicians reported a statistically significant level of more enjoyment during the experimental conditions, and they also reported that they felt successful in incorporating “new nuances” into the performance. The researchers used the “new nuances” question as an indirect way of measuring mindfulness, which is difficult to measure directly. Review of a recording of each performance by subjects from a community chorus showed that these reviewers preferred the mindful performance over the traditional performance; the results were statistically significant.

Study Two

Study two was included to replicate study one, controlling for two potential conditions that could have altered the results in study one. The existence of a practice effect and order effect in audience preference were both controlled for in this study. Instead of using one piece of music – as in study one – this study used two pieces of
music, each played under both control and experimental conditions. During the listening review by members of a local community chorus, the order in which the recordings were played varied (the reviewers were randomly split into two groups). The findings were the same, indicating that neither of the extraneous factors likely caused any bias in study one.

Discussion

The authors conclude that musicians who mindfully engage in performance by adding subtle nuances enjoy playing more and rate their orchestra as playing better. In addition, musically-literate listeners preferred the performance of a mindfully engaged orchestra. The role of repetition in learning music is considered: the authors concede that while repetition of passages is important in learning music, the repetitions must be done in a mindful way for optimum results (like increased enjoyment and greater attention to detail). The authors also note that this study may demonstrate that mindfulness can be induced via experimental manipulation, and does not require meditative practices. This is a form of applied mindfulness rather than meditative mindfulness.

Summary Regarding Mindfulness Research

Mindfulness is a topic which is receiving an increasing amount of attention from researchers across various disciplines in the social sciences. While rooted in Buddhist meditation practices, mindfulness is a function of mind and does not have any religious affiliation. Some research has looked at mindfulness in the context of meditation, while other research has looked at mindfulness in the context of non-meditation. The lack of a uniform definition and construct across researchers makes generalizations difficult.
Nonetheless, researchers such as Bishop et al. (2007), Brown and Ryan (2004), and Ellen Langer (1989, 1997) have proposed similar, yet distinct, constructs of mindfulness. For the purposes of this study relating to mindfulness in music education, social psychological (or non-meditative) mindfulness is stressed. In particular, Langer’s research into non-meditation based mindfulness is useful to the field of music education. Langer’s construct is well-researched in a variety of fields and is highly respected in the field of mindfulness research. For these reasons, applications of Langer’s construct of mindfulness to listening instruction in the field of music education will be studied in this experiment.

Research on non-meditative, or social psychological, mindfulness has shown that mindfulness based instruction can result in increased learning outcomes (Langer and Piper, 1987). In a small but relevant pilot study by Whitmore, DeMay, and Langer (Langer, 1997, p. 26), piano instruction based on principles of social psychological mindfulness resulted in greater competency, creativity, and enjoyment in piano playing.

Langer, Russell, and Eisenkraft (2009) found that asking orchestral musicians to play in a way that promoted mindfulness while playing (by adding novel subtle nuances to their playing), music-literate listeners preferred the performance with mindful playing; also, musicians reported greater enjoyment while playing mindfully. Diaz (2010) investigated the effects of meditative mindfulness on music listening and found that the mindfulness treatment did have an effect, though further research is required to fully understand the implications of his work.

To date, no research on the effect of social psychological mindfulness on Music Listening Sensitivity or Music Listening Enjoyment exists. Questions related to this area
of inquiry are explored in this research. The purpose of this experiment is to investigate an instructional strategy based on “mindful listening.” In particular, the effect of “mindful listening” on student Listening Enjoyment and Listening Sensitivity will be investigated.
RESEARCH QUESTIONS

Primary Research Questions

1.) What is the effect of Mindful Listening Instruction on student Music Listening Sensitivity?

2.) What is the effect of Mindful Listening Instruction on student Music Listening Enjoyment?

Secondary Research Question

Is Mindful Listening Instruction effective for both elementary and college students?

STATEMENT OF HYPOTHESES

1.) Research Hypothesis 1: Inclusion of Mindful Listening Instruction produces greater Music Listening Sensitivity in students.

2.) Research Hypothesis 2: Inclusion of Mindful Listening Instruction produces greater Music Listening Enjoyment in students.

VARIABLES

Independent Variable

Listening Instruction – two levels: Mindful and Control.

Dependent Variables

Two Dependent Variables were investigated in this study:

1.) Music Listening Sensitivity

2.) Music Listening Enjoyment

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CHAPTER 3
METHODOLOGY

Introduction

This study was designed to investigate the effect of Mindful Listening Instruction on student Music Listening Sensitivity and Music Listening Enjoyment. Mindful Listening Instruction may influence cognitive listening approaches students employ when listening to music. The review of related literature indicates that Mindful Listening Instruction may reasonably enhance student Music Listening Sensitivity and Music Listening Enjoyment. The addition of Mindful Listening Instruction to traditional methods of listening instruction requires relatively little additional effort on the part of the instructor, yet the benefits of such instruction on student listening may be significant. Therefore, the following methodology was developed to investigate an approach to Mindful Listening Instruction on student listening.

Participants

The participants in this study were of two different age groups: fourth-grade students and college students.

The fourth-grade students (N = 42) were from a single urban school in the Northeastern United States. Initially 43 students were included in the study, but one student, who had been randomly assigned to the control group, did not complete the study due to excessive absences during the treatment and absence during the administration of the posttests. Students at the school received music instruction for 45 minutes weekly with a music specialist, and it was in these classes that this experiment was conducted.
Students from two intact fourth-grade classes were placed into one of two groups through random selection.

The college students (N = 48) were undergraduate education majors at a large university in the Southern United States enrolled in a music education course for general education majors. Initially 58 students were included in the study. One student, who had been randomly assigned to the experimental group, withdrew course enrollment and hence did not complete the study. Five students did not complete the study due to excessive absences during the treatment. An additional four students did not complete the study due to absence during the administration of the posttests.

The course lasted one semester, and the treatment was included in the course as a variation on the normal course curriculum. The course had five sections of students. Students from four of the five sections came together in larger groups with two instructors once per week. It was during the larger group time with two instructors present that the experiment was conducted; hence, the fifth section was excluded from the experiment. The students from the four different intact sections of the course were placed into one of two groups through random selection.

All participants were given the Music Experience Questionnaire (MEQ), found in Appendix D (pp. 172-173), before beginning treatment to investigate for prior experience in music instruction.

**Research Design**

The pretest-posttest control group experimental design was used for this study. After the pretest and Music Listening Questionnaire (MLQ) had been administered to all participants, participants were placed randomly in either the experimental group or the
control group, stratified by age group. The random selection process involved assigning each student from the fourth-grade group and the college-student group a number. Using Minitab statistical software, each number was randomly placed in one of the two groups. For fourth-grade participants, more than two absences on any two treatment days or absence on the posttest day prevented the use of data from that participant. For college-student participants, more than one absence on any treatment day or absence on the posttest day prevented the use of data from that participant.

**Instrumentation**

**Pretests**

*Fourth-Grade Pretest*

This study used the *Intermediate Measures of Music Audiation* (IMMA) by Edwin Gordon as a pretest for fourth-grade students. The IMMA was chosen because it measures music aptitude. In particular, this test measures tonal and rhythmic musical aptitude based on the aural discrimination ability of the test-taker, making it especially appropriate for the current study. The IMMA *Test Manual* (Gordon, 1986) reports findings related to the validity, reliability, and intercorrelations of the test. According to the IMMA Test Manual, the mean score of fourth-grade students used to derive normative data (N = 752) on the IMMA is 35.2, with a standard deviation of 3.03. Regarding validity, Gordon considers the content validity of the test to be self-evident, and reports positive correlations in longitudinal studies designed to evaluate the predictive value of the test on musical achievement.

The following reliability statistics are reported in the manual for fourth-grade students. Split-half reliability calculations, as reported in the manual, resulted in
coefficients of .72 for the tonal section, .70 for the rhythm section, and .80 for the composite score (tonal and rhythm combined). Test-retest reliability calculations, as reported in the manual using raw scores, resulted in coefficients of .85 for the tonal section, .83 for the rhythm section, and .90 for the composite score. The standard error of measurement (a measure of the internal inconsistency of an individual student’s test score) is reported to be 1.10 for the tonal section, 1.30 for the rhythm section, and 1.50 for the composite score.

Correlations between the tonal, rhythm and composite scores of the test for fourth-grade students are reported in the manual: the correlation coefficient is .40 for the tonal scores and rhythm scores, .81 for the tonal scores and composite scores, and .86 for the rhythm scores and composite scores. The test manual states that the tonal and rhythm portions of the test have no more than 25 percent of their variances in common.

The complete IMMA consists of two sections that can be administered during a single 45 minute class: tonal and rhythmic. The IMMA test manual provides normative data for the composite score, as well as each of these two sections, for students in grades 1-4. The data from the test was examined to ascertain whether groups were statistically equivalent on the composite score, the tonal score, and the rhythmic score, as well as to investigate whether groups were approximately representative of typical fourth-grade students as compared to the normative data reported in the test manual. The outcomes of the pretest data analysis are presented in Chapter 4.

**College Student Pretest**

The *Advanced Measures of Music Audiation* (AMMA) as a pretest for college students was chosen because it is the analogous to the *Intermediate Measure of Music*
**Audiation (AMMA)** in that it measures music aptitude, but it is designed for use with older test-takers. The AMMA consists of 30 test items. For each item, two musical excerpts are played. The test-taker is asked to indicate one of three answers for each question: the musical excerpts are the same, the musical excerpts differ with regards to tonal content, or the musical excerpts differ with regard to rhythmic content. The test takes about 20 minutes to administer.

The AMMA *Test Manual* (Gordon, 1989) reports findings related to the validity, reliability, and intercorrelations of the test. For undergraduate and graduate nonmusic majors, the mean scores (and standard deviations) on the AMMA are reported in the test manual as 24.3 (4.89) tonal, 27.4 (4.11) rhythm, and 51.7 (8.49) composite. Regarding validity, Gordon considers the content validity of the test to be self-evident, and reports positive correlations in longitudinal studies designed to evaluate the predictive value of the test on musical achievement. Regarding reliability of the test for undergraduate and graduate non-music majors, the AMMA Test Manual reports split-halves reliability.80 tonal,.80 rhythm, and.81 composite. The standard error of measurement for the same population is 2.2 tonal, 1.8 rhythm, and 3.7 composite.

Correlations between the tonal, rhythm, and composite scores of the test for undergraduate and graduate non-music majors are reported in the manual: the correlation coefficient is .74 for the tonal scores and rhythm scores, .95 for the tonal scores and composite scores, and .94 for the rhythm scores and composite scores. Gordon reports in the test manual that the variances between the tonal scores and rhythm scores are substantially different, but he does not cite any numerical value regarding differences in the variances between the tonal and rhythm scores.
The data from the test was examined to ascertain whether groups were statistically equivalent on the composite score, the *tonal* score, and the *rhythmic* score, as well as to investigate whether groups were approximately representative of typical undergraduate and graduate non-music major students as compared to the normative data reported in the test manual. The outcomes of the pretest data analysis are presented in chapter four.

**Posttests**

Three different measurement instruments were used to measure the two different Dependent Variables. To measure Music Listening Sensitivity, the researcher-created *Anderson Test of Music Listening Sensitivity*, and Gordon’s *Music Aptitude Profile* were used. To measure Music Listening Enjoyment, the researcher-created *Music Listening Questionnaire* was used. The fourth-grade students and college students were administered the same posttests.

*Dependent Variable 1: Music Listening Sensitivity*

*Anderson Test of Music Listening Sensitivity*

The *Anderson Test of Music Listening Sensitivity* (ATMLS) was created by the researcher for this study. The test consists of 20 listening selections of Western instrumental music, each of which is played twice for the test-taker. For some of the items, the two playbacks are identical, and for other items the two playbacks are of different recordings of the same musical composition (for example, as played by two different orchestras). Test-takers are told to listen to the 20 pairs of excerpts carefully and to indicate whether the two items of each pair are the “same” or “different.” The test construction bears similarity to the treatment lessons, described below, as each treatment
lesson included students listening to the same musical composition twice, either with the same or with a different recording. Some items on the exam were also included in the treatment. However, participants were not told during the treatment whether the recordings they heard were the same or different, and therefore the inclusion of these items on the ATMLS provided no direct indication for what the correct answer may have been on the ATMLS; nonetheless, the items used in the treatment were analyzed to investigate for a response pattern different than the other items. The results of this investigation are presented in the following chapters.

When constructing the ATMLS, the researcher sought to create a test with 20 items. Initially, 25 musical compositions were selected for test item construction, providing for the possibility of eliminating items based on pilot testing. When selecting the 25 items, the 10 musical compositions used in the treatment were included. For those lessons that used two different excerpts of the same composition, the two different excerpts were included for the test; and for those lessons that used only one excerpt for the composition, only that one excerpt was used (resulting in a “same” response item on the test). The additional 15 musical compositions were chosen based on listening lesson materials presented in the textbook series *Share the Music*, Grades 1-5. Initially, the researcher made a list of all the Western instrumental music included in listening lessons in *Share the Music*, Grades 1-5. From the list, the researcher randomly selected the additional 15 items; additionally, eight of the 15 items were randomly selected to be “different” items on the test. The researcher then identified alternate recordings of those musical compositions with different performers to use for the test stimuli.
Excerpts ranged from 12 to 30 seconds in length, and the researcher used the Audacity computer program to excerpt the appropriate portions of the recordings. Also, some items required a fade-in or fade-out, and in these cases this was accomplished using Audacity. After a pilot test of the ATMLS on non-participant fifth-graders to determine administrative procedures and perform an item analysis, five items were eliminated, resulting in the current 20-item format of the test. Appendix F (pp. 176-188) includes the test instructions, answer form, the answer scoring key, and a listing of the music used for the test stimuli along with a discography of the recordings used.

Two doctoral candidates in music education, as subject matter experts, evaluated the test. Both of the experts agreed that the ATMLS is a valid measure of Music Listening Sensitivity. The agreement of the experts established construct validity for the ATMLS. The reliability of the ATMLS is further discussed in the following chapters, along with difficulty and discrimination indices for the items on the test.

*Music Aptitude Profile*

This study used the *phrasing* section of the *Music Aptitude Profile* (MAP) by Edwin Gordon as a posttest, along with the *Anderson Test of Music Listening Sensitivity*, to measure *Music Listening Sensitivity*. The complete MAP takes 3.5 hours to administer and consists of seven sections falling under three categories.
Category 1: Tonal Imagery

Section 1: Melody, and Section 2: Harmony

Category 2: Rhythm Imagery

Section 3: Tempo, and Section 4: Meter

Category 3: Musical Sensitivity

Section 5: Phrasing, Section 6: Balance, and Section 7: Style

The MAP Test Manual (1965) provides normative data for the composite score, as well as each of the seven sections, for students in grades four through adult. The test manual reports validity and reliability of the test for various age groups. Normative data is available for fourth-grade students, but only selected normative data is available for college-age students. Therefore, some of the normative data reported here is for twelfth-grade students, as this is the available normative data that most closely matches the age range of the college students who participated in this study. The manual reports the following means, standard deviations, and standard errors of measurement for the phrasing section of the test. For fourth-grade students, the mean is 44.3 (sd 8.96), and the standard error of measurement is 5.1. For twelfth-grade students, the mean is 55.2 (sd 9.65), and the standard error of measurement is 5.0. Split-half reliability coefficients for the phrasing section of the MAP are.67 for fourth-grade students, and.73 for twelfth-grade students. Only the phrasing section of the MAP was administered; therefore, the various correlations between various subtests of the MAP, as reported in the test manual, are not relevant to this study.
For the current study, measurement was needed only for musical sensitivity. Of note, Wang (1987) used the sensitivity portion of the *Music Aptitude Profile* for measurement a Dependent Variable in prior research. Wang’s test results using the MAP yielded statistical significance between experimental and control groups using the MAP, thus further supporting the use of this test in the current study as a posttest measurement.

Administering all three sections of the MAP in the musical sensitivity category would have taken two 45 minute classes. The researcher chose to use only the *phrasing* section of the three musical sensitivity sections for this study.

The researcher chose the *phrasing* section of the MAP for three reasons:
1.) It could easily be administered in a single 45 minute class,
2.) It provided an appropriate spread of scores (as demonstrated in the pilot study), and
3.) The researcher considered the listening stimuli in the *phrasing* section as the most appropriate to the current study of the three musical sensitivity sections of the MAP.

