

THE RELATIONSHIP OF LEARNING STYLES AND MIDDLE SCHOOL STRING  
ORCHESTRA STUDENTS

FEROL P. CARYTSAS

SUPERVISORY COMMITTEE:

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A PROJECT IN LIEU OF THESIS IS PRESENTED TO THE COLLEGE OF FINE ARTS OF  
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*This project is dedicated to my parents:*

*Mom: for your unconditional love, patience, friendship, all the late nights spent proof reading papers and always believing I could achieve anything I wanted to accomplish*

*Dad: who continually inspired me with his creativity and always encouraged my quest for knowledge*

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Summary of Project Option in Lieu of Thesis  
Presented to the College of Fine Arts of the University of Florida  
in Partial Fulfillment of the Requirements for the  
Degree of Master of Music

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By

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Chair: Charles R. Hoffer  
Major: Music Education

The purpose of this descriptive study was to examine the relationship of learning styles and the musical instruments studied by middle school string orchestra students. The specific research questions investigated were: the relationship between student learning styles and the musical instruments studied, whether students chose the instrument they currently played in their school orchestra program, and if an overall trend of a particular learning style existed within the study. Participants ( $N=229$ ) were students selected through convenience sampling from one middle school string orchestra program in the Tampa Bay area. Students were asked to complete a shortened version of the VARK learning inventory questionnaire and results were analyzed using descriptive statistics. An overall trend was observed within the study that the preferred learning style of string orchestra students was kinesthetic, suggesting that a relationship existed between student learning styles and the musical instrument studied.

## **CHAPTER ONE**

### **Introduction**

Different studies have been conducted on the relationship between learning styles and music. Moore (1990) conducted a study examining the relationship between compositional processes and learning styles. Zhukov (2007) conducted a study regarding student learning styles in advanced music lessons. In another study, undergraduate music students' learning styles were examined, the mean scores of their learning preference were measured, and differences among classes and gender were determined (Tanwinit & Sittiprapaporn, 2010). There is no apparent evidence that the relationship between learning styles and musical instruments studied by middle school students has been researched. The need for this study is to contribute research to the area of learning styles and musical instruments studied among middle school string orchestra students.

### **Statement of purpose**

The purpose of this descriptive study was to examine the relationship of learning styles and the musical instruments studied by middle school string orchestra students.

The research questions included:

1. Is there a relationship between student learning styles and the musical instruments studied?
2. Did students choose the instrument they are currently playing or was it chosen for them?
3. Is there an overall trend within the study toward a particular learning style?

### **Limitations**

It is acknowledged that most individuals are multi-modal, but it was assumed that the majority of individuals would have one dominant learning style. Self-reported data from

students can have intrinsic restrictions and could be biased because it is self reported. In spite of this limitation, self-reported data were considered to be the only realistic way to obtain data from the students.

### **Application of research**

This research can serve as a supplemental tool for teachers enabling them to consider students' learning styles when helping them select a musical instrument. Teachers can use this research to communicate instruction in a way that students will process the information to the best of their ability. The result should increase instruction time, thus create more efficiency in the classroom. This research is not an attempt to stereotype learning styles with specific instruments.

## CHAPTER TWO

### Review of the Literature

#### Learning Styles

Learning styles can be defined numerous ways, but for the purpose of this study, the term ‘learning style’ will be defined as an individual’s preferred approach to learning. The concept of teaching to one’s learning style has become increasingly popular. Individuals learn to adapt learning styles, also known as learning modalities or sensory modalities, to meet different learning situations, but generally individuals have a dominant learning style (Silver, Strong & Perini, 2000; Sprenger, 2003). Learning style inventories classify individuals into categories and this is attractive to students and parents because it allows students to be seen as unique individuals (Pashler, McDaniel, Rohrer & Bjork, 2008). Knowledge of learning styles enables teachers to discuss the way students learn and how their preferences for specific forms of thinking processes affect their learning behaviors (Silver et al., 2000). Several learning style theories exist, but only the more prominent theories will be examined.

