

STRING STUDENT SELF-EFFICACY AND DELIBERATE MUSIC PRACTICE:
EXAMINING STRING STUDENTS' MUSICAL BACKGROUND
CHARACTERISTICS, SELF-EFFICACY BELIEFS,
AND PRACTICE BEHAVIORS

Jennifer L. Cahill Clark, B.M., M.M.

Dissertation Prepared for the Degree of
DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

August 2008

APPROVED:

Debbie Rohwer, Major Professor,
Chair of the Music Education Department
Warren Henry, Committee Member
Karrell Johnson, Committee Member
Donna Emmanuel, Coordinator of the
Music Education Ph.D. Program
Graham Phipps, Director of Graduate Studies,
College of Music
James C. Scott, Dean of the College of Music
Sandra L. Terrell, Dean of the Robert B.
Toulouse School of Graduate Studies

Cahill Clark, Jennifer L., String student self-efficacy and deliberate music practice: Examining string students' musical background characteristics, self-efficacy beliefs and practice behaviors. Doctor of Philosophy (Music Education), August 2008, 285 pp., 4 tables, references, 117 titles.

This study examined the musical background characteristics, self-efficacy beliefs, and practice behaviors of string students auditioning for an all-region orchestra in one large South-Central district. Purposes of the study were: (1) to describe the musical backgrounds and self-efficacy beliefs of high school string students, (2) to measure the relationship between self-efficacy scores and performance achievement, and (3) to describe the practice behaviors and thoughts of high and low self-efficacy string students.

Questionnaires were given to 101 high school string students; 65 competed in all-region orchestra. Descriptive data from the questionnaire revealed information such as how many took private lessons and that those who did tended to have a higher sense of perceived self-efficacy in relation to playing their string instruments. Other descriptive items asked questions such as whether or not students started in public school and how much they practiced outside of orchestra.

The relationship of summed self-efficacy scores to a competition ranking was found to be statistically significant and inverse. For all string participants ($n=65$) Spearman's rho was, $r_s = -.37$, ($p=.001$) with 14% of the variance explained ($r^2 = .14$). This inverse relationship documents the linear trend for students with better rankings (lower ranking numbers) to also tend to have higher self-efficacy scores.

Observation and interview data of 8 higher and 8 lower self-efficacy sub-group students were also analyzed. The higher self-efficacy sub-group students tended to use more cognitive practice strategies, while the lower self-efficacy sub-group tended to use dissimilar and less advanced strategies. Understanding string students' musical background

experiences and characteristics and the possible relationship self-efficacy may have with practice and achievement could benefit certain students. Helping these students gain a higher sense of perceived self-efficacy in their musical endeavors, or obtain certain characteristics that successful students share, could possibly enable them to develop and understand more complex practice strategies and compete more confidently.

Copyright 2008

by

Jennifer L. Cahill Clark

ACKNOWLEDGEMENTS

For me this has been a tremendous journey, and so many people have been supportive, kind and patient. My husband Vincent never tired in his love and support, while our son Matthew, the love of our life, gave me a reason to complete this process. My parents Bobby and Sandra Cahill and my grandmothers Fannie Boardman and Eula Cahill Orr helped make this dream a reality for me. Larry and Jan Cahill, as well as other extended family, have also shown constant support. The Clark family has been wonderful: Paul Clark, Senior, and Marylou Clark, Tom and Leann Clark, and Paul and Mary Clark, who gave more than just their support, and all my nieces and nephews. Friends to thank include the Arambula family, Nicole and Gregg Duhon-Crowell, Cathy Logan, Dr. Fritz Gechter and Suzanne Ramo, Wendy Spann, Stacy Weill, and my fellow PhD students Joseph Sullivan, Dr. Dru P. Davison and Dr. Lynette Vincent.

I cannot begin to thank the UNT College of Music and its faculty enough. Dr. Debbie Rohwer spent countless hours with me, and Dr. Susan Dubois has been by my side from the very beginning. Committee members Dr. Warren Henry and Mr. Karrell Johnson, along with Dr. Hildegard Froehlich, Dr. Darhyl Ramsey, and Dr. Donna Emmanuel, have also shown nothing but understanding. I also want to thank my friends and colleagues at the University of Texas at San Antonio, including Dr. Susan Dill Bruenger, Dr. Stacey Davis, Dr. Eugene Dowdy, Dr. Laura Kelly, Dr. Rita Linard, Dr. Amy Simmons, and Dr. Si Millican.

Thank you, everyone, for believing in me, and thank you Christ, Lord our God in Heaven, and the Blessed Mother, for a beautiful life and for giving me the means to accomplish something I never thought I could.

TABLE OF CONTENTS

| | Page |
|---|------|
| ACKNOWLEDGEMENTS..... | iii |
| LIST OF TABLES..... | vii |
| Chapter | |
| 1. INTRODUCTION..... | 1 |
| Self-efficacy | |
| Deliberate Practice and Motivation | |
| Need for the Study | |
| Purposes of the Study | |
| 2. REVIEW OF THE LITERATURE..... | 11 |
| Cognitive Motivational Processes | |
| Attribution Theory | |
| Expectancy-value Theory | |
| Goal Theory | |
| Self-efficacy | |
| Self-efficacy in Academic Research | |
| Self-efficacy in Music Research | |
| Motivation | |
| Motivation and Music Practice Research | |
| Motivation to Practice and Choice | |
| String Specific Research and Motivational Factors | |
| Deliberate Music Practice | |
| String Specific Research and Deliberate Practice | |
| Summary of Literature Review | |
| 3. METHOD AND PILOT ANALYSIS | 58 |
| Participants and Procedures for the Main Study | |
| Measurements Used in the Main Study | |
| Questionnaire | |
| Regional Competition Exam | |
| Interview and Behavioral Observation Forms | |
| Test Development | |
| Content Validity | |
| Questionnaire | |
| Interview Questions | |
| Observation Form | |

- Field Test
- The Pilot Study
 - Time in the pilot
 - Practice session repertoire and scales for the pilot
 - Location and equipment for the pilot
 - Interview questions for the pilot
- Reliability
 - Internal Consistency for Reliability
 - Observation and Interview Reliability
- Results of the Pilot Study
 - Demographic results
 - Descriptive Pilot Results

4. RESULTS AND DATA ANALYSIS90

- Research Questions and Purposes
- String Students' Musical Characteristics and Self-efficacy Beliefs
- Self-efficacy Scores Correlated to Ranked Competition Scores
- Practice Behaviors and Beliefs of String Students with High and Low Self-Efficacy
 - Scale practice
 - Unique scale practice
 - Trends in addressing the tonic note
 - Arpeggios incorporated
 - Rhythm and articulation
 - Technique practiced during the scales
 - Etude and Repertoire Practice
 - Passages isolated after an initial run through
 - Tempo variations used
 - Non-performance methods of practice approach

5. SUMMARY AND CONCLUSIONS.....121

- Purpose reviewed
- Summary of Findings
 - Research Questions
 - Question #1: What are the musical background characteristics and self-efficacy beliefs of a group of high school string students, regarding playing their string instruments in orchestra?
 - Question #2: What is the relationship between string students'perceived musical self-efficacy and their ranked scores in a regional competition?
 - Question #3: What are the deliberate music practice behaviors and beliefs of a sub-group of high and low self-efficacy string players?

| | |
|--------------------------------------|--|
| Scale practice | |
| Repertoire and etude practice | |
| General practice techniques observed | |
| Conclusions and Recommendations | |
| Musical background characteristics | |
| Gender | |
| Self-efficacy and achievement | |
| Practice habits | |
| Future Research | |

| | |
|---|-----|
| APPENDIX A | |
| STRING STUDENT SELF-EFFICACY SURVEY | 152 |
| APPENDIX B | |
| PILOT VIDEOTAPE TRANSCRIBE..... | 155 |
| APPENDIX C | |
| PILOT INTERVIEW DATA TRANSCRIBED | 171 |
| APPENDIX D | |
| ALL-STATE REPERTOIRE..... | 182 |
| APPENDIX E | |
| OBSERVATION FORMS..... | 185 |
| APPENDIX F | |
| MAIN STUDY INTERVIEW DATA TRANSCRI..... | 246 |
| APPENDIX G | |
| APPROVED SCRIPT READ TO MAIN STUDY STUDENTS EXPLAINING SELF- EFFICACY AND THE STRING STUDENT SELF-EFFICACY STUDY..... | 270 |
| APPENDIX H | |
| QUESTIONNAIRE DIRECTIONS READ TO STUDENTS..... | 272 |
| APPENDIX I | |
| PILOT EXPLANATION AND DIRECTIONS READ TO STUDENTS..... | 274 |
| REFERENCES | 276 |

LIST OF TABLES

| | |
|---|-----|
| Table 1. Table of String Student All-Region Numbers Distribution..... | 61 |
| Table 2. Comparison of High and Low Self-Efficacy Pilot String Students to Hallam’s Strategy Levels..... | 89 |
| Table 3. Higher and Lower Self-efficacy Sub-group Students’ Self-efficacy Scores and All-Region Rankings..... | 96 |
| Table 4. Comparison of High and Low Self-Efficacy Pilot String Students to Hallam’s Strategy Levels..... | 169 |

CHAPTER 1

INTRODUCTION

Motivation has long been an important area of interest in music education and music educators continue to try to understand what helps motivate their students as well as what might enable their students to succeed in their musical endeavors. Music educators understand that to succeed in the area of music performance, students need to practice to improve, and that to engage in the act of independent deliberate music practice, individual students must be motivated. When investigating the varying facets of deliberate practice in music, music education research has stressed the importance of motivation and incentive involved in music (Hallam, 1997a; Harnischmacher, 1997). Some students may have plenty of self-motivation and follow instructions easily and successfully, while others seem to constantly fluctuate in their successes and attitudes about deliberate music practice. Furthermore, there are students who may perform more successfully than those students who might have practiced and prepared more, whereas there are some students who claim to have spent many hours practicing according to their teachers' instructions, who show little, if any, improvement.

Music practice research related to motivational processes has focused on general motivation orientation aspects, such as the influences of intrinsic and extrinsic motivation on musical achievement (Schmidt, 2005; Schmidt, Zdzinski, & Ballard, 2006) and creativity (Priest, 2001), but specific ideas related to motivation and success can also be found in the theoretical frameworks and research related to attribution theory, goal theory, expectancy-value theory, and personal investment theory. Self-efficacy is a common thread among these theories, and may be an important part of understanding

achievement and success in many domains, such as music practice and achievement. According to Bandura (1986), it may be that students, who have sufficient skills in a certain field of study, in this case music, might have a better chance of succeeding and persisting, even despite unforeseen challenges, if they have a positive sense of perceived self-efficacy.

Self-efficacy

According to Bandura (1986), self-beliefs should be considered when interpreting any human behavior and its motivation for action. Success in any venture will probably involve some aspects of the self, such as self-awareness, self-esteem, self-direction, or self-efficacy. Self-efficacy reflects a person's judgment of what they think they can do or accomplish in a given circumstance (Bandura, 1997). Efficacy beliefs are developed through personal "experience and reflective thought rather than being simply a disjointed collection of highly specific self-beliefs" (Bandura, 1997, p. 51).

Efficacy beliefs can be important to human functioning in personal achievements, what people choose to do, how much effort they choose to exert when challenges emerge, what they decide to do toward self-improvement or development, and even the self-regulative action of a healthy lifestyle. If a person is resilient as well as positive in his or her efficacy beliefs and continues with perseverant effort after failures, that person may be more likely to persevere at a given task. It may also be likely that a person might gain an overall optimistic demeanor, possibly transferring that attitude to other activities and life circumstances (Bandura, 1990).

However, if the necessary skills and knowledge for a successful performance in a given activity are not present in an individual, self-efficacy can not overcome

incompetence (Schunk, 1994). Furthermore, to excel and advance above a level at which someone is already capable, that person's general self-beliefs in a given situation may need to be more than just having a positive or confident self-image. It may be beneficial to have a higher sense of self-efficacy. "If self-efficacy beliefs always reflected only what people [could] do routinely, they would rarely fail, but they would not mount the extra effort needed to surpass their ordinary performance" (Bandura, 1990, p. 95).

While a small number of investigators have taken an interest in the possible connection between self-efficacy and music related activities (McCormick & McPherson, 2003; McPherson & McCormick, 2006; Nielsen, 2004), there still seems to be less self-efficacy research in the field of music compared to general academics. It might be valuable to further this body of knowledge in the areas of music performance and music education. One area of music skill study that music researchers have stressed is the importance of deliberate practice and its probable relationship to musical achievement. Therefore, it could be telling to consider the two areas of interest together and investigate any possible trends.

Deliberate Practice and Motivation

Research has shown that the amount of deliberate practice can positively affect achievement in many areas, including music, and expert skill in an area can develop through extensive practice over a number of years (Ericsson, Krampe, & Tesch-Römer, 1993; Williamon & Valentine, 2000). But researchers have also reported that it is important to look beyond the quantity of practice (Gagne, 1999) and consider quality and content (Williamon & Valentine, 2000), as well as available resources and any motivational constraints (Ericsson et al., 1993; Hallam, 1997a; Hurley, 1992).

It may be helpful in understanding the motivational components of music practice, for teachers to not only understand what their students are practicing, but how they are practicing, what they are thinking, and how they are managing their time. Research has considered a wide variety of motivational aspects in deliberate music practice research, such as competitive reasons for performance preparation (Rohwer, 2002) or a musician's personal self-beliefs (Smith, 2005).

Deliberate practice has been defined as involving cognitive and metacognitive thought processes in which an individual monitors and attempts to accomplish specific goals that have either been self-selected or set by a teacher (Ericsson et al., 1993; Williamon & Valentine, 2000). Deliberate practice also requires intentional effort, proper resources, and guidance (Ericsson et al., 1993). Knowing this, teachers aim to give students good practice strategies, and research has helped teachers better understand what strategies have been used most or have been considered most productive or successful in relation to performance outcomes (Barry, 1992; Hallam, 2001; Nielsen, 1999; Rohwer, 2002). For example, in researching string students, Pacey (1993) found that variable practice, such as introducing a simplified form of improvisation within the key or scale being studied in addition to working on standard repertoire and etudes, was beneficial.

Research has also shown that musicians who have exhibited positive results of deliberate practice have also tended to have appropriate help from expert teachers, musical home environments, proper parental support, and priorities that set music as equal to other activities (Ericsson et al., 1993; Lehmann & Davidson, 2002). Therefore, successful practicing may involve different influences in the learning setting, such as

informative and directive teacher feedback and support, as well as student/peer feedback, or other influential concepts affecting beliefs. Smith (2003) found that these influences may also include attribution beliefs which are based on past successes or failures; and as a result, some string teachers have been known to try and eliminate negative ego attributions in their classrooms by rotating chairs rather than having challenges, portraying to their students that everyone is equally important to the orchestra.

The learning environment might also include aspects of a student's culture and social or societal surroundings, which may be influential aspects that can affect practice behaviors (Hallam, 1997b). If students understand and give personal importance to the value of music and playing their instruments well, or performing well in a competition, their goals and expectations may be aimed at playing their instruments successfully, motivating them to take time and effort to practice carefully and with determination.

In deliberate practice, students ideally regulate their practicing based on the knowledge and understanding of what they are learning in order to "maintain or improve the standard of their playing" (Hallam, 1997b, p. 209). This self-regulation is a metacognitive process that can help monitor, focus and organize their time, and is an important part of self-efficacy (Bandura, 1997). These metacognitive processes can include strategy, planning, and task management. Because there are many components of deliberate practice, students may need to develop a way in which they can concentrate and be consciously aware of what they are doing in spite of a certain amount of distractions to consider. For example, practice time and energy may be in conflict with school work or other activities, or a student might be tired at the end of a

long school day. Also, students may be influenced by a variety of variables when they enter the practice room, such as getting set up, worrying about the time, deciding what is the most important aspect on which to work, surrounding noise, the decision of where to practice, etc. Even when they seem to have set goals or to have properly prepared for their practice time, it may be difficult for them to get started or persevere successfully through a task. Therefore, motivating factors behind the behavior or action of deliberate music practice may be important, and when considered, could encourage a student to stay focused and succeed.

Need for the Study

As music educators have studied the motivational components of deliberate music practice, ideas of self-beliefs have been considered in investigating how students prepare to practice, engage in practice, and succeed in practice (McCormick & McPherson, 2003; Smith, 2005). Research on deliberate music practice has focused on amount of practice, strategy, and many other aspects among musicians of all ages and instrumentation, and though there has been a recent interest in the possible link between self-efficacy and deliberate music practice, there has been little investigation of these variables focusing on string players, specifically.

Music students are individuals who may think differently from one another, and therefore might have their own independent styles or approaches to deliberate music practice, as well as their own thoughts and ideas about it, before, during, and after their practice sessions. The thought processes that students engage in while practicing not only include aspects of the music, how to approach it, and how to portray it, but also aspects of their beliefs in their own capabilities, their musical self-efficacy. Therefore,

examining students' thought processes during and after practicing, as well as considering their musical self-efficacy and practice behaviors as they prepare for a competition, may help in understanding the variety of ways in which students are motivated to approach practice and how different the outcomes may be.

This individuality may also be seen between groups of different musical instrument families or voice types, giving researchers possible reasons to study groups of particular types of instrumentalists or vocalists independently from one another. Few researchers have investigated high school string players' practice habits in relation to their level of musical self-efficacy. McPherson and McCormick (2006) surveyed music students about their practice habits and self-efficacy beliefs and included string players, but did not consider them separately from other musicians. Other researchers focused on string players independently from other groups (Hallam, 1997; Hamann & Frost, 2000; Hurley, 1992), but self-efficacy was not considered.

Researchers have also compared and contrasted different instrumental families or musician groups, and the results of these comparisons could influence the justification for investigating string instrumentalists separately from other instrument families. For example, Austin and Berg (2006) investigated motivation and self-regulation of practice comparing band to orchestra students and found that string students were more highly motivated to practice even though they did not necessarily show more self-regulation in practice behavior; while Kemp (1981) evaluated the personality traits of different instrumental families as well as vocalists and discovered string instrumentalists to be more withdrawn and aloof than other musicians. This

uniqueness between different instrumental groups helped influence the need for this study.

This study focused specifically on string players and their self-efficacy beliefs related to playing their string instruments. Once self-efficacy scores were gathered, to investigate how string students with opposite and acute self-efficacy beliefs might engage in deliberate practice, a sub-group of string students with high and low musical self-efficacy scores were videotaped and interviewed. This mixed methods approach helped to answer a previous call for future research. Austin and Berg (2006) suggested that to describe “the nature of the relationship between practice regulation and motivation [was] beyond the scope of [their] study, [and] direct observations of music practice may help us better understand differences between more and less regulatory/motivated instrumentalists” (p. 550).

There is also a general need for more string research. Considering high school string players separately from other high school musicians in relation to their musical self-efficacy beliefs and practice habits was not only a novel combination of investigative variables, and possibly beneficial due to previous research (Austin & Berg, 2006; Kemp, 1981) making comparisons and discoveries between string players and other musicians, but it was important in the area of string education. There seems to be fewer string programs than other music programs, particularly in smaller districts, rural, or urban areas (Smith, 1997). But as orchestra programs in other, more affluent communities, have grown in the last decade, researchers have noted that the number of qualified string teachers has fallen short (Gillespie & Hamann, 1999). Therefore, the investigation of self-efficacy beliefs among high school aged string students and

observation of their practice habits, considering them separately from other instrumentalists or vocalists, may not only help promote positive learning environments in orchestra classes, but also be a positive impact on string education. It might possibly help orchestra teachers become more aware of self-efficacy in terms of practice behaviors, musical achievement, and persistence and retention in orchestra programs.

Self-efficacy research in academic related fields has shown that success and achievement are usually associated with high levels of perceived self-efficacy within specific academic domains (Bouffard-Bouchard, 2001; Schulz, 2005). In music education, researchers (McCormick & McPherson, 2003) have found similar results when considering self-efficacy as a predictor of success, and as being influenced positively by favored musical activities in the classroom (Davison, 2006). There is a need to further investigate the link between success and self-efficacy in music to help our students not only advance to their individual potential, but to help them grow in the music group setting or learning environment of the musical ensemble.

Purposes of the Study

The intended purposes of this study were: (1) to describe the *musical background characteristics* and self-efficacy beliefs of a group of string students, (2) to measure the relationship between self-efficacy belief scores and performance achievement, and (3) to describe the practice behaviors and thoughts of high and low self-efficacy string students. For the purposes of this study, musical background characteristics were operationally defined as: how long students had been playing their string instruments, whether or not they started in public school, whether or not they took private lessons, whether they intended to continue playing their instruments after high

school, whether or not they owned their own instruments, how much they practiced outside of orchestra, and gender. The following research questions were investigated:

1. What are the musical background characteristics and self-efficacy beliefs of a group of high school string students, regarding playing their string instruments in orchestra?
2. What is the relationship between string students' perceived musical self-efficacy and their ranked scores in a regional competition?
3. What are the deliberate music practice behaviors and beliefs of a sub-group of high and low self-efficacy string players?