The third reason requires some explanation. Each of the three sections of the MAP that measure musical sensitivity consists of a series of questions, and each question presents two musical stimuli. The *balance* and *style* sections use musical stimuli that have different musical notes. For example, in the *balance* section, each question has two musical stimuli that share the same music for the first half of the stimulus; the second half of the stimulus differs in regards to musical notes played.

The stimuli of each question in the *phrasing* section consist of two performances of the exact same short musical score, with the musical phrasing being the only
difference between the two performances. For the other two musical sensitivity sections of the MAP, each individual question uses two slightly different musical excerpts as stimuli. As the treatment in this study used musical excerpts of the same music but performed slightly differently, the stimuli of the \textit{phrasing} section most closely corresponded to the experimental treatment in the current study.

\textit{Dependent Variable 2: Music Listening Enjoyment}

The \textit{Music Listening Questionnaire} (MLQ) consisted of two questions, both of which all students answered after each listening lesson. The MLQ measured the \textit{Music Listening Enjoyment} Dependent Variable. The questions were “How much have you enjoyed listening to the music we’ve heard together in this lesson?” and “How much would you like to hear this music again in the future?”. Students responded to these questions using Likert-type scales (range= 1 to 7; 1 = low enjoyment, 7 = high enjoyment). Hence, two scores were obtained from each student for each lesson. A similar method of measuring Music Listening Enjoyment was used in other research (Anderson, 2011b). Reliability and correlations were analyzed for the MLQ, as presented in the next chapter. The outcomes of the posttest data analysis are presented in the next chapter.

\textbf{Procedure}

\textbf{Procedure for Fourth-Grade Students}

The experiment required 12 classes, each meeting once per week. Table 3.1 indicates what occurred during each week of the treatment period. Lessons 1-10, as presented in Appendix A (pp. 137-150) with some lessons adapted from the \textit{Share the
Music textbook series, were used with both the mindful listening group and the control group. For each lesson, both groups heard each musical excerpt twice, though the second playback was sometimes with the same performing group and sometimes with a different performing group. All lessons included Mindful Listening Instruction for the experimental group; however, some lessons also included listening-map-based instruction.

For odd-numbered lessons, lessons were based on the Share the Music textbook series. During the first playback, no listening map was presented, and students were not given any visual stimuli. During the second playback of the music for each lesson, the listening map was projected on a SmartBoard for all students to see. Listening instructions delivered by the teacher differed between the groups for the first playback only. Odd-numbered lesson listening instructions for the mindful listening treatment group, as well as the listening instructions for the control group, are shown in table 3.3. For each piece, the second listening excerpt may have been the exact same as the first or may have been a different recording (for example, with a different orchestra playing the same musical score). Table 3.5 indicates what music was played with each lesson. Table 3.1 indicates which lessons used the exact same excerpt and which lessons used different excerpts for listening.

For even-numbered lessons, lessons used listening selections from the Share the Music textbook series, but the lessons did not use listening maps or listening-map-based instruction. Instead, students were given only instruction with regards to mindful listening or control group listening. Table 3.4 presents the instructions delivered to participants during the even-numbered lessons. For each piece, the second listening
excerpt may have been the exact same as the first or may have been a different recording (for example, with a different orchestra playing the same musical score). Table 3.5 indicates what music was played with each lesson, as well as which lessons used the exact same excerpt and which lessons used different excerpts for listening.

**Procedure for College Students**

The number of treatment sessions for college students was less than for fourth-graders due to limitations in instructional time available for this experiment. The difference in number of treatment sessions prevented direct comparisons between fourth-grade students and college students. For each lesson, both groups heard each musical excerpt twice, though the second playback was sometimes with the same performing group and sometimes with a different performing group. All lessons included Mindful Listening Instruction for the experimental group; however, some lessons also included listening-map-based instruction.

The experiment for college students required seven classes. Table 3.2 indicates what occurred during each week of the treatment period. Five lessons from the fourth-grade lesson treatment sequence were randomly selected from the 10 lessons used with the fourth-grade students.

For randomization of lessons, first, the researcher randomly assigned three of the listening lessons to listening-map-based instruction. As five lessons were delivered to college students, this was used to determine whether listening-map-based instruction or non-listening-map-based instruction should have one additional lesson. The random assignment resulted in three listening-map-based lessons and two non-listening-map based lessons. Then, the researcher randomly assigned three listening-map-based lessons
(of the five potential lessons), and did likewise for the non-listening-map-based lessons. The lessons were presented in the same sequence as they were for the fourth-grade students. Lessons 1, 3, 4, 9, and 10, as presented in Appendix A (pp. 137-150), adapted from the *Share the Music* textbook series, were used with both the mindful listening group and the control group. For each lesson, both groups heard each musical excerpt twice, though the second playback was sometimes with the same performing group and sometimes with a different performing group.

For the odd-numbered lessons, during the first playback, no listening map was presented, and students were not given any visual stimuli. During the second playback of the music for each lesson, the listening map was projected on a SmartBoard for all students to see. Listening instructions delivered by the teacher differed between the groups for the first playback only. Odd-numbered lesson listening instructions for the mindful listening treatment group, as well as the listening instructions for the control group, are shown in table 3.3. For each piece, the second listening excerpt may have been the exact same as the first or may have been a different recording (for example, with a different orchestra playing the same musical score). Table 3.5 indicates what music was played with each lesson. Table 3.2 indicates as which lessons used the exact same excerpt and which lessons used different excerpts for listening.

For even-numbered lessons, lessons used listening selections from the *Share the Music* textbook series, but the lessons did not use listening maps or listening-map-based instruction. Instead, students were given only instruction with regards to mindful listening or control group listening. Table 3.4 presents the instructions delivered to participants during the even-numbered lessons. For each piece, the second listening
excerpt may have been the exact same as the first or may have been a different recording (for example, with a different orchestra playing the same musical score). Table 3.5 indicates what music was played with each lesson. Table 3.2 indicates as which lessons used the exact same excerpt and which lessons used different excerpts for listening.

**Mindful Listening Group Instruction**

The researcher designed the instructions given to the mindful listening treatment group to promote mindful listening. The instructions were designed based on the recommendations of Ellen Langer (namely of using the idea of a ‘listening story’ and of playbacks with differing performing groups) during a personal communication (August, 2010). In addition, the researcher had used the listening story strategy as a method to promote mindful listening in prior research with good results (Anderson, 2011b).

As explained in Chapter 2, mindfulness is a heterogeneous construct consisting of (1) openness to novelty, (2) alertness to distinction, (3) sensitivity to different contexts, (4) implicit, if not explicit, awareness of multiple perspectives, and (5) orientation in the present. The instructions for the Mindful Group engaged these five dimensions of mindfulness. The instructions encouraged “openness to novelty” and “alertness to distinction” though explaining the analogy of how two people may read the same book aloud slightly differently, and how this also applies to how musicians perform music. The instructions supported the dimensions of “sensitivity to different contexts” and “awareness of multiple perspectives” through noting that students may have created completely different stories to accompany the music, and that this is acceptable. “Orientation in the present” was encouraged by asking students to notice any changes...
throughout the “beginning, middle and end,” which promoted sustained attention to the music throughout the duration of playback.

The images on the listening maps may have influenced the stories that participants produced. However, as both the experimental and control groups saw the same images, this possibility would not have interfered with the treatment. Also, listening maps were only presented to students during the second of two playbacks; therefore, the listening map would not have influenced student listening stories during the first playback.

**Stimuli Selection**

The listening excerpts were chosen based on the compositions that included listening maps in the textbook series *Share the Music*, grade levels 4 and 5. After compiling all of the compositions with listening maps in these texts, the researcher excluded non-Western and non-instrumental music. Hence, the researcher used only Western instrumental music for this study. Non-Western music was excluded from this study because the pretest and posttest predominately measure musical abilities with regard to Western music; therefore, the use of the pretest and posttest may not accurately measure the possible effect of the treatment if non-Western music were used. Vocal music was excluded to prevent lyrics from influencing the treatment for the mindful listening group (which instructs the listener to think of a story).

Of the Western instrumental music that included listening maps in the grade 4 and grade 5 texts of *Share the Music*, five excerpts were randomly chosen from each grade, for a total of 10 excerpts. Listening maps were not used with all treatment sessions, and only five of the 10 excerpts were used with college level participants.
Figure 3.1, Fourth-Grade Student Research Design

Pretest
IMMA
Music Experience
Questionnaire (MEQ)
N = 42

Mindful Listening Group
n = 22

Control Group
n = 20

Posttests
ATMLS
MAP: Sensitivity – phrasing
(given only after all lessons were completed)
Music Listening Questionnaire (MLQ) (given after each lesson)
N = 42
Figure 3.2, College-Student Research Design

Pretest
AMMA

Music Experience
Questionnaire (MEQ)
N = 48

Mindful Listening Group
n = 23

Control Group
n = 25

Posttests

ATMLS

MAP: Sensitivity – phrasing
(given only after all lessons were completed)

Music Listening Questionnaire (MLQ) (given after each lesson)
N = 48
Table 3.1, Fourth-Grade Student Treatment Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Mindful Treatment Group</th>
<th>Control Group</th>
<th>Same or Different Recordings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pretest (IMMA); <em>Music Experience Questionnaire</em> (MEQ)</td>
<td>Pretest (IMMA); <em>Music Experience Questionnaire</em> (MEQ)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Lesson 1 (<em>Troika</em>) with Mindful Listening Script; <em>Music Listening Questionnaire</em> (MLQ)</td>
<td>Lesson 1 (<em>Troika</em>); <em>Music Listening Questionnaire</em> (MLQ)</td>
<td>Same</td>
</tr>
<tr>
<td>3</td>
<td>Lesson 2 (<em>Promenade</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 2 (<em>Promenade</em>); (MLQ)</td>
<td>Different</td>
</tr>
<tr>
<td>4</td>
<td>Lesson 3 (<em>Shrovetide Fair</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 3 (<em>Shrovetide Fair</em>); (MLQ)</td>
<td>Same</td>
</tr>
<tr>
<td>5</td>
<td>Lesson 4 (<em>Hoedown</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 4 (<em>Hoedown</em>); (MLQ)</td>
<td>Different</td>
</tr>
<tr>
<td>6</td>
<td>Lesson 5 (<em>Haydn String Quartet</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 5 (<em>Haydn String Quartet</em>); (MLQ)</td>
<td>Same</td>
</tr>
<tr>
<td>7</td>
<td>Lesson 6 (<em>Slavonic Dance</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 6 (<em>Slavonic Dance</em>); (MLQ)</td>
<td>Same</td>
</tr>
<tr>
<td>8</td>
<td>Lesson 7 (<em>Haydn Trumpet Concerto</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 7 (<em>Haydn Trumpet Concerto</em>); (MLQ)</td>
<td>Same</td>
</tr>
<tr>
<td>9</td>
<td>Lesson 8 (<em>Fanfare</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 8 (<em>Fanfare</em>); (MLQ)</td>
<td>Different</td>
</tr>
<tr>
<td>10</td>
<td>Lesson 9 (<em>Polonaise</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 9 (<em>Polonaise</em>); (MLQ)</td>
<td>Different</td>
</tr>
<tr>
<td>11</td>
<td>Lesson 10 (<em>Brandenburg Concerto</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 10 (<em>Brandenburg Concerto</em>); (MLQ)</td>
<td>Different</td>
</tr>
<tr>
<td>12</td>
<td>Posttest (ATMLS, MAP)</td>
<td>Posttest (ATMLS, MAP)</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.2, College-Student Treatment Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Mindful Treatment Group</th>
<th>Control Group</th>
<th>Same or Different Recordings</th>
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</thead>
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<td>Pretest (AMMA); <em>Music Experience Questionnaire</em> (MEQ)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Lesson 1 (<em>Troika</em>) with Mindful Listening Script; <em>Music Listening Questionnaire</em> (MLQ)</td>
<td>Lesson 1 (<em>Troika</em>); <em>Music Listening Questionnaire</em> (MLQ)</td>
<td>Same</td>
</tr>
<tr>
<td>3</td>
<td>Lesson 3 (<em>Shrovetide Fair</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 3 (<em>Shrovetide Fair</em>); (MLQ)</td>
<td>Same</td>
</tr>
<tr>
<td>4</td>
<td>Lesson 4 (<em>Hoedown</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 4 (<em>Hoedown</em>); (MLQ)</td>
<td>Different</td>
</tr>
<tr>
<td>5</td>
<td>Lesson 9 (<em>Polonaise</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 9 (<em>Polonaise</em>); (MLQ)</td>
<td>Different</td>
</tr>
<tr>
<td>6</td>
<td>Lesson 10 (<em>Brandenburg Concerto</em>) with Mindful Listening Script; (MLQ)</td>
<td>Lesson 10 (<em>Brandenburg Concerto</em>); (MLQ)</td>
<td>Different</td>
</tr>
<tr>
<td>7</td>
<td>Posttest (ATMLS, MAP)</td>
<td>Posttest (ATMLS, MAP)</td>
<td></td>
</tr>
</tbody>
</table>
Table 3.3, Listening Instructions Provided to Treatment Group and Control Group for *Odd-Numbered* Lessons

<table>
<thead>
<tr>
<th>MINDFUL LISTENING GROUP</th>
<th>1st PLAYBACK:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“When two different people read the same book aloud, they are saying the same thing, but they sound different. It is similar with music. Two groups of musicians might play the same music, but it will sound slightly different. For example, some parts might be louder or softer. You will now hear one musical composition played twice. It may be played by the same group of musicians both times, or it may be a different group of musicians for each of the two times.”</td>
</tr>
<tr>
<td></td>
<td>“Listen to this music. Pretend it tells you a story. Try to find out if this music tells a story to you. Your story may be completely different than the story of others, and that is okay. Make sure you notice how the story changes through the beginning, middle, and end. For example, if your story has a boy in it, was he perhaps calm, happy, or sad at the beginning? Did he change in the middle, perhaps becoming sleepy? Did he change even more at the end of the music? You will hear the music performed two times. Remember, each performance may have a different group of musicians playing.”</td>
</tr>
<tr>
<td></td>
<td>2nd PLAYBACK:</td>
</tr>
<tr>
<td></td>
<td>[Teacher reads instructions from listening map lesson.]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTROL GROUP</th>
<th>1st PLAYBACK:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Please listen carefully to the following music.”</td>
</tr>
<tr>
<td></td>
<td>2nd PLAYBACK:</td>
</tr>
<tr>
<td></td>
<td>[Teacher reads instructions from listening map lesson.]</td>
</tr>
</tbody>
</table>
Table 3.4, Listening Instructions Provided to Treatment Group and Control Group for *Even-Numbered* Lessons

<table>
<thead>
<tr>
<th>MINDFUL LISTENING GROUP</th>
<th>1st PLAYBACK:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“When two different people read the same book aloud, they are saying the same thing, but they sound different. It is similar with music. Two groups of musicians might play the same music, but it will sound slightly different. For example, some parts might be louder or softer. You will now hear one musical composition played twice. It may be played by the same group of musicians both times, or it may be a different group of musicians for each of the two times.”</td>
</tr>
<tr>
<td></td>
<td>“Listen to this music. Pretend it tells you a story. Try to find out if this music tells a story to you. Your story may be completely different than the story of others, and that is okay. Make sure you notice how the story changes through the beginning, middle, and end. For example, if your story has a boy in it, was he perhaps calm, happy, or sad at the beginning? Did he change in the middle, perhaps becoming sleepy? Did he change even more at the end of the music? You will hear the music performed two times. Remember, each performance may have a different group of musicians playing.”</td>
</tr>
<tr>
<td></td>
<td>2nd PLAYBACK:</td>
</tr>
<tr>
<td></td>
<td>“Please listen once more to the music.”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTROL GROUP</th>
<th>1st PLAYBACK:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Please listen carefully to the following music.”</td>
</tr>
<tr>
<td></td>
<td>2nd PLAYBACK:</td>
</tr>
<tr>
<td></td>
<td>“Please listen once more to the music.”</td>
</tr>
</tbody>
</table>
### Table 3.5, Discography of Music Used

<table>
<thead>
<tr>
<th>Lesson Number</th>
<th>Musical Excerpt</th>
<th>Recording 1 and duration {minutes:seconds}</th>
<th>Recording 2 and duration (n/a if not applicable) {minutes:seconds}</th>
</tr>
</thead>
</table>
Table 3.5 (continued), Discography of Music Used

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
Note: the first 0:37 and last 0:64 of this recording were deleted to allow the music to correspond with the Share the Music recording |
|   |   |   |
|   |   |   |
|   |   |   |

85
Table 3.5 (continued), Discography of Music Used

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Composer</th>
<th>Year</th>
<th>Discography</th>
</tr>
</thead>
</table>

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CHAPTER 4

RESULTS

Introduction

This study used a pretest-posttest design to investigate the effect of Mindful Listening Instruction on Music Listening Enjoyment and Music Listening Sensitivity. Fourth-grade students and college non-music majors participated in the study. Fourth-grade and college participants completed the Music Experience Questionnaire to report prior training in music. Fourth-grade students were pretested using Gordon’s Intermediate Measures of Music Audiation, and college students were pretested using Gordon’s Advanced Measures of Music Audiation. Of the fourth-grade participants, 42 of the initial 43 students completed all parts of the study. Of the college-student participants, 48 of the initial 58 students completed all parts of the study.