Psychologist Carl Jung is considered to be the father of the learning style theory (Snyder, 1999). In the 1920’s, he introduced the idea that individuals have different methods, or preferences, of perceiving and judging information. (Myer-Briggs Foundation, n.d.; Silver et al., 2000). Jung felt that these different methods represented the characteristics of an individual’s personality (Silver et al., 2000).

#### *Learning Style Inventory*

During 1968-69, Dunn and Dunn (1978) developed and tested a sequence of questions to determine students’ self-identified learning style preferences. These questions and subsequent studies led to the creation of the Learning Style Inventory (Dunn & Dunn, 1978). The LSI

examines environmental, emotional, sociological, and physical factors (Dunn & Dunn, 1978; Zhukov, 2007). The components of the factors are presented in Table 1. The inventory identifies a student’s learning style, and a supplementary manual provides instructions for achieving the most ideal learning and academic growth based on the student’s learning style (Dunn & Dunn, 1978).

**Table 1**

*Dunn and Dunn Learning Style Factors*

<b>Factor</b>	<b>Elements</b>
<b>Environmental</b>	Sound, Light, Temperature, Design
<b>Emotional</b>	Motivation, Persistence, Responsibility, Structure
<b>Sociological</b>	Peers, Self, Pair, Team, Adult
<b>Physical</b>	Perceptual, Intake, Time, Mobility

*Note.* Adapted from *Teaching Students through their Individual Learning Styles: A Practical Approach* (p.4) by R. Dunn and K. Dunn, 1978, Reston VA: Prentice-Hall Company

*Myer-Briggs Type Indicator*

The Myer-Briggs Type Indicator, MBTI, groups individuals with the same personality traits which is often useful in occupational settings (Pashler et al., 2008; Feldman, 2011). It is a personality focused inventory and classifies personalities on four scales (Zhukov, 2007; Pritchard 2009). These four scales are Extroversion or Introversion, Sensing or Intuition, Thinking or Feeling, and Judging or Perceiving which can be combined to create sixteen different personality types (Myer-Briggs Foundation, n.d.; Pritchard, 2009). For example, an individual may be an E-S-T-P which means that they are an extrovert, sensor, thinker, perceiver personality type. The MBTI’s purpose is to make the theories introduced by Jung more accessible to individuals (Myer-Briggs Foundation, n.d.).

### *Kolb Learning Style Inventory*

The Kolb Learning Style Inventory assesses students' strengths and weaknesses based on experiential learning theory (Zhukov, 2007; Kolb Learning Style Inventory, n.d.). Experiential learning theory defines learning as "the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p. 24; Hawk & Shaw, 2007). Kolb's Learning Style Inventory evaluates students' learning style preferences in two bipolar dimensions (Diaz & Cartnal, 1999; Pritchard, 2009). Kolb describes four general learning types, diverger, assimilator, converger, and accommodator (see Table 2), based on the two dimensions, concrete or abstract and active or reflective (Pritchard, 2009).

**Table 2**

#### *Definitions of Kolb's Learning Types*

<b>Learning Type</b>	<b>Strength</b>
<b>Converger</b>	The ability to practically apply ideas
<b>Diverger</b>	The ability to be creative and imaginative
<b>Assimilator</b>	The ability to understand and create theories
<b>Accommodator</b>	The ability to experiment and take risks

*Note.* Adapted from "Kolb's Learning Style Inventory," n.d.

### *Multiple Intelligences*

Gardner (1983, 1999) identifies nine different intelligences: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, the personal intelligences: interpersonal and intrapersonal, naturalist, and existential (see Table 3). Like learning styles, individuals typically demonstrate favor in one or two of these intelligences. (Silver et al., 2000) Gardner did not develop the multiple intelligences with the intention of educators incorporating the concept into their teaching methodology (Gardner, 1996).

**Table 3**

*Definitions of Multiple Intelligences*

<b><u>Intelligence</u></b>	<b><u>Definition</u></b>
<b>Linguistic</b>	To think in words and to use language to express and understand complex meanings
<b>Musical</b>	To think in sounds, rhythms, melodies, and rhymes
<b>Logical-mathematical</b>	To think in terms of cause and effect and to understand relationships among actions, objects, or ideas
<b>Spatial</b>	To think in pictures and to perceive the visual world accurately
<b>Bodily-kinesthetic</b>	To think in movements and to use the body in skilled and complicated ways for expressive as well as goal-directed activities
<b>Interpersonal</b>	The ability to understand people and relationships
<b>Intrapersonal</b>	To have a heightened awareness of oneself and others
<b>Naturalist</b>	To understand the natural world including plants, animals, and scientific studies
<b>Existentialist</b>	The ability to conceptualize questions regarding human existence.