CHAPTER 2

REVIEW OF THE LITERATURE

This study focused on self-efficacy as it related to young string players' performance outcomes and practice habits in preparation for those outcomes. The intended purposes of this study were: (1) to describe the musical background characteristics and self-efficacy beliefs of a group of string students, (2) to measure the relationship between self-efficacy belief scores and performance achievement, and (3) to describe the practice behaviors and thoughts of high and low self-efficacy string students. Because the development of self-efficacy may be linked to the different theories of cognitive motivation, this chapter includes an overview of these theories and their related research. Self-efficacy theory has only been used in a small number of music education studies, and therefore, in addition to self-efficacy research in music and music practice, this literature review contains self-efficacy research in the areas of psychology and academic education. Research on motivation in music and music practice is also included, as well as general research in deliberate music practice. Music education research associated with string instruments or instrumentalists is addressed as it applies to each of the chapter's main areas of discussion. The chapter is divided into five sections: 1) cognitive motivational processes, 2) self-efficacy, 3) motivation, 4) deliberate music practice, and 5) a brief summary of the literature review.

Cognitive Motivational Processes

In consideration of what might motivate music students to take the initiative to practice their instruments and prepare for a competition or performance, researchers have investigated certain areas of cognitive motivation. Bandura (1997) claimed that

“purposive action is rooted in cognitive activity” (p. 122), and that forethought about certain plans or goals becomes incentive before action takes place. People guide their own behavior based on what they think they might be capable of doing, and the anticipation of what they think will happen as they try and reach their goals. Because deliberate music practice takes independent thinking and behavior, it also requires the metacognitive and motivational aspects of self-directed learning. According to Bandura (1997) there are several different types of processes that operate within individuals regarding the “motivational facet of self-directed learning” (p. 228), often interlinked together to help motivate human action and behavior. Three of these areas of self-directed motivational processes that music education research has focused on are also the three different theories of cognitive motivation: attribution theory, which is based on what a person retrospectively attributes to the cause of a success or failure (Weiner, 1974); expectancy-value theory, which considers a person’s incentive developed through the anticipation of an outcome and the value placed on that expected outcome (Atkinson, 1964); and goal theory, which is based on self-evaluative thought and reaction to a person’s own behavior, conditioned by standards, personal incentives, and planned challenges (Bandura, 1990; 1997). Researchers have investigated aspects of these three theories as well as other theories of cognitive motivation in the field of music education. Bandura (1990) has described self-efficacy as an important part of *psychosocial functioning*, operating in all forms of cognitive motivation. Therefore, because self-efficacy is theorized to be a key component in cognitive motivation, this chapter has included related music education research in attribution theory, expectancy-value theory, and goal theory.

Attribution Theory

Attribution theory is one of retrospective thinking. Decisions about future actions may be affected by past failures and/or successes. According to the theory, people who blame their lack of success on whether or not they are capable of a task, i.e. their ability, will not persevere in accomplishing that task. However, if lack of success is blamed on not exercising the appropriate amount of effort, or success is credited to hard work, people might approach future endeavors with proper motivational attitude and perseverance (Bandura, 1997; Weiner 1974; 1986). The ideal results might be that as individuals succeed through effort, their ability increases (Bandura, 1997). However, this may not always be the case, and when considering effort attributions, the way in which effort attributions are related to efficacy can vary.

In some cases self-efficacy may strengthen when success has been attributed to ability rather than effort. Because self-efficacy is linked to capability and whether or not someone believes they can accomplish a given task, it can also be linked to the stable innate belief of ability. However, some research has shown that when helping students understand that effort is responsible for their success, showing them how to improve that task, and then giving them the opportunity to try the task, their self-efficacy increases (Schunk & Cox, 1986). Music research (Duke & Henninger, 2002) has shown that direct feedback and opportunity to practice a given task a number of times is a successful way to reach students and possibly increase their ability. A problem that can occur when the task at hand does not result in success, though more and more effort has been exerted, is that frustration and wonderment of why one is not successful may evolve, and self-efficacy can diminish (Bandura, 1990; 1997).

Several studies have investigated concepts of attribution theory and its importance to music education. Austin and Vispoel (1998) interviewed and tested 153 seventh grade general music students and discovered that students who were generally successful in their musical endeavors and had positive self-perceptions in music did not necessarily attribute their success and failure to the same causes. The study revealed that the successful students attributed success to family influence and ability, but they attributed failure to reasons that were more conducive to effort and strategy. Students' musical self-perceptions and their attributional beliefs about musical endeavors were correlated to musical achievement. Musical achievement outcomes were categorized into specific attributional concepts of ability, effort, luck, task complexity, and determination. Social and environmental influences were also included, such as peers, teachers, and family. Again, even though results showed that reasons for failure were blamed on lack of effort, accomplishments were generally credited to ability. Austin and Vispoel (1998) also found that students, who had lower perceptions of themselves in relation to music, as well as low scores on musical achievement, blamed their lack of ability on lack of a musical family or proper musical background. The researchers considered this to be a fatalistic view and concluded that such beliefs and attitudes could lead to learned helplessness.

An earlier study (Asmus, 1985) on attribution theory in music asked 118 general music 6th-grade students to write out reasons why they believed people might be successful or unsuccessful in music classes. Using Weiner's (1974) concepts of Attribution Theory as a model, the responses were distributed among four different attribution categories: ability, effort, task difficulty, and luck. Effort and ability were

classified as internal and stable, while task difficulty and luck were considered external and unstable. Asmus (1985) found that “the majority of the students selected the internal attribution categories of ability and effort to be the major causes for success and failure in music” (p. 6). Among these internal categories, the majority of responses were interpreted as effort-related. Asmus believed this to be encouraging to music educators. However, his study only investigated elementary students.

In a larger study including vocal, instrumental and general music subjects, grades 4 through 12 (Asmus, 1986b), a significant difference was found among grade levels when investigating attribution beliefs. Asmus found that students’ internal attributions changed as they got older; as grade level increased, unstable beliefs about success or failure attributed to effort decreased and stable beliefs attributed to ability increased. This has been supported by more recent findings. Arnold (1997) found similar results when comparing 6th-, 8th-, and 10th-grade students, and concluded that this may be due to a natural adolescent behavior of protecting the ego and justifying failure by blaming it on “circumstances beyond their control” (p. 22).

Significant results have also been found when considering gender as a variable in attribution beliefs related to music. “Females made more internal-stable attributions than males” (Asmus, 1986b, p. 271), but in general academic research, females consistently had lower self-efficacious beliefs, affecting academic success and career choice (Schulz, 2005). Also in regard to gender and music research, Arnold (1997) noted that there were over twice as many girls than boys participating in band. Asmus (1986b) wondered if both the effects of age and gender in music programs were due to the opinions and views of society and the current culture of music education. Many view

participation in musical activities as feminine, especially as students get older, and music instruction becomes more specialized and formal as grade level increases, therefore, in agreement with some research, there may be a possible shift in attributional beliefs from effort-related to ability-related beliefs as students mature (Austin & Vispoel, 1998).

When researching attribution beliefs of future music educators and music therapists, Asmus (1986a) found that these music majors attributed others' successes or failures to effort. This attribution is considered internal and malleable; therefore, this finding could be positive for music education because "the assignment of effort to others promotes teacher persistence at getting students to learn" (Asmus, 1994, p. 18). But when thinking of themselves, the music education or therapy students attributed their successes and failures to task difficulty. The conscious awareness of reasons for success was also affected more by attribution variables than attribution variables were affected by success variables. Therefore, "attributional causes are more important in determining success tendency than success tendency is in determining causal attitudes" (Asmus, 1986a, p. 83). Asmus suggested that this be applied to education by encouraging teachers and therapists to help students understand the reasons why they may succeed or fail. This might be just as important as giving them multiple opportunities to perform or compete, which Asmus (1986a) considered to be a way of heightening their self-image to improve achievement, thereby possibly increasing their self-efficacy perceptions.

A study investigating traditional school band chair tests or challenges also considered the possible influence of attributional beliefs (Chandler, Chiarella, & Auria,

1987). If students chose to challenge, then the hypothesis was that those students were confident in their performing abilities, and believed that their success was related to internal attributions. The opposite was also considered. Students who were insecure about their levels of performing abilities and dissatisfied with their chair placements might not only have seen themselves as failures, but might have viewed the results of challenges with external attributions. Another hypothesis of the study included aspects of expectancy-value theory by considering whether or not playing an instrument had value to each student. How this value affected the outcome of success or failure in the chair tests, as well as their self-efficacy, was also investigated.

To explore the possible outcomes of these hypotheses, the researchers (Chandler, et al., 1987) developed a questionnaire that asked information such as chosen instrument, practice habits, private instruction, how long they played their instrument, and past chair challenges. Students were also asked about their reactions to chair tests in regards to future goals, as well as the subjects' satisfaction with their current level of skill and enjoyment. The attributions considered in this study included "technical knowledge of the instrument, effort, natural musical ability, difficulty level of the instrument, help from the director, help from others, and luck" (p. 251).

The variety of inquiries in Chandler, Chiarella, and Auria's (1987) study of traditional band challenges yielded a number of results. Participants who indicated that they would want to play the same instrument if they could go back and choose again were also statistically more satisfied than the other students with their current performing level. These same participants also indicated that they practiced more than

the other subjects. The results also showed that the participants attributed success in performing to natural ability rather than luck.

The questions about practice yielded statistically significant results, as well. Positive correlations were found between the amount of practice and the following: the number of challenges; success perceived by the subject; enjoyment in playing the instrument; and the importance and amount of perceived effort, technical knowledge, ability, and director's help. Similar correlations were found between the amount of time subjects expected to continue playing their instruments and all other inquiries. Therefore, the researchers (Chandler, et al., 1987) stated: "the results revealed that perceived success and enjoyment were consistent predictors of the students' attributions" (p. 252), and "those who perceived success and satisfaction challenged more and attributed that success to internal factors" (p. 255). However, help from the teacher was defined in this study as an external factor, one that is usually perceived as being uncontrollable and related to those who typically believe failure is due to uncontrollable factors and success is due to luck. Therefore, the researchers suggested that the influential attribution of a band directors' help may be considered a predictor of helplessness and that teachers and band directors may need to approach this attributional aspect with caution.

Expectancy-value Theory

While attributions are considered causal influences related to motivation and therefore, also influences of performance or achievement, motivation in expectancy-value theory is controlled by expectations and cultural values. These expectations are defined by the awareness that certain outcomes and the importance of those outcomes

may result from definite behaviors (Bandura, 1995). According to expectancy-value theory, persistence in a task involves the expectation of completing the task as well as the perceived value of that task (Atkinson, 1964). This value may be related to a student's perception of her capabilities, her perceived self-efficacy, which might include being creative or athletic, achieving high outcomes in academics, or it may be related to skills and activities that the student believes to be useful and important for future expectations in employment, collegiate settings, or cultural or social environments (Stipek, 1998).

Expectancy-value theory assumes that the more valued an expected outcome is to a person; the more motivated that person will be to take action, and that generally people try to optimize their expectations to the highest degree. But people are not always so courageous, perseverant, or efficient, and the value of an expected outcome may be too subjective to make generalizations. Therefore, an argument to this model or "main issue in dispute is the disparity between the postulated judgmental process and how people actually go about appraising and weighing the probable alternative consequences of alternative courses of action" (Bandura, 1997, p. 126).

In research related to expectancy-value theory and music education, Nielsen (1999) investigated self-regulation and music practice and concluded that the metacognitive skills necessary to regulate practice goals and strategies are accompanied by expectations and values. McCormick and McPherson's (2003) study of musical achievement was also linked to expectancy-values. According to the study, how a student expected to do on an exam, an expectancy outcome, was based on that

student's personal capability beliefs, his or her self-efficacy, and positively related to the actual results of the exam.

In other studies investigating expectations, McPherson (2000-2001) questioned young beginning band instrumentalists about their intended commitment to learning an instrument before they started. Their practice time was monitored through interviewing parents at three different points throughout the year, and at the end of the year their musical achievement was measured using the Watkins-Farnum Performance Scale (1954) along with other performance tasks. Results indicated that the students who showed higher levels of achievement not only had practiced more, but were also those students who had commented that they expected to play their instruments long-term, indicating pre-determination and perseverance, both qualities of positive self-efficacy. Students who scored lower on the achievement test were those students who had indicated that they only had intentions for a short-term commitment. McPherson concluded that a young person's musical development may be influenced and affected by her expectations of success and her opinions of values related to a musical culture.

Goal Theory

Another aspect related to motivation and success may be the outlining of goals. People can strive for self-satisfaction through setting and achieving goals. People set personal standards based on what they know about themselves, and they motivate themselves by creating incentives for their behavior, then they evaluate the results. When necessary, they make adjustments, re-evaluate, and continue to pursue their goals. The process to develop goals that challenge and require effort with perseverance but are still realistic and plausible involves self-regulation and cognitive forethought

(Bandura, 1997). “Perceived self-efficacy [for goal attainment] determines whether discrepancies between standards and attainments are motivating or discouraging” (Wood & Bandura, 1989, p. 368).

Self-regulation has been shown in research to be a functional component of goal orientation and self-efficacy. In a case study of two organists training at the Norwegian Academy of Music, Nielsen (2001) investigated “the diverse and individual ways in which students attempt to learn on their own” (p. 155). Information was collected during the very first practice session and several learning periods in preparation for an examination performance. Each student showed different ways of regulating his or her own learning. One student practiced his selected piece more than 1 hour each day in the first learning period, with a set goal of presenting it for his teacher at the end of 1 week. The other student also spent 1 hour per day, but presented her piece several times to the teacher throughout a 2-week period. Problem-solving skills, as well as strategic planning were found to be important during the second and third learning periods. Nielsen concluded that these advanced music students used goal-setting as a motivating factor to help organize their self-regulated learning processes in preparation for a performance. Their goals also included incremental levels of preparation for their lessons with their private teachers. They were motivated to use specific strategies with different and unique practice procedures to prepare their individual repertoire, most likely preparing them for the next level of achievement.

Some researchers have looked at more than one cognitive motivational theory simultaneously. Smith (2002) surveyed 344 music students, the majority being music education majors, from 17 different universities to explore the relationship between self-

reported behaviors of practice and motivational beliefs, focusing on task and ego goal orientations, but also included attribution theory concepts. Task goals were defined as mastery or learning goals set by individuals who were focused on self-improvement, and ego goals were defined as goals set by individuals who were concerned about social comparisons. These opposite constructs may simultaneously exist in one individual, depending on what is being learned and the strategies being used to develop skills in a particular domain or field.

The most common strategies of practice that Smith (2002) found were the following: division of musical excerpts into smaller sections, slow practice then gradually getting faster, writing in the music, and counting the different rhythms. When comparing practice strategies to motivational constructs, Smith (2002) found that “the participants who reported using more practice strategies more often had higher levels of task goals” (p. 50), and ego-oriented goals were negatively related to certain practice strategies such as singing and practicing mentally. These results were found to be statistically significant, though the practical significance was small. Smith explained that “implicit theories of ability are conceptually related to attribution processes” (p. 38). And when investigating these motivational concepts, Smith found that a statistically significant number of students, who shared the belief that musical ability or other attributes were fixed or innate, also set and strived to attain ego-related goals, goals defined by comparing themselves to others. Smith also found a statistically significant number of students who attributed success to effort-endorsed task goals, goals defined by wanting to improve oneself, showed an interest in learning and favored being challenged in their music learning. Therefore, according to Smith, if a music student is ego driven, that

student strives to attain goals that demonstrate ability, and avoids any situation in which lack of ability or embarrassment may be seen, and a student who is effort driven is more interested in learning and improving at a task.

Smith (2002) concluded “that task goals and incremental theories are adaptive and may lead to deep and efficient learning processes” (p. 51), and therefore, educators might consider changing their approach of how they influence their students’ motivational beliefs as well as the beliefs of parents, guardians, and others in the environment or culture that affect students. It might be best if educators could steer the beliefs of their students, parents, and related public from that of talent and ability being born and fixed, to a belief that promotes the importance of the availability of musical learning opportunities for everyone. Focusing on the idea “that everyone has musical potential” (Smith, 2002, p. 51), rather than worrying about whom has musical talent.

Self-efficacy

Human behavior involves more than just motivational drive, whether that drive is instinctive or conscious. Social conditions and varying circumstances involving the environment as well as personal concepts of the self, such as self-awareness, self-direction, and self-efficacy may be important when interpreting human behavior and its motivation for action (Bandura, 1986). Regulation of behavior is filtered through beliefs about the self, a person’s perceived self-efficacy. Perceived self-efficacy has been defined by Bandura (1997) as belief “in one’s capabilities to organize and execute the course of action required to produce given attainments” (p. 3). Bandura (1986) claimed that self-efficacy can affect people’s involvement in their chosen activities, including in what activities they might want to participate, and how much effort and persistence they

are willing to put forth. A person with high self-efficacious beliefs will choose to ultimately work harder towards their intended goals and invest more time than someone who doubts their learning capacities, ultimately influencing their motivation. Self-efficacy is more than just self-confidence or self-esteem, which is related to self-worth and self-liking. Self-efficacy, a perceived belief in oneself, has to do with what people think they can do or accomplish in a given circumstance or situation (Bandura, 1997).

According to Bandura (1995), people cognitively develop forethought about situations that may lead them to the motivational processes of deciding to take action or not to take action depending on what they think about their own capabilities. People may also be more willing to partake in challenging activities when they find themselves in safe environments in which they perceive themselves capable of succeeding. “They anticipate likely outcomes of prospective actions” (Bandura, 1995, p. 6). If someone has a confident and positive sense of self-efficacy, he or she might attain a set of goals by structuring and following through a certain plan of action despite failures or difficulties along the way.

This construct of perceived self-efficacy has helped researchers understand why some people are successful while others are not able to persevere or achieve success in behaviors that might be clearly within their reach (Bouffard-Bouchard, 2001). The thought processes that individuals go through in analyzing the various concepts involved in human behaviors and beliefs, enable not only daily functioning, but the achievement of goals in purposeful direction of specific tasks, as well as avoidance of unwanted outcomes (Bandura, 2001).

To make their way successfully through a complex world full of challenges and hazards, people have to make good judgments about their capabilities, anticipate the probable effects of different events and courses of action, size up sociostructural opportunities and constraints, and regulate their behavior accordingly. (Bandura, 2001, p. 3)

Therefore, “People are sentient purposive beings [who] act mindfully to make things happen...” (Bandura, 2001, p. 5). Bandura (2001) described this intentional and proactive analysis, involving forethought and planning, of human functioning as *human agency* in Social Cognitive Theory. “Among the mechanisms of personal agency, none is more central or pervasive than people’s beliefs in their capability to exercise some measure of control over their own functioning and over environmental events” (Bandura, 2001, p. 10).

According to Bandura (1986; 1990) psychosocial functioning, or psychological human behavior, has been viewed and interpreted through one-directional theories, presumptions that are defined by one linear, direct link. For example, behaviorists interpret behavior through a stimulus-response model, where input from the environment creates an automatic, non-participatory reaction, while cognitivists focus on the connection between mind and purposeful action. However, Wood and Bandura (1989; see also Bandura, 1986) has described human behavior, functioning and operation in a multidirectional model in social cognitive theory.

In social cognitive theory, behavior is interpreted by considering self-reflection, self-reaction, and the environment, which in turn can influence perceived self-efficacy. Self-efficacy is an important part of social cognitive theory, where conscious social

thought and coordinative efforts are equally important to personal contemplation and the importance of the behavior of others. These different cognitive and socially influential means of activity either influence or are influenced by incentive and motivation.

According to social cognitive theory, motivation is a construct that leads people to action through biological and physiological conditions, social influences of approval or disapproval, and the cognitive process of forethought and self-regulation in anticipating valued outcomes as well as setting goals and planning for the future (Bandura, 1986; 1990; 1997).

Self-efficacy in Academic Research

As researchers have taken an interest in social cognitive theory and the ideas of self-beliefs, some have honed in on the importance of self-efficacy and its relationship to motivation. Much of this research has investigated areas of interest in education, such as academic outcomes (Multon, Brown, & Lent, 1991), learning in certain academic areas, including science and language (Cole & Denzine, 2004), and academic motivation in general (Bong & Clark, 1999). Researchers have found that a student's self-efficacy is an important predictor of performance success in academic areas (Bong & Clark, 1999; Yassir, 2006), and "for students to meaningfully involve themselves in learning for sustained periods, sufficient self-efficacy is required" (Margolis & McCabe, 2004, p. 248).