The treatment consisted of 10 music listening lessons for fourth-grade students and five music listening lessons for college students. The Independent Variable was type of Listening Instruction: Mindful or Control. The Dependent Variables were Music Listening Sensitivity and Music Listening Enjoyment. Music Listening Sensitivity was measured using two tests, Gordon’s Music Aptitude Profile, Phrasing Subsection and the researcher-created Anderson Test of Music Listening Sensitivity. Music Listening Enjoyment was measured using the Music Listening Questionnaire, which was given to all participants after each lesson to assess the degree to which they enjoyed listening to the music.
In this chapter, descriptive statistics are presented to describe the characteristics of the participants and to present the means and standard deviations for each group on each of the measurements used in this study. Correlations among the various data gathered are reported. To test the hypotheses, results of inferential statistical tests are presented to report any statistically significant differences between experimental and control groups, thereby rejecting or confirming the null hypotheses. The level of significance for statistical testing was set at $\alpha = .05$. Of note, the data gathered from fourth-grade participants and the data gathered from college participants are subjected to different inferential statistical analyses due to the many differences (including treatment length) in these population samples. However, the results of the separate analyses are presented alongside one another for the fourth-grade and college student data to facilitate ease of reading and interpretation. Secondary results related to analysis of data collected using the Anderson Test of Music Listening Sensitivity (ATMLS) and the Music Listening Questionnaire (MLQ), the instrument used to measure Music Listening Enjoyment, are discussed. Before presenting results of the data analysis, the hypotheses are stated again.

**Statement of Hypotheses**

**Research Hypotheses**

1.) Inclusion of Mindful Listening Instruction produces greater Music Listening Sensitivity in students.

2.) Inclusion of Mindful Listening Instruction produces greater Music Listening Enjoyment in students.
Null Hypotheses for Statistical Testing

1.) Inclusion of Mindful Listening Instruction has no effect on Music Listening Sensitivity in students.

2.) Inclusion of Mindful Listening Instruction has no effect on Music Listening Enjoyment in students.

Descriptive Statistics

Demographic descriptive statistics for the fourth-grade participants and for the college-student participants are reported in table 4.1. Participant age and gender are reported. Regarding demographics related to participant experience in music, mean number of years of experience in instrumental music ensembles, choral music ensembles, private music lessons, and other music experience is reported, along with the respective standard deviations.

Descriptive statistics, consisting of means and standard deviations, of all tests used for measurement in this study for the fourth-grade participants and for the college-student participants are reported in table 4.2. The Intermediate Measures of Music Audiation (IMMA) was given as a pretest for fourth-grade participants only, and the Advanced Measures of Music Audiation (AMMA) was given as a pretest only for college-student participants only; hence, the descriptive statistics for these tests are listed only the for the appropriate pool of participants. The descriptive statistics for the three posttests are included.
Table 4.1, Demographic Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Fourth-Grade Participants</th>
<th>College Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 42</td>
<td>N = 48</td>
</tr>
<tr>
<td>Experimental</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n = 22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n = 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>41%</td>
<td>96%</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>92%</td>
</tr>
<tr>
<td>Male</td>
<td>59%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>70%</td>
<td>8%</td>
</tr>
<tr>
<td>Age</td>
<td>9.14 (0.56)</td>
<td>20.09 (2.35)</td>
</tr>
<tr>
<td></td>
<td>9.20 (0.41)</td>
<td>20.48 (3.00)</td>
</tr>
<tr>
<td>Instrumental Ensembles</td>
<td>0.13 (0.47)</td>
<td>1.61 (2.30)</td>
</tr>
<tr>
<td></td>
<td>0.25 (0.79)</td>
<td>0.76 (1.27)</td>
</tr>
<tr>
<td>Choral Ensembles</td>
<td>0.18 (0.85)</td>
<td>0.94 (1.33)</td>
</tr>
<tr>
<td></td>
<td>0.25 (0.55)</td>
<td>1.86 (2.46)</td>
</tr>
<tr>
<td>Private Lessons</td>
<td>0.27 (0.77)</td>
<td>1.09 (2.07)</td>
</tr>
<tr>
<td></td>
<td>0.35 (0.81)</td>
<td>1.32 (2.27)</td>
</tr>
<tr>
<td>Other</td>
<td>0.14 (0.64)</td>
<td>0.52 (1.04)</td>
</tr>
<tr>
<td></td>
<td>0.00 (0.00)</td>
<td>1.32 (4.11)</td>
</tr>
</tbody>
</table>
Table 4.2, Means and Standard Deviations of All Groups on All Tests

<table>
<thead>
<tr>
<th></th>
<th>Fourth-Grade Participants</th>
<th></th>
<th>College Participants</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 42</td>
<td></td>
<td>N = 48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Experimental n = 22</td>
<td>Control n = 20</td>
<td>Experimental n = 23</td>
<td>Control n = 25</td>
</tr>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>IMMA</td>
<td>67.41 (5.64)</td>
<td>67.00 (6.25)</td>
<td>_____ (_____</td>
<td>_____ (_____</td>
</tr>
<tr>
<td>AMMA</td>
<td>_____ (_____</td>
<td>_____ (_____</td>
<td>50.61 (6.73)</td>
<td>49.60 (8.32)</td>
</tr>
<tr>
<td>MAP-P</td>
<td>41.05 (7.85)</td>
<td>35.65 (6.98)</td>
<td>20.04 (3.90)</td>
<td>17.88 (2.67)</td>
</tr>
<tr>
<td>ATMLS</td>
<td>14.09 (1.93)</td>
<td>11.45 (2.78)</td>
<td>12.57 (1.41)</td>
<td>11.24 (1.90)</td>
</tr>
<tr>
<td>ENJOY</td>
<td>5.67 (1.51)</td>
<td>4.33 (1.41)</td>
<td>5.24 (0.93)</td>
<td>4.60 (0.96)</td>
</tr>
</tbody>
</table>

IMMA=Intermediate Measures of Music Audiation Scores (Fourth-Grade Pretest; Possible Range: 0-80)
AMMA=Advanced Measures of Music Audiation Scores (College Pretest; Possible Range: 0-80)
MAP-P=Music Aptitude Profile – Phrasing Subsection Scores (Possible Range: 16-80; Scores reported here are based on normative data for age from the test manual)
ATMLS=Anderson Test of Music Listening Sensitivity Scores (Possible Range: 0-20)
ENJOY=Music Enjoyment Questionnaire Composite Scores (Possible Range: 1-7)
Correlations

Correlations, computed using Pearson’s $r$, between the three posttests are given in tables 4.3 and 4.4 for the fourth-grade participants and college-student participants, respectively. The $p$-value of each correlation is also listed. Correlations which are statistically significant at the .05 significance level are marked with asterisks.

Table 4.3, Table of Correlations for Fourth-Grade Posttests

<table>
<thead>
<tr>
<th>ENJOY</th>
<th>ATMLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATMLS</td>
<td>$r = .08$</td>
</tr>
<tr>
<td></td>
<td>($p = \text{ns}$)</td>
</tr>
<tr>
<td>MAP-P</td>
<td>$r = .22$</td>
</tr>
<tr>
<td></td>
<td>($p = \text{ns}$)</td>
</tr>
<tr>
<td></td>
<td>$r = .38$</td>
</tr>
<tr>
<td></td>
<td>($p = .013$)</td>
</tr>
</tbody>
</table>

Table 4.4, Table of Correlations for College Posttests

<table>
<thead>
<tr>
<th>ENJOY</th>
<th>ATMLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATMLS</td>
<td>$r = .15$</td>
</tr>
<tr>
<td></td>
<td>($p = \text{ns}$)</td>
</tr>
<tr>
<td>MAP-P</td>
<td>$r = .28$</td>
</tr>
<tr>
<td></td>
<td>($p = \text{ns}$)</td>
</tr>
<tr>
<td></td>
<td>$r = .23$</td>
</tr>
<tr>
<td></td>
<td>($p = \text{ns}$)</td>
</tr>
</tbody>
</table>
Results of Pretests

Fourth-Grade Results

No statistically significant difference was found between the experimental and control groups on the pretest, Gordon’s Intermediate Measures of Music Audiation (IMMA), $t(38) = 0.22, p = ns.$

College-Student Results

No statistically significant difference was found between the experimental and control groups on the pretest, Gordon’s Advanced Measures of Music Audiation (AMMA), $t(45) = 0.46, p = ns.$

Results of Posttests

For fourth-grade participants and for college-student participants, two Dependent Variables were measured using three tests. The Music Listening Sensitivity Dependent Variable was measured using two tests: the Music Aptitude Profile, Phrasing Subsection (MAP-P), and the researcher-created Anderson Test of Music Listening Sensitivity (ATMLS). The Music Listening Enjoyment Dependent Variable was measured using the composite score of all Music Listening Questionnaire results (possible range: 1-7).

Fourth-Grade Results

To investigate for any significant differences on the measurements of the Dependent Variables between the experimental and control groups, multivariate analysis was used. A MANOVA test of differences between groups using the Pillai’s trace criteria was statistically significant ($F(3,38) = 0.403; p < .001$). To determine which of the measurements yielded statistically significant differences between the experimental and
control groups, follow-up univariate analyses (ANOVA) were used. The univariate analyses yielded statistically significant differences between the experimental and control groups on all three measurements of the Dependent Variables: the ANOVA for Music Listening Sensitivity as measured by the MAP-P ($F(1, 40) = 5.49, p = .024$), the ANOVA for Music Listening Sensitivity as measured by the ATMLS ($F(1, 40) = 13.00, p = .001$), and the ANOVA for Enjoyment ($F(1, 40) = 8.74, p = .005$). ANOVA tables for these analyses are presented in tables 4.5, 4.6, and 4.7.

Effect sizes for measurements that yielded statistical significance, computed using Cohen’s $d$, are presented in table 4.8. The effect size coefficient, $r$, is also included, as is the percentile standing. In general, $d \leq 0.20$ is considered a small effect size, $d > 0.20$ but $\leq 0.50$ is considered a medium effect size, and $d > 0.50$ is considered a large effect size (Cohen, 1988). However, these descriptive indicators of effect size are imprecise, and the numerical value of $d$ is of primary importance. The percentile standing represents where the value of the treatment mean would be if it were computed as a percentile ranking of the control group. An effect size provides useful information, as it is a measure of the magnitude of the difference between groups using standard deviation units. In this study, the effect size depicts the magnitude of the difference between the experimental and control groups. A greater effect size means that the magnitude of difference between the experimental and control groups is greater.
Table 4.5, Analysis of Variance for Fourth-Grade MAP-P

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>1</td>
<td>304.97</td>
<td>304.97</td>
<td>5.49</td>
<td>.024</td>
</tr>
<tr>
<td>Error</td>
<td>40</td>
<td>2221.50</td>
<td>55.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>2526.48</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.6, Analysis of Variance for Fourth-Grade ATMLS

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>1</td>
<td>73.065</td>
<td>73.065</td>
<td>13.00</td>
<td>.001</td>
</tr>
<tr>
<td>Error</td>
<td>40</td>
<td>224.768</td>
<td>5.619</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>297.833</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.7, Analysis of Variance for Fourth-Grade ENJOY

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>1</td>
<td>18.726</td>
<td>18.726</td>
<td>8.74</td>
<td>.005</td>
</tr>
<tr>
<td>Error</td>
<td>40</td>
<td>85.683</td>
<td>2.142</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>104.409</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.8, Table of Effect Sizes for Fourth-Grade Participants

<table>
<thead>
<tr>
<th></th>
<th>Experimental</th>
<th>Control</th>
<th>Cohen’s $d$ Effect Size, $r$</th>
<th>Percentile Standing in Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAP-P</td>
<td>41.05 (7.85)</td>
<td>35.65 (6.98)</td>
<td>$d = 0.73$</td>
<td>76$^{th}$ Percentile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$r = .34$</td>
<td></td>
</tr>
<tr>
<td>ATMLS</td>
<td>14.09 (1.93)</td>
<td>11.45 (2.78)</td>
<td>$d = 1.10$</td>
<td>86$^{th}$ Percentile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$r = .48$</td>
<td></td>
</tr>
<tr>
<td>ENJOY</td>
<td>5.67 (1.51)</td>
<td>4.33 (1.41)</td>
<td>$d = 0.92$</td>
<td>82$^{th}$ Percentile</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$r = .42$</td>
<td></td>
</tr>
</tbody>
</table>
College-Student Results

To investigate for any significant differences on the measurements of the Dependent Variables between the experimental and control groups, multivariate analysis was used. A MANOVA test of differences between groups using the Pillai’s trace criteria was statistically significant \(F(3,44) = 4.708; p = .006\). To determine which of the measurements yielded statistically significant differences between the experimental and control groups, follow-up univariate analysis (ANOVA) was used. The univariate analyses yielded statistically significant differences between the experimental and control groups on all three measurements of the Dependent Variables: the ANOVA for Music Listening Sensitivity as measured by the MAP-P \(F(1, 46) = 5.10, p = .029\), the ANOVA for Music Listening Sensitivity as measured by the ATMLS \(F(1, 46) = 7.43, p = .009\), and the ANOVA for Enjoyment \(F(1, 46) = 5.45, p = .024\). ANOVA tables for these analyses are presented in tables 4.9, 4.10, and 4.11.

Effect sizes for measurements that yielded statistical significance, computed using Cohen’s \(d\), are presented in table 4.12. The effect size coefficient, \(r\), and the percentile standing are also included in the table.
Table 4.9, Analysis of Variance for College-Student MAP-P

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>1</td>
<td>56.07</td>
<td>56.07</td>
<td>5.10</td>
<td>.029</td>
</tr>
<tr>
<td>Error</td>
<td>46</td>
<td>505.60</td>
<td>10.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>561.67</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.10, Analysis of Variance for College-Student ATMLS

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>1</td>
<td>21.04</td>
<td>21.04</td>
<td>7.43</td>
<td>.009</td>
</tr>
<tr>
<td>Error</td>
<td>46</td>
<td>130.21</td>
<td>2.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>151.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.11, Analysis of Variance for College-Student ENJOY

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>1</td>
<td>4.88</td>
<td>4.88</td>
<td>5.45</td>
<td>.024</td>
</tr>
<tr>
<td>Error</td>
<td>46</td>
<td>41.15</td>
<td>41.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>46.03</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4.12, Table of Effect Sizes for College-Student Participants

<table>
<thead>
<tr>
<th>Experimental</th>
<th>Control</th>
<th>Cohen’s $d$ Effect Size, $r$</th>
<th>Percentile Standing in Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean $(SD)$</td>
<td>Mean $(SD)$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAP-P</td>
<td>20.04 (3.90)</td>
<td>$d = 0.65$</td>
<td>$74^{th}$ Percentile</td>
</tr>
<tr>
<td></td>
<td>17.88 (2.67)</td>
<td>$r = .31$</td>
<td></td>
</tr>
<tr>
<td>ATMLS</td>
<td>12.57 (1.41)</td>
<td>$d = 0.79$</td>
<td>$79^{th}$ Percentile</td>
</tr>
<tr>
<td></td>
<td>11.24 (1.90)</td>
<td>$r = .37$</td>
<td></td>
</tr>
<tr>
<td>ENJOY</td>
<td>5.24 (0.93)</td>
<td>$d = 0.68$</td>
<td>$75^{th}$ Percentile</td>
</tr>
<tr>
<td></td>
<td>4.60 (0.96)</td>
<td>$r = .32$</td>
<td></td>
</tr>
</tbody>
</table>
Results of Hypothesis Testing

The results of the inferential statistical tests performed on the data provide the necessary information for the acceptance or rejection of the hypotheses of this study. The null hypotheses for statistical testing, along with the corresponding research hypothesis, are restated here.