*Note.* Adapted from “Multiple Intelligences: Definitions and Examples,” 2002.

Learning styles and multiple intelligences are sometimes construed as being synonymous. To clarify this misconception, learning styles differ from multiple intelligences. Learning styles concentrate on how concepts are learned or on the process of learning rather than focusing on the topic being learned or the matter and outcome of learning (Silver et al., 2000; Snyder, 1999).

*Hemispheric Dominance*

Another way of looking at learning styles is to examine the way the brain processes information, sometimes called hemispheric dominance. The left hemisphere of the brain, the linguistic side, processes information in a logical and sequential order. The right hemisphere of the brain, the visual side, processes information intuitively and holistically. As seen with the other learning styles, most individuals demonstrate a dominant hemisphere (Hopper, 2006). Gardner (1983) refers to hemispheric dominance when he discusses musical intelligence which is

housed primarily in the right hemisphere of the brain. However, the left hemisphere becomes more active based on the amount of musical training an individual has received (Gardner, 1983).

### *VARK Inventory*

One of the most standard learning style inventories is the VARK due to its “face validity, its simplicity, its ease of use, and the wealth of learning materials that have been designed to accompany it” (Leite, Svinicki & Shi, 2009, p. 24). In 1987, Fleming developed the VARK inventory which identifies four learning styles: visual (V), auditory (A), read/write (R), and kinesthetic/tactile (K) (Fleming, 2011). These four learning styles create the acronym “VARK.” The VARK assesses preferred receptive learning styles and how much individuals rely on these visual, auditory, read/write, and kinesthetic methods (Feldman, 2011). The VARK inventory is an extension of an idea generated from neuro-linguistic programming, the manner in which we communicate and how this shapes our learning (Pritchard, 2009).

Visual learners prefer materials which present information visually, such as diagrams or pictures. Auditory learners process material most easily when listening. Read/write learners favor information which is written and reinforce what they read by taking notes. Kinesthetic learners learn by touching objects. (Feldman, 2011) Individuals will typically demonstrate unimodal or multimodal learning style preferences, but they may also demonstrate bimodal or trimodal preferences.

### **Instrument Selection**

Although the primary focus of this study was on learning styles, it is necessary to briefly examine factors which influence instrument selection. Eros (2008) identifies musical instrument selection as one of the most crucial points in a student’s music education. There are a variety of methods which can be used to help a student choose a musical instrument (Eros, 2008). Some of

the factors which effect a student's musical instrument selection include teachers, parents, friends, instrument availability, and the instrument's timbre (Bayley, 2004; Fortney, Boyle, & DeCarbo, 1993). Gender stereotyping can also play a role in instrument selection. This stereotyping contributes to the preconceived notion regarding the ease of learning an instrument and whether they will be able to master the instrument successfully (McPherson & Davidson, 2006). Albert LeBlanc has done a considerable amount of research on musical preferences as they relate to the interactions between environment and musical variables (Radocy & Boyle, 2003). Musical preference is a topic too wide for the scope of this paper but should be acknowledged as an influencing factor in instrument selection.

## CHAPTER THREE

### Method

#### Participants

This descriptive study consisted of male and female middle school string orchestra students ( $N=229$ ). One middle school orchestra program in the Tampa Bay area was selected through convenience sampling. The study focused on the learning styles of students playing string family instruments: violins, violas, cellos, and basses.