Much of self-efficacy research has been conducted predominantly with quantitative methods in academic areas. In a meta-analysis of 39 educational studies, researchers found that there were significant positive relationships between high self-efficacy and academic achievement, as well as academic perseverance (Multon, Brown

& Lent, 1991). Multon et al. (1991) concluded that students' perceived self-efficacy in academia accounted for 14% of the variance in performance outcomes and 12% in relation to their determination. When analyzing the 2003 mathematics results of the Program for International Student Assessment (PISA), Schulz (2005) found similar results. Self-efficacy as well as self-concept had positive correlations with mathematical literacy. Optimistic perceptions of self-efficacy were stronger and more positively related to mathematical achievement than any other self-construct, and these results were found in a significant number of the countries measured in the PISA. Pietsch, Walker, and Chapman (2003) also found that self-efficacy was related to positive performance in mathematics, and more so than general self-concept. When self-beliefs and mathematics were examined by Schulz (2005), results indicated that self-efficacy was positively related to math scores, and like previous research, self-efficacy was found to have a higher correlation to scores than the other tested theories of self-belief.

In research investigating foreign language learning, perceived self-efficacy influenced subjects' task performance, as well as their level of goal settings and task orientation persistence, independent from their actual level of skill acquisition (Bouffard-Bouchard, 2001). Bouffard-Bouchard used experimental means to artificially create self-efficacy perceptions among college language students. Positive instructional feedback was successfully used to induce high self-efficacy, and negative feedback was successfully used to induce low self-efficacy. Results indicated that there was a significant positive relationship between the high self-efficacy group and their success in solving the linguistic task problems and their persistence at the task. The correlations for the low self-efficacy group did not yield significant results.

In other language study research involving self-efficacy, Wagman (2005) found that students studying Latin could increase their self-efficacy when changing study approaches and study interests related to the topic at hand. Students were able to increase their self-efficacy in learning Latin when using self-regulated study habits and when researching certain topics of interest related to Latin, such as the history of the Latin language and its influences, or how it had affected the English language. This increase in self-efficacy helped students' perseverance and determination in their Latin studies.

Self-efficacy in Music Research

In one of the studies that explored musical performance and self-efficacy specifically, McCormick and McPherson (2003) investigated correlations between a musical examination, practice, and aspects of motivation, including self-efficacy. The researchers found that self-efficacy was not only positively related to the success of the performances, but the best predictor of success among the variables being correlated to the performance exam. This research in music supports the results in academic research that have found self-efficacy to be a positive predictor of performance (Bandura, 1997; Zimmerman, Bandura, & Martinez-Pons, 1992).

McCormick and McPherson (2003) surveyed 332 students aged 9 to 18 and asked them how they practiced and how they regulated their practice, including strategies, frequency, and the amount of time they devoted to the behavior. Students were also asked how important playing their instrument was to them, and how they felt about their competence on their instrument in regard to their possible success in the examination. The researchers wanted to know what variables were related to both self-

efficacy and the outcome of the exam. Anxiety was not statistically significant in this study, but all other variables, “except for Self-Regulation, [had] a direct path to Self-Efficacy” (p. 46). The researchers found that how the students expected to do on the exam, or how they believed they would do in terms of self-efficacy, was the most significant predictor of performance. However, there were only 3 items on the questionnaire related to this topic, and the researchers cautioned not to interpret these results as causal, but to realize the importance of self-efficacy and its possible relation to motivation.

Recently, McPherson and McCormick (2006) replicated their research with a larger group of 446 young musicians, exam grades 1 through 8. This study used the Australian Music Examination Board’s graded music exam. Like the first study, the subjects were also pianists, string instrumentalists, and brass or woodwind instrumentalists. The researchers wanted to confirm the significant self-efficacy results they found in their previous research (McPherson & McCormick, 2003). Structural equation modeling was used to analyze the results. Some important differences between the two studies included clearer questioning regarding self-efficacy, a larger sample, and a more structured music exam that included etudes and ear training portions. The researchers also used Bandura’s (2001) suggestions and made sure their self-efficacy questions pertained to whether or not a subject believed they could do something versus whether or not they intended to do it, and the self-efficacy questions were task specific.

A difference in the results was that the first study had more correlated paths from “cognitive strategy use” (McPherson & McCormick, 2003, p. 330), and the second study

had more paths from formal practice. The most significant path was from cognitive strategy use to formal practice. These results possibly indicated that students who did more formal practice were also students who were more cognitively engaged while practicing (McPherson & McCormick, 2006). The students who practiced formally also tended to practice more, and there was a direct path to performance from formal practice. However, a stronger significant correlation was found for the path that went from informal practice through self-efficacy before arriving at performance. Direct paths through self-efficacy to performance were practice regulation and grade level. Cognitive strategy use and practice time went through formal practice before they were linked to self-efficacy, and in the final path to performance, the link from self-efficacy was stronger than any other correlated path overall. In conclusion, the 2006 study, like McCormick and McPherson's (2003) original study, found that self-efficacy was the strongest predictor of success in a graded music exam.

Nielsen's (2004) study yielded similar results when investigating the practice habits of 130 collegiate instrumentalists and vocalists. The investigation focused on first-year collegiate students, their practice strategies, how these strategies might have related to their self-efficacy, and any possible self-efficacy differences between instrument or voice, degree program, or gender. Nielsen used two questionnaires to gather the information, one for strategies and one for self-efficacy. Results indicated that the first-year students used a wide range of different strategies and ideas when practicing, although managing these strategies was their least used skill. And though there were no significant differences between instrument groups or degree groups when testing for specific strategy use, males used critical thinking significantly more than

females. In regards to self-efficacy, males perceived themselves with higher self-efficacy than did females. And finally, there was an interaction effect when comparing gender, degree program, and self-efficacy:

Male students in the performance and church music programmes were more likely to have higher self-efficacy beliefs than female students in these two programs, while male students in the music education programmes were more likely to have lower self-efficacy beliefs in instrumental practicing than female students. (Nielsen, 2004, p. 425)

The most critical finding was that, in general, the higher a student's self-efficacy, the more cognitively engaged the student tended to be when practicing.

As music education researchers have begun to realize the importance of self-efficacy, they have begun to include it in their research investigations, such as McCormick and McPherson (2003) considering different variables that might relate to musical success and finding that self-efficacy was the best predictor of a young musician's achievement in a music examination, and finding similar results when replicating the study in 2006 (McPherson & McCormick, 2006). Recently, Davison (2006) discovered a similar, but alternative relationship when investigating improvisation and self-efficacy, finding that students who participated in learning musical improvisation skills experienced increased levels of musical self-efficacy.

Motivation

"Efficacy beliefs play a key role in the self-regulation of motivation" (Bandura, 1995, p. 6). Not only do these beliefs affect whether or not a person begins a task, but also the amount of effort and the amount of time that a person is willing or motivated to

contribute to a task (Bandura, 1997). “Motivation is the driving force behind behavior” (Asmus, 1994, p. 6), the initial spark and purpose behind sustained effort that is needed for successful, deliberate action, and can only happen if people believe in what they are capable of doing (Bandura, 1997). Deliberate music practice in the traditional sense is often considered effortful, difficult, time consuming, and requiring this sustained effort. Some even relate it to feelings of loneliness or isolation (Ericsson et al., 1993), and therefore, individuals might need a certain amount of encouragement and motivation to engage in such a purposeful and decisive activity.

However, motivation is not only the initial spark to begin a task, but possibly a key element necessary for success or achievement over an extended amount of time. In Ericsson et al.’s (1993) description of a theoretical framework for achievement in acquiring expert levels of performance in a given area, motivation was considered to be a critical component along with amount of time spent in preparation, available resources, and amount of applied effort.

Throughout history human nature has had the proclivity to surpass and improve levels of expertise in all domains. The motivation to learn in a field may be influenced by the attempt to achieve levels of accepted expertise, as well as the desire to rise above a contemporary society’s standards. Ericsson et al. (1993) concluded that “to make an eminent achievement, one must first achieve that level of an expert and then in addition surpass the achievements of already recognized eminent people and make innovative contributions to the domain” (p. 366).

As musicians and music students are motivated to work to achieve these ideals in their domain, they must develop and demonstrate a wide variety of knowledge and

skills simultaneously (Williamon & Thompson, 2004). These may include kinesthetic capacities; mental and psychological functions of analysis and concentration, as well as memorization using logic and spatial intelligences; the personal understanding to interpret and portray musical meaning to an audience; the musical vocabulary, both in music notation and actual musically-related linguistics to fully understand a composer's intentions or to possibly interpret the text of a song; and the psychological control to balance all of this with the emotion tied to music (Gardner, 1997).

The dedication it takes to persevere and sustain effort when learning and developing the variety of knowledge and skills necessary to create and perform music is difficult to assess (Ericsson et al., 1993; Woody, 2001). According to Sansone and Smith (2000), the motivation needed to maintain interest in any activity includes aspects that are both intrinsic and extrinsic. Through experimental research investigating intrinsic versus extrinsic motivating factors, Sansone and Smith concluded that individuals seem to actively attempt to create their own motivational reasoning and incentive, and that whether intrinsic motivation or extrinsic motivation is present may depend on the situation and the individual. However, "both may become necessary over time for [an] activity to be continued or resumed" (p. 367).

Important motivational factors that might be considered extrinsic include aspects of an individual's environment, such as parents (Howe & Sloboda, 1991; Zdzinski, 1996; Lehmann, 1997b; McPherson, 2000-2001) or teachers (Howe & Sloboda, 1991; Davidson, Howe, Moore, & Sloboda, 1996; da Costa, 1999; Lehmann, 1997b; McPherson & Pitts, 2000). O'Neill (1997) found an important communication link between parent and teacher to be important in early instrumental success for young

music students. Though less than 30% of the study's parents actually attended lessons, there was a relationship found between high levels of musical achievement and other forms of parental involvement such as inquiring about progress, asking for advice, and providing information to the teacher about home practice. Similar results have emerged in academic research, as well. In an experimental study of lower-socioeconomic 9th-grade students who had low grades or high amounts of absences, results revealed that even a small amount of parental support, such as communicating with teachers or giving students a place to study, helped students to achieve more academically than other students (Anderson, 1994).

However, O'Neill (1997) also concluded that the support and encouragement of parents and teachers cannot be enough if a child does not have some intrinsic value-reasoning for engaging in the persistent act of instrumental learning. In addition, Sloboda and Davidson (1996) found that the more advanced a student became, the less involved the parents were. Therefore, extrinsic motivation may become intrinsic as young musicians develop and grow. In Zdzinski's (1996) investigation, significant relationships were found between parental involvement and three areas of investigation: performance outcomes, scores on tests of cognitive musical skill, and aspects of affective musical response. Statistical significance was found at the elementary level between parental involvement and performance achievement, and parental involvement and cognitive scores. These same correlations were not significant for high school students, but results of affective measures increased in significance as grade level increased.

Intrinsic motivating factors can also include personal choice and investment in goal attainment as well as self-satisfaction in achievement. Students learning and developing musical skills may also need to have a metacognitive and emotional understanding of how they think about the music, both when learning it and when performing it (O'Neill & McPherson, 2002). It might be important for them to know and understand how they feel about the music they are playing. This may be important in terms of interpreting the music and portraying that interpretation to the audience. From their review of research, O'Neill and McPherson (2002) concluded that if students are aware of themselves, their preferences and self-beliefs, and their perception of their own learning, they may be more successful in developing their musical skills and learning, as well as interpreting music.

Considering both intrinsic and extrinsic motivational factors, Csikszentmihalyi, Rathunde, and Whalen (1993) found that young people who were considered talented in the ability of certain skills were different from other teens. The skills and abilities that Csikszentmihalyi et al. (1993) studied were those that were considered to be important in the development of certain socially recognized domains, such as mathematics, art, or music. These participants were able to concentrate and work with higher levels of endurance, while understanding or demonstrating a balance between wanting and experiencing the opportunity to be expressive, and still recognizing the importance of active goal setting and awareness of future endeavors; ultimately, they were motivated.

The subjects in Csikszentmihalyi et al.'s (1993) study were also unusual because their environment was different. They spent more time alone and were productive in their individual areas of specialization, rather than socializing and/or working part-time

jobs. The subjects spent more time with their families and parents than most young people and were greatly encouraged by their parents to develop unique work ethics in learning activities, rather than being told to do household chores. They had experienced at the appropriate point in the development of their domain an extraordinary moment where they felt motivated, inspired by the success of their efforts. The memory of that moment alone may be a motivating factor on a student's self-efficacy, self-confidence, or self-belief and may give that student the underlying strength to persevere through difficulties that might be encountered or failures that might be experienced as a talent is developed. When all of these different aspects align and balance well between skill level and challenge, an ideal sense of equilibrium may occur within an individual, described by Csikszentmihalyi et al. (1993) as *flow*. These unusual examples of properly motivated individuals were consistent in their desire to learn in their given field of study. This ideal level of self-awareness combined with planning and forethought can enable motivation to emerge and lead to success, sometimes over and over again in the most positive of situations. This ultimate ideal is what educators would like to see for their students, and therefore, researchers have tried to investigate motivational aspects of incentive, dedication, or retention in learning a skill such as music performing.

Motivation and Music Practice Research

Motivation to learn and succeed within a certain skill involves cognitive, behavioral, and/or psychological aspects of human nature to help satisfy needs, reach goals, and fulfill aspirations with purpose, effort, planning, or problem solving (Pintrich & Schunk, 1996). In general education and psychology research, motivation has been investigated and considered an important factor in helping students learn and construct

knowledge (Palmer, 2005). Music educators have also realized this critical component of learning and have investigated motivation in the context of learning and developing musical skills, which involves deliberate music practice.

The cognitive, behavioral, and/or psychological components of motivation in human action can work together differently within each individual, resulting in individuals exerting dissimilar amounts of effort in deliberate music practice as well as approaching practice in a variety of ways, and therefore developing varying levels of achievement in performance. Pitts, Davidson and McPherson (2000) studied motivation and music practice in an investigation of how students learn different approaches to practice effectively. The researchers considered the importance of a music learner's personality and environment, as well as any motivation in learning to play, practice, or perform as a musician. They explored personality in musical development because they believed that "the most important factor in children's musical instrument learning is their own enjoyment and satisfaction" (p. 54). Nine subjects were separated into case studies from a larger longitudinal study to investigate motivation and instrumental learning. Other concepts that were investigated included the relationship between motivation and effort in practicing as well as motivation and self-efficacy, and understanding in learning.

The researchers (Pitts, et al., 2000) viewed video recordings of practice sessions and interviewed the subjects, as well as their parents and teachers. The results yielded information regarding aspects of motivation, amount of practice, practice quality, involvement of parents, and the subject's enjoyment and satisfaction in playing an instrument. The nine cases were divided into three categories: (1) 3 who sustained interest after 20 months of playing and learning an instrument; (2) 3 who continued to

take music lessons after 20 months of playing and learning an instrument, but were having a decrease in motivation; and (3) 3 who discontinued their music lessons after 20 months.

The first group of 3 students all showed a commitment to learning their instruments with personal interest and ambition. The researchers (Pitts, et al., 2000) found that all 3 children used self-regulation when practicing. For example, they made educated decisions about the length of time that they practiced rather than just timing their practice sessions with a clock. The subjects also indicated a high level of comprehension and understanding when practicing their instruments, using important metacognitive skills. For example, one subject stated, "I think about what I'm going to do, then I check the notes and correct them and then speed it up again" (p. 57). All 3 also reported a supportive but non-interfering amount of parental support; they indicated that they mostly worked independently, but could ask for help if needed.

The second group of students, 3 subjects who lost interest but continued after the first 20 months, had not indicated any specific commitment of time. This group also lacked a personal attachment or identification with their instrument. They did not have the same high level of interest or expectations as the first group when starting their instrument. One subject even complained of being bored. Another subject did gain some interest after the first 10 months, but in general all 3 were influenced more by external factors such as practicing to make a certain band or not practicing because of a change in a teacher. The students in this group all had a set time to practice, yet none showed great enthusiasm to practice even in the beginning of their learning. They were also affected more by others' comments, like criticism from a sibling; one subject viewed

practicing as a task similar to homework; and all subjects in this group seemed to want to do only the minimum.

The subjects in the final group, the 3 subjects who chose not to continue their instrumental studies, all reported fewer intrinsic factors for choosing to learn an instrument. One subject's mother claimed that her daughter made the choice because her friends were going to learn to play an instrument. Another student indicated that he was unhappy and felt isolated because the friends that he knew well were not in the band. These subjects also expressed concerns for the practicality of their instruments, such as size or melodic importance in the ensemble. All 3 subjects also practiced only the minimum amount, and made excuses such as not having a scheduled time to practice or being tired after school. Also, parents were not as supportive. They did not seem to understand or support the dedication and process involved in successful music learning, and did not support the importance of music education, especially in comparison to learning other subjects. The final group also displayed a lack of understanding how to practice. For example some students tended to focus more on favorite pieces or were only able to do exactly what the teacher indicated rather than showing some level of self-regulation or independent thinking.

In a larger study, McCormick and McPherson (2006) asked students about their interest in music, how important they thought it might be for their future, how difficult they thought it would be to study, and how they thought their parents would view its significance to their growth and development. Results indicated that as students got older, their views toward music changed to a more negative concept. The students thought that music would be more difficult to learn, but less important in comparison to

other areas of study, and that their parents would not expect them to expend as much effort toward accomplishment in music as in other academic areas.

In regard to motivation and retention, Stewart (2005) found that band students who took private lessons were more likely to stay in their band programs. Students also responded that they would stay in a band program due to social reasons or peers. They indicated that they might leave a band program because of lack of time management, other interests, or academic grades. Academic grades did not correlate significantly to retention, but interest in playing in concerts and as an ensemble did. Performing sight-reading exercises alone was not significantly correlated, and therefore, reasons for participation and retention point back to the social aspect of band.

In a study of students' motivation to practice, Harnischmacher (1997) found that although preparing for a performance explained motivation to practice the best, motivation without "the extrinsic push of performance preparation tend[ed] to be influenced by planning and action-orientation aspects of personality" (p. 84). Therefore, people whose personality it is to take action and be proactive in their chosen activities may be successful at practice. Hallam (2001) also found that planning correlated positively with task efficiency: the better the practice routine was planned, the more successful it was. Madsen and Geringer (1981) discovered similar results with practice and task-driven students. Students were given a distraction index chart to mark and indicate whether or not they were on-task during a practice session, those who were able to stay more attentive and had better focus during their practice sessions also increased in their level of performance ability.

To research motivational components of the practice habits of professionals, Hallam (1997a; 2001) interviewed 22 professional musicians and 55 novices about their deliberate music practice. Of the sample, only 5 professionals indicated that they were intrinsically motivated and only 9 practiced daily. It was concluded that for those who were not intrinsically motivated, the need to maintain a professional level of musicianship kept them practicing. Particular events and competitions also helped to extrinsically motivate these professionals, even if they did not have a daily routine. Other researchers have also noted that impending performances served as motivators for students (Hallam, 1997a; Rohwer, 2002), though Hallam (1997a; 2001) found that novices did not cope as well as the professionals with the anxiety of performance preparation and its impact on motivation to practice.

Hallam (1997a; 2001) did reveal that there was a wide variety of reasons for motivation in practice, even among professionals, and that though some enjoyed the process of practicing, others realized the need, but claimed that the regular schedule of practicing was tedious. Therefore, some professionals interviewed also used a variety of approaches to practice to keep their practicing more interesting, such as improvisation or unique cognitive strategies using musical analysis. Bruser (1999) suggested that musicians followed their curiosity and inquisitiveness as they planned their practice schedules to help motivate them, while others have advocated more structured routines and strategies, as well as goal setting in practice (Barry, 1992; Lehmann, 1997a; Rohwer, 2002).

Researchers have also investigated the possible differences between what teachers and students might consider motivating factors in promoting good practice

habits. Ciabattari (2004) surveyed both band directors and students, asking them whether or not they believed certain motivating strategies were effective in encouraging students to engage in deliberate practice. When responses between teachers and students were compared, both differences and similarities were found. Band directors believed that extra help, encouraging hard work, demonstrating how to practice, supporting private study, and using challenging music were all ways in which students' motivation to practice might be increased. However, students did not completely agree. Ciabattari found that the two largest differences in results between teachers' and students' responses were in regards to recommending private instruction and giving extra help. The band directors believed that recommending private instruction and giving extra help was highly motivating, yet the students did not. Ciabattari concluded that students might perceive these teacher responses as indicating weaknesses, and possibly making the students feel inadequate or incapable rather than encouraging them to practice more to grow and improve. Students did indicate that they believed challenging music helped with motivation, but directors believed this to be a motivating factor significantly more so than did students.