1.) Null Hypothesis 1 (for statistical testing): Inclusion of Mindful Listening Instruction produces no greater Music Listening Sensitivity in students.
   a. Research Hypothesis 1: Inclusion of Mindful Listening Instruction produces greater Music Listening Sensitivity in students.

2.) Null Hypothesis 2 (for statistical testing): Inclusion of Mindful Listening Instruction produces no greater Music Listening Enjoyment in students.
   a. Research Hypothesis 2: Inclusion of Mindful Listening Instruction produces greater Music Listening Enjoyment in students.

Fourth-Grade and College-Student Results

For fourth-grade participants and for college-student participants, the results of hypothesis testing were the same. Statistical tests for significant differences between the experimental and control groups, as described above, yielded confirmation of statistically significant differences between the experimental and control groups for all three posttests. Furthermore, the means of the experimental groups were higher than the means of the control groups on all three posttests. Therefore, the results of significance testing, for both the fourth-grade and the college-student groups, reject the null hypotheses and support the research hypotheses.
Secondary Results

The primary purpose of data analysis in this research was to evaluate any differences between the experimental and control groups on measures that would allow for the acceptance or rejection of the null and research hypotheses. The data already presented in this chapter provides the necessary data for such hypothesis testing. However, further analysis of the data gathered in this study is warranted. In particular, further brief analyses of the research-created *Anderson Test of Music Listening Sensitivity* (ATMLS) and *Music Listening Questionnaire* (MLQ) were necessary for determining reliability and validity of the measurement. Additionally, some *post hoc* analyses of the data yielded results of potential importance in the design of future research or in educational practice; the results of these *post hoc* analyses are presented in this section.

**Analysis of the Anderson Test of Music Listening Sensitivity**

This analysis reports the reliability and validity of the ATMLS, as well as an item analysis. The reliability of the ATMLS for fourth-grade data was Cronbach’s $\alpha = .58$. The reliability of the ATMLS college-student data was Cronbach’s $\alpha = -.16$. The reliability of the ATMLS is further discussed in chapter five. Two doctoral candidates in music education, as subject matter experts, evaluated the test and agreed that the ATMLS was a valid measure of Music Listening Sensitivity. The agreement of the experts established construct validity for the ATMLS. An item analysis, consisting of difficulty and discrimination indexes for fourth-grade and college-student data, is presented in table 4.13. The results of the item analysis could be useful in further refinement of the instrument.
Table 4.13, Difficulty and Discrimination Indexes of the ATMLS

<table>
<thead>
<tr>
<th>Item</th>
<th>Fourth-Grade Students</th>
<th>College Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p</td>
<td>D</td>
</tr>
<tr>
<td>1</td>
<td>.74</td>
<td>.58</td>
</tr>
<tr>
<td>2</td>
<td>.93</td>
<td>.25</td>
</tr>
<tr>
<td>3</td>
<td>.84</td>
<td>.42</td>
</tr>
<tr>
<td>4</td>
<td>.63</td>
<td>.25</td>
</tr>
<tr>
<td>5</td>
<td>.53</td>
<td>.00</td>
</tr>
<tr>
<td>6</td>
<td>.53</td>
<td>.42</td>
</tr>
<tr>
<td>7</td>
<td>.42</td>
<td>.58</td>
</tr>
<tr>
<td>8</td>
<td>.79</td>
<td>.33</td>
</tr>
<tr>
<td>9</td>
<td>.58</td>
<td>.50</td>
</tr>
<tr>
<td>10</td>
<td>.63</td>
<td>.17</td>
</tr>
<tr>
<td>11</td>
<td>.74</td>
<td>.00</td>
</tr>
<tr>
<td>12</td>
<td>.81</td>
<td>.50</td>
</tr>
<tr>
<td>13</td>
<td>.42</td>
<td>.50</td>
</tr>
<tr>
<td>14</td>
<td>.70</td>
<td>-.17</td>
</tr>
<tr>
<td>15</td>
<td>.49</td>
<td>.58</td>
</tr>
<tr>
<td>16</td>
<td>.35</td>
<td>.33</td>
</tr>
<tr>
<td>17</td>
<td>.35</td>
<td>.25</td>
</tr>
<tr>
<td>18</td>
<td>.81</td>
<td>.17</td>
</tr>
<tr>
<td>19</td>
<td>.91</td>
<td>.25</td>
</tr>
<tr>
<td>20</td>
<td>.47</td>
<td>.50</td>
</tr>
<tr>
<td>Mean</td>
<td>.63</td>
<td>.32</td>
</tr>
<tr>
<td>SD</td>
<td>.18</td>
<td>.21</td>
</tr>
</tbody>
</table>

p = difficulty indexes
D = discrimination indexes
Attention Span in Music Listening

The purpose of this secondary analysis was to determine if participant listening attention span varied during the course of the ATMLS test administration. One possible way to measure a change in attention span would be to compare a student’s score from the first half of the test with the student’s score from the second half of the test. If student scores are lower for the second half of the ATMLS, then that might suggest that student listening attention was weaker during the second half of the approximately 16 minute test.

To investigate whether any statistically significant difference existed between the scores on the first half of the ATMLS versus the second half of the ATMLS, a paired $t$-test was computed using the pooled data from the treatment and control groups; paired $t$-tests were computed separately for the fourth-grade data and the college-student data. The paired $t$-test yielded statistical significance for neither fourth-grade nor college-student data.

In addition, to investigate whether any statistically significant differences existed between the scores on the first half of the ATMLS versus the second half of the ATMLS for the experimental group or the control group, paired $t$-tests were computed using the data from the respective groups; again, paired $t$-tests were computed for fourth-grade data and college-student data separately. Neither the experimental nor control group data resulted in statistically significant differences regarding scores from the first and second halves of the ATMLS; this was true for fourth-grade as well as college-student analysis.
The means, standard deviations, paired $t$-test results, and $p$-values for the fourth-grade participants and the college-student participants are shown in tables 4.14 and 4.15, respectively. Cohen’s $d$s were not computed, as no statistically significant differences existed in this data.
Table 4.14, Fourth-Grade Analysis of ATMLS Items: First Half vs. Second Half

<table>
<thead>
<tr>
<th></th>
<th>First Half</th>
<th>Second Half</th>
<th>Paired $t$-test</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ($SD$)</td>
<td>Mean ($SD$)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pooled</td>
<td>6.64 (1.78)</td>
<td>6.05 (1.72)</td>
<td>$t(41) = 1.79$</td>
<td>ns</td>
</tr>
<tr>
<td>Experimental</td>
<td>7.32 (1.67)</td>
<td>6.64 (1.36)</td>
<td>$t(21) = 1.45$</td>
<td>ns</td>
</tr>
<tr>
<td>Control</td>
<td>5.90 (1.62)</td>
<td>5.40 (1.88)</td>
<td>$t(19) = 1.04$</td>
<td>ns</td>
</tr>
</tbody>
</table>

Table 4.15, College-Student Analysis of ATMLS Items: First Half vs. Second Half

<table>
<thead>
<tr>
<th></th>
<th>First Half</th>
<th>Second Half</th>
<th>Paired $t$-test</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ($SD$)</td>
<td>Mean ($SD$)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pooled</td>
<td>5.81 (1.20)</td>
<td>6.02 (1.56)</td>
<td>$t(47) = -0.69$</td>
<td>ns</td>
</tr>
<tr>
<td>Experimental</td>
<td>6.04 (1.22)</td>
<td>6.44 (1.27)</td>
<td>$t(22) = -0.96$</td>
<td>ns</td>
</tr>
<tr>
<td>Control</td>
<td>5.60 (1.16)</td>
<td>5.64 (1.73)</td>
<td>$t(24) = -0.09$</td>
<td>ns</td>
</tr>
</tbody>
</table>
The Effect of Prior Exposure to a Musical Excerpt on Listening Sensitivity

The purpose of this secondary analysis was to determine if prior exposure to a musical excerpt influenced student Listening Sensitivity upon later exposure to the same excerpt. Some musical excerpts used in the Anderson Test of Music Listening Sensitivity (ATMLS) were also used during the listening lessons of the treatment in this study. Therefore, students had been previously exposed to some of the musical excerpts used for items in the ATMLS. The inclusion of some musical excerpts in both the listening lesson treatments and the ATMLS made it possible to investigate whether any significant differences existed in student responses on the ATMLS items that had been included in the listening lesson treatments versus those ATMLS items that had not been included in the listening lesson treatments.

Nine of the 20 items on the ATMLS (item numbers 2, 6, 7, 8, 10, 11, 16, 18, and 19) were used in the fourth-grade treatment for both the experimental and control groups. Four of the 20 items on the ATMLS (item numbers 2, 7, 11, and 18) were used in the college-student treatment for both the experimental and control groups. To investigate whether any statistically significant differences existed between the scores on the items of the ATMLS used during treatment versus the scores on the items of the ATMLS not used during treatment, two paired $t$-tests were computed using the pooled data from the fourth-grade treatment and control groups and the pooled data from the college-student treatment and control groups.

Before analyzing the data for statistical significance, each participant’s ATMLS data was converted into two scores: percentage of ATMLS items used during treatment answered correctly, and percentage of ATMLS items not used during treatment answered
correctly. This standardization of data was necessary because the ATMLS stimuli used and not used during treatment were uneven (for fourth-grade participants, stimuli from nine of the 20 ATMLS items were used during the treatment, and stimuli from 11 of the 20 items were not used during the treatment; for college-student participants, stimuli from four of the 20 ATMLS items were used during the treatment, and stimuli from 11 of the 20 items were not used during the treatment).

For fourth-grade participants, the paired $t$-test for the pooled experimental and control groups yielded statistical significance, while neither the paired $t$-test for the experimental group alone nor the paired $t$-test for the control group alone resulted in statistical significance. For college-student participants, the paired $t$-test for the pooled experimental and control groups did not yield statistical significance; in addition, neither the paired $t$-test for the experimental group alone nor the paired $t$-test for the control group alone resulted in statistical significance. The means, standard deviations, $t$-test results, $p$-values, and Cohen’s $d$s for the fourth-grade participants and the college-student participants are shown in tables 4.16 and 4.17, respectively. Cohen’s $d$s are reported only for data with statistically significant differences.
Table 4.16, Fourth-Grade Analysis of ATMLS Items Used vs. Not Used in Treatment

<table>
<thead>
<tr>
<th></th>
<th>Used Items</th>
<th>Unused Items</th>
<th>Paired t-test</th>
<th>p-value</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pooled</td>
<td>68.25 (15.63)</td>
<td>59.52 (17.87)</td>
<td>$t(41) = 2.89$</td>
<td>.006</td>
<td>0.52</td>
</tr>
<tr>
<td>Experimental</td>
<td>71.21 (14.41)</td>
<td>62.81 (14.82)</td>
<td>$t(21) = 2.05$</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>65.00 (16.63)</td>
<td>55.91 (20.49)</td>
<td>$t(19) = 2.00$</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.17, College-Student Analysis of ATMLS Items Used vs. Not Used in Treatment

<table>
<thead>
<tr>
<th></th>
<th>Used Items</th>
<th>Unused Items</th>
<th>Paired t-test</th>
<th>p-value</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pooled</td>
<td>62.50 (18.59)</td>
<td>58.72 (11.00)</td>
<td>$t(47) = -1.14$</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>68.48 (15.48)</td>
<td>61.68 (9.66)</td>
<td>$t(22) = 1.52$</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>57.00 (19.79)</td>
<td>56.00 (11.62)</td>
<td>$t(24) = 0.20$</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>
Analysis of the *Music Listening Questionnaire*

The correlation between the two questions on the *Music Listening Questionnaire*, each designed to measure Music Listening Enjoyment, was \( r = .93 \) \((p < .001)\) for fourth-grade participants and \( r = .92 \) \((p < .001)\) for college-student participants. Reliability of the MLQ for fourth-grade participants was Cronbach’s \( \alpha = .92 \); reliability of the MLQ for college-student participants was \( \alpha = .71 \). Two doctoral candidates in music education, as subject matter experts, evaluated the questionnaire and agreed that the MLQ was a valid measure of Music Listening Enjoyment. The agreement of the experts established construct validity for the MLQ.

The Effect of Listening Maps on Listening Enjoyment

The purpose of this secondary analysis was to determine the use of a listening map during a listening lesson influenced student Listening Enjoyment. To investigate for any statistically significant differences between the Listening Enjoyment scores of lessons that used listening maps and lessons that did not use listening maps, paired \( t \)-tests were performed. Separate paired \( t \)-tests were computed for the fourth-grade data and the college-student data. For this analysis, experimental and control group data was pooled.

The \( t \)-tests yielded no statistically significant differences between the Enjoyment means of the lessons that used listening-maps and the lessons that did not use listening-maps for either the fourth-grade or college-student data. Table 4.18 displays Listening Enjoyment means, standard deviations, paired \( t \)-test results, and \( p \)-values. Cohen’s \( d \) were not computed, as no statistically significant differences existed in this data.
Table 4.18, Analysis of Listening Enjoyment Data for Listening-Map-Based Lessons vs. Lessons without Listening Maps

<table>
<thead>
<tr>
<th></th>
<th>Listening Map</th>
<th>No Listening Map</th>
<th>Paired t-test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fourth-Grade</td>
<td>5.16 (1.49)</td>
<td>4.89 (1.81)</td>
<td>$t(41) = 1.95$</td>
<td>ns</td>
</tr>
<tr>
<td>College-Student</td>
<td>4.82 (1.11)</td>
<td>5.08 (1.13)</td>
<td>$t(47) = -1.14$</td>
<td>ns</td>
</tr>
</tbody>
</table>

**The Effect of Gender on Posttest Results**

The purpose of this secondary analysis was to determine whether any significant differences existed between the male and female participants on the measurements of the Dependent Variables. This was possible only with fourth-grade participant data, where the male to female ratio of participants to permitted such an analysis (64% male, 36% female). The college-student participant data included 94% females and only 6% males, preventing such an analysis. All three measurements of the Dependent Variables were included in the analysis: the *Music Listening Questionnaire*, the *Anderson Test of Music Listening Sensitivity*, and the *Music Aptitude Profile – Phrasing* subsection.

To test the fourth-grade participant data for any statistically significant differences based on gender, three separate MANOVA tests of differences using the Pillai’s trace criteria were computed: one using pooled data from the experimental and control groups ($F(3,38) = 0.490; p = ns$), one using data only from the experimental group
\( F(3,18) = 1.950; p = \text{ns} \), and one using only data from only the control group \( F(3,16) = 0.595; p = \text{ns} \). The results of the testing yielded no statistically significant differences between the male and female participants on any of the tests.

**Summary**

The current study included one Independent Variable: type of listening instruction (mindful or traditional). Two Dependent Variables were included: Music Listening Sensitivity and Music Listening Enjoyment. Two posttests, the *Music Aptitude Profile – Phrasing* subsection (MAP-P) and the *Anderson Test of Music Listening Sensitivity* (ATMLS) measured the Listening Sensitivity Dependent Variable. One posttest, the *Music Listening Questionnaire* (MLQ), measured the Listening Enjoyment Dependent Variable.

For fourth-grade participants and for college-student participants, the results of hypothesis testing yielded statistically significant differences between the experimental and control groups for all three posttests. Furthermore, the means of the experimental groups were higher than the means of the control groups on all three posttests. Therefore, for fourth-graders and for college-students, the null hypotheses are rejected and the research hypotheses are accepted.

According to the results of data analyses here, the first research hypothesis, “Inclusion of Music Listening Instruction produces greater Music Listening Sensitivity in students,” is accepted. The second research hypothesis, “Inclusion of Music Listening Instruction produces greater Music Listening Sensitivity in students,” is also accepted.