#### Procedure

An adaptation of the VARK questionnaire was administered by the regular classroom music education teacher. The VARK questionnaire was chosen because of its accessibility and straightforwardness. The standard VARK questionnaire consists of sixteen questions. A shortened version of the VARK questionnaire which consisted of eight questions rather than sixteen was used for time purposes (see Appendix A). Students were allowed to choose one or more options if more than one answer applied to their perceived learning style. In addition to the shortened VARK questionnaire, students were asked to identify their gender, grade level, instrument played in their school orchestra program, and whether they chose the instrument they play in their school orchestra program. The questionnaires were evaluated by the researcher based on previously validated scoring instructions constructed by the instigator of the VARK questionnaire and the total number of student responses was computed to determine preferred learning styles.

The questionnaire was reviewed for content and clarity by peer-researchers for validity and reliability. The research proposal and parental consent form were submitted to the University of Florida's Institutional Review Board for approval, a letter was sent to parents

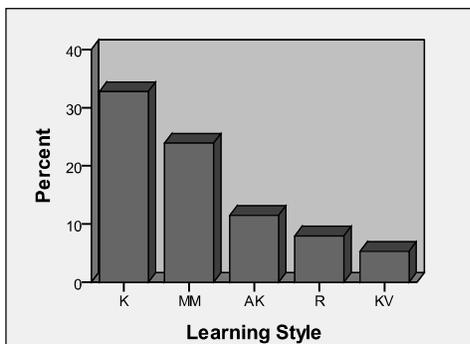
asking for passive consent of their child's involvement in the study (see Appendix B) and verbal assent was received from the students. No identifying information was given and student identity remained anonymous.

## CHAPTER FOUR

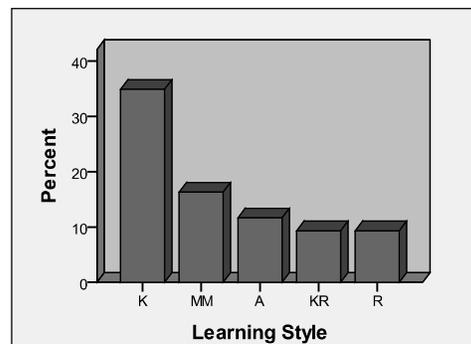
### Results

The study consisted of 134 female students, 94 male students, and 1 student whose gender was undeclared. Forty-five percent of students were in sixth grade, 34.1% were in seventh grade, and 21.4% were in eighth grade. Of those students, 49.3% played violin, 25.8% played cello, 18.8% played viola, and 6.1% played bass. An examination of frequencies indicated that 42.9% of bassists, 34.9% of violists, 32.7% of violinists, and 25.4% of cellists, had kinesthetic learning style preferences.

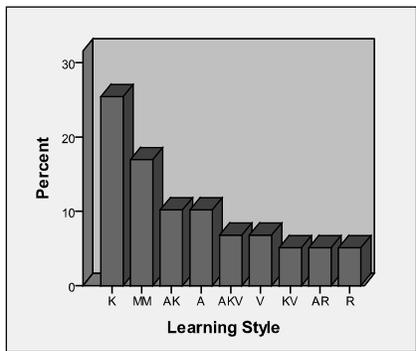
Figures 1 through 4 demonstrate the learning style preferences for each instrument. Kinesthetic and multimodal learning styles, with the exception of the viola, were the two most frequently indicated preferences among students. In these results, multimodal means that the student scored evenly on at least two learning style preferences, thus not demonstrating a specific dominant learning style. The overall learning style preferences within the study can be seen in figure 5, but the two most preferred learning styles were kinesthetic and multimodal.



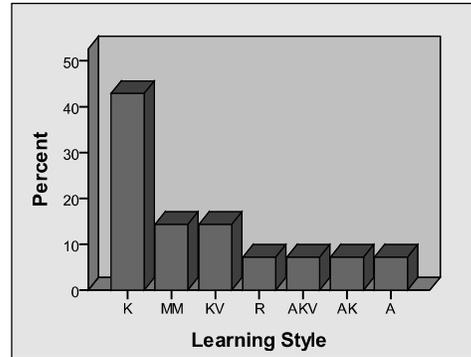
*Figure 1.* Learning Style Preferences for Violin



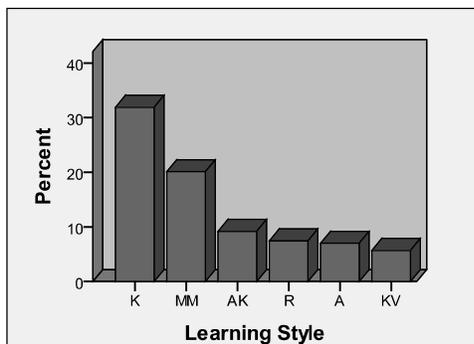
*Figure 2.* Learning Style Preferences for Viola



**Figure 3.** Learning Style Preferences for Cello



**Figure 4.** Learning Style Preferences for Bass



**Figure 5.** Learning Style Preferences within the Study.

Note. In all bar graphs, learning styles which received sum responses of less than 5% were excluded from the chart.