Ciabattari's (2004) teachers and high school band students did agree that parental involvement in home practice was *not* a helpful motivator. This could be considered a contradiction to earlier research that found student musicians to have success with parental involvement (Zdzinski, 1996). But Sloboda and Davidson (1996), found that as students who are successful get older, parental involvement lessens, and Ciabattari's (2004) study focused on older, high school students.

As part of a study investigating the effects of certain practice techniques, Hewitt (2001) surveyed junior high school band students' attitudes and beliefs about practice within the context of the study's practice treatments, using a researcher-designed questionnaire. According to the data, practice attitudes and beliefs were consistent throughout the study and did not vary among treatment groups, even though results indicated significant differences across practice treatments for achievement factors. For example, in areas other than intonation and melodic accuracy, listening to an ideal representation of the music significantly improved a student's performance level. Hewitt suggested that the consistent and positive attitude of the students throughout the study may have been due to a treatment effect; the students may have been excited about the assigned practice methods, and therefore, more motivated to practice during the treatment.

Motivation to Practice and Choice

Other studies have investigated motivational processes in music practice and achievement, and have documented results related to student choice, interest, and/or enjoyment. Da Costa (1999) found that students enjoyed practicing and could learn their music faster when given the opportunity to choose certain aspects of their practice routine within selected boundaries. Some subjects were given a sheet of strategies from which to choose, and others were given instructions on how to mark phrases in the music. The students were taught how to identify, isolate, and mark certain phrases or sections in the music, but chose their own method of practicing those sections. They may have been choosing methods they were comfortable with, or believed they were capable of executing. Nielsen's (1999) case study of an organ student's regulation of

practice strategies yielded similar results. The student was successful and motivated to practice when taking ownership in his development and making appropriate practice method choices, as well as involving metacognitive behavior to help successfully complete the practice session.

In another study of practice related to motivation and choice, Renwick and McPherson (2002) investigated a young clarinet player and her intrinsic motivation to learn a piece she favored. She chose the piece due to its jazz rhythms and characteristics, which appeared to positively influence her practice behavior. Observation of video-taped practice sessions revealed that Clarissa used more advanced practice strategies and higher levels of self-regulatory behavior in self-monitoring of practice in the jazz version of a piece, versus the other classical repertoire and technical exercises. Duke, Flowers, and Wolfe (1997) also found that interest in what was being practiced was important in motivating students. Students are typically more motivated to practice when repertoire has been self-selected music, popular music, or improvisation. While standard repertoire and literature may be important for students to learn, enhancing it with student-selected works or informal improvisation pieces may help increase intrinsic interest, and overall motivation (Renwick & McPherson, 2002; Sloboda & Davidson, 1996).

Another possible extrinsic motivating factor in deliberate practice is the impact of competition. Competition may affect the amount of practice time and the use of practice strategies. Rohwer (2002) investigated high school band students preparing to audition for an All-State competition, and found that the students ranked in the middle practiced significantly more than the lower ranked group two weeks prior to the competition. The

higher ranked students did not practice significantly more than the other students, but they used different practice strategies, such as more metronome work while alternating tempi and rhythms. The higher ranked students also alternated between slow and correct tempi more so than the other students. The middle ranked students tended to end practice sessions by playing through entire sections, and the lower ranked students tended to clap rhythms to assist in learning more than the other students. Rohwer concluded that though intrinsic motivation might be considered an important element in the long term success of young musicians, some extrinsic and tangible incentives might also need to be considered. Also, because the higher ranked students did not indicate significantly more hours of practice than the lowest ranked group, aspects of practicing other than amount of time might need to be considered.

In an earlier study of 4th- and 6th-grade band students, Austin (1988) compared students competing in a solo contest who received Division I ratings (which is considered excellent) through Division IV (which is considered poor) to those who only received comments. Austin found that a slight majority (66%) of all the subjects in the study believed that students who knew they would receive a rating rather than just comments worked harder to prepare. And when asked if they would choose to compete for a rating again, 100% of those who received a First Division, said yes, while the majority in each additional category also said yes, providing a combined 76% majority of students who would prefer to compete with ratings. Subjects were also asked whether or not they thought the students who received ratings actually played their solos better. Only 34% said yes, but 82% indicated that they thought “students who receive ratings generally feel better about themselves when compared to students who receive

comments only” (p. 102). In conclusion, findings from the study may indicate that competitive situations where numerical ratings are given might encourage students to work harder and participate.

String Specific Research and Motivational Factors

Research has indicated that different personality traits can be found and identified within different instrumental groups, and that these particular traits may play an important role in both motivation for continuation of music study, and development of musical skill (Kemp, 1981). For example, Kemp (1981) found string instrumentalists to be more withdrawn and aloof than other instrumentalists. This may add to the rationale for the investigation of string instrumentalists independently from other instrument groups.

There may be other reasons to research string instrumentalists separately from other music groups. Generally speaking, there seems to be less string-specific research than other music education sub-group research; e.g. less research has focused on string education independently or separately from band or choir, particularly in a school setting. In addition to research differences, there may be other important differences as well. When considering fine arts programs, there are fewer string and orchestra programs, in general, compared to other instrumental music programs, particularly in smaller areas or districts (Smith, 1997), and researchers have claimed a recent string teacher shortage (Gillespie & Hamann, 1999).

Few researchers have considered high school aged string players alone, while also investigating their practice habits in relationship to their level of musical self-efficacy or motivational factors. Hamann and Frost (2000) compared string students

taking private lessons to string students not taking lessons. Results indicated that the students taking lessons were more motivated to practice in relation to practice time, and more organized in their practice time, but self-efficacy was not considered. Hurley (1992) researched beginning string students and motivational processes and found that teachers, friends, and siblings were more influential than parents, and that non-ego attributions of success were also positively influential in string education and motivation.

In relation to self-concept, Hurley (1992) found that students did not have accurate impressions of their own capabilities, but those impressions influenced decisions. For example, one student who was doing well but did not believe that he was successful, had a low self-concept, and ended up quitting. Therefore, Hurley advocated that self-efficacy may be an important aspect to investigate in relation to string student retention.

However, Hurley (1992) also found that positive self-concept was not necessarily enough, because even though most of the students in the study had positive self-beliefs in regard to their playing, some still quit. Therefore, the researcher concluded that the motivational concept of value-expectancy was important as well: "it is important for teachers to understand other variables that might influence student valuing of the task and that could build positive self-concepts in order to sustain student interests" (p. 223). Hurley also concluded that attribution beliefs were important influences, and that in relation to the results of the study, teachers may need to focus more on effort rather than outcome in the beginning of string instruction. Hurley believed ego-goals should be avoided and that a class where task-goals are encouraged and implemented may find better retention.

Hallam (1997a) interviewed 22 professional musicians that included string players and compared the results to 55 student string players aged 6 to 18, and concluded that successful practice behaviors may depend on the musician's experience and level of playing ability. For example, early learners might need more repetition and aural representation for their practice, while advanced musicians tend to use metacognitive skills that are built on a well-developed knowledge base. There has been a wide range of different types of research related to deliberate music practice, including looking at strategies, but also time, environment, and motivation.

Deliberate Music Practice

Practicing musicians and music educators are aware of the importance of practice and its influence on musical achievement and success. Many consider practice to be an essential part of gaining proficiency and expertise in any field (Ericsson et al., 1993; Sloboda et al., 1996). To attempt to understand the relationship between music practice and musical achievement, many researchers have investigated the quantity and quality of practice, practice strategies, and the effects of important influential aspects of practice, such as competition and environmental influences, producing an extensive amount of research on deliberate practice.

One conclusion that researchers have determined is that the amount of time spent practicing can be related to musical success. Ericsson et al. (1993) investigated deliberate practice and determined that amount of time spent in deliberate practice was a positive predictor of expert performance. However, they also concluded that other influential aspects might need to be considered as well, such as the environment, a musician's resources, and a musician's motivational processes.

Research with young musicians has supported Ericsson et al.'s (1993) findings. Sloboda (1994) found that the more often a young music student practiced the better that student's level of skill became, and O'Neill (1997) investigated children beginning formal instruction on their instruments and found amount of practice to be positively related to achievement, as well. Time accumulated in minutes over a 2-week period was found to be significantly more for the highest versus lowest achievement groups in O'Neill's study. But when measuring the actual number of days that the subjects practiced, a significant difference was only found between the medium and lower-level achievement groups.

Researchers investigating collegiate music students' practice time have discovered that the amount of time practiced may depend on students' specializations, i.e. what instrument they play, or if they are vocalists. In a collegiate conservatory, Jorgensen (2002) found a positive relationship between the amount of time instrumentalists practiced and their skill level, but this relationship did not exist for vocalists and organists. In an earlier study Jorgensen (1997) found similar results with string players; both string instrumentalists and guitarists tended to practice more than other instrumentals. Madsen and Geringer (1981) also concluded that keyboard players practiced more than other instrumentalists and that all instrumentalists practiced more than vocalists. Jorgensen (2002) determined that individuals' personal values and goals, along with other motivational influences had an effect on their practice behavior.

In an earlier collegiate study, Wagner (1975) focused on self-reported practice time and a treatment condition with college music majors in applied studios. Wagner randomly assigned 48 students into four groups: the first group used practice report logs

for eight weeks; the second group used practice logs during the first, second, fifth and sixth weeks; the third group used practice report logs for the fifth and sixth weeks only; and the fourth group, a control group, did not use practice report logs at all. No significant differences were found between groups. However, when comparing the amount of practice time between the three experimental groups during weeks five and six, Wagner found that group three practiced significantly more than the other groups designated into assigned practice reporting. This third group also had better, though not significantly better, pre-test scores than the other three groups prior to the experiment, possibly indicating that practice time may not be the only factor to consider when practice is compared to achievement in music education.

In other research investigating self-reported practice time, Geringer and Kostka (1984) analyzed practice behaviors of college music majors and observed that the students did not practice technical exercises as much as was self-reported by the subjects, but did spend as much time on solo repertoire as they had indicated. These estimated time variables seemed to be affected by other activities in which the students were involved, and it was discovered that more time was spent preparing to practice and setting up than students realized. These findings were not compared to any achievement levels

Madsen and Yarbrough (1975) conducted a study in 1972 that recorded the practice time of university music majors during a specific semester. Madsen (2004) then interviewed the same individuals who had participated in that study, and although these subjects believed that practice was an important factor in developing high levels of performance, they did not remember their practice time accurately. Madsen also

discovered that no relationship was found between the different levels of musical performance expertise and the amount of actual practice time recorded. Therefore, Madsen concluded that expert achievement might be a combination of factors, including university practice time accumulated over a number of collegiate semesters, advanced instruction, practice beyond the university level, and the possibility of innate talent.

Ultimately, the process and accomplishment of deliberate practice that is necessary to successfully perform on a musical instrument may be considered so multifaceted that it might be difficult to name one aspect that would be deemed most important. Researchers have investigated the importance of practice time, but have discovered that although time spent practicing may be important, other aspects are also influential. To investigate the results of musical performance success beyond the results of practice time alone, researchers have also considered musicians' different strategies and approaches to practice. For example, Hallam (1997b) suggested that researchers develop a coherent approach to investigating practice, making sure that purposes are clear and explicit when trying to explore the varying facets that are important to music practice behavior.

Hallam (1997b) organized these strategic concepts of deliberate practice into a three tiered practice model: presage, process, and product. The first part of this model looks at the student or learner and the teacher, considering characteristics, background, level of skill, student learning capacities and motivation, and teaching methods. The process, or heart of the model, focuses on the task at hand, the cognitive procedure and physical behavior of deliberate practice in music. And the product is not only a specific

test or task result, but takes into consideration affective responses of audience or teacher, as well as quality of performance.

As part of a deliberate music practice research study, Lehmann and Ericsson (1997) also proposed a model to describe deliberate music practice. Their model included three components: the desired goal of what the piece should sound like, the performer's actual ability to achieve the goal, and the current level of the performer. The current performance level may be related to the performer's self-monitoring capabilities as practice occurs.

Subjects in Lehmann and Ericsson's (1997) study relayed to the researchers what they were thinking while they practiced. The musicians were able to describe their monitoring of mistakes, and the researchers found unique and different mental strategies among the performers. The researchers found that piano students who learned to memorize faster described techniques such as hearing the musical phrase in their minds or focusing on the harmonic changes. The slower learners tended to rely more on rote learning and individual notes. The more advanced students tended to use more complex strategies to practice.

There are many different ways to organize and execute musical practice, and researchers have found that strategies can change or differ as performance levels or practice skill levels increase (Gruson, 1988; Hallam, 1997a; 2001; Rohwer, 2002). Lehmann (1997a) and Gruson (1988) found that students, who were considered advanced, explained their practice strategies more clearly and the strategies were more cognitively engaging and complex.

In deliberate practice research using observation and interviews, Hallam (1997a) analyzed the practice habits of 55 students, 49 who were considered novices from a beginning level to grade seven, and 6 who were considered advanced. Data revealed that practice strategy use was more significantly related to levels of expertise than to age and development or performance outcomes. Hallam categorized students' practice strategies and correction attempts according to their levels of expertise. "Students were categorized in relation to the highest level of practicing behaviour that they exhibited" (p. 100). The following are the six deliberate practice strategy levels Hallam defined in order of increasing expertise. Strategy level 1: Task requirements incomplete. This was the lowest level defined and students may have been too focused on the first part of the repertoire to even complete the assigned sections. Strategy level 2: Material played through, no corrections. At this second level, students may have played through the repertoire more than once, but no corrections were attempted. Strategy level 3: Material played through, single notes corrected. In this middle level category, students also played through the repertoire more than once, but recognized some errors and stopped to correct single notes. Strategy level 4: Material played through, short sections repeated. At level four, more attempts at corrections were noticeable. Students "repeatedly played through the piece, but on making an error stopped and replayed a short section of the music before continuing (p. 100). Strategy level 5: Material played through, large sections practiced en route. Students played through the repertoire, possibly more than once, but stopped while playing through to repeat larger more complicated sections in need of improvement. Strategy level 6: Material initially played through, difficult passages identified and practiced in isolation. In this final, most

advanced strategy level, students played through the repertoire first to gain an overall understanding of the piece, but then went back to sections identified as problem areas that needed focused practice.

Rohwer and Polk (2006) found a significant positive relationship between the number of deliberate practice strategies students could describe and their improvement between two performances. However, like in Hallam's (1997a) study, students did not always use the strategies that they referred to in their interviews (Rohwer & Polk, 2006). The researchers concluded that this could be either because there simply was not enough time in the 5 minute practice sessions, or because students' skill levels were not advanced enough to go beyond the basic ability to perform with both correct rhythm and correct notes.

Rohwer and Polk (2006) also labeled students and their practice habits as either "holistic," referring to the students who repeatedly played through the music, or "analytic," referring to those who took the music they were practicing and broke the music up into sections. Within the holistic group students were found to be "corrective" practicers, in that they stopped and started as they fixed problem areas, or "noncorrective" practicers, where no corrections were made, only repeated plays of the music were made. In the analytic group students were either "reactive," as they systematically took sections apart to fix problems that emerged during an initial run through of the material, or "proactive," where students started at areas they thought would be a problem rather than starting at the beginning.

By investigating the length of repertoire segments practiced by different subjects, Williamon and Valentine (2000) determined that quality of practice had just as important

an influence on a successful performance as did the amount of time spent practicing. The researchers found that practice excerpts increased in length and difficulty as age and level of ability or developing stages of practice increased. This was particularly true when investigating how different musicians prepared chosen works of repertoire for specific performances. Williamson and Valentine concluded that there is a need for more research focusing on the content and quality of deliberate practice to fully understand performance results.

Some research has demonstrated the important influence that student choice may have on student success (da Costa, 1999; Renwick & McPherson, 2002), but others have advocated that guidance is needed for students because knowledge of what to choose to practice or strategies to use to practice is developed over time through attained expertise (Hallam, 1997a). Regardless of whether it is student-selected, teacher-selected, or self-selected by professional/expert, practice organization and strategy may help to motivate and improve a musician's practicing.

String Specific Research and Deliberate Practice

Few researchers have grouped string players alone in research on the topic of deliberate musical practice. Hallam (1998) investigated violin and viola students' learning and practice habits and found that the time spent learning and the comprehension of the learning task itself predicted levels of achievement more than just the amount of time spent in deliberate practice. Hamann and Frost (2000) investigated the practice routines and attitudes of middle school and high school string students through a survey research study. The questionnaire asked how much and when they practiced, how they felt after they practiced, how they might have felt if they did not get

to practice, how practicing affected them physically, and other questions that might have explained a student's approach to practicing.

Hamann and Frost (2000) documented that string students taking private lessons were more motivated to practice and were motivated by different reasons than those not taking lessons. Private lesson students practiced more and longer than students not taking lessons. In general, most of the private lesson students also set goals and stuck to practice routines regardless of homework, family or social commitments, or exhaustion or pain. If these students did not practice, they felt guilty and anxious. Private lesson students indicated that they practiced when challenged by grades, competition, peers, or teachers, and were motivated to practice to progress in general or achieve goals. Students not taking private instruction practiced more for relaxation and enjoyment. In general, the students taking private lessons were more motivated to spend the needed time practicing regardless of other factors in their lives.

Hurley (1992) researched string students and motivational factors regarding deliberate practice and found that 4th- through 6th-grade beginning string students were not doing large amounts of practice. The researcher concluded that maybe in beginning class situations, teachers should encourage small and even some larger group practicing to encourage accomplishment, since many students may have joined for social reasons, and that at this beginning stage, caution might need to be taken with the issue of competition.

Summary of Literature Review

When linking deliberate music practice with performance achievement, there are a number of motivational factors that can be found to influence the amount of practice

as well as the quality of practice needed to be successful. This chapter reviewed literature and research that has investigated some of these different areas of influence. One might conclude that there are such a wide variety and number of influential variables to explore, that some music students or teachers could become overwhelmed by what to consider. And yet, these possible influences of motivation may be of particular importance when studying practice habits of music students.

Theoretical concepts of cognitive motivation that have been investigated in relation to musical practice include attributional beliefs, values and expectations, and the setting of appropriate goals. Self-efficacy is a common link among these areas of cognitive motivation and has been the theoretical focus of this study. To partake in the effortful act of deliberate practice musicians need some amount of intrinsic motivation and cannot help but be influenced by ownership in what they have invested, the results of their efforts and accomplishments they have made, and what they think of their own capabilities. This awareness of capacity, their self-efficacy, may be an important key in understanding students' motivational aptitude and competence needed to persevere and reach success in musical achievement.

CHAPTER 3

METHOD AND PILOT ANALYSIS

There were three research questions developed for this study: (1) What are the musical background characteristics and self-efficacy beliefs of a group of high school string students, regarding playing their string instruments in orchestra?, (2) What is the relationship between string students' perceived musical self-efficacy and their ranked scores in a regional competition?, and (3) What are the music practice behaviors and beliefs of a sub-group of high and low self-efficacy string players?

Participants and Procedures for the Main Study

The participants for this study were 101 high school string students from one district in a south central region of Texas. The ethnic demographics of the main study's participants were very similar to the district's population. The main study's district had approximately 85,546 students, with 7.98% of the students being African American, 3.24% Asian/Pacific Islander, 26.09% Caucasian, 62.42% Hispanic, and 0.27% Native American.

For research question one (What are the musical background characteristics and self-efficacy beliefs of a group of high school string students, regarding playing their string instruments in orchestra?) a researcher-designed questionnaire was used to describe the musical traits and musical self-efficacy of high school string students. Musical background characteristics referred to students' experience such as whether or not they took private lessons, if they started in a public school program, or how much

they practiced. For this portion of the study, all students in the district planning to audition for the top All-Region orchestra were invited to take the questionnaire.

At the beginning of the school year all string students in the participating district who planned to audition for the top All-Region orchestra were asked by their orchestra directors to take a UNT approved consent form home and to return the form as soon as possible. The orchestra directors explained the study to the students, that it was completely voluntary, and that it would not affect their grades in any way. The directors read an approved script to the students explaining self-efficacy and the string student self-efficacy study (see Appendix G).

There were nine high schools in the main study's district that had an orchestra program and participated in All-Region. This district was considered one of the five largest districts in the state, covering 355 square miles with 106 facilities and 85,546 students enrolled, and included 59 elementary schools, 15 middle schools, and 12 high schools. Therefore, to be able to reach all schools in a reasonable time frame and before the All-Region competition, two additional people were trained to distribute the approved consent forms and administer the questionnaire. All three people administering the questionnaire, including the researcher, read the same instructions to the students for the questionnaire (see Appendix H).