In addition, the *Anderson Test of Music Listening Sensitivity* (ATMLS) demonstrated the ability to detect differences between the groups, confirming its
usefulness in the current research for measuring Music Listening Sensitivity. Likewise, the Music Listening Questionnaire (MLQ) demonstrated the ability to detect differences between the groups, confirming its usefulness in the current research for measuring Music Listening Enjoyment. Furthermore, the current study supports the idea that listening skills can be influenced by instructional strategies such as the use of mindfulness and taught to fourth-graders and students in college.
CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

In this chapter the purpose, procedure, and results of this study will be reviewed. Conclusions based on this research will be presented. Possible threats to the validity of the experiment and steps taken to control such will be addressed. The theoretical foundations of the study will be discussed along with its findings. Recommendations for further research on mindfulness in music education, including the potential for exploring Dalcroze eurhythmics lessons as potential instruction for body-based mindful music education, will be discussed. Additionally, recommendations for further research in the measurement of Music Listening Sensitivity will be addressed. The chapter closes with a discussion of the implications of the results of this study on educational practice.

Overview of the Study

The present study investigated “mindful listening” as an instructional strategy to promote aural sensitivity in music. Two primary research topics were explored 1.) The effect of Mindful Listening Instruction on student Listening Sensitivity, and 2.) The effect of Mindful Listening Instruction on student Listening Enjoyment. A secondary research question explored whether the effects of Mindful Listening Instruction between fourth-grade students and college students were similar, though no direct statistical comparisons were included in the experimental design.

The participants for the study were from two institutions: fourth-grade students (N = 42) from an urban public school and college non-music majors (N = 48) at a large university enrolled in a course for undergraduate education majors. The Independent Variable was mode of listening instruction. Participants were randomly assigned to one
of two groups that varied in regards to the method of listening instruction: mindful or traditional. The Dependent Variables were Music Listening Sensitivity and Music Listening Enjoyment. Hypotheses were, 1.) “inclusion of Music Listening Instruction produces greater Music Listening Sensitivity in students,” and 2.) “inclusion of Music Listening Instruction produces greater Music Listening Enjoyment in students.”

The fourth-grade participants were given Gordon’s *Intermediate Measures of Music Audiation* as a pretest, and the college students were given Gordon’s *Advanced Measures of Music Audiation* as a pretest. Both the fourth-grade participants and the college-student participants completed the *Music Experience Questionnaire* to assess prior musical experiences. The procedure for the mindful listening group consisted of listening twice to the same musical excerpt. The two playbacks of the musical excerpt consisted either of recordings of the exact same performance or recordings of two different ensembles playing the same musical score. During the first playback, the participants were given instructions in mindful listening. During the second playback, participants either listened without further instruction or were given a short lesson utilizing a listening map. The listening maps were only presented during the second playback for the experimental and control groups; this was done to prevent any visual stimuli from the listening maps from interfering with either listening or (for the experimental group) the listening story created by the listeners.

The procedure for the control group differed with regard to the instructions given for the first playback, which simply instructed students to listen carefully to the music; all other elements of the treatment remained the same. For fourth-grade students, a total of 10 lessons were administered, and for college students, a total of five lessons were
presented. Lessons were presented once per week. After each lesson, participants completed the *Music Listening Questionnaire* to assess Music Listening Enjoyment. At the end of the lessons, all participants took Gordon’s *Music Aptitude Profile – Phrasing Subsection* and the researcher-created *Anderson Test of Music Listening Sensitivity* as posttests to measure Music Listening Sensitivity.

**Results of the Study and Conclusions**

Based on the data analysis in the previous chapter, the following results can be presented and conclusions made.

1.) Music Listening Sensitivity can be altered based on instructional strategy for fourth-grade and college students.

2.) Inclusion of Music Listening Instruction produces greater Music Listening Sensitivity in fourth-grade and college students.

3.) Inclusion of Music Listening Instruction produces greater Music Listening Enjoyment in fourth-grade and college-students.

4.) The effect of Mindful Listening Instruction on Music Listening Sensitivity and Music Listening Enjoyment yields effect sizes that are large enough to be of practical significance for music educators.

5.) The *Anderson Test of Music Listening Sensitivity* (ATMLS) is a useful assessment for measuring Music Listening Sensitivity, though further refinement would likely produce more precise results.

6.) The inclusion of a listening map in a listening lesson resulted in no greater Listening Enjoyment for fourth-grade or college students.
7.) There were no statistically significant differences for the fourth-grade or college-student scores on the first-half versus the second-half of the ATMLS. This suggests that student ability to notice subtle nuances in musical performance did not differ significantly throughout the duration of the test, which lasted approximately 16 minutes.

8.) For fourth-grade students, having heard a musical excerpt previously resulted in higher scores on the ATMLS, suggesting that prior exposure to a musical excerpt results in greater ability to discriminate subtle differences in that excerpt.

9.) The *Music Aptitude Profile – Phrasing Subsection* (MAP-P) can be used to measure Listening Sensitivity as a Dependent Variable.

10.) For fourth-grade students the correlation between the ATMLS and the MAP-P was statistically significant (*r* = .38, *p* = .013). While not statistically significant for college students (*r* = .23), the correlation was a positive one. Therefore, there may be a significant overlap in what is measured by the ATMLS and the MAP-P for fourth-grade students, suggesting possible evidence of concurrent validity for the ATMLS as a measure of Music Listening Sensitivity.

**Internal and External Experimental Validity**

According to Campbell and Stanley (1963), there are various ways to assess different kinds of threats to experimental validity, and these are addressed in the discussion that follows. The pretest-posttest control group design inherently ensures a high level of internal validity. The potential for pretest/treatment interactions was minimal, as the pretest did not consist of material that would be expected to cue or
cognitively prime the participants for the Dependent Variables. The pretests, and the *Music Experience Questionnaire*, were all typical measures that teachers might use in a regular course of study. The low reliability, particularly for college-student data (Cronbach’s $\alpha = .58$ for fourth-grade data; Cronbach’s $\alpha = -.16$ for college-student data) of the *Anderson Test of Music Listening Sensitivity* (ATMLS), could pose potential problems regarding validity; however, the *Music Aptitude Profile – Phrasing Subsection* (MAP-P) measured the same Dependent Variable and yielded the same statistically significant results.

The reliability measurement of the ATMLS for the fourth-grade participants is acceptable. The reliability measurement for the college-student participants was low. Though it cannot be known from the available data, it is possible that the test reliability was influenced by external sources. In particular, the test administrator of the ATMLS for the college-student participants noted three potential external sources that may have influenced the ATMLS reliability. First, students were given the test on the last day of classes before a weeklong university holiday, which may have had an impact on student concentration during the test. Second, the test was given during midterm week at the university, a week when the students may have experienced an unusually high degree of mental stress. Third, a severe weather warning, resulting in early closure of the university for the day, was issued the day the test was given, and the warning may have preoccupied students, though the test was administered before the early closure of the university. Therefore, as the available college-student reliability of the ATMLS may have been influenced by external factors, it would be reasonable to administer the test to a similar group of students solely to investigate for any potential differences in reliability.
of the ATMLS before making substantial changes to the test. The fact that the ATMLS detected a statistical difference between the experiential and control groups supports the usefulness of the instrument.

Absence of a fourth-grade participant for more than two of the treatment lessons or absence of a college-student participant for more than one treatment lesson resulted in exclusion of their data in the analysis. The data collected from one student from the fourth-grade group and nine students from the college-student group was excluded from the data analysis due to having excessive absences during the treatment lessons or absence from the posttests. Of the nine excluded college students, four were excluded because of absence during the posttest administration. On the day of posttest administration, a severe weather alert may have promoted some students to not attend class. Additionally, one of the college students in the experimental group withdrew from the course and was hence eliminated from the study. The mortality resulting from these causes present a theoretical threat to validity; this is a relatively minor threat with the low mortality for fourth-grade participants, but a larger threat with the slightly higher mortality rate for college students. Though the effect of this mortality on the results of the study cannot be definitively determined, it is unlikely that it influenced the results of the study vastly.

The fourth-grade lessons, for both the experimental and control groups, were delivered by the same teacher. The teacher endeavored to ensure equality in the delivery of the lessons with regards to enthusiasm, body language, and tone of voice. The college-level lessons were delivered primarily by two instructors. One instructor taught the experimental group while the other instructor taught the control group. The small
number of instructors in this study could potentially limit the validity of the study, as idiosyncratic characteristics of the instructors may have influenced the Dependent Variables. However, all of the instructors were as vigilant as possible in guarding against this possibility. Notably, all instructors followed researcher-created teaching scripts, which further reinforced homogeneity in instructional practice. All other factors remain equal for both experimental and control groups, as the participants attended the same schools and were randomly placed into the groups. Also, sample size of each group was relatively small but adequate. It is thought that the results of this study are likely generalizable to other populations of similar ages. In addition, only Western instrumental music was used in this study; hence, the generalizability of these findings may possibly be limited to the effects of Western instrumental music.

**Discussion of the Theoretical Foundations of the Study**

Trehub (2006) and Trehub, Schellenberg, and Hill (1997) presented evidence strongly supporting their hypothesis that infants have robust biological predispositions toward music listening at birth. Using creative methodologies, the researchers investigated the abilities of infants to hear changes in musical patterns. Infants are able to discriminate in their listening at a high level, at times noticing single incorrect tones inserted into melodies. The researchers also noted the relatively rapid decay of these discriminatory abilities if the environment did not provide adequate musical stimulation. Montgomery (1978) found that third-grade students could aurally discriminate changes in music as well as adult professional musicians, though third-graders lacked the terminology to express the changes verbally.
North and Hargreaves (2008) reported on research investigating different listening strategies used by adult listeners. Two studies, one by Hedden (1973) and the other by Hargreaves and Colman (1981), classified music listening strategies into “cognitive and associative” and “objective-analytic and affective,” respectively. These two categories basically differentiate between those listeners who interpret what they hear by way of emotional or non-musical associations with the music, and those who interpret what they hear by way of music analysis (such as form, theme recurrence, etc.). North and Hargreaves also cite Smith’s (1987) research that the major difference between non-expert and expert listeners is whether the listener employs a referential (or associative) approach to understanding what they hear, or a “syntactic” (or “objective-analytic”) approach to understanding what they hear. Bamberger (1991, 1994) shares a similar approach to the classification of listening strategies, which she calls “figural” and “formal” representations.

The current research exposed students in the experimental group to a series of music listening lessons designed to increase mindfulness during listening (similar instructions were used in a study by Anderson, 2011b). Mindfulness theory, as developed by Ellen Langer, served as the theoretical foundation for the development of the treatment. Knowing that children are endowed with relatively precise listening skills from birth, and that different listeners adopt different listening strategies based on their level of listening expertise, the researcher designed the current research to provide students with mindful listening lessons that engaged both their high levels of musical listening discrimination and their non-expert listening skills. Specifically, students in the experimental group engaged in music listening that: (1) required fine levels of aural
discrimination of complex listening events, that is, complete musical excerpts (by considering whether two playbacks of the same musical score were recorded by the same or different performing ensembles); and (2) encouraged students to use a listening strategy that promoted referential, associative listening, that is, students were asked to create a “listening story” that they could create that would correspond, in their experience, with the music they heard. Students in the control group did not receive the instructions. During a second playback, students in both groups were asked to either listen to the music without further instruction, or were presented a listening map with a short lesson to present the listening map.

Gruhn (1995/1996), based on prior research by Richter (1991), conducted an experiment that asked high school students to use a narrative, associative listening story to promote student engagement with music listening. As was explained in chapter two, it is imperative for listeners to build adequate networks of mental representation in order for them to make sense of the music they hear. However, before listeners can form analytical listening strategies, it is likely that listeners must form associative listening strategies. Associative listening strategies, such as listeners creating a “listening story,” build the mental representation necessary for a foundation of music listening development. Gruhn’s approach to listening in his study emphasized that the associations one may have when listening to music will not employ musical terminology or classifications until the appropriate musical representation networks have been developed in the listener. Hence, listening to music (especially in terms of global listening to complete pieces rather than to isolated stimuli consisting of single notes or small patterns) requires association in order to have meaning.
Patel (2007) presents a concept of a representational network that aligns well with Gruhn’s study. Patel makes a convincing case for a shared syntax processing between language and music, which he calls the Shared Syntactic Integration Research Hypothesis (SSIRH). He argues that music and language share syntactic processing, but each has different representation systems in the brain. He uses the analogy of a factory that makes a part needed for both motorcycles and cars, though each is stored in a separate warehouse. If the factory is damaged, then neither motorcycles nor cars can be produced. However, if a warehouse is damaged, then the factory will still function. Gruhn’s concern is with mental representations, which corresponds to the warehouse of vehicles in Patel’s metaphor. The same was true in the current study: the concern was with promoting students’ formations of associative mental representations.

Custodero (2010) makes reference to Bruner (1990) and Dissanayake (2000) when she states that, “contemporary scholars attribute meaning making to a sense of narrative – stories and systems drawn from the complexities of [student] experience” (p. 78-79). She notes that Bruner (1990) describes meaning as a “a culturally mediated phenomenon that depends upon prior existence of a shared symbol system” (Custodero, p. 79). The approach to Mindful Listening Instruction used in this study provided one possible framework for promoting students in making meaning through a sense of narrative stories. The results of the analysis of data collected in this study, as presented earlier in this chapter, support the hypothesis that Mindful Listening Instruction has a beneficial effect on Music Listening Sensitivity and Music Listening Enjoyment for fourth-grade students and college students.
Recommendations for Further Research on Mindfulness in Music Education

The treatment used in this experiment is only one of many possibilities for designing curricular materials with the intent of engaging learners in mindful listening. Mindful activity and mindful learning, as proposed by Ellen Langer and as presented in this study, consists of five distinct yet related characteristics: of (1) openness to novelty, (2) alertness to distinction, (3) sensitivity to different contexts, (4) implicit, if not explicit, awareness of multiple perspectives, and (5) orientation in the present (e.g. Langer, 1997; Langer & Moldoveanu, 2000; Sternberg 2000). These five characteristics were described at length in chapter two.

Studying a phenomenon as elusive as mindfulness can present difficulties for the researcher. Mindfulness is an internal state of mind and hence is not something that can be concretely measured by an external observer. Advances in neuroscience may eventually allow researchers to monitor mindfulness in a quantitative manner by using brain imaging or measuring brainwave activity. However, it is not necessary to directly confirm the state of mind of individual participants in studies measuring the effects of mindfulness. Instead, researchers can design tasks that encourage mindful engagement and then measure the effect of those mindfulness-enhancing stimuli on groups. This approach to mindfulness research provides the researcher with a practical yet useful method for examining the effects of mindful engagement. The difficulty that remains in this research approach becomes how the researcher can ensure that a task indeed does encourage mindful engagement. The theoretical basis proposed by Ellen Langer, as was used in this study, provides a conceptual framework from which the researcher can design tasks that promotes the mindful engagement of research participants.
To provide future researchers with a tool for judging whether a task promotes mindful engagement, the current researcher has designed the rubric presented in figure 5.1. This rubric is based on the theoretical framework of mindfulness proposed by Ellen Langer. The various criteria included in the rubric are the components of mindfulness in Ellen Langer’s construct. The rubric offers the researcher a clear basis upon which he or she may evaluate the degree to which a task meets the criteria for mindful engagement as proposed by Ellen Langer. Having multiple judges, preferably with a high level of expertise in music education, complete the rubric for any given instructional task would provide data to compute interjudge reliability for measurement of the degree to which a given task encourages mindful engagement. This rubric could also be used to perform analyses of pre-existing data. For example, many lessons used in music textbook series may encourage, to a greater or lesser degree, mindful learning. By assessing the degree to which a lesson engages students in mindful learning tasks, and by rating the success of the lesson with objective learning outcome criteria, correlations between mindful learning tasks and learning outcomes could be computed. Mindful learning could potentially become a new conceptual framework for curricular and lesson design.
Figure 5.1, Mindful Learning Lesson Rubric

Please examine the attached lesson plan. This rubric is designed to help researchers evaluate the potential of a lesson for engaging students in mindful learning tasks. Five characteristics of mindful learning are listed below. Please evaluate to what extent this lesson encourages students to exhibit the following five characteristics.