**Table 2**

*Key for Bar Graphs*

<b>A</b>	Aural
<b>AK</b>	Aural/Kinesthetic
<b>AKV</b>	Aural/Kinesthetic/Visual
<b>AR</b>	Aural/Read-Write
<b>K</b>	Kinesthetic
<b>KR</b>	Kinesthetic/Read-Write
<b>KV</b>	Kinesthetic/Visual
<b>MM</b>	Multimodal
<b>R</b>	Read-Write
<b>V</b>	Visual

## CHAPTER FIVE

### Discussion

This study surveyed the entire population of a middle school orchestra program in the Tampa Bay area. The demographics of the population showed that almost 60% of the sample was female and the largest enrollment number was in sixth grade which equaled a total of 102 students. Enrollment rates dropped as the grade level increased with seventh grade equaling a total of 78 students and eighth grade equaling a total of 49 students.

Ninety-nine percent of the students indicated that they had chosen their own instrument. Based on this response and instructor feedback, it is believed that the wording of question four on the questionnaire needed more clarity. This specific question should have provided more response options allowing students to indicate factors which influenced their instrument selection choice. Having more information on the factors of how students chose their instruments would have strengthened the study, but was not crucial to the outcome of the study.

Even though it is assumed that most students will have a dominant learning style, 20.1% of students did not have an identifiable dominant learning style preference. The lack of reported dominant learning styles might have been decreased by asking an odd number of learning style questions rather than an even number. Previous studies indicate that a high majority of individuals demonstrate multimodal learning style preferences.

According to the VARK website, performing art students typically demonstrate a higher preference for the visual learning style (Fleming, 2011). This study indicated that within each musical instrument classification, the kinesthetic learning style was the most preferred preference, thus indicating a possible overall trend within the study. In the study conducted by Tanwinit and Sittiprapaporn (2010), which examined the learning styles among undergraduate

music students, they found that the undergraduate music students' preferred learning modality was aural. Based on the contradiction of studies, it is evident that more research needs to be conducted. Lastly, it is worth noting that each instrument group indicated significantly strong preferences for kinesthetic learning styles also supporting the need for future research in this area.

## **Conclusion**

The purpose of this study was to examine the relationship of middle school students' learning styles and the musical instruments they studied, whether students had chosen the instrument they were currently playing, and if an overall trend toward a particular learning style existed within the study. An overall trend was observed within the study indicating the preferred learning style of string orchestra students was kinesthetic, thus suggesting that a relationship existed between student learning styles and the musical instrument studied. A future replication of this study would further confirm these findings.

As stated earlier, self-reported data from students can have intrinsic restrictions. One way to eliminate this problem in the future would be to conduct observation based research. An observational approach research design would reduce errors of reliability and validity.

Implications for the future include conducting a larger scale study for all instruments, not just one instrument family. It might be beneficial to test learning styles using other learning style inventories to cross-correlate results. Finally, a related research subject to this topic would be an examination of personality styles and instrument selection.

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## Appendix A: Learning Style and Instrument Selection Questionnaire

### Part I:

1. What is your gender?  
 MALE                       FEMALE
  
2. What grade are you in?  
 6                               7                               8
  
3. What instrument do you play in your school orchestra program?  
 VIOLIN                       VIOLA  
 CELLO                       BASS
  
4. Did you choose the musical instrument you are currently playing in your school orchestra program?  
 Yes, I chose my instrument  
 No, my instrument was chosen for me

**Part II:** Choose the answer which best explains your preference and circle the letter next to it. Please **circle more than one** if a single answer does not match your perception.