One-hundred and one string students took the questionnaire: 52 violins, 20 violas, 19 violoncellos, and 10 basses. There were 43 female students and 58 male students. Because the questionnaire was given early in the year and all students from the district who thought they might audition for the top All-Region orchestra were invited to take the questionnaire, some students took the questionnaire but did not register to

go to All-Region. Among those students there were 27 violins, 8 violas, and 11 violoncellos, and therefore, data from those 46 questionnaires were not used to investigate any relationship, but other information regarding their musical background characteristics were considered. Sixty-five of the students that took the questionnaire did participate in the region audition.

For research question two (What is the relationship between string students' perceived musical self-efficacy and their ranked scores in a regional competition?) self-efficacy scores were correlated to regional competition rankings. In the measured region there were 48 districts, but only two of the districts had active high school string programs. Another district had a new string program that was beginning to develop and become active, while a different district without a string program usually sent a small number of home school students to the competition. Therefore, the district used in the study was chosen due to the fact that it had the largest number of high school string programs of the region with nine high school orchestras. The other districts either had much smaller programs with only one high school orchestra or none at all. Also, the district chosen was in close proximity to the state university for convenience of data collection in comparison to the other districts within such a large-spread region.

Students were auditioning for two orchestras: *Symphony*, 9th through 12th-grade and *Allegretto*, 9th-grade only. The main study only examined students auditioning for the *Symphony*. Out of the 101 string students from the main study that took the questionnaire, only 65 registered and went to the audition. All bass students that took the questionnaire registered and went to the audition. See Table No. 1 for more string student All-Region distribution details.

| Instrument | Number of Students Who took the Questionnaire | Number of Students Who Registered to Audition for the All-Region Orchestra | Number of Students Who Registered to Audition for the All-Region Orchestra and Took the Questionnaire | Number of Students Who Auditioned for the All-Region Orchestra | Number of Students Who Were placed in the All-Region Orchestra | Number of Students who Were placed in the All-Region Orchestra Who took the String Student Questionnaire |
|--------------|---|--|---|--|--|--|
| Violin | 52 | 58 | 33 | 45 | 36 plus 2 alternates | 22 plus 1 alternate |
| Viola | 20 | 20 | 17 | 16 | 12 plus 2 alternates | 12 plus 2 alternates |
| Violon-Cello | 19 | 25 | 12 | 14 | 12 with no alternates | 9 |
| Double Bass | 10 | 17 | 9 | 16 | 8 with 2 alternates | 4 |

Table No. 1. Table of String Student All-Region Numbers Distribution

For the third research question (What are the music practice behaviors and beliefs of a sub-group of high and low self-efficacy string players?), 16 string students from two of the high schools in the district were videotaped: 8 students with higher musical self-efficacy scores and 8 with lower musical self-efficacy scores. The practice habits of these students were compared to Hallam's (1997a) six strategy levels, also discovered through observation and interview methods: 1) Task requirements incomplete, 2) Material played through, no corrections, 3) Material played through,

single notes corrected, 4) Material played through, short sections repeated, 5) Material played through, large sections practiced en route, 6) Material initially played through, difficult passages identified and practiced in isolation.

The two schools that were used for this research question were chosen as a convenience sample and were in close proximity to each other as well as the local state university so that the researcher could gather data in a timely manner. Of these students, 6 were male and 10 were female. There were 7 violinists, 2 violists, 5 violoncellists, and 2 double bass players videotaped. Ten were from one high school and 6 from the other. Three of these students did not go to the audition: one violinist, one cellist, and one bassist. To protect the self-esteem and psychological state of the students, none of the students were told their self-efficacy scores, and therefore, the sub-group of students did not know they had high or low measured musical self-efficacy.

Measurements Used in the Main Study

There were three measurement tools used in the current study: (1) a questionnaire, (2) a regional competition exam, and (3) interview and behavioral observation forms.

Questionnaire

There were 25 questions on the questionnaire, including 7 demographic questions and 18 self-efficacy questions. The demographic questions included five nominal level questions (gender, whether or not they took private lessons, whether or not they owned their own instruments, whether or not they started playing their string instruments in a public school system, and whether or not they intended to continue

playing their instruments after high school) and two interval level questions (the number of years they had been playing their instruments and how many hours a week they practiced, independently and outside of orchestra). These questions were analyzed individually using descriptive statistics to give context to the group of respondents. The 18 musical self-efficacy items on the questionnaire were developed using Bandura's (2001) *Guide for Constructing Self-Efficacy Scales*, and based on a similar questionnaire investigating the self-efficacy beliefs of band instrumentalists (Davison, 2006). For this portion of the questionnaire, students were asked to rate their confidence levels from 0 ("certain I cannot do at all") to 10 ("certain that I can do"), with a moderate statement listed at 5 ("moderately certain I can do"). These 18 items were summed to provide a musical self-efficacy estimate for each string player, regarding playing their string instruments.

The questionnaire was administered during orchestra classes. There were several blocks of orchestra classes scheduled throughout the day at each school. To be considerate to all students in the setting, students taking the questionnaire were asked to accompany the test administrator to another room near to the orchestra hall or classroom. The specific location varied at each school, but with traveling to another room, taking the actual questionnaire, and returning to class, the time taken was 20 minutes or less.

Regional Competition Exam

For the second research question (What is the relationship between string students' perceived musical self-efficacy and their ranked scores in a regional competition?), regional competition rankings were used as a measurement instrument.

All students who participated in the main study were students who had planned to audition for the All-Region *Symphony* orchestra. The competition was held 7 weeks after school began.

Each student played three excerpts in the regional competition. There were five judges on a panel and each panel was in a separate room. There was one panel for viola students, one panel for violoncello students, and one panel for double bass students, but there were three panels (a panel *for each excerpt heard*) for the violin students due to the number of students trying out. Therefore, violin students were split into 3 groups in 3 separate rooms and violin judging panels moved rooms three different times. All judges were asked to rank the students for *each excerpt heard*. They were not given a specific rubric to follow, but asked to give students a number within a range of their choice that might help them keep track of their own ranking system as long as they stayed consistent within their chosen scale, and as long as they broke any ties. For example, one judge listening to over 20 violins might have given an extremely strong and impressive candidate a score of 180 out of 200, or a very weak candidate a score of 45, ranking these two players at the two opposite extremes of their chosen scale, but still leaving room for the possibility of a higher or lower ranked competitor.

For violas, violoncellos and double basses, judges totaled each student's score given within their own scale for all three excerpts. Again, each judge could use a different scale of choice. All judges' numbers were entered into the computer and a ranking was determined for each student under each judge. Then each competitor's rankings from the five judges were averaged using the Olympic scoring system, throwing out the highest and lowest judge's rankings to determine a final, composite

ranking score for each student. However, for the violins, each student's rankings from each of the nine judges on the three excerpt panels was considered and then averaged after throwing out the highest and lowest ranking scores. Therefore, only the rankings were averaged, not the actual numbers that judges used to help them rank the students. All rankings resulted in first chair having the lowest ranking number for each instrument.

Interview and Behavioral Observation Forms

For the final research question (What are the music practice behaviors and beliefs of a sub-group of high and low self-efficacy string players?), a total of 16 string students from two of the high schools in the district were videotaped: 8 students with high musical self-efficacy scores and 8 with lower musical self-efficacy scores. The eight questionnaires with the highest scores and the eight questionnaires with the lowest scores were pulled out from the two schools' collective data sets. These questionnaires were matched with the students' names and the students were contacted. As these students consented to be interviewed and videotaped practicing, they were given a second consent form to take home and bring back as soon as possible. Only one student did not want to participate in the videotaped portion of the study and therefore, the next student who had the next lowest self-efficacy score from the two schools was invited to participate and agreed. Videotaping began as soon as the first consent form was returned. Each videotaped session took place in a large practice room during orchestra class, with the permission of the principal and the director. Any class work that was missed was made up.

Students were videotaped practicing in 2 practice sessions, 10 minutes in each session, on 2 separate days. First they were asked to practice a three- or two-octave

scale, depending on their instrument, for 5 minutes, and then the All-Region etude excerpt for 5 minutes. Students were asked to practice the scale beginning on their lowest open string; bass players only practiced the scale in two octaves. For students not able to play three-octaves, using two octaves was acceptable, depending on their skill level. They were asked to vary the bowing and/or the rhythm in the scale however they wanted to do so during the five minute session. For the second practice session they were asked to practice the first region orchestral repertoire excerpt for 5 minutes and the second excerpt for 5 minutes. In total, there were four, 5-minute intervals of practice: one scale and three All-Region excerpts. These intervals of practice were videotaped in two 10-minute sessions.

The region etude for each instrument was chosen from the *Texas Music Educator's Association's* All-State etudes (see Appendix C). Both a lyrical and a technical excerpt were chosen from the All-Region concert literature. The two concert repertoire excerpts were chosen from each of the following All-Region repertoire pieces: *Montagues and Capulets* taken from Prokofiev's (1937) *Romeo and Juliet* and Rimsky-Korsakov's *Russian Easter Festival Overture, Op. 36* (1989).

The video camera used was a Canon NTSC ZR200 mini-digital video camcorder with a tripod and high quality tape (Fujifilm DVC mini-digital video cassette). Practice behavior was videotaped for observation and interviews were videotaped for accuracy of information. The camera was carefully placed so that the student being videotaped was as comfortable as possible. In the two schools where the videotaping was done, there were practice room facilities in a separate area from the orchestra hall. Each school had one larger practice room for small ensembles where the videotaping took

place. These were fairly new facilities with practice room doors that were all see-through glass. Therefore, the students would stand opposite the door to avoid outside distraction, but the researcher always stayed out of the line of vision of the student being videotaped.

The sub-group of students videotaped because of high or low musical self-efficacy scores was also interviewed after the final practice session. The first 5 of the 10 questions were developed from practice techniques and concepts that have been found to be the most common or successful from past literature (Hallam, 1997a; Rohwer, 2002; Smith, 2005). Questions six through eight asked specifics regarding practicing and playing string instruments (Galamian, 1985; Hamann & Frost, 2000), and the final two questions were developed based on the field test. The field test subject mentioned how awareness of key signatures helped her stay focused throughout the practice sessions, and she commented on how surprised she was that even though the practice sessions were very short, she was able to succeed and accomplish one or two goals. The following were the 10 interview questions asked: (1) How did you decide where to start practicing in the All-Region etude or excerpts? (2) What were you thinking while you were practicing the All-Region etude, excerpts, and scale? (3) Why did you decide to use or not use a metronome? (4) How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session? (5) How much time did you take to warm up before each practice session? (6) How did you practice any dynamics in the All-Region etude or repertoire excerpts? (7) How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale? (8) How did you practice intonation? (9) Were you at any point during the videotaped practice

sessions thinking about key signatures? And (10) How successful or not successful do you think your practice sessions were?

Once videotaping was complete, to gather data regarding the third research question, an observation form was used to help narrow the wide possibilities of the qualitative observation procedures. The observation form was a researcher-designed set of questions developed to help narrow and clarify the observation process, based on the reviewed literature (Hallam, 1997a). The questions on the form were also adjusted based on the videotaped observation data of the pilot practice sessions, and the suggestions of the content validity panel chosen for the observation form. The observation form required the researcher to focus on different areas of practice strategies as well as specific string area concepts by documenting activities based on 14 prompt questions along with an open-ended section at the end. The development of the form and its final format will be explained in the section, *Test Development and Content Validity*.

Test Development

Content Validity

The Questionnaire

The initial version of the questionnaire had 17 items regarding self-efficacy and included a separate answer sheet that asked for name, questionnaire number, instrument, gender, and the following questions about musical background: (1) How many years have you been playing your instrument? (2) Did you start in a public school program? (3) Do you take private lessons on your instrument? (4) Do you plan to continue to study your instrument after high school? (5) Do you own your own

instrument? (6) How many hours do you practice a week during the school year (not including orchestra rehearsal time)? The eighteenth self-efficacy item was added during the content validity procedure to address rhythm and bowing.

The survey instrument was reviewed by four expert judges with adjustments made to ensure its content validity. These judges included experts and researchers knowledgeable within the following areas: general music education, survey research within music education, self-efficacy research within music education, and string education research. The general music education expert taught at a private school for 3 years and public school for 2 years before teaching at the university level for over 10 years. She had published research investigating motivation and student teacher retention. The next expert, the survey and music education expert, had three years of high school teaching experience, two years of university experience while completing her doctorate, and publications related to survey research and teaching in lower socioeconomic areas. The third expert was a self-efficacy expert who was a band director for 7 years with experience teaching elementary and overseeing student teachers as a university graduate assistant before becoming a district fine arts director, and the fourth expert was a string research expert who taught at the university level for 6 years and published works related to the psychology of music and string performance related to perception research.

First, the layout of the questionnaire was adjusted twice to read easier and then individual item numbers were changed. Item number one was changed to: "I can overcome most problems I encounter when learning difficult music my teacher has given me." It initially read: "I can overcome most problems I encounter when learning a

hard piece of music that my teacher has given me.” In item number five the words “stick to the problem” were adjusted to “work on the problem.” Item number 11 was changed from the statement: “If I make a mistake I can keep going until I get it right,” to the statement: “If I make a mistake I can continue playing without too much distraction.” A change was also suggested for the seven musical background characteristic questions. “How many hours do you practice a week during the school year (not including orchestra rehearsal time)?” was changed to “How many hours per week (outside of orchestra) do you practice?” to simplify and clarify the question.

To help include concepts of rhythm related to bowing, item 18 was added. It first read: “I feel confident slurring difficult rhythms into one bow,” but it was changed to: “I can slur difficult rhythms into one bow.” All four experts agreed on the final version of the questionnaire and that it seemed to include a sufficient number of components that would give a well-rounded concept of a string student’s self-efficacy. They also agreed that the musical background questions, which were on a separate answer sheet for the pilot, were appropriate questions to ask string students in order to obtain descriptive findings.

Before the main study was conducted, these experts were contacted again and shown a version of the questionnaire with the musical background characteristics and gender question added to the questionnaire itself rather than on a separate answer sheet. The experts agreed to this layout and the following recommendations were made. First, it was suggested that a new answer sheet ask for name, survey number, instrument, and school and grade. Then, to ensure accuracy, it was recommended that the demographic items *male* or *female* be typed out and given as an option to circle

rather than written out as it had been on the pilot answer sheet version. The last suggestion was to change the question asking about continuing music study to add the phrase “in some way.”

Interview Questions

The interview questions were reviewed by four different expert judges for both content validity and linguistic comprehension. The judges included two music education experts as well as two linguistic experts. One music expert had 10 years of experience in music education research and over 20 years of music teaching experience, including choral and instrumental instruction as well as elementary music in public education, and most recently 7 years of university experience. The other music expert taught orchestra for 12 years and worked with various youth orchestras. The linguistic experts, both having masters degrees in their field, included a speech pathologist of over 30 years and an *English as a second language* expert who taught ESL classes in public education as well as the private sector.

It was suggested that certain questions asked in the interview be adjusted for clarification. For questions one, six, and seven, rather than leaving each question open to all repertoire practiced in all the sessions for the study, each item was rephrased so that it asked the subject to think about each question as it pertained to specific practice sessions, such as when subjects practiced the scale, the All-Region etude, or the All-Region repertoire excerpts. Questions three and four were also changed after recommendations. Question three originally read “Do you practice independently with a metronome?” to “Why did you decide to use or not use a metronome?”. Question four was originally written as “How did you decide what tempo you were going to use during

your practice session?” and was changed to “How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?”. It was also suggested that more specification was needed in the questions six, seven, and eight, which initially asked “How do you practice... dynamics, difficult slurred passages, and intonation?”. These items were adjusted to: (6) “How did you practice any dynamics in the All-Region etudes or repertoire excerpts?”. (7) “How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?”. And (8) “How did you practice intonation?”. All other questions were approved of by the experts and left in the interview questioning form. These questions were aimed at gaining a perspective of what students thought about their own practicing as well as what they might be thinking while they practice. The music area experts agreed that the questions that were asked included a wide range of concepts related to practicing and that descriptive conclusions could be made about the string students’ practice habits with these questions.

Observation Form

The observation form was reviewed by four experts, one of whom reviewed the questionnaire as well. The first was a music education professor whose recent research and area of expertise were in secondary music education and deliberate music practice research, and who also was a band director for 7 years, university professor for two years, and researcher for four years. The second expert was a secondary music education research expert who taught band for 12 years, and university music education courses for 2 years, with a specialization in survey research within music education. The third expert was the same self-efficacy music education researcher who

reviewed the string student self-efficacy questionnaire. The fourth expert was an orchestra director for over 25 years, who had taught both elementary music as well as strings at the secondary level, was a Master Teacher for the researcher's university's *String Project*, had taught university coursework, and was a well-known string pedagogue throughout the state. Each expert was contacted and shown the observation form three times: the initial version, a version with their suggested changes, and then the final version of the form.

Adjustments were made from the suggestions of the panel that would help simplify the data collection and to help further investigate how string students practice. A simple aspect that was changed was in sentence structure. Originally each question on the form seemed to be worded differently, unnecessarily elongating the form. Therefore, all sentences were made to fit into a similar sentence structure. For example, initially, two sentences had asked, "Whether or not attempts were made at any corrections?" and "If intonation was corrected, how was it practiced?". These were simplified to ask, "Were correction attempts made?" and "How was intonation practiced?".

Three questions were changed based on suggestions regarding the practice of segments. Questions four, five, and six originally read, (4) "Were any small sections repeated for correction?" then (5) "Were large sections practiced as the material was played through?" and (6) "What technical aspects were practiced?". These questions were changed to (4) "Were any small sections repeated for correction, such as one motive or measure?", (5) "Were any large sections, beyond a measure, practiced as the material was played through?", and (6) "What technical aspects were practiced, such as

shifting, difficult bowings, or difficult fingerings?”. Also, there was no question referring to whether or not students might be writing things down to make notes, singing to assist their practice, or showing any evidence of making adjustments in their practice if goals were not being met. Therefore, two questions were added, (13) “Did the student write anything in the music during the practice session?”, and (14) “Did the student do any kind of singing, counting out loud, or non-instrument practice?”.

All experts agreed that the questions could help obtain a representative collection of observed data for the observation portion of the study. String students’ practice behaviors certainly vary, and the experts also agreed that the form, with its wide range of practice techniques and concepts that were included, might help the observer in deciding what to look for as well as organizing the data.

The following are the final 14 questions and one open-ended question used as the observation form for the main study: (1) Where in the repertoire does a student begin each practice session?, (2) Were any attempts made at corrections?, (3) What, if any, tempo variations might have been used to help with practice?, (4) Were any small sections repeated for correction, such as one motive or measure?, (5) Were any large sections, beyond a measure, practiced as the material was played through?, (6) What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?, (7) How was intonation practiced?, (8) How was rhythm practiced?, (9) Was a metronome used? If so, how?, (10) How were dynamics practiced?, (11) How were difficult slurred passages practiced?, (12) Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?, (13) Did the student write anything in the music during the practice session?, (14) Did the student do any

kind of singing, counting out loud, or non-instrument practice?, and an additional open comment question.

Field Test

To check equipment and room set-up, time designated for the practice sessions, and responses to interview questioning before the pilot test, a field test subject was videotaped and interviewed. This helped the researcher ensure that the room was appropriate; the camera was at a comfortable distance from the students, all video equipment was working properly, and that procedures were timed well. The field test subject had a self-efficacy score of 101, just above the low self-efficacy group. She spent additional time helping get the video equipment set up properly, practicing on tape to test the audio and visual equipment, and responding to all questions. It was discovered that adjustments needed to be made in the timing of the practice sessions. They were originally two 15 minute sessions and the field test subject claimed that she felt this was too much time with the addition of the interview. She said she felt uncomfortable that the video camera was set up at an angle where other students might be able to look into the room. Therefore, the camera was turned so that she felt more at ease and could focus on the music better. During the interview she was fine with all the questions and answered them confidently. She also commented on the questionnaire and suggested that the seven musical background questions be moved to the main questionnaire. She made a comment about privacy and said some students might not answer the questions as honestly, like the one regarding amount of practice time, if the question was on the same answer sheet as their name. Therefore, all questions were moved to a two-page questionnaire that had two sections: the seven musical

background questions plus gender, and the string student self-efficacy portion. The answer sheet would then ask for name, questionnaire number (to keep names and all responses separate and confidential), instrument, grade, and school.

The Pilot Study

The pilot study used one high school orchestra program. The pilot district was chosen due to its similarity in location, size, and demographics to the main study district. The pilot orchestra program was also chosen due to its central location within the pilot district, and the size and level of the orchestra. There was a wide range of ability levels of the students in the group, and the level of the orchestra overall could be considered average or moderate within the strong reputation of the district.