<table>
<thead>
<tr>
<th>Characteristic:</th>
<th>Circle One: (1=low, 7=high)</th>
<th>Evidence:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.) Openness to novelty</td>
<td>1  2  3  4  5  6  7</td>
<td></td>
</tr>
<tr>
<td>2.) Alertness to distinction</td>
<td>1  2  3  4  5  6  7</td>
<td></td>
</tr>
<tr>
<td>3.) Sensitivity to different contexts</td>
<td>1  2  3  4  5  6  7</td>
<td></td>
</tr>
<tr>
<td>4.) Implicit, if not explicit, awareness of multiple perspectives</td>
<td>1  2  3  4  5  6  7</td>
<td></td>
</tr>
<tr>
<td>5.) Orientation in the present</td>
<td>1  2  3  4  5  6  7</td>
<td></td>
</tr>
</tbody>
</table>
The theoretical basis of this study was Ellen Langer’s research on mindfulness outside of the context of meditation. Langer’s construct of mindfulness can be used in future research projects, both quantitative and qualitative, to provide a theoretical basis for investigating the role of mindfulness on a broad range of results, including attitudes, learning, perceptual sensitivity, creativity, musical improvisation, and other variables. The instructional strategy used in this research is only one possible strategy for promoting mindful listening instruction. Other instructional strategies in listening (as well as other areas of teaching and learning in music education) using Langer’s framework should be devised and studied; doing so will enable researchers to assess the degree to which mindfulness theory meaningfully contributes to lesson design, which then leads to increased learning outcomes for students.

Future research should investigate any interactions between student personality traits and their responses to mindful instruction response. As North and Hargreaves (2008) review, personality traits can influence how people respond to music listening experiences. For example, studies by Ellis (1995) and Ellis and McCoy (1990) explored the effect of field independence on listening abilities. The researchers reported that listeners who are field independent (that is, those who are more easily able to distinguish a specific characteristic from its holistic context) are able to analyze music more successfully. Likewise, North and Hargreaves (2008) summarize research by Lewis and Schmidt (1991), which found that listeners who are “intuitive” respond “more deeply and sensitively” (p. 118) to music than listeners who are “sensing.”

Specifically, future research should investigate any potential interactions between trait mindfulness and response to mindfulness-based instructional strategies in listening.
Trait mindfulness pertains to the general disposition of a person to be mindful in daily life, while state mindfulness pertains to the degree to which a person is mindful in a given situation. Trait mindfulness may interact with state mindfulness in an educational context, but currently there is no research in this area to provide any answers. Research, however, could address this area. Ellen Langer has developed a trait mindfulness scale (Bodner & Langer, 2001). Langer has designed a 21 item, self-report scale for measuring trait mindfulness called the “Langer Mindfulness/Mindlessness Scale” (Bodner & Langer 2001). It assesses four domains associated with mindfulness: novelty seeking, engagement, novelty producing, and flexibility (Haigh et al. 2011). Haigh et al. (2011) assessed the structure of the Langer Mindfulness/Mindless Scale and found it psychometrically valid and reliable, though the researchers recommend some changes to the scale. Future researchers could administer this assessment prior to presenting students with mindful learning tasks to investigate for any potential interaction effects between trait mindfulness and mindful learning instruction.

Several studies by Flowers and others have investigated student self-awareness of distraction during music listening (Abril & Flowers, 2007; Flowers, 2001; Flowers & O’Neill, 2005). In these studies, students were asked to touch a computer touchpad when they realized they had become distracted and returned their attention to the listening task. Hence, students tapped the touchpad to indicate a return of attention after a period of inattentiveness or distraction. The studies indicated about one to five distractions per minute for middle school students. Student distraction frequency varied highly between individual students, but the researchers found the distraction frequency for individual students to be relatively stable. Additional studies using mindfulness-based listening
instruction could integrate such measurement of self-awareness of distraction in order to explore the effect mindfulness-based listening instruction may have on student distraction during listening.

Additional studies, possibly utilizing qualitative methodologies, should be executed using the theoretical framework of mindfulness as presented by Ellen Langer. These studies could look at the experiential and phenomenological differences that could result from student engagement in mindfulness-based music lessons. Other methodologies, such as longitudinal studies that could examine the effect of long-term exposure to mindfulness-based music lessons, could also enhance understanding of the potential durability of such lessons. Studies which examine factors such as the potential interaction of individual learning styles and mindfulness-based instruction, the effect of mindful learning instruction on special needs students, and the effect of mindful learning instruction across a spectrum of age groups and demographics (including amount of prior instruction in music) would be useful additions to the literature on mindfulness-based instructional strategies.

**Recommendations for Research on Mindfulness in Dalcroze Eurhythmics**

Lessons based on the eurhythmics principles developed by Dalcroze offer one potentially promising field of inquiry regarding music education and mindfulness-based instruction. According to Custodero (2010, p. 66), “Ultimately, meaning is made through connections, and embodiment may be the most intimate connection we make to music, leaving us vulnerable to the consequences of unexpected memories or general mood states being evoked through associations with specific music.” Many meditative
approaches to mindfulness present body-based awareness (Kabat-Zinn, 2003), though this field remains unexplored in relationship to Western social psychological mindfulness. The somatic music instructional strategies utilized in the Dalcroze approach to music education may provide one prospective link between music education and body-based social psychological mindfulness. Studies of the effect of various eurhythmics activities on mindfulness, as well as studies of the intersection of mindfulness and eurhythmics, would be valuable. In addition, studies regarding the role of the body in music education may help provide a philosophical rational for further empirical investigation.

Juntunen and Hyvonen (2004), relate the ideas of Dalcroze with the philosophical ideas of Merleau-Ponty. Arguing that the body presents the primary mode of perceiving the world, the authors argue that body movement “represents prereflective knowing and can be understood as physical metaphor in the process of musical understanding from the concrete doing/musicising to the abstract and (or) conceptual” (p. 199). Merleau-Ponty developed a system of phenomenology that emphasized the role of the body in precognitive knowing, which contrasts with the typical Western viewpoint of a body/mind dichotomy, as formalized in the writings of Descartes.

The Cartesian idea of a body/mind dichotomy has come to dominate the typical Western scientific perspective; however, this does not necessarily mean that this system proposed by Descartes is entirely correct. Juntunen and Hyvonen (2004) describe the philosophy of Merleau-Ponty: “All theoretical thinking, and all achievements in science, are based on the stratum of the primordial experiences that are attained though our bodily contact with the world” (p. 200). Hence, the training of students through Dalcroze
eurhythmics allows the student to experience and learn about music through body movement.

Juntunen and Westerlund (2001) also provide an interesting philosophical discussion of the approach of Dalcroze eurhythmics, drawing on philosophical inquiry from David Elliott and John Dewey. Here, the authors argue that “the body can be taken as a conscious object of transformation within a framework of ‘holistic duality’ rather than dualism, and that this idea should be more consciously considered and applied to research and practice in music education” (Juntunen & Westerlund, 2001, p. 203). The authors argue against the mind/body dualism of Cartesian philosophy typically held to be true within a Western scientific context. However, they do see that the mind and body are interdependent. Hence, emphasizing precognitive knowing through the body is perfectly reasonable within a philosophical framework such as the one proposed by Merleau-Ponty. David Elliott’s philosophy, according to the authors, is in agreement with Dalcroze that embodied action is a necessary component of music education.

With this corpus of philosophical support, as well as the growing body of research on mindfulness-based instruction, researchers should be empowered to design creative methodologies for investigating the interplay of social psychological mindfulness, Dalcroze eurhythmics, and somatic learning. As Damasio (2003) notes, “mental processes are founded in the brain’s mapping of the body, collections of neural patterns that portray responses to events that cause emotions and feelings” (Custodero, 2010, p. 66).
Recommendations for Further Research on Measuring Music Listening Sensitivity

This study used two separate instruments for measuring Music Listening Sensitivity: the phrasing subsection of Gordon’s Music Aptitude Profile (MAP-P) and the researcher-created Anderson Test of Music Listening Sensitivity (ATMLS). Both instruments served the purposes of this study well. The data collected from these two tests resulted in statistically significant differences between the experimental and control groups (for both fourth-grade students and college students) as measured by both tests, though the ATMLS reliability was not optimal. As for MAP-P, the success of employing this test for measurement in this study has important implications. First, the test, which formally measures music aptitude and hence should remain fairly constant, is sensitive to relatively short-term changes in instruction. However, Gordon notes that this is a possibility in the test manual (1965), mentioning that the test likely measures some combination of innate aptitude and prior learning. A second important implication of the successful use of this measurement in this study is that future researchers can include the MAP and its subsections as potential tools for measuring Dependent Variables in other research endeavors.

The Anderson Test of Music Listening Sensitivity (ATMLS) was created for the purpose of data collection in this study, though the instrument could be further refined into a useful tool for measuring Listening Sensitivity in other contexts. Criterion validity was established by agreement by two expert judges that the test measured Music Listening Sensitivity. The positive correlation between the ATMLS and the MAP-P for college-student and fourth-grade participants demonstrated concurrent validity for the ATMLS; furthermore, this positive correlation was statistically significant for fourth-
grade participants. Further expert validation, along with potential correlations between the results of the test with other tests that measure similar constructs, would supplement the evidence of validity for this measurement. The test detected statistically significant differences between the experimental and control groups in this research for fourth-grade students and for college students. Despite the success of this test in the context of discovering statistically significant differences in the current study, the test reliability was low (Cronbach’s $\alpha = .58$ for fourth-grade students and Cronbach’s $\alpha = -.16$ for college students). Future studies should address ways of maintaining validity while increasing reliability. The item analysis presented in table 4.13 provides some potentially useful information for revision of the ATMLS.

Prince (1977) designed a similar instrument designed to measure “discrimination of complex musical events.” The instrument was never published commercially and is currently unavailable. His stimuli were, as with the ATMLS, presented in pairs that were either the same or different. “Complex musical event,” as he used the phrase, referred to actual musical excerpts (as opposed to computer generated tones), all less than a minute in length. However, he found that, even among expert listeners, levels of agreement between “same” and “different” response types were relatively low, despite the fact that the excerpts were, actually, either the same or different; test reliability therefore was relatively weak. To confront this difficulty in measurement, Prince decided to change the response type to a Likert-type response type of one through four, with one end of the scale representing complete certainly of the test-taker that the excerpts were different, and the other end representing complete certainty that the excerpts were the same. Using a weighted scoring procedure, where partial credit was possible for each test item, Prince
was able to achieve acceptable reliability and validity. The ATMLS could also be changed to gather the responses of test-takers using a similar four-level Likert-type method of data collection.

One anecdotal observation merits mentioning here. During test administration of the ATMLS to fourth-grade students, the researcher informally observed that students often seemed to become very excited by faster, louder music, frequently moving their bodies to accompany the music; this arousal may have diverted student attention away from the test on the items that followed. Though the diversion of attention may be apparent in the physical movement of fourth-graders, it is possible that the attention of college students might similarly be diverted after arousing music. However, college students would likely control their body movement and instead be distracted only mentally.

**Implications for Educational Practice**

The results of this study support using mindfulness-based music listening instruction. The mindful learning instruction used in this study consisted of instructing students to create a listening “story” or narrative based on their associations with the music, and of cueing students to the possibility that two consecutive playbacks of the same musical score may or may not have been by the same performing ensemble. These two tasks were framed in the theoretical context of social psychological mindfulness, as presented by Ellen Langer. Though the listening instruction in this study was considered by the researcher and by expert opinion to meet the criteria to be considered as mindful instruction, the effects of Mindful Listening Instruction beyond the specific treatment
used in this study requires further research. Nonetheless, for the specific Mindful Listening Instruction used in this study, the effect clearly improved student outcomes with regard to Listening Sensitivity and Listening Enjoyment for fourth-grade students and college undergraduate non-music majors.

Teachers can incorporate the mindful listening treatment used in this study easily, as it requires very little extra preparation. Due to the ease of incorporating these instructions and the efficacy of the instructions on student outcomes, it is highly recommended that teachers include these instructions, or very similar ones, when presenting listening lessons to students. The study demonstrates that small changes in the instructional language of teachers can result in large differences in learning outcomes of students. The listening instructions used for the mindful listening group in this study encouraged student listening “stories,” or narratives imagined by the students to accompany the music, thus connecting their listening with their emotional and associative cognitions. As Custodero (2010) asserts, “The ease in which music can be associated with strong feelings has implications for music learners, suggesting both much potential for personal growth and also a need to approach musical choices with caution and sensitivity” (p. 66).

No additional research on the effect of social psychological mindfulness-based instruction on student learning outcomes in music is available. Hence, other instructions that still may meet the criteria for mindful instruction may not have the same effect. Nonetheless, the current study presents preliminary evidence that instructional methods utilizing a mindfulness-based lesson design may be helpful in promoting learning. Therefore, until further research is available, it can tentatively be recommended that
music teachers incorporate instructional strategies that encourage mindfulness during learning. The current study investigated only music listening, so the potential effects of mindful music education in other domains remain unknown.
APPENDIX A

LESSON PLANS
The following 10 lessons were used in this study. Odd-numbered lessons used listening maps, and even-numbered lessons did not use listening maps. For the even-numbered lessons, the only instruction given was the mindful listening instruction (for the experimental group) and the control group listening instruction; hence no listening map or textbook-based instructions were given for the even-numbered lessons. The table below shows the title and placement of each lesson. A discography of the recordings of the music used, as well as the procedures relating to the lessons, can be found in chapter three.

<table>
<thead>
<tr>
<th>Lesson</th>
<th>With Listening Map</th>
<th>With No Listening Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Troika</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Promenade</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Shrovetide Fair</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Hoedown</td>
</tr>
<tr>
<td>5</td>
<td>String Quartet</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Slavonic Dance</td>
</tr>
<tr>
<td>7</td>
<td>Trumpet Concerto</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Fanfare</td>
</tr>
<tr>
<td>9</td>
<td>Polonaise</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Brandenburg Concerto</td>
</tr>
</tbody>
</table>

The two tables below list the instructions given for the odd-numbered lessons and the even-numbered lessons, respectively.
Listening Instructions Provided to Treatment Group and Control Group for *Odd-Numbered* Lessons

**MINDFUL LISTENING GROUP**

1st PLAYBACK:

“When two different people read the same book aloud, they are saying the same thing, but they sound different. It is similar with music. Two groups of musicians might play the same music, but it will sound slightly different. For example, some parts might be louder or softer. You will now hear one musical composition played twice. It may be played by the same group of musicians both times, or it may be a different group of musicians for each of the two times.”

“Listen to this music. Pretend it tells you a story. Try to find out if this music tells a story to you. Your story may be completely different than the story of others, and that is okay. Make sure you notice how the story changes through the beginning, middle, and end. For example, if your story has a boy in it, was he perhaps calm, happy, or sad at the beginning? Did he change in the middle, perhaps becoming sleepy? Did he change even more at the end of the music? You will hear the music performed two times. Remember, each performance may have a different group of musicians playing.”

2nd PLAYBACK:

[Teacher reads instructions from listening map lesson.]

**CONTROL GROUP**

1st PLAYBACK:

“Please listen carefully to the following music.”

2nd PLAYBACK:

[Teacher reads instructions from listening map lesson.]
Listening Instructions Provided to Treatment Group and Control Group for *Even-Numbered* Lessons

<table>
<thead>
<tr>
<th>MINDFUL LISTENING GROUP</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; PLAYBACK:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“When two different people read the same book aloud, they are saying the same thing, but they sound different. It is similar with music. Two groups of musicians might play the same music, but it will sound slightly different. For example, some parts might be louder or softer. You will now hear one musical composition played twice. It may be played by the same group of musicians both times, or it may be a different group of musicians for each of the two times.”</td>
</tr>
<tr>
<td></td>
<td>“Listen to this music. Pretend it tells you a story. Try to find out if this music tells a story to you. Your story may be completely different than the story of others, and that is okay. Make sure you notice how the story changes through the beginning, middle, and end. For example, if your story has a boy in it, was he perhaps calm, happy, or sad at the beginning? Did he change in the middle, perhaps becoming sleepy? Did he change even more at the end of the music? You will hear the music performed two times. Remember, each performance may have a different group of musicians playing.”</td>
</tr>
<tr>
<td></td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; PLAYBACK:</td>
</tr>
<tr>
<td></td>
<td>“Please listen once more to the music.”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTROL GROUP</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; PLAYBACK:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Please listen carefully to the following music.”</td>
</tr>
<tr>
<td></td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; PLAYBACK:</td>
</tr>
<tr>
<td></td>
<td>“Please listen once more to the music.”</td>
</tr>
</tbody>
</table>
The listening maps and listening-map-based lesson scripts are included below for the odd-numbered lessons.