1. I like websites that have:
  - a. things I can click on and do.
  - b. audio channels for music, chat and discussion.
  - c. interesting information and articles in print.
  - d. interesting design and visual effects.
  
2. You are not sure whether a word should be spelled 'dependent' or 'dependant'. I would:
  - a. see the words in my mind and choose by how they look.
  - b. hear them in my mind or out loud.
  - c. find them in the dictionary.
  - d. write both words on paper and choose one.
  
3. You want to plan a surprise party for a friend. I would:
  - a. invite friends and just let it happen.
  - b. imagine the party happening.
  - c. make lists of what to do and what to buy for the party.
  - d. talk about it on the phone or text others.

4. When learning to play a new computer or video game, I learn best by:
  - a. using the controls or keyboard and trying things out.
  - b. talking to people who are familiar with the game.
  - c. clues from the diagrams in the instructions.
  - d. reading the instructions.
  
5. After reading a play you need to do a project. Would you prefer to?:
  - a. write about the play.
  - b. act out a scene from the play.
  - c. draw or sketch something that happened in the play.
  - d. read a speech from the play.
  
6. A new movie was just released. What would most influence your decision to go?
  - a. you hear friends talking about it.
  - b. you read what others say about it online or in a magazine.
  - c. you see a preview of it.
  - d. it is similar to others you have liked.
  
7. Do you prefer a teacher who likes to use:
  - a. demonstrations, models or field trips.
  - b. class discussions, online discussion, online chat and guest speakers.
  - c. a textbook and plenty of handouts.
  - d. diagrams, graphs or charts.
  
8. You have to present your ideas to your class. I would:
  - a. make diagrams or get graphs to help explain my ideas.
  - b. write a few key words and practice what to say again and again.
  - c. write out my speech and learn it by reading it again and again.
  - d. gather examples and stories to make it real and practical.

Fleming, N.D. (2011). *VAR K: A Guide to Learning Styles*. Retrieved from <http://www.vark-learn.com/documents/The%20VAR K%20Questionnaire%20-%20Younger.pdf>.

## Appendix B: Passive Consent Letter

Dear Parent or Legal Guardian,

I am doing research on learning styles and musical instrument selection. I would like to know whether there is any relationship between student learning styles and the musical instrument they are studying.

The study will occur in music class during regular school hours and should take less than 10 minutes to complete. Students will be asked to take a learning styles questionnaire and to answer a few questions about how they chose the musical instrument they are studying.

There are no direct benefits, risks, or compensation to your child for participating in the study. No identifying information will be gathered; therefore, your child will remain anonymous. The results of this study will be included in my final graduate project, but any identifying information will not be revealed.

If you do not wish your child to be in this study, please sign below and return this form to school with your child within 3 days. You may withdraw your consent at anytime without penalty. For information regarding your child's rights as a research participant please contact the University of Florida Institutional Review Board at 352-392-0433. If you have any questions regarding the study, please contact me.

Sincerely,

Ferol Carytsas, Master of Music candidate  
University of Florida  
Fpc10@ufl.edu

Return this portion if you do **NOT** want your child to participate in the study described above.

I do not wish my child \_\_\_\_\_ to be in the research study regarding learning styles and musical instrument selection.

\_\_\_\_\_  
Signature of Parent/Legal Guardian

\_\_\_\_\_  
Date

## BIOGRAPHICAL SKETCH

Ferol Carytsas was born and raised in Bradenton, FL. Ferol attended Longy School of Music in Cambridge, MA, where she studied with violist, Patricia McCarty, and graduated with an Undergraduate Diploma in viola performance in 2007. After returning to Florida, she attended Florida State University and received her Bachelor of Arts in music with a minor in psychology in 2010. In Fall 2010, she began the masters program in music education at the University of Florida.

Prior to attending Florida State University, she worked in arts administration as an Education Programs Assistant for the Sarasota Orchestra and as an Administrative Assistant for the Perlman Music Program Suncoast. While attending the University of Florida, she has had the privilege of serving as research assistant and Editorial Assistant to the Co-Editor, Dr. Timothy S. Brophy, of the *International Journal of Music Education: Practice*.