The pilot district, at the time of the study, had approximately 61,006 students enrolled, including 42 elementary schools, 12 middle schools, and 7 high schools. The main study and pilot districts were located next to each other, covering the northeast, central, west and surrounding areas of a large metropolitan area in south central Texas. In the pilot district 9.40% of the students were African American, 3.60% Asian/Pacific Islander, 41.30% Caucasian, 45.40% Hispanic, and 0.30% Native American.

The chosen pilot high school was estimated to have the following approximate ethnic distribution: 11.40% African American, 2.70% Asian/Pacific Islander, 45.10% Caucasian, 40.40% Hispanic, and 0.40% Native American. The percentages of the racial/ethnic populations for the chosen pilot orchestra matched what was reported for the school as a whole. In terms of gender, the orchestra population had approximately 60% female and 40% male students. No student was excluded based on any demographic characteristic.

The pilot study surveyed 38 string students about their musical self-efficacy, regarding playing their string instruments in orchestra. The percentages of each gender in the survey sample were similar to the estimated percentages of the orchestra and school as a whole. There were 13 males (34.21%) and 25 females (65.79%) who took the questionnaire; 23 violinists, 5 violists, 6 violoncellists, and 4 double bassists. Of these students, 7.89% were African American, 5.26% were of Asian/Pacific origin, 21.05% were Caucasian, and 65.79% were of Hispanic decent. These demographics are given as approximations since ethnic origin was not specifically asked on the questionnaire.

Six orchestra classes were visited at the pilot high school, grades 9 through 12, inviting all orchestra students to participate in the pilot study. The students were instructed that they could answer questions that would indicate their musical self-efficacy beliefs in regard to playing their string instruments. Self-efficacy was defined in a way that the students could understand, trying to explain that it is a belief in what they think they are actually capable of doing, based on the knowledge of their own skills in a given area, such as playing their string instruments in orchestra. The students were asked if they had any questions about the study, and then they were assured that participation in the study was completely optional, and that whether or not they decided to participate would have no effect on their orchestra grade. (See Appendix I for an exact copy of what was read to the students.)

During this first visit, the approved UNT Institutional Review Board consent forms were distributed which provided students with permission materials to be able to participate in the first part of the pilot study, taking the questionnaire designed to

measure string students' musical self-efficacy in regard to playing their string instruments. The pilot district was on an A/B Block schedule where classes met every other day, and due to the fact that their school would be out for summer break in less than 2 weeks, the students were asked if they could bring back the consent forms by the next class meeting.

Those students who had returned their consent forms at the next class meeting were then administered the questionnaire, which included instructions and an answer sheet where they wrote the number of the questionnaire, their name, and answered 6 questions regarding their musical backgrounds and experiences. Later these musical demographic questions were added to Section I of the actual questionnaire (see Appendix C), but the version of the questionnaire used for the pilot only included the 18 self-efficacy items as they were developed and finalized in Section II of Appendix C, while the answer sheet asked the musical demographic questions.

The questionnaires were collected and musical self-efficacy scores of playing a string instrument were summed. Based on the summed scores, a majority of the students had a musical self-efficacy score of 101 or above or less than 148. Therefore, the extreme scores were considered less than 100 or higher than 148, and students who had musical self-efficacy scores of 148 or above, or below 100, were approached and invited to participate in the second portion of the study. To protect the students' self-beliefs, none of the students were told of their self-efficacy score, and therefore the students for the second portion of the study did not know that they were chosen because they had extreme high or low musical self-efficacy.

In regard to gender and scores, a male student had the highest self-efficacy score of 171 out of a possible 180. However, 5 of the top 8 string students who had a self-efficacy score of 148 or above were females, and the 4 students who had a self-efficacy score of 147 were all female students. When considering the top half of the 38 student self-efficacy scores, which were 131 and above, a majority were female students (68%).

Three students with high self-efficacy scores and 3 students with low self-efficacy scores were invited to participate, and consent forms were given out. One form did not come back in a reasonable amount of time, and so an additional low self-efficacy subject was chosen that was willing to participate with signed consent forms. This new and separate consent form asked for their parent/guardian'(s)' permission to participate in the videotape and interview portion of the study. The additional student was approached and invited to be a test subject in the second portion of the study.

Nine students were actually measured in the pilot study, not including the first field test subject. The first 3 of the 9 students were a part of the investigator's training, used to help learn to give better instructions to the participants, practice minimizing any involvement, and to help refine and expand the questions for the interview portion that was to immediately follow the practice sessions. Two of these students were also older beginner students and therefore practicing different repertoire and playing at a different level. In the original plan and IRB application, 6 subjects were to be videotaped: 3 high and 3 low self-efficacy students. However, because the first 4 students videotaped had sessions that were more training in nature, and were not used in the pilot analysis, 10 students were videotaped in total, using data only from the final 6.

Students were videotaped and interviewed as soon as the first consent forms were returned, for both the low and high self-efficacy groups. Any conclusions that were made were only considered with the final 3 high and 3 low musical self-efficacy students. Of the final 6 students videotaped, 2 of the low self-efficacy group did need additional instruction and explanation. The first measured student, not one of the 6 used for data and the intentional field-test subject, claimed to have never truly practiced at home or on her own much and was not able to practice independently for more than 2 minutes. She needed constant guidance. Two other students that were not part of the final 6 were older beginner students who were also unable to practice without constant guidance. Their videotaped sessions were used to practice research protocols and to help set up the videotaping equipment in a way that was comfortable for the students.

The first older beginner was a violoncellist and seemed eager to participate, but was working on different repertoire. She played through her scales for the first practice session and asked several questions about how the scale was supposed to be played. When working on the solo repertoire she asked for the physical set-up to be changed. We adjusted it until she felt comfortable. This made a definite impact on the set-up for the rest of the study. It was important to take into consideration students playing the larger instruments or students who wanted to sit down to practice. Incorporating the chair changed the size of the videotaping area and once again the camera was moved in order for the students to play comfortably but not where they felt other students could look in on them, or where the researcher was staring at them.

The next student was also a beginner and working on different repertoire. Therefore, her experience was also considered a test run of the set-up and videotaping.

This student did not have any problems during the videotaping or interview, but suggested that the interview be immediately following the last practice session. This was done after every student's final practice session due to this suggestion.

Time in the pilot

Oral directions for the questionnaire took less than 2 minutes and the students took approximately 8 minutes to finish the questionnaire. However, each class was slightly different due to size of class and age differences. There were two freshman classes, one large and one small, and four other classes with mixed age levels, three of 20 or fewer students and one with approximately 35 students.

Because this school was on an A/B schedule, it took 2 days to complete the questionnaire. Self-efficacy scores were summed and consent forms were distributed for the video portion of the study the next A/B day. Videotaping began as soon as the first videotape consent form was returned. The videotapes were completed in 1 week and 2 days.

The times assigned to practice sessions were adjusted as the first pilot practice sessions and interviews were videotaped. Fifteen minutes for each practice session, the original time planned for each, proved to be too much time for the assigned repertoire section and then for each scale. The higher self-efficacy students did seem more comfortable with the longer sessions than the lower group, but the time usage was not always completely productive. For example, the first higher self-efficacy student videotaped was not able to be productive through the entire 15 minutes, particularly during the scale practice. Therefore, time was adjusted to 10 minutes for the assigned

repertoire section and 5 minutes for each scale. This amount of time had been used in other observation practice research (Hallam, 1994, 1997).

Practice session repertoire and scales for the pilot

The repertoire chosen for the first practice session of the pilot study was an excerpt from the pilot high school's final exam music, *James Bond 007*, written by Monty Norman, arranged by Victor Lopez (Norman, 2003). The students were taking this exam the same week of the videotaping. They were not told by their teacher where the final exam excerpts were in the music. But for the videotaped practice sessions for the study, they were asked to practice one or two page lengths of the repertoire (page one for violin, part of page two and three for viola and violoncello, and page one for double bass) which contained one or two of the final exam excerpts. They were told that this page or sections of pages contained the final exam excerpts and to approach their practice session with this in mind. Two students had actually taken the exam before the videotaping, but were asked to pretend as though they had not so they could try and practice with the same mind set as the other students. There was one student who played a J. S. Bach *Minuet* (Suzuki, 1995) rather than *James Bond 007*. She was a first year string player and 1 of the first 4 tested subjects.

The scales chosen depended on the instrument and the level of the student. Initially scales were to be two major, three-octave scales, the first beginning on the lowest open string, and the second beginning on the first finger of the lowest string. The students were asked to practice varied bowing styles, including one, two, and four notes per bow. One student took the concept further and practiced several different bowing options. Some students that were not as advanced only played two octaves scales, and

one student only played a one-octave scale and took more than the 5 minutes given to even begin to accomplish the different bowing options.

Location and equipment for the pilot

Videotaping took place in a sound proof room located within the orchestra hall. It was a large ensemble practice room that the orchestra director usually used to store instruments. He took out one row of shelved instruments to leave an open space in the middle, and though there were instruments stored around the room, the room was still much larger than a typical practice room and appropriately served the purposes of videotaping. However, there was a large window in the door that was distracting when other students looked in, and because some students stored their instruments in that room, there were three different interruptions during videotaping.

The video camera used was a Canon NTSC ZR200 mini-digital video camcorder with a tripod and high quality tape (Fujifilm DVC mini-digital video cassette). Both practice sessions and interviews were videotaped by the researcher while the orchestra director was in the orchestra hall, right outside the room.

Interview questions for the pilot

The initial interview questions were formed based on the review of the literature that considered what practice techniques and concepts have been found to be the most common or important when learning how to practice:

- 1) How did you decide where to start or what to practice first from the given scale or piece?
- 2) What were you thinking while you were practicing the given scale or piece?
- 3) Why did you decide to use or not use a metronome?

4) How did you decide what tempo you were going to use to begin, engage in practice, and end the practice session?

5) How much time did you take to warm up before this practice session?

Five questions were added and developed based on the first videotaped sessions, with the goal being to further inquire about the students' cognitive processes and possible understanding of their playing capacity while they practiced. Three of these questions were specific to string players. The last 6 students who were videotaped were each interviewed after their practice sessions by the researcher and 5 of these students were asked the complete list of nine questions. With one student, time ran out before all nine questions were asked. The following were the added four questions:

6) How do you practice dynamics?

7) How do you practice difficult slurred passages?

8) How could you practice to improve your intonation?

9) How do you remember to play all the correct sharps or flats when you are practicing?

Reliability

Internal Consistency for Reliability

All 18 questionnaire responses from the 38 pilot subjects who took the questionnaire were analyzed using SPSS (2005). When considering all 18 questions, the alpha coefficient for internal consistency was .96. When question two, a lower loading question was taken out to possibly improve the consistency of the questionnaire, the alpha coefficient remained the same. When another low loading question, number seven, was taken out, the alpha coefficient decreased. Therefore,

because taking out one or two questions did not increase the reliability, all 18 questions were kept in the final questionnaire, with the final reliability coefficient being $r=.96$.

Observation and Interview Reliability

To ensure reliability regarding the observation procedures of the videotaped practice sessions and interviews, triangulation was used. Triangulation in qualitative research is defined as “using multiple investigators, sources of data, or data collection methods to confirm emerging findings” (Merriam, 2002, p. 31).

In this study, two extreme sub-groups were videotaped practicing their string instruments as they prepared for a final exam and played some assigned scales. Following, the same sub-groups were interviewed about their practice behaviors. The practice sessions and interviews were videotaped. The interview tapes were reviewed by both the researcher and another outside, objective and experienced language specialist and speech pathologist who over the past 30 years had transcribed student recorded interviews for linguistic accuracy and communication. This was also the same expert that made suggestions for the interview form. Reviewing the interview video with a language expert helped verify any language that was difficult to understand, helped the researcher understand the importance of simplicity and clarification of questions as well as possible interviewer bias through demeanor of questioning and response. This specialist watched the first four test videos and noticed that the interview questions were not always asked in the same manner. Adjustments were made and she was shown the first two pilot subjects whose information was used. The expert said there was greater measurement consistency. This expert also agreed with the wording of the questioning and claimed it was fine for the students to comprehend and respond.

Practice session videotapes were reviewed by an experienced string teacher and violoncellist who had been teaching orchestra at the high school level for over 10 years and had a master's degree in orchestral conducting. This was done to ensure accuracy of the observations. Discussions with this colleague concerning the first three videos (not including the initial field-test subject) also helped the researcher understand how important it was to be non-participatory to avoid any bias or researcher influence on the data. Comparisons were also made between the expert's observations of two students' practice behaviors and the researcher's. The expert noted an additional task the researcher did not notice. The expert noticed that the first of the 6 pilot subject students changed her fingering more than once for the same passage. Other observations were consistent between the researcher and the expert. Because of this the researcher made sure to watch for different or unique fingerings in all observations. Therefore, portions of both videotaped practice sessions and videotaped interviews were reviewed by unbiased parties in addition to the researcher to strengthen validity and reliability (Merriam, 2002).

It has been suggested that peer review of a project, including discussion of "the congruency of emerging findings with raw data, and tentative interpretations" (Merriam, 2002, p. 31) may help validity and reliability. For this study, two peer university colleagues were consulted, made suggestions, read material, discussed data and findings, looked at initial survey drafts, and reviewed the pilot analysis. As changes were made from the experts' suggestions and field testing in the tests and videotaping procedures, the two colleagues were shown any changes and both gave their approval.

Results of the Pilot Study

Demographic results

There were seven demographic questions asked of all 38 string students who took the self-efficacy questionnaire. The first was gender. There were more females than males among the group, 25 females and 13 males. Students were also asked whether or not they had started in public school or owned their own instruments. All but 2 started in the public school system, and 78.76% owned their own instruments. Twelve students out of the 38 took private lessons, and 19 (50%) were interested in continuing to play their string instruments after high school. Most of the students had been playing for at least 5 years since these were high school students, but there were 3 older beginners in the program who took the questionnaire and had only been playing for 1 to 2 years. Nine students claimed that they practiced for at least an hour a week outside of orchestra, while 8 other students claimed either 2 or more hours. Five students indicated that they practiced 3 hours a week, 2 students claimed 5 hours and another 2 students claimed 8 hours. Only 6 students admitted to none, but one student indicated 14 hours.

Descriptive Pilot Results

Thirty-eight string students were surveyed in the pilot study about their musical self-efficacy beliefs regarding playing their string instruments. Six of these students had self-efficacy scores lower than 100 out of a possible score of 180, and 8 of these students had a score of 148 or above. The lowest score was 41 and the highest score was 171. The majority of students scored between 101 and 148, with the most common score being 147. Four students had this score, which was 10.52% of the total group.

The mean score was 124.18 ($SD=32.02$) and because 22 out of the 38 scored above this, the self-efficacy beliefs of the pilot study string students were generally above the pilot study's descriptive average. Also, the scores had a statistical skewness of -1.13 with a standard error of .38.

Pilot study string students were videotaped practicing and preparing for a final exam. The final exam scores could not be used to correlate with self-efficacy scores because of access issues to the test scores. Also, it would have been too difficult to recreate the regional competition repertoire excerpts, too much to ask the students to prepare any additional material near the time of a final exam time, and too difficult to recreate the regional judging situations or competitive atmosphere.

Observation Data

Observation data were analyzed in conjunction with the interview data and questionnaire responses for 6 students, subjects A through F. In general, the higher self-efficacy subjects tended to use more advanced practice techniques than the lower self-efficacy subjects did. In other deliberate practice research using observation, Hallam (1997) spelled out six levels of "task orientation strategy" (p. 100) to help define deliberate music practice:

- 1) Task requirements incomplete
- 2) Material played through, no corrections
- 3) Material played through, single notes corrected
- 4) Material played through, short sections repeated
- 5) Material played through, large sections practiced en route
- 6) Material initially played through, difficult passages identified and practiced in isolation

These levels or categories of strategy approach were easily identified among the 6 students observed in this study, compared here in order of increasing self-efficacy scores, beginning with student F.

Analyzing the 6 students measured in the pilot study, the following table (Table 2) indicates how they related to Hallam’s (1997a) list of task-oriented strategy levels:

| Students in order by extreme and ascending self-efficacy scores: | Strategy levels (Hallam, 1997) used most: |
|--|---|
| F self-efficacy score of 45 | 1 and 2 only |
| E self-efficacy score of 60 | 2, some of 3 and 4 |
| D self-efficacy score of 91 | 2 and 3, some of 4 |
| C self-efficacy score of 157 | 3 and 4, some of 2 |
| B self-efficacy score of 161 | 4 and 5, some of 3 |
| A self-efficacy score of 171 | 6 and some of 3-5 |

Table No. 2. Comparison of High and Low Self-Efficacy Pilot String Students to Hallam’s Strategy Levels

Details of the observation data in terms of practice strategies can be found in Appendix B.

CHAPTER 4

RESULTS AND DATA ANALYSIS

The results have been organized based on the purposes of this study and the research questions: (1) What are the background musical characteristics and self-efficacy beliefs of a group of high school string students, regarding playing their string instruments in orchestra? (2) What is the relationship between string students' perceived musical self-efficacy and their ranked scores in a regional competition? And (3) What are the deliberate music practice behaviors and beliefs of a sub-group of high and low self-efficacy string players?

Research Questions and Purposes

String Students' Musical Characteristics and Self-efficacy Beliefs

One-hundred and one high school string students who planned to audition for the All-Region Orchestra took the researcher-designed string student self-efficacy questionnaire, which included seven musical background characteristic questions. Students answered the seven questions regarding their musical characteristics at the beginning of the string student questionnaire. The questions were: (1) How many years have you been playing your instrument? (2) Did you start in a public school program? (3) Do you take private lessons on your instrument? (4) Do you plan to continue playing your instrument after high school? (5) Do you own your own instrument? (6) How many hours per week (outside of orchestra) do you practice? And (7) Gender (circled choice of female or male).

There was a wide range of years students claimed to have played their instruments: 1 to 11 years. All students who took the questionnaire ($N=101$) averaged

5.60 years total ($SD = 1.80$). Students who took the questionnaire and made the All-Region orchestra averaged 6.05 years ($n = 47$, $SD = 1.64$, ranging from 3 to 11 years), and for students who took the questionnaire but did not audition ($n = 36$), the average number of years students had been playing their instruments was 5.47 ($SD = 2.11$, ranging from 2 to 11 years). When considering students who were in the self-efficacy sub-groups ($n=16$), the average number of years that the 8 students in the lower self-efficacy sub-group had played was 6.63 ($SD = 2.20$), ranging from 4 to 11. The average number of years for the 8 students in the higher self-efficacy sub-group was 6.25 years ($SD = 1.98$), ranging from 3 to 9.

In regard to whether or not string students started in a public school program, only 10 out of the total number of participants ($N=101$) who took the questionnaire did not start in a public school program, and 7 of these 10 went to the All-Region audition. All but 1 of the 7 made the top orchestra, and the student who did not make the top orchestra placed as an alternate. From the higher and lower self-efficacy sub-groups, 2 students of those who did not start in a public school program were students in the higher self-efficacy sub-group and 2 were in the lower self-efficacy sub-group.

Two students in the lower self-efficacy group were also the only two out of the 16 sub-group students who did not take private lessons. When considering all students who took the questionnaire ($N= 101$), including the ones who took it but did not participate in the audition, 53 did not take private lessons and 48 did. Out of the 48 who did take lessons, 8 did not go to the auditions, and 8 did audition but did not make it, though 2 of these students made first alternate and 1 made second alternate. Thirty-two of the students who did take private lessons went to the audition and made it.

All students who participated in the study and took private lessons had an average self-efficacy score of 154 ($SD= 22.48$, ranging from 90 - 180); those who participated and did not take private lessons had a lower self-efficacy score average of 131 ($SD= 20.08$, ranging from 79 – 177). Students in the higher self-efficacy sub-group (average self-efficacy score of 158) all took private lessons, but two from the lower sub-group (average self-efficacy score of 110) did not.

Eighty-five students, a majority of all students who took the questionnaire ($N=101$) indicated that they were interested in continuing to play their instruments after high school. Of these students, 45 took private lessons. From the 16 sub-group participants, only 2 from the lower self-efficacy sub-group did not want to continue after high school.