**Lesson 1: Troika**

**Instructions (From *Share the Music Resource Masters, Grade 4*, page 8):**

Have students identify as many instruments as they can on the listening map. (tambourine, triangle, jingle bells, trombone, saxophone, violin, and piccolo) Explain that the sleigh a and the horses b represent two phrases which, when heard together, make up the main melody of this selection. Have students find the difference between the pictures for the first row melody and the others. (sleigh and horses are standing still in the first row melody and moving very fast in the others) Note that at the end there is an extra b part, in which the horses are shown standing still as in the beginning.

**Lesson 1 Teacher Script**

- Now we are going to listen to the music and look at a listening map to help.
- First, look at the map. What instruments do you see?
  - [Students reply]
- The sleigh, which has an “a” by it [point to sleigh], represents a musical phrase. This phrase makes half of the main melody for that part.
- The horses, which have a “b” by them [point to horses], represent the next musical phrase. This phrase makes up the second half of the main melody for that part.
- What is difference between the pictures on the first row [point] and the other pictures of the sleigh and horses?
  - [They are still in the first row but moving in the others]
- What is different at the end [point to last row]?
  - [Students reply] There is an extra set of horses, or “b” part.
- Now, let’s listen.
Troika (entire) from Lieutenant Kijé Suite
by Sergei Prokofiev
Lesson 3: Shrovetide Fair

Instructions (From *Share the Music Resource Masters, Grade 4*, page 82):

Ask students to identify each instrument on the listening map. (flute, trumpet, bass drum, violin, piano keyboard) The arrows around the flute player show the general direction of the flute solo. The two stars above each character’s head at the end of the first row represent the three pairs of piccolo notes... The upward arrows in the B section represent the ascending xylophone runs. In the D section, the wavy line represents the ascending and descending clarinet runs. Have students echo-clap the rhythm of the A section. Find all six $A$ or $A'$ sections on the map before listening.

Lesson 3 Teacher Script

- Now we are going to listen to the music and look at a listening map to help.
- First, look at the map. What instruments do you see?
  - [Students reply]
  - These arrows around the flute player show when the flute solo goes up and down [point].
  - The two stars above each character’s head at the end of the first row show three pairs of piccolo notes [point].
  - The upward arrows in the B section [point] show when the xylophone plays a fast run going up.
  - The wavy line in the D section [point] shows when the clarinet plays music that goes up and down.
  - Let’s clap the rhythm of the A section [point]. I’ll clap it in small parts, and you echo me. [Teacher claps two measures; students echo. Do this until all eight measures are clapped.]
  - One last thing before we listen. How many times do you see an “A” in a triangle?
    - [Students reply]
  - Now, let’s listen.
The Shrovetide Fair (excerpt) from Petrushka
by Igor Stravinsky

Introduction: A man at the fair makes puppets come to life with his flute.
Lesson 5: String Quartet

Instructions (From Share the Music Resource Masters, Grade 5, page 54):

Point out the rhythm of the theme and echo-clap the rhythm. Have the students find each lettered section and subsection on the map, and tell the form. (A B A’ C A” coda) The number of measures for each part is given to help keep track of elapsed time. The map shows texture, relative pitch levels, and dynamics in an abstract way. Darker dots represent louder sounds. The downward-flowing ribbons represent descending runs, and the curled symbols represent ornamented passages. Point out the quarter rests, the fermata, and the parts labeled minor. Also note the repeat signs before listening.

Lesson 5 Teacher Script

- Now we are going to listen to the music and look at a listening map to help.
- Let’s clap the rhythm here at the top of the map [point]. [Teacher claps; students echo.]
- Find the letters in shapes on the map. These represent different sections of the music. What is the order of the sections? We call this the “form” of the music.
  - [Students reply] A B A’ C A” coda
- The map tells you how many “bars” there are for each place on the map. Each bar gets two beats, like this. [Teacher claps, calling out a number on every other beat to count measures.]
- Loudness and softness in music is called “dynamics.” In this map, darker dots represent louder sounds [point].
- The downward-flowing ribbons [point] represent music that goes down quickly.
- The curled symbols [point] represent “ornamented” parts. This means they are decorated.
- Look at these repeat signs [point to the first “A” section]. The music between repeat signs is repeated [point to show repeats].
- Look at the end of the “B” section. This is called a “fermata” [point]. Here, the musicians hold the music longer and the beat stops for a moment.
- Now, let’s listen.
String Quartet Op. 33, No. 3, Fourth Movement
by Franz Joseph Haydn

Aa Theme

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Coda

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Use with page 244. Grade 5
Lesson 7: Trumpet Concerto

Instructions (From *Share the Music Resource Masters, Grade 5*, page 92):

Have the students locate the main section on the map. (A A’ B A” cadenza, closing) Ask the students which section does not contain the theme. (B) Next have them tell if the orchestra or the trumpet is featured in the various sections. (A: orchestra; A’: trumpet; B: both trumpet and orchestra; A”: trumpet; cadenza: trumpet; closing: orchestra) Explain that the cadenza is a special section near the end of a concerto movement, featuring the solo instrument without orchestral accompaniment. Play the theme on a pitched instrument before playing the recording so that the students will recognize it when they hear it within the orchestra.

Lesson 7 Teacher Script

- Now we are going to listen to the music and look at a listening map to help.
- First, look at the map. What main sections do you see?
  - [Students reply] (A A’ B A” cadenza, closing)
- This is the music of the theme [point to theme in first section]. The theme sounds like this [teacher sings theme twice].
- Which section does not have the theme in it?
  - [Students reply] (B)
- Which sections feature the trumpet, which feature the orchestra, and which have both?
  - [Students reply] (A: orchestra; A’: trumpet; B: both trumpet and orchestra; A”: trumpet; cadenza: trumpet; closing: orchestra)
- This section is for the “cadenza” [point]. A “cadenza” is a special section in some types of music where the solo instrument plays alone without the orchestra.
- Now, let’s listen.
Trumpet Concerto in E♭, First Movement
by Franz Joseph Haydn

A orchestra

Theme

plus other melodies

A trumpet, orchestra

Theme

plus other melodies

B orchestra and trumpet

Keys change.
Melodies are varied.
Motives are echoed.

A trumpet, orchestra

Theme

Cadenza

Orchestra closing
Lesson 9: Polonaise

Instructions (From Share the Music Teachers’ Edition, Grade 5, page 391-G-H):

Following the listening map:
Each triangle (representing one measure in 3/4 meter) resembles the conducting pattern, with the dark vertical line standing for the downbeat. Explain that the pianist makes slight changes in tempo for expressive purposes. This is known as rubato. The different colors of the triangles and different dance poses show the internal aba parts of this section. The theme in the c parts of the B section provides an opportunity to trace the melodic contour with hands in the airs. Note the Da Capo alFine.

Teaching suggestions:
Practice conducting in 3/4. Listen for a strong beat in the first part of the A section, while watching you follow the map.

Conduct to show 3/4 meter for the b part of the A section, and then listen for the strong beat in the last part.

Listen and follow the melodic contour during the c parts of the B section, and listen for the trills and rhythm patterns of the a part.

Lesson 9 Teacher Script

- Now we are going to listen to the music and look at a listening map to help.
- First, let’s clap the rhythm here at the top of the map [point]. [Teacher claps; students echo.]
- The music we are going to hear has three beats in each measure, so we count it like this [teachers says “ONE, two, three, One, two three]. You can conduct it by making small triangles in the air with your finger [teacher demonstrates]. Now try it with me.
  - [Students and teacher conduct in small triangles with finger while counting ONE, two three, ONE, two three]
- Each triangle you see on the map represents one measure of three beats.
- What main sections do you see?
  - [Students reply] (A and B)
- In the “A” section [point], what sections do you see?
  - [Students reply] (a, b, a)
- In the “A” section, look at the repeat sign [point]. This means that music will be repeated. At the end of the “A” section you see the word “fine” [point]. That means end.
- In the “B” section, there are three main parts: c, d, and c [point].
- The rhythm of the c section sounds like this. Clap it back after me.
  - [Teacher claps first two measures of “c,” students repeat]
- The rhythm of the “d” section sounds like this. Clap it back after me.
  - [Teacher claps first measure of “d,” students repeat]
- Now, let’s listen.
Polonaise in A Major Op. 40, No. 1
(Military Polonaise)
by Frédéric François Chopin

Theme
\[ \frac{3}{4} \]

A
\[ \frac{3}{4} \] a

B
\[ \frac{3}{4} \] c

Da Capo al Fine, no repeat

Use with pages 391C-H. * Grade 5
APPENDIX B

IRB FORM
EXEMPTION CERTIFICATION

MEMO: William Anderson,
Fine Arts - Art
c/o Cecilia Wang
105 Fine Arts Bldg.
0022
P1 phone #: (859) 974-1826

FROM: Institutional Review Board
c/o Office of Research Integrity

SUBJECT: Exemption Certification for Protocol No. 11-0739-X4B

DATE: October 7, 2011

On September 29, 2011, it was determined that your project entitled, The effect of mindful listening instruction versus listening-mood-based instruction on listening sensitivity, meets federal criteria to qualify as an exempt study.

Because the study has been certified as exempt, you will not be required to complete continuation or final review reports. However, it is your responsibility to notify the IRB prior to making any changes to the study. Please note that changes made to an exempt protocol may disqualify it from exempt status and may require an expedited or full review.

The Office of Research Integrity will hold your exemption application for six years. Before the end of the sixth year, you will be notified that your file will be closed and the application destroyed. If your project is still ongoing, you will need to contact the Office of Research Integrity upon receipt of that letter and follow the instructions for completing a new exemption application. It is, therefore, important that you keep your address current with the Office of Research Integrity.

For information describing investigator responsibilities after obtaining IRB approval, download and read the document "PI Guidance to Responsibilities, Qualifications, Records and Documentation of Human Subjects Research" from the Office of Research Integrity's Guidance and Policy Documents web page [http://www.research.uky.edu/ori/human/guidance/htm/fqpps]. Additional information regarding IRB review, federal regulations, and institutional policies may be found through ORI's web site [http://www.research.uky.edu/ori]. If you have questions, need additional information, or would like a paper copy of the above mentioned document, contact the Office of Research Integrity at (859) 257-9428.
PILOT STUDY

Prior to conducting the main study, the researcher carried out a pilot study. The main reasons for engaging in the pilot study was to assess the appropriateness of the measurement instruments for the Dependent Variables, to analyze the appropriateness of three randomly selected lessons (all 10 of which has already been prepared for the main study), and to ensure that the mindful listening instructions for the treatment group were clear and sensible to the students. The data resulting from this pilot study provided useful information for the research procedure in the main study. Changes based on the data gathered from the pilot study are listed below in the “conclusions and proposed revisions” section.

Research Questions

1.) What is the effect of Mindful Listening Instruction on student Listening Sensitivity?

2.) What is the effect of Mindful Listening Instruction on student Listening Enjoyment?

3.) What is the effect of Mindful Listening Instruction on student Music Concept Recall?

Statement of Hypotheses

1.) Research Hypothesis 1: Using Mindful Listening Instruction with regular listening instruction results in greater student Listening Sensitivity than regular listening instruction alone.
2.) Research Hypothesis 1: Using Mindful Listening Instruction with regular listening instruction results in greater student Listening Enjoyment than regular listening instruction alone.

3.) Research Hypothesis 3: Using Mindful Listening Instruction with regular listening instruction results in greater student Music Concept Recall than regular listening instruction alone.

**Independent Variable**

Listening Instruction – two levels: Mindful and Control.

**Dependent Variables**

Three Dependent Variables were investigated in this study:

1.) Music Listening Sensitivity
2.) Music Listening Enjoyment
3.) Music Concept Recall

**Participants**

Fifth grade students from an intact class (N = 22) at an elementary school were randomized into two groups: mindful and control (n = 11 each). One student in the control group left the school during the course of the study, leaving n = 10 for the control group.
Pretest

Instrumentation

Gordon’s *Intermediate Measures of Music Audiation, Tonal* (IMMA-T) was used as a pretest to determine if a significant difference existed between the two groups.

Posttest

Instrumentation

Gordon’s *Music Aptitude Profile – Sensitivity – Phrasing* (MAP-S-p) and the researcher-created *Music Listening Questionnaire* (MLQ) were used. The MAP-S-p score was used as a measure of the Music Listening Sensitivity Dependent Variable.

The MLQ consisted of two questions. The first (MLQ1) was “How much have you enjoyed listening to the music we’ve heard together with our listening maps over the past three lessons?” Students replied using a single Likert-type scale (range = 1 to 7; 1 = low enjoyment, 7 = high enjoyment); this single question, MLQ1, was used as a measure of the Music Listening Enjoyment Dependent Variable.

The second question (MLQ2) allowed for an open written response to the question ‘Name which of the three pieces we’ve heard together over the past three lessons did you like the best? Why did you like it the best? Use as many music words as you can in your explanation.’ The researcher then counted the number of music-related words (regardless of accuracy in usage) to create a score. The MLQ2 score was used as a measure of Music Concept Recall.
**Procedure**

The pilot study lasted five weeks. In Table 1 the procedure for each week is listed. Lessons A, B, and C (adapted from *Share the Music*) were used with both groups. (The instructions and lessons titles for Lessons A, B, and C are listed at the end of this appendix; for the listening map images, refer to Appendix A; for information regarding the musical recordings used, see Chapter 3.) However, the mindful listening treatment group was read the instructions shown in Table 2 in addition to the lessons. Listening maps were displayed on a SmartBoard in the classroom.

**Table 1: Treatment schedule**

<table>
<thead>
<tr>
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<th>Mindful Treatment Group</th>
<th>Control (Listening-Map Group)</th>
<th>Same or Different Recordings</th>
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<td><strong>Week 1:</strong></td>
<td>Pretest (IMMA-T)</td>
<td>Pretest (IMMA-T)</td>
<td></td>
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<td><strong>Week 2:</strong></td>
<td>Lesson A + Mindful Listening Script</td>
<td>Lesson A</td>
<td>Same</td>
</tr>
<tr>
<td><strong>Week 3:</strong></td>
<td>Lesson B + Mindful Listening Script</td>
<td>Lesson B</td>
<td>Same</td>
</tr>
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<td><strong>Week 4:</strong></td>
<td>Lesson C + Mindful Listening Script</td>
<td>Lesson C</td>
<td>Different</td>
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<tr>
<td><strong>Week 5:</strong></td>
<td>Posttest (MAP-S-p; MLEQ)</td>
<td>Posttest (MAP-S-p; MLEQ)</td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Listening instructions provided to each group

**MINDFUL LISTENING GROUP**

Random assignment

“When two different people read the same book aloud, they are saying the same thing, but they sound different. It is similar with music. Two groups of musicians might play the same music, but it will sound slightly different. For example, some parts might be louder or softer. You will now hear one musical composition played twice. It may be played by the same group of musicians both times, or it may be a different group of musicians for each of the two times.”

“Listen to this music. Pretend it tells you a story. Try to find out if this music tells a story to you. Your story may be completely different than the story of others, and that is okay. Make sure you notice how the story changes through the beginning, middle, and end. You will hear the music performed two times. Remember, each performance may have a different group of musicians playing.”

**CONTROL GROUP**

Random assignment

[Read directions from listening map Lesson A, B, or C]

For each piece, both groups heard each musical excerpt twice. For each piece, the second listening excerpt may have been the exact same as the first or may have been a different recording (for example, with a different orchestra playing the same musical score). Table 1 indicates which lessons will use the same excerpt and which lessons will use different excerpts during the lesson.
The listening excerpts were chosen based on the compositions, which included listening maps in the textbook series *Share the Music*, grade levels 4 and 5. After compiling all of the compositions with listening maps in these texts, the researcher excluded non-Western and non-instrumental music. Hence, the researcher used only Western instrumental music for this study. Non-Western music was excluded from this study because the pretest and posttest predominately measure musical abilities with regard to Western music; therefore, the use of the pretest and posttest may not accurately measure the possible effect of the treatment if non-Western music were used. Vocal music was excluded to prevent lyrics from influencing the treatment for the mindful listening group (which instructs the listener to think of a story).

Of the Western instrumental music that included listening maps in the grade 4 and grade 5 texts of *Share the Music*, five excerpts were randomly chosen from each grade, for a total of 10 listening maps with music. For the current pilot study, three of these 10 were randomly chosen for inclusion in the study.

**Results**

Data collected were investigated using statistical analyses; significance testing was determined at the level of $\alpha = .05$. Results are described below, and the statistical results are presented in the tables below.

**Pretest**

The mindful group and the control group took the pretest, the IMMA-T. The IMMA-T pretest scores of the randomized groups were compared using Student’s $t$-test to investigate for any differences between the groups. An F-test for the significance of
the difference between the variance of the two samples yielded $p = .132$, a value greater than $\alpha = .05$, indicating no significant difference between the variances of the two groups. The results of the $t$-test between the two groups yielded $p = .226$, a value greater than $\alpha = .05$; hence, no statistically significant difference existed between the two groups on the pretest. Therefore, no covariate was necessary for statistical testing of the posttest scores.

Posttest

A MANOVA was computed at $\alpha = .05$ after posttest data collection. MANOVA showed no significant treatment effect ($p = .998$). Thus, ANOVA testing for each DV was computed to investigate for any other notable findings. Correlations between the variables were insignificant at the .05 alpha level, with one exception: The correlation between Sensitivity and Recall was significant at $p = .011$. This indicates that the variables of Sensitivity and Enjoyment are different measures of listening responses while Recall may be related to Sensitivity.
### ANOVAs of DVs

#### Sensitivity  
**Mindful**
- Mean: 42.45
- SD: 8.39

**Control**
- Mean: 41.7
- SD: 9.60

**Total**
- Mean: 42.10
- SD: 8.77

#### Enjoyment  
**Mindful**
- Mean: 5.54
- SD: 1.70

**Control**
- Mean: 5.6
- SD: 1.17

**Total**
- Mean: 5.57
- SD: 1.43

#### Recall  
**Mindful**
- Mean: 2
- SD: 1.48

**Control**
- Mean: 1.9
- SD: 1.60

**Total**
- Mean: 1.95
- SD: 1.50

### DV Correlations

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<tr>
<td>Recall</td>
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<td>.013</td>
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**Cell Contents:** Pearson Correlation

**p-value**
Discussion

The listening maps used in this study may have influenced the stories that students in the mindfulness group developed to accompany each excerpt. However, as both treatment groups saw the same listening maps, the possibility of the solely visual stimuli affecting the differences between the groups is controlled.

The lack of statistical significance was expected considering the small sample size and short treatment duration. However, the pilot yielded data that could be used to modify the experimental protocol for the main study. This information is discussed below.

Conclusions and Proposed Revisions for Main Study

1.) As a pretest, administer the complete IMMA (both the tonal and the rhythm sections) instead of only administering the IMMA tonal section. For college students, similarly administer the complete AMMA. The complete IMMA and AMMA can each be administered in a single 45 minute class period. Also, having data for the entire exam will allow conversion to standardized scores, as well as provide a greater amount of data for investigating any potential initial differences between groups.

2.) Add teacher scripts, based on instructions from Share the Music (1995, 2003), to the listening-map lesson plans. The instructions supplied for the pilot were from Share the Music but without a teacher script. Providing a teacher script will ensure greater uniformity when lessons are delivered to different groups at distinct times by varying instructors.
3.) The measurement instrument for the *Music Listening Sensitivity* Dependent Variable seemed appropriate and provided an acceptable range of responses.

4.) The measurement instrument for the *Music Concept Recall* Dependent Variable seemed to not provide reliable or valid data. Student responses were limited and random. Most likely, lack of music vocabulary skills resulted in difficulty in this measurement. As it would be beyond the scope of the present study to provide intensive instruction in music vocabulary skills, this Dependent Variable (and the hypothesis which accompanies it) would best be omitted from the study. Depending on the data gathered in the study, future research could consider alternative ways of investigating this domain.

5.) To provide more data for the *Music Listening Enjoyment* Dependent Variable, a second question will be added to the measurement instrument: “How much would you like to hear this music again in the future?” Participants will respond to this statement using a seven-point Likert-type scale. A similar method for measuring Enjoyment was also used in previous research (Anderson, 2011b).

6.) To gather more data, the researcher decided to ask students to rate their listening enjoyment after each individual lesson (rather than only as a composite at the end of the study). Also, in an attempt to more clearly measure solely listening enjoyment, the question will be rephrased to emphasize the music listening experience without mention of the listening map. The question will now be presented as follows. “How much did you enjoy listening to the music we heard together today?”
7.) Some students in the mindful listening group asked what was meant in the instructions by the phrase “Make sure you notice how the story changes through the beginning, middle and end.” Therefore, adding an example of what this means may prove helpful for the study. The following sentence will be added to the instructions: “For example, if your story has a boy in it, was he perhaps calm, happy or sad at the beginning? Did he change in the middle, perhaps becoming sleepy? Did he change even more at the end of the music?”

8.) Some students seemed to be distracted by the colorful design of the listening maps, to such an extent that the maps became a distraction to their listening. As the colors were not essential for the purposes of this study, the researcher decided to use black-and-white versions of the listening maps for the main study. The maps chosen for the study were already available in Share the Music (1995, 2003) as black-and-white versions for use with monochrome photocopiers.

9.) The researcher discussed the procedure with the students who participated in the pilot study. Some students indicated that the visual design of the listening maps at times seemed to distract them from actually listening to the music, so the researcher decided to present the listening map only during the second playback of each music recording. During the first playback, the map was not displayed. This allowed students to initially listen to the music without the potential distraction of the listening map during the first listening.

10.) The changes mentioned in the previous two points in this list; namely, that the listening maps would be used in black-and-white format, and that listening maps would only be presented for the second of the two playbacks; resulted in the
decision to slightly modify the mindfulness treatment delivery. The revision is as follows. For the first playback of each piece, both groups heard the music played without the projection of the listening map. In addition, during the first playback, the mindful listening group was read the mindful listening instructions; for the control group, students were asked only to listen to the music. For the second playback of each piece, both groups received the same listening-map-based instruction.

11.) To further emphasize listening and decrease the potential aural/visual interaction, the researcher decided to use listening-map-based lessons in only half of the treatments. The half of the treatments that did not use listening maps solely used the mindful listening instructions for the experimental group and only the instruction “Please listening carefully to the following music” for the control group. For the college student participants, three of the five treatment periods did not use listening maps, and two of the five did use listening maps. Since the treatment lasted for five weeks, an odd number, the decision to include one additional non-listening map session instead of one additional listening map session was made at random. The researcher had already identified the 10 maps for use in the study. Of the listening maps which were removed from the treatment, three of the five were chosen because they were only available in color graphics (and hence would have required conversion to black-and-white, resulting in loss of image quality). The remaining two maps to be removed were removed at random. The lesson order was slightly adjusted so that treatment sessions alternated between listening-map-based and non-listening-map-based lessons.
12.) A second testing instrument was added for measuring Music Listening Sensitivity to collect additional data on this variable. The instrument was the researcher-created Anderson Test of Music Listening Sensitivity (ATMLS). The researcher designed the test using pairs of musical excerpts from Western instrumental music. All of the compositions included in the test are included in the Share the Music textbook series for student listening. For some of the pairs, the recordings of the excerpts were exactly the same (from the same recording). For other pairs, the excerpts were of the same musical composition played by different performing ensembles (from different recordings). The test is described further in a separate appendix.
Lesson A: Troika

Instructions (From Share the Music Resource Masters, Grade 4, page 8):

Have students identify as many instruments as they can on the listening map. (tambourine, triangle, jingle bells, trombone, saxophone, violin, and piccolo) Explain that the sleigh a and the horses b represent two phrases which, when heard together, make up the main melody of this selection. Have students find the difference between the pictures for the first row melody and the others. (sleigh and horses are standing still in the first row melody and are moving very fast in the others) Note that at the end there is an extra b part, in which the horses are shown standing still as in the beginning.

Lesson B: Shrovetide Fair

Instructions (From Share the Music Resource Masters, Grade 4, page 82):

Ask students to identify each instrument on the listening map. (flute, trumpet, bass drum, violin, piano keyboard) The arrows around the flute player show the general direction of the flute solo. The two stars above each character’s head at the end of the first row represent the three pairs of piccolo notes... The upward arrows in the B section represent the ascending xylophone runs. In the D section, the wavy line represents the ascending and descending clarinet runs. Have students echo-clap the rhythm of the A section. Find all six A or A’ sections on the map before listening.

Lesson C: Brandenburg Concerto

Instructions (From Share the Music Resource Masters, Grade 5, page 92):

Have the students locate the main section on the map. (A A’ B A” cadenza, closing) Ask the students which section does not contain the theme. (B) Next have them tell if the orchestra or the trumpet is featured in the various sections. (A: orchestra; A’: trumpet; B: both trumpet and orchestra; A”: trumpet; cadenza: trumpet; closing: orchestra) Explain that the cadenza is a special section near the end of a concerto movement, featuring the solo instrument without orchestral accompaniment. Play the theme on a pitched instrument before playing the recording so that the students will recognize it when they hear it within the orchestra.
The listening maps for Troika and Shrovetide Fair can be found in appendix A.

The listening map for Brandenburg Concerto is included here on the following page, as the listening map for Brandenburg Concerto was not used in the main study. The maps presented in this document are black-and-white; color versions of these maps were used during the pilot study.
Brandenburg Concerto No. 2, Third Movement
by Johann Sebastian Bach
MUSICAL SENSITIVITY TEST – PHRASING

NAME: ________________________ DATE:____________ CLASS: _____________

This test will tell how sensitive you are to musical phrasing. Please listen to the instructions on the recording.

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Music Listening Questionnaire

1.) How much have you enjoyed listening to the music we’ve heard together with our listening maps over the past three lessons?

Circle one number for your answer.

Very Little      Some          Very Much
1  2  3  4  5  6        7

__________________________________________________________________________

2.) Which one of the three pieces we’ve heard together over the past three lessons did you like the best? Why did you like it the best? Use as many music words as you can in your explanation.

The piece I enjoyed the best: _______________________________.

Why?
APPENDIX D

MUSIC EXPERIENCE QUESTIONNAIRE (MEQ)
Music Experience Questionnaire

Instructions:

Fill in the appropriate circles below. If you answer “yes” to a question, fill in the blanks.

1.) Have you ever participated in an instrumental music ensemble?
   ○ Yes If yes, how many years? ______________
   If yes, circle the type.
   ○ BAND / ORCHESTRA / OTHER
   ○ No

2.) Have you ever participated in a vocal music ensemble?
   ○ Yes If yes, how many years? ______________
   If yes, circle the type.
   ○ CHOIR (OR CHORUS) / OTHER
   ○ No

3.) Have you ever participated in private music lessons outside of school?
   ○ Yes If yes, how many years? ______________
   If yes, what kind? ________________
   ○ No

4.) Have you participated in any other musical activities outside of school?
   ○ Yes If yes, how many years? ______________
   If yes, what activities? ________________
   ○ No
APPENDIX E

MUSIC LISTENING QUESTIONNAIRE (MLQ)
AS USED IN MAIN STUDY
Music Listening Questionnaire

1.) How much have you enjoyed listening to the music we’ve heard together in this lesson?

   Circle one number for your answer.

   Very Little     Some         Very Much
   1               2            3           4           5           6           7

2.) How much would you like to hear this music again in the future?

   Circle one number for your answer.

   Very Little     Some         Very Much
   1               2            3           4           5           6           7
TEST ADMINISTRATION INSTRUCTIONS

INSTRUCTIONS FOR THE PROCTOR

Ensure that all students have a pencil and an answer sheet with their name, class, and date clearly written.

Next, read the following instructions to students:

“This test will measure your ability to hear small changes in musical excerpts. There are 20 items on this test. After the number for each item is announced, you will hear a pair of two similar musical excerpts separated by a slight pause. For each item, listen carefully to the two musical passages and answer whether they are the same or different. Some differences might be very small, so you must listen carefully. You should mark your answer before the next item number is announced so that you can listen closely to the music.”

After reading the instructions, ask if there are any questions regarding the instructions and answer any questions regarding the procedure for the test. Remind students that they must remain quiet during the test so as not to distract others or prevent others from clearly hearing the excerpts. Then, playback the MP3 file, making sure that the volume is loud enough for all students to hear it clearly.
The purpose of this test is to find out how well people listen. Please answer every question. It is alright to guess if you are unsure of an answer. Please listen to the instructions of your instructor.

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ANDERSON TEST OF MUSIC LISTENING SENSITIVITY (ATMLS)

**ANSWER KEY**

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Discography of Music Used as Test Stimuli

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| 3. | No        | Bydlo from Discography of Music Used as Test Stimuli (continued)
     |           | Mussorgsky, M.   |
     |           | (1874). *Pictures at an Exhibition* |
     |           | [recorded by Cleveland Orchestra, conducted by G. Szell]. On *Share the Music, Grade 2, Disc 5 [CD]* New York, NY, McGraw-Hill Classical. [Reproduced from Sony Music Special Products] |
|     |           | Mussorgsky, M.   |
     |           | (1874). *Pictures at an Exhibition* |
| 4. | No        | March of the Wooden Soldiers from *Album for the Young* by Tchaikovsky, arr. Dubinsky |
|     | Same      | Tchaikovsky, P. I. |
|     |           | n/a |
| 5. | No        | Caprice in A minor (excerpts) by Paganini |
|     | Same      | Paganini, N. (1809). |
|     |           | *Caprice in A Minor* (excerpts) [recorded by Midori, Violin]. On *Share the Music, Grade 3, Disc 6 [CD]* New York: NY, McGraw-Hill Classical. [Reproduced from Sony Music Special Products] |
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183
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DOI: 10.1007/s10942-006-0022-5


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207


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Case Western Reserve University, Cleveland.
VITA

Name
William Todd Anderson

Date and Place of Birth
October 24, 1981
Bowling Green, KY

Educational Institutions Attended and Degrees Awarded

Visiting Student
City College
City University of New York
New York, NY
2010-2011

Orff Schulwerk Graduate Certificate
University of Kentucky
Lexington, KY
2005

Rank One in Music Education
University of Kentucky
Lexington KY
2005
Master of Music
University of Kentucky
Lexington, KY
2004

Visiting Student
California State University, Los Angeles
Los Angeles, CA
2004

Bachelor of Music in Music Education
University of Kentucky
Lexington, KY
2003

Professional Positions Held
2007-Present  General and Choral Music Education Specialist, Grades PK-8
P.S./I.S. 210:
The Twenty-First Century Academy for Community Leadership
New York, NY
2006-2007  Choral Music Director, Grades 6-8
I.S. 218, Salomé Ureña Middle School
New York, NY
2004-2006  Arts and Humanities Specialist and Music Educator, Grades K-5
Cane Ridge Elementary School
Paris, KY
2002-2005  Director of Music, Organist, and Choir Director
North Middletown Christian Church
North Middletown, KY
2001-2002  Director of Music, Organist, and Choir Director
Carlisle Presbyterian Church
Carlisle, KY
2000-2001  Choral Musician and Children’s Choir Director
Hunter Presbyterian Church
Lexington, KY

Scholastic and Professional Honors
2011-2012  Reviewer for publication *Psychology of Music*
2011-2012  Dalcroze Society of America Memorial Scholarship
2010-2012  Phi Kappa Phi Honor Society
2000-2012  University of Kentucky Scholarships:
            Keyboard Scholarship (2000), Vocal Scholarship (2000-2003),
            Merit Scholarship (2000-2004), McCracken Scholarship Award
            (2001), University of Kentucky Friends of Music Travel Grant
            (2001), Flossie Minter Greene Memorial Grant (2002), University
            of Kentucky Friends of Music General Scholarship (2003), School
            of Music Support Award (2010-1012)
2006  Distinguished Participant, Kentucky Music Educators Convention
2004       Full Scholarship, Sewanee Church Music Conference
2003       Summa cum Laude Graduate, Standard Bearer

University of Kentucky, B. M. in Music Education

Professional Publications and Presentations


Anderson, W. T. (February 9, 2006). “An Investigation of the Use of Rhythmic Manipulatives versus Practice of Teacher-Written Rhythms on Students’ Ability to Identify Correct and Incorrect Performances of the Rhythms.” Presentation at Kentucky Music Educators’ Association State Conference, Louisville, KY.


**Professional Memberships**

- Dalcroze Society of America
- American Choral Directors Association
- American Orff Schulwerk Association
- The National Association for Music Education
- National Education Association
- United Federation of Teachers

William Todd Anderson

April 11, 2012