Seventy-four out of all 101 students claimed that they owned their own instruments. Nine of those that did not were double bass players, and all of these students auditioned for the All-Region orchestra. However, only 3 of the bass players made it with a fourth making first alternate. There were 17 other student participants who did not own their own instruments, and of these students 10 auditioned for the All-Region orchestra. Two of the 17 students who did not own their own instrument were from the self-efficacy sub-groups. One was from the higher self-efficacy sub-group and was a double bass player. Because of the size and cost of the instrument, it is not uncommon for students who play the double bass to use a school instrument. For instance, only one double bass student from all 10 bass students who took the questionnaire owned her own instrument, and she was from the lower self-efficacy sub-group

The average number of hours practiced outside of orchestra for all 101 students who took the questionnaire was 4.53 hours ($SD = 4.95$, ranging from 0 to 30 hours). The students who took the questionnaire and chose to audition ($n=65$) averaged more hours of practice per week ($M= 4.94$ hours, $SD= 5.12$, ranging from 0 to 30 hours) than the students who decided not to audition ($n=36$, $M= 3.79$ hours, $SD= 4.59$, ranging from 0 to 20 hours). Out of all 65 students who took the questionnaire and auditioned, those who made the All-Region orchestra averaged 5.71 hours of practice per week outside of orchestra ($SD= 5.35$, ranging from 1 to 30), and practiced more than those who did not make the All-Region orchestra, who averaged 3.23 hours of practice per week outside of orchestra ($SD= 4.18$, ranging from 0 to 19). Female ($n=43$) students ($M=4.59$ hours, $SD =4.41$, ranging from 0 to 21) averaged just slightly more hours of practice than male ($n=58$) students ($M=4.48$ hours, $SD=5.35$, ranging from 0 to 30) per week, but with a smaller range.

The average self-efficacy score for all students who took the questionnaire ($N=101$) was 139.43 ($SD=21.35$, ranging from 79 to 180). The median score was 141 and there were four modes: 120, 130, 140, and 148. When considering gender and self-efficacy scores, male students had an average self-efficacy score of 139.10 ($SD= 22.43$, ranging from 79 to 180) and female students had an average self-efficacy score of 139.70 ($SD= 20.22$, ranging from 99 to 171). The two students in the study with the highest (180) and lowest scores (79) were both male students.

String Students' Self-efficacy Scores Correlated to Ranked Competition Scores

Of the 101 students who answered the questionnaire and who planned to audition for the All-Region Orchestra, only 65 of these students ended up going to the

audition: 30 violinists, 16 violists, 10 violoncellists, and 9 double bassists. After the seven background characteristic questions, there were 18 additional questions asked in regard to how students felt about their capabilities related to playing their string instruments, their self-efficacy.

To answer the second research question, all students of all four instruments who took the questionnaire and auditioned for All-Region were considered together, and their self-efficacy scores were correlated to their All-Region rankings. Possible rankings were from 1, being the highest ranking a student could receive, to 45, the lowest ranking a student could receive. Self-efficacy scores ranged from 79 to 180 with 180 being the highest possible score a student could obtain. The average self-efficacy score for all string students auditioning ($n=65$) was 140.43 ($SD=20.50$) with a skewness of $-.44$. The median for the rankings of all the string students auditioning was 13.

The correlation between self-efficacy scores and audition rank was inverse. For all string participants ($n=65$) Spearman's rho was, $r_s = -.37$, ($p=.001$) with 14% of the variance explained ($r^2 = .14$). This inverse relationship documents the linear trend for students with better rankings (lower ranking numbers) to also tend to have higher self-efficacy scores.

Practice Behaviors and Beliefs of String Students with High and Low Self-Efficacy

To answer the third research question and investigate the deliberate practice behaviors and beliefs of high school string students, 16 students who had taken the questionnaire were videotaped practicing and then interviewed as they prepared for their All-Region orchestra audition. There were 8 students who had self-efficacy scores between 99 and 120, the lowest range from the two schools chosen for videotaping, and

8 students whose self-efficacy scores were between 148 and 173, the highest range from the two schools. These 16 students were referred to as Students K through R (since Students A through J were field test and pilot test participants) for those whose self-efficacy scores ranged from 173 down to 148, and Students S through Z for those whose scores ranged from 120 down to 99. Student K had the highest self-efficacy score of all 16 and Student Z had the lowest.

Descriptive statistics were used to investigate the self-efficacy scores of the high and low self-efficacy sub-groups and their All-Region rankings. In the higher sub-group, 2 students made first chair in their sections, while two others ranked 3rd and 7th, respectively. When considering higher and lower self-efficacy sub-group students, the higher sub-group generally ranked higher than the lower sub-group. However, there was one lower sub-group student who placed higher than two of the higher sub-group students, and one who placed higher than one of the higher sub-group students. See Table No. 3 for self-efficacy scores and ranking results for all self-efficacy sub-group students.

Each student was videotaped in two separate practice sessions. These sessions were 10 minutes each and were divided into two smaller 5 minute sessions. First, students were asked to practice a three octave scale beginning on the lowest open string of the string instrument they played, for 5 minutes. Next the students were asked to practice the All-Region etude excerpt assigned to their instrument, for 5 minutes. For the second 10 minute session, students were asked to practice the All-Region Repertoire excerpts. Students were told to choose two excerpts, one from each piece that would be performed at All-Region and heard for the audition.

| Self-efficacy scores of higher sub-group students | All-Region rankings of Higher sub-group students | Instrument Played |
|---|---|-------------------|
| Student K – 173 | 1 st out of 16 who auditioned, 8 taken | Bass |
| Student L – 163 | Did not go to the audition | Violoncello |
| Student M – 161 | 1 st out of 14 who auditioned, 12 taken | Violoncello |
| Student N – 155 | 7 th out of 45 who auditioned, 36 taken | Violin |
| Student O – 154 | 3 rd out of 14 who auditioned, 12 taken | Violoncello |
| Student P – 153 | 13 th out of 45 who auditioned, 36 taken | Violin |
| Student Q – 153 | 34 th out of 45 who auditioned, 36 taken | Violin |
| Student R – 148 | 20 th out of 45 who auditioned, 36 taken | Violin |
| Self-efficacy scores of lower sub-group students | All-Region rankings of Lower sub-group students | Instrument Played |
| Student S – 120 | 24 th out of 45 who auditioned, 36 taken | Violin |
| Student T – 116 | Chose to audition for the freshmen orchestra | Bass |
| Student U – 114 | 16 th out of 45 who auditioned, 36 taken | Violin |
| Student V – 113 | 12 th out of 16 who auditioned, 12 taken | Viola |
| Student W – 110 | 5 th out of 14 who auditioned, 12 taken | Violoncello |
| Student X – 105 | 11 th out of 16 who auditioned, 12 taken | Viola |
| Student Y – 101 | Did not go to the audition | Violin |
| Student Z – 99 | 11 th out of 14 who auditioned, 12 taken | Violoncello |

Table 3. Higher and Lower Self-efficacy Sub-group Students' Self-efficacy Scores and All-Region Rankings

Some students practiced more than two excerpts, but kept to the assignment given of choosing excerpts from each piece for each 5 minute session.

To analyze the observation videotapes as precisely as possible, the researcher designed and used an observation form based on a review of the research literature and the pilot study of this project. Summarized practice habits of the higher and lower self-efficacy sub-groups were compared to previous research that outlined practice strategies into six different levels (Hallam, 1997a). The following section is organized based on the order of items practiced: each student's scale, etude, and repertoire excerpts. Findings from the observation form and the comparison to previous observation research (Hallam, 1997a) are also included, as well as additional anecdotal qualitative data related to video practice observation and data from the interviews.

Scale practice

All students were asked to practice a three octave major scale beginning on their lowest open string for 5 minutes. Double bass players could practice two octaves if they preferred. Observation data revealed that some students were unique in their scale practice, while others showed commonalities among their approaches to the following: bringing out the tonic or including arpeggios; incorporating rhythmic, bowing, or articulation variations of the scales; isolating and/or repeating certain parts or notes of the scales; and incorporating certain technical aspects in the scale practice.

Unique scale practice. Certain students practiced particular aspects of their scale in a unique manner. In regard to unique practice, higher self-efficacy students tended to use more varied left hand techniques in their scale practice. They also did more slurring of notes together, while the lower self-efficacy sub-group used more rhythmic variations

and unique practice methods related to bow articulation and slurred fewer notes together.

Some of the left hand techniques used by higher sub-group students included additional shifting, trilling, and isolating finger patterns. Because double bass players could practice a two octave scale starting on the open “A” if they preferred, Student T, from the lower self-efficacy sub-group, chose to do so. However, Student K, the bass player from the higher self-efficacy sub-group, who had the highest self-efficacy score, chose to practice a three octave scale. This scale shifted into a much higher position and therefore used advanced left hand technique. Student P, also from the higher self-efficacy sub-group, included a unique practice variation, trilling one pitch to the next. Student N, another student from the higher self-efficacy sub-group, isolated her fingerings by individually practicing the appropriate finger pattern for each string within the key of the scale. This student also varied her fingering, which was unique from all other students in both sub-groups.

Another unique aspect of the higher self-efficacy sub-group was that one student used a metronome. Student O, a student from higher self-efficacy sub-group, was the only student from either sub-group who used a metronome. However, when asked about this in his interview, he said he used it because his private teacher made him. He also slurred his rhythmic variations into one bow rather than playing them separately.

Three of the lower self-efficacy sub-group students also used unique techniques to practice their scales. Student V, from the lower self-efficacy sub-group, varied her scale with repeated spiccato, playing four bow strokes per pitch, and Student X, also from the lower self-efficacy sub-group, slurred two notes, repeating each second note of

the slur as he went down the scale. Student Y, with a self-efficacy score of 101, used a unique practice technique where she slurred two notes starting on the second scale degree, creating the feeling of syncopation.

Trends in addressing the tonic note. Though all students started at the beginning of their respective scales, 5 demonstrated a common approach in regard to the tonic note of the scale. Three students held tonic notes longer, i.e. half notes when they had been playing quarters, and two students repeated each tonic note. There did not seem to be a difference between the higher and lower self-efficacy sub-groups regarding the reinforcement of the tonic because students from both sub-groups approached this activity similarly; the student with the highest self-efficacy score of 173, Student K, repeated the tonic notes in the scale, as did Student Z who had the lowest self-efficacy score of 99.

Arpeggios incorporated. Four students chose to add an arpeggio to their scale practice. The bass student from the higher self-efficacy sub-group, who chose to play a three octave scale, also added a three octave arpeggio. He played the arpeggio several times, almost every other time he played through the scale. Two other students in the higher self-efficacy sub-group and one other student in the lower self-efficacy sub-group also incorporated arpeggios in their scale practice.

Rhythm and articulation. Six students from the higher self-efficacy sub-group and 4 students from the lower self-efficacy sub-group all started their scale practice with separate quarter notes, playing one note of the scale per bow. The student with the second highest self-efficacy score, Student L, began practicing his scale in quarter notes as well, but then he slurred two eighth notes together before varying the rhythm

and articulation. Four students from the lower self-efficacy sub-group started their scale practice in slow half notes, while no students from the higher self-efficacy sub-group began their scale practice with half notes.

Like Student L, most of the higher self-efficacy sub-group students incorporated a rhythmic variation of the scale that involved mixed note lengths, such as a dotted eighth and sixteenth version (Students K, M, P and Q), a version with a sixteenth note first, then a dotted eighth (Students L and Q), and an eighth note followed by two sixteenths or a quarter eighth, eighth pattern, and then two eighth notes followed by a quarter note (Students M, N and R).

Students S, T, U, and V, from the lower self-efficacy sub-group, also used rhythmic variations in their scale practice. Students T and Z used bowing variations as well. Student T played one down bow on a quarter note and then two hooked up bows in eighth notes. Student Z varied her bowing and played the scale slurring two notes then separating two notes; a slurred two, separate two pattern repeated throughout the scale. Two of the students also used a version that created a feeling of syncopation. Student Y played the first note of the scale separately and then slurred two notes, while Student X repeated each last note played while coming down the scale in two notes per bow (slurred two).

Several students from the higher self-efficacy sub-group played the scale with different numbers of notes slurred together, such as two, three, four, six, eight, and even 12. Student M, the student with the third highest self-efficacy score of 161, played the scale with 2, 4, 8, 12, and 16 notes per bow. She focused on her vibrato while playing a slower version with two notes per bow. Student O, who had a self-efficacy

score of 154, slurred two, four, and attempted to slur eight notes per bow. Student N, whose self-efficacy score was 155, slurred four to a bow after her separate quarter notes, and then slurred each octave together. Student Q, with a self-efficacy score of 153, slurred four notes together. Student P slurred 4, 6, 8, and 12, and then played all three octaves in two bows before practicing the scale in her unique, trill-like variation. Student R, whose self-efficacy score was 148, played two notes per bow as well as three and then eight.

Students from the lower self-efficacy sub-group practiced their scales with slurring variations as well, but they did not slur as many notes together or practice as many slurred variations as the higher self-efficacy sub-group. Also, not as many of the lower sub-group chose to practice with the slurred variations and if they did, they did not necessarily go in order of the number of notes per bow like the higher self-efficacy sub-group. Student S, whose self-efficacy score was 120, the highest self-efficacy score of the students in the lower self-efficacy sub-group, started with slow quarter notes and then faster eighths all separately, before slurring eight notes to a bow and finally only two notes per bow. Student U, with a self-efficacy score of 114, practiced his scale with separate quarter notes first, then slurred six, eight, four, and two notes per bow, in that order. Student W, with a self-efficacy score of 110, slurred four notes together in his scale twice, and then practiced it slurring two notes per bow. Students X and Y only practiced one slurred version with two notes per bow. Student Z, the student with the lowest self-efficacy score of 99, practiced the scale slurring eight notes per bow. She also varied the articulation in her quarter note version, quickly doubling each note by playing two separate bows on every pitch.

Isolating and/or repeating sections in scale practice. Some students isolated a certain section or octave within their scale practice. Student M, a student in the higher self-efficacy sub-group isolated one octave to repeat the top three pitches slowly. She also repeated the first three low notes to regroup. Student O, the fifth highest self-efficacy student, also repeated the top section of the top octave, focusing on the top four notes. All but one student from the higher self-efficacy sub-group repeated a small section of the scale for correction. Student K repeated the second octave arpeggio and slowed down, while Student L repeated the top four notes of the third octave once he remembered the fingering to practice them. Student N practiced a small section of the scale slurring each octave together as well as part of the arpeggio. Student O repeated and practiced several small portions of his scale slowly: the top of the third octave in a rhythmic variation, half of the third octave in another version, and the fifth and sixth scale degrees of the second octave in a slurred variation. He also isolated and worked on string crossing difficulties. Student Q repeated the top portion of the top octave and she slowly repeated and compared certain notes to her open strings, while Student R repeated and isolated the entire top octave.

Students in the lower self-efficacy sub-group also used repetition and isolated small portions of the scale. Student S used repetition and practiced small sections of the scale, and Student T repeated the latter half of the second octave, her top octave in her practice as a bass player, as well as other isolated pitches. Student U repeated each octave in isolation, while Student X slowly repeated six notes of the top octave. Student Y focused on her shifts, and Students W and Z both used some repetition and slowing down.

Technique practiced during the scales. Students also focused on certain technical aspects while practicing their scales. From the higher self-efficacy sub-group, Student K practiced and repeated a very quick separate note version of his scale involving nimble finger agility. Student M practiced vibrato during her slow version of the scale, while Students K, N, O, and P all practiced a shift in their scales. Student O isolated and practiced a string crossing within one of his slurred versions of the scale, and Student P practiced finger agility using a trill-like variation of the scale. Students U, V, W, X, and Y, from the lower self-efficacy sub-group, also isolated a shift in their scale practice, and Student V worked on coming down the scale with a shift. She also practiced repeated spiccato notes.

Etude and Repertoire Practice

After their scale practice, students were videotaped practicing their All-Region etude excerpts for 5 minutes, and then on a separate day, 10 minutes of the All-Region repertoire excerpts (5 minutes from each of the two pieces to be performed at their All-Region concert). Based on the observation form and details in the observation data, the following sections developed through common trends in the students' practice sessions: how students began their practice sessions; whether or not large or small sections were isolated and/or repeated; tempo variations used; technical aspects practiced; and finally, isolating passages after an initial run through. Also included were references to any non-instrumental approaches to practicing.

How students began their practice sessions. Most students started at the beginning of their etude or repertoire excerpt practice sessions. A small number of students from the higher self-efficacy sub-group also attempted to play through their

etude excerpts from beginning to end. Student K, the student with the highest self-efficacy score, started at the beginning of his entire etude, rather than just the excerpt of the etude, and played through it without stopping. When asked in the interview how he chose where to start, he stated that he wanted to work on the entire etude because he needed to practice all of it for All-State. Student P, also in the higher self-efficacy sub-group, was the other student who practiced her etude excerpt this way. She explained in her interview that she liked to go all the way through something first to see if there were any problem areas before going back over anything. Student M made reference to this in her interview as well, and attempted to do so, but she made quick stops or adjustments as she played through the etude excerpt several times.

Students V, W, X, and Z, all from the lower self-efficacy sub-group, started at the beginning of their etude or repertoire excerpts, but stopped immediately to fix or isolate a problem. From this group of students, Student W and X made specific references to isolating and correcting problems once they had started during their interviews, while the other students claimed to have started practicing at the section they thought was the most difficult. However, because these students had actually started at the beginning of all their excerpts, they did not do exactly as they claimed, but may have focused on what they thought was most difficult once they began.

There were only 3 students that did not start at the beginning of their etude or repertoire excerpts, Students S and Y, from the lower self-efficacy sub-group, and Student O from the higher self-efficacy sub-group. Student S started three measures into her etude excerpt, while Student Y began several measures into her etude excerpt. They seemed focused on checking notes in these spots before continuing, and claimed

in their interviews that they wanted to start at the places that seemed most difficult to them. Student O, from the higher self-efficacy sub-group started at challenging sections of the etude and repertoire excerpts rather than the beginnings and though he did not indicate this in his interview, he did state that he wanted to start with the most challenging “excerpts” first.

Large sections isolated and/or repeated. All students in the higher self-efficacy sub-group did some large section practice in the etude and repertoire excerpts. They practiced half of an excerpt and then repeated that section, sometimes more than once, focused on three or more measures to practice before going on to the rest of the excerpt, or isolated other large sections in some way. The 4 students with the highest self-efficacy scores, Students K, L, M, and N did this more consistently than the other students and their large practice sections were generally longer. They also made reference to going back over sections in their interviews. Student K repeated the first half of each repertoire excerpt he chose and then played the excerpts in their entirety. Student L started at the beginning of both the etude excerpt and repertoire excerpts and then worked on sections anywhere from three to six measures long, repeating these sections and isolating slow melodic themes or difficult fast note passages. Student M repeated large sections or the entire excerpt for both her etude excerpt and her repertoire excerpts, and Student N repeated each half of the first repertoire excerpt she practiced and three large sections of the second repertoire excerpt. Students O and Q only practiced one large section in their repertoire excerpts, while Student R, the student with the lowest self-efficacy score of the higher sub-group, did practice in large

sections in both her etude excerpt and repertoire excerpts, but skipped over difficult spots.

Seven students from the lower self-efficacy sub-group practiced in large sections, but the sections they isolated were generally smaller than those chosen by the higher self-efficacy sub-group and they did not isolate as many large sections. Students S, T, U, and Z isolated sections two to four measures in length. One student from the lower self-efficacy group, Student W, did repeat one large section six measures in length, while Students V and Y did not practice any sections beyond two measures in length.

Small sections isolated and/or repeated. Students also practiced small motives or sections, one measure or less in length. From the higher self-efficacy sub-group, this included Students L, M, O, and Q. Student L repeated a fast section with string crossings and a spiccato articulation, while Student M repeated several individual notes, motives, a difficult shift, the grace notes in one place, and two other short sections for technique practice. Student O isolated and worked on a shift, repeated a short spiccato passage to work on articulation, and repeated a measure that had double notes (two sixteenth notes to be played for every eighth note). Student Q repeated two small motives and one measure.

Students in the lower self-efficacy sub-group also broke up their excerpts into smaller sections. Students V, W, X, and Z, all started at the beginning and stopped immediately to fix or isolate a small motive or section one measure or less in length as they attempted to play through their etude and repertoire excerpts. Student T repeated one small motive five different times. She also repeated three other small sections and focused on the first phrase of her etude excerpt practice. Students V and X repeated at

least one small motive several times until it was corrected and then practiced the first part of the etude, starting over more than once, and not completing the excerpt.

Students S, T, Y, and Z used practice techniques such as varying the tempo, rhythm, or bowing as they isolated small sections of the etude and repertoire excerpts. The other lower-self-efficacy sub-group students repeated a single note, motive, or measure.

Passages isolated after an initial run through. Only two students from the higher self-efficacy sub-group and one student from the lower self-efficacy sub-group practiced difficult passages in isolation after an initial run through of either the repertoire excerpts or the etude excerpt. Student K played all the way through the entire etude and then went back over large sections. Student P played once through the etude excerpt, not completely in the same tempo, but all the way through, before going back and working on a section. Student Z, the student with the lowest self-efficacy score used this practice technique in one of her repertoire excerpt practices. She repeated several measures of quick double notes after an initial run through of the entire excerpt. Students K, P, and Z all stated that this was their intention when practicing, to play all the way through something before going back to focus on anything specific.

Students M, U, V, and W also claimed in their interviews that attempting to play through something first was their preferred method of approaching practice. Student M, from the higher self-efficacy sub-group, used this practice technique to some degree. She stopped quickly and went back to repeat three different short segments before getting all the way through the etude excerpt the first time. Two students from the lower self-efficacy sub-group also attempted this practice technique, but with less success. Both Students W and V tried to play all the way through the etude initially, but had

difficulty doing so without stopping. Once they did finish the excerpt, they went back to sections; Student W isolated a spiccato section, a section with grace notes, and a shift, and Student V isolated a section in the upper register. Student U, from the lower self-efficacy sub-group, also attempted to do so as well. He tried playing through the first repertoire excerpt, only making one quick adjustment, but finishing it to the end before going back and isolating any sections and practicing slowly.

Two students from the higher self-efficacy sub-group attempted to play all the way through an excerpt and did so at some point, but not necessarily initially. Student L, from the higher self-efficacy sub-group, played through most of an excerpt before he went back slowly over a section containing a repeated pattern of an eighth note and two sixteenths. Then he went back and played the excerpt all the way through. For the repertoire excerpts, Student K played through more than half of the first excerpt, and then he played the entire excerpt before he practiced four measures at half tempo.

Tempo variations used. The practiced tempo showed some distinct variations between the students within each sub-group and also across sub-groups. Students in the higher self-efficacy sub-group began their etude and repertoire excerpt practice either close to performance tempo or at performance tempo. Students K and M, the students with the highest and third highest self-efficacy scores, began the etude and repertoire excerpts at performance tempo. Student K repeated the entire etude excerpt and large sections of the repertoire excerpts at tempo. He did slow down during a quick quarter note section in one of the repertoire excerpts, and he repeated a section that had a down up, up hooked bowing (the bow goes in the same direction with an articulated stop between notes, rather than legato). He did not make reference to this

particular passage in his interview, but he did say that if he thought a certain passage might have a difficult bowing he would slow it down. Student M made quick adjustments attempting to play through the etude and repertoire excerpts at performance tempo.

Students L and O, the students with the second and fifth highest self-efficacy scores also began at performance tempo. Student O went back and repeated sections slowly, such as one measure that had a difficult scale run. He repeated this passage slower and with double notes (playing each note of the run twice in separate bows). Student L slowed down during his first play through of the etude to work on a difficult combination of slurs and separate bows. Students N and P, also from the higher self-efficacy sub-group, started at performance tempo, but did not keep it steady. Student N repeated notes and slowed down, and in her interview she said, "I played it slowly, and then I tried to figure out what goes wrong... when I play it fast... I try to fix it." Student P slowed down drastically to a note for note practice tempo when she went back to work on different sections. In the last section of the etude that she had slowed down, she repeated it three times, gradually speeding the tempo back up. Once she had done this and felt comfortable with these sections, she played through it again, quickly playing through the sections she knew well, almost faster than performance tempo. Student R, from the higher sub-group, tried to play everything quickly in general. When asked about tempo, she said that she liked to play it at the tempo she was used to. She did slow down two times to practice individual aspects, but some sections were played very fast, and she did not slow down to fix things as much as the other students in the higher self-efficacy sub-group.

Most of the students in the lower self-efficacy sub-group practiced their etude and repertoire excerpts slowly. Four of them, however, started at what was close to performance tempo and then either immediately slowed down to correct problems or slowed down once they came across difficult passages. Student T slowed down and took out doubled notes (a slash mark indicated two sixteenths per eighth note). She played the quick sixteenth note section slower with single eighth notes. Student U slowed down to practice the octaves and notes in the upper register in his etude excerpt, never playing through it at one steady tempo. Student W slowed down to work on the bowing in one passage, practicing at a slower tempo until the passage had improved. Student Z attempted to play the etude excerpt at tempo, but slowed down for a difficult string crossing passage and gradually sped that section up as she played through the etude excerpt again. Student Z also used repetition and slower tempi to practice rhythm and slurs. Students W, X, Y, and Z all mentioned in their interviews starting or practicing a section at a slower tempo before speeding up. The other students in the lower self-efficacy sub-group began their excerpt practice slowly, some immediately focusing on problem areas; others still learning or practicing notes.

Technical and musical aspects practiced. Students in both sub-groups focused on certain technical aspects in their practice. In the higher self-efficacy sub-group, certain students practiced shifts and grace notes, intonation and correct pitch, phrasing and dynamics, and articulation, including separate and slurred bowing. Student K played straight through his etude for the most part, but he did isolate one shift. He also repeated individual notes and slowed down to correct pitch. He repeated large sections as well, such as each half of the repertoire excerpts, which had certain articulation

problems in them, including fast doubled notes or slurs with shifts. He exaggerated the musical phrasings and dynamics as well, as he claimed in his interview. He also stated that he liked to play through everything first to get an idea of where the problems were before going back over sections. Student M, also from the higher self-efficacy sub-group, said the same thing in her interview, and claimed that once she found the challenges, she repeated them and slowed down for difficult slurred passages.

Therefore, after an attempt at an initial run through of the etude and repertoire excerpts, she focused on grace notes and practiced awkward bowings and articulations. She also slowed down in places to correct pitches. In her interview she said that she was not always paying attention to how in tune her notes were while she was practicing, but she did claim that she would slow down when she knew there was a problem. Student M exaggerated dynamics in all of her practice as well, and in her interview she said that she always tried to learn the dynamics and incorporate them, including the ones her teacher might have added. Student M also discussed in her interview how she adjusted the angle of her bow and the distance of her bow from the bridge for dynamic affect as well as intonation, through tone.

Students N, P, and R, 3 students from the higher self-efficacy sub-group, focused on some of the same technical things that the other students did, but they also did something similar among themselves. These students used the same double stop practice technique (playing two strings together simultaneously) to isolate and work on an octave passage two measures in length. All but one of these students, Student N, made reference to this technique in their interviews. Student P isolated a passage for left and right hand coordination. In her interview she referred to this by discussing how

she practiced a difficult slurred passage with separate bows. Student P also incorporated the dynamics and worked on difficult rhythmic passages through repetition and difficult string crossings by adjusting the height of her right elbow.

Students L, N, O, and R, also from the higher self-efficacy sub-group, did technical practice that was similar to the other students in the higher sub-group. Student L, the student with the second highest self-efficacy score, worked on rhythm through repetition, string crossings and slurs by slowing down, spiccato articulation through repetition, shifts and grace notes by isolating them, and he attempted to practice intonation by slowing down. According to his interview, though, he was not always able to correct his intonation. To practice a section with string crossings and slurs, Student N took out the slurs and then went back and slowly added the slurs while exaggerating the string crossings. Student O practiced string crossings, a difficult shift, spiccato articulation, and rhythm with repetition and slower tempi. Student R used repetition to practice rhythm and slurred passages. She played through passages with confidence, loudly and quickly. When asked how she would practice difficult slurred passages, she claimed that she would play the passage separately first and then gradually add notes to the slur, but she did not do this in the repertoire practice. However, she did slow down where there were slurs combined with difficult string crossings.

High and low self-efficacy sub-group students also made some similar references in their interviews to two general practice strategies. In the high sub-group, when asked how they practiced difficult slurred passages, 3 students said they would slow down, 1 mentioning that he would gradually speed up. One student discussed how he believed this was related to awareness of bow distance from the bridge, and 3 other high sub-

group students said they would practice in separate bows first. Two of these students actually did this in their practice sessions. The lower self-efficacy sub-group had similar responses. Two students said they would slow down, 2 said they would slow down and repeat, and 3 students referred to using separate bows first. Two students from the lower sub-group also actually did this in their practice sessions. And 1 student mentioned applying slurs to scales as a means of preparing for difficult slurs in certain passages.

Students were also asked in their interview whether or not they were thinking of key signatures. The two sub-groups answered similarly to this question as well. In the high sub-group, 5 said no and 3 said yes. In the low sub-group, 4 said no, 3 said yes, and 1 said that he thought of key signatures only before he would start playing. This aspect was not analyzed during the actual practice sessions.

Students from the higher self-efficacy sub-group also demonstrated behaviors that were unique in their etude and repertoire excerpt practice. Students L, N, O, and R did things that were different from all the other students in both sub-groups in their attempts to work on tuning and intonation. Student R played everything loud. When attempting to practice intonation, she did slow down and play some notes as long tones, but she played so loudly that the tone and pitch were bent or distorted. Student L's practice was unique in that he did more stopping and either contemplating his next strategy or taking a break, creating more silence in between segments of practice. In his interview he claimed to always be listening carefully for pitch. Student O was the only student to use a metronome as well as a tuning note from a tuner to adjust intonation in one passage, a technique he claimed to use at home as well. Student N's unique

approach was that she used a scale in one place to help find pitches in the upper register. She stated in her interview that she could not always tell when she was playing in tune and needed something to help her. In regard to dynamics, none of these 5 higher self-efficacy sub-group students actually used dynamics in their practice. Even though both Students L and O claimed to have gone to extremes in regard to practicing and including dynamics, it was not obvious in their practice sessions like it was for Students K and M.

Student Q, also from the higher self-efficacy sub-group, did several unique things in her practice. She worked on bowing and articulation, but by isolating the bowing and rhythm without the left hand on open strings, something different from all the other students. Another difference in her practice from the others, Student Q did not use a metronome but looked at her watch, nodded in time with the watch, and then counted to herself. She made two comments in reference to using a metronome. First, she said she liked metronomes because metronomes helped keep a beat and she stated how important this was, but she also explained that she did *not* like metronomes because they negatively affected the musical interpretation of a piece. Also, to practice the octave section, Student Q did not use double stops like some of the other students, but she compared certain pitches in the upper register to more stable notes in the lower octave or open strings. She did this to practice other sections as well for intonation, as she claimed in her interview.

Students from the lower self-efficacy sub-group did many of the same things as the higher self-efficacy sub-group for their technical and musical practice, but either fewer of them focused on these technical aspects than the higher self-efficacy students

or it was done less frequently among the lower sub-group students. Three students from the lower self-efficacy sub-group (Students S, W, and Z) practiced dynamics either by exaggerating them or focusing on phrasing. Five out of 8 students from this sub-group (Students S, W, X, Y, and Z) slowed down and used long tones to practice and adjust intonation, versus all students in the higher self-efficacy group. Also the lower self-efficacy students did not make these adjustments as often as the students from the higher self-efficacy group.

Like Students N, P, and R, from the higher sub-group, Students S and U, from the lower sub-group, practiced a two measure octave section from one the etude excerpts using double stops. In her interview Student S claimed that she would repeat a small section for intonation practice rather than going back to the beginning, but she made no reference to the double stop technique. Students S and U also isolated at least one motive in both their etude and repertoire excerpt practice. Student U did not make reference to using double stops to practice the octaves in his interview, but did say that he would play things in first position if he was having trouble playing something in the upper positions.

Students Y, T, and V, from the lower self-efficacy sub-group, attempted to fix pitch and work on awkward passages. Student Y did not use double stops to practice the octave passage, but she did check notes with her open strings. She also isolated a string crossing section and repeated two small motives. Student T isolated one shift and worked on a repeated note section. Student V practiced string crossings within a slurred passage and worked on left and right hand coordination. She also stated that she was not sure of some of the pitches in the upper register and played these notes very slowly.

Students W through Z, from the lower self-efficacy sub-group, focused on some of the same technical concepts as other lower self-efficacy students and higher self-efficacy students. Student X focused on certain shifts and played open strings with some pitches for intonation, as he claimed in his interview. Students W and Z isolated and practiced the same larger passage as one another with slurred string crossings followed by spiccato articulation. Students W and Z also isolated and worked on small motives containing shifts and grace notes, repeating these portions two to three times. Student W slowed down the tempo and focused on difficult bowings combined with string crossings and different articulations. He only incorporated dynamics in his repertoire excerpt practice. In his interview he claimed that he tried to think about dynamics. Student Y seemed to be focused on learning the notes rather than the rhythm, so she played difficult rhythms slowly and she worked on string crossings and the octave passage slowly, all of which matched her statements in her interview. Dynamics were not a focus, though she stated that she thought a good way to practice dynamics would be to color code them on the sheet music. Student Z used repetition as a main practice technique and she tried to phrase gently in her dynamics practice. However, in her interview she said that she did not really focus on dynamics until she learned all the notes and rhythms, though she also made reference to marking the dynamics more clearly in the music. She also talked about slowing the tempo down to practice difficult passages, but she really only used repetition in the etude practice.

There were several students among the lower self-efficacy sub-group who also used unique techniques or approaches to practice. Students S, T, U, and V, did things such as slowing down and varying the rhythm or bowing in unique ways. Student S

played notes slowly in groups of four with pauses in between to help make adjustments in the octave passage. Student S also took the slurs out to practice the dotted eighth sixteenth passage and she made adjustments between different bowings and articulations, a technique she mentioned in her interview. Student T isolated and slowed down to repeat certain unique passages, like a pizzicato section. Her focus was more on left hand and notes than rhythm or bowing. She not only practiced the section marked pizzicato, but she also did a great deal of practicing pizzicato in the sections marked arco. Student T also mentioned in her interview that she felt learning the notes first was the most important thing. Student U paused in between attempts to correct intonation, listening to himself and repeating passages under tempo. In his interview he claimed that he had a good ear and that after hearing the music in orchestra so much as his director “drilled” the pieces with them, he could tell when it was out of tune and would make adjustments. Students U and V used repetition and slowing down the tempo to work on rhythm or difficult slurred passages, but did not incorporate the dynamics. Both students admitted that they did not usually pay attention to dynamics in their individual practice, but Student U did state that he paid more attention to dynamics during rehearsals. Both students also made reference to slowing down for practicing difficult slurred passages, and Student V commented that she took slurs out first to learn a passage, and then slowly added them back into a section.

Non-performance methods of practice approach. When looking for whether or not students did any kind of non-performance practice or made any markings in the music, 11 students were observed using non-performance approaches during their repertoire practice; 4 students from the higher self-efficacy sub-group and 7 from the lower self-

efficacy sub-group. From the higher self-efficacy sub-group, Student P paused for about 15 seconds and studied the music silently before going on to the next isolated section. Student L, also from the higher sub-group, made a comment to himself and adjusted his music stand. Students O and Q, from the higher self-efficacy sub-group, both did rhythmic things. Student O tapped his cello with his metronome while looking at the music. He also adjusted his in-pin and his sitting position. Student Q took off her watch, never taking her eyes off the music, then looked at the watch while counting to herself, and nodded gently in time as she placed the watch on the stand to use as a metronome.

From the lower self-efficacy sub-group, Students T through Z all did some kind of non-performance behavior during practice. These behaviors also tended to be more prevalent in the lower self-efficacy sub-group. Student T looked carefully at the music and corrected herself out loud, reminding herself of the flat notes in the key signature. Student U stopped twice and looked at the music. She also adjusted her shoulder rest on more than one occasion and adjusted her neck, arm, and shoulder. She seemed to have greater ease playing the string crossings after she had done so. Student W made one comment out loud before repeating a passage. Student V asked herself out loud, “What is that supposed to be?” relating to a section in the upper register, and Student W stated out loud that he needed to try again. Student X stopped and looked at the music for 20 seconds before starting at the beginning of the excerpt again. Student Y immediately marked fingerings and made other markings during her repertoire practice, while Student Z stopped and adjusted her music. Student Z also adjusted her left hand position and then practiced pizzicato without the bow.

Comparing Main Study Data to Other Deliberate Practice Research Strategies

Hallam's (1997a) deliberate music practice strategies defined. In other deliberate music practice research using observation, Hallam (1997a) described six levels of “task orientation strategy” (p. 100):

- 1) Task requirements incomplete
- 2) Material played through, no corrections
- 3) Material played through, single notes corrected
- 4) Material played through, short sections repeated
- 5) Material played through, large sections practiced en route
- 6) Material initially played through, difficult passages identified and practiced in isolation

These six strategies have been compared to the observed practice behaviors of the 16 self-efficacy sub-group students. Students in the higher self-efficacy sub-group tended to use the higher level practice strategies and the students in the lower self-efficacy sub-group tended to use the lower level practice strategies.

Students K and P, from the higher self-efficacy sub-group, both used Hallam's (1997) sixth and most advanced practice strategy level more than the other students. This strategy involves playing through the repertoire initially before going back and isolating passages for practice. Student K also ranked first, or principal, in his bass section. Student P placed 13th out of 36 violins and was placed in the first violin section. Both of these students took private lessons as well. Student M did use this practice technique somewhat, making a stop immediately after starting her etude excerpt, but adjusting that problem quickly and then going through the entire etude before going

back. Like Student K, Student M took private lessons and placed first in her All-Region section.

Students K, L, M, and N all had success with practice strategy five, playing the material through, while practicing large sections en route. Students O and Q also practiced this way in one instance each, and Student R attempted this strategy but was unsuccessful, resulting in practice strategy one during her practice of one excerpt. This student kept starting at the beginning and repeating passages of the material in her etude and repertoire practice, not successfully playing completely through all of the excerpts. Several of the students used practice strategy four (playing the music through, with short sections repeated) throughout their practice, especially those in the higher self-efficacy sub-group.

All of the students in the lower self-efficacy sub-group used practice strategies two and three (material played through, no corrections and material played through, single notes corrected) at some point during their observed practice sessions. During the repertoire excerpt sessions, the majority, 6 out of the 8, started at the beginning of each excerpt, stopped immediately to isolate a small problem, and used different methods to practice, such as varying the tempo, rhythm, or bowing, or repetition of a note, motive, or measure, all as they played through the excerpts.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Purpose Reviewed

Understanding what motivates students to engage in deliberate music practice has been shown to be an important part of helping them to succeed in their musical accomplishments (Ericsson, Krampe, & Tesch-Römer, 1993). Why do we choose to partake in and exert effort towards certain activities such as deliberate music practice? Bandura (1986) recommended that self-beliefs be considered when trying to understand or promote motivation for *any* human activity or behavior. He claimed that self-efficacy can be particularly important to human functioning in motivation and personal achievement.

Bandura (1997) claimed that “people function as active agents in their own motivation” (p. 133). Instead of simply reacting to affective events, people cognitively compare what they do not know to what they might desire or aspire to know before they aim in a new direction of learning. “It is the aspirational standards, together with perceived self-efficacy, that exert selective influence over which many activities will be actively pursued” (p.133). If a goal is appropriately challenging and possibly takes someone to a new level of skill, then a person’s self-efficacy, when appropriately matched, can help someone to succeed. Self-efficacy can affect what goals are set, how difficult any goals might be, how committed the person is to accomplishing the goals, any strategies used to complete them, and how much effort the person may apply to the goals.

Self-efficacy research in academic related fields has found that success and achievement have been associated with high levels of perceived self-efficacy (Bouffard-Bouchard, 2001; Schulz, 2005). These findings have laid the groundwork for music self-efficacy research, which has shown high correlations between students' self-efficacy and performance achievement (McCormick & McPherson, 2003). McPherson and McCormick (2003; 2006) surveyed instrumental music students about their self-efficacy and practice habits, but did not focus on string players separately from other musicians. Others have researched string players (Hallam, 1997; Hamann & Frost, 2000), but self-efficacy was not a variable.

There is a need to further investigate this possible link between self-efficacy and music practice and achievement, and because string instrumentalists have been included in, but never singled out as an independent subject group in music self-efficacy research (McPherson & McCormick, 2006; Nielsen, 2004), it may be beneficial to investigate this group. Also, pragmatically, there is a lack of string research in comparison to band or choral research and a need for string education support.

Students filled out a questionnaire and a sub-group of higher as well as lower self-efficacy students were videotaped, interviewed, and observed while practicing and preparing for a competition. The intended purposes of this study were: (1) to describe the musical background characteristics and self-efficacy beliefs of a group of string students, (2) to measure the relationship between self-efficacy belief scores and performance achievement, and (3) to describe the practice behaviors and thoughts of high and low self-efficacy string students.

Summary of Findings

Research Questions

1. What are the musical characteristics and self-efficacy beliefs of a group of high school string students, regarding playing their string instruments in orchestra?

Research question one addressed the purpose: to describe the musical background characteristics and self-efficacy beliefs of a district-wide group of string students. The questionnaire used to answer this research question began with seven questions asking about students' musical experiences and backgrounds as well as their gender. Then there were 18 questions related to string student self-efficacy that were summed to estimate a total self-efficacy score for each student ($N= 101$).

Musical background characteristics:

- Years playing: There was some similarity among all students and student sub-groups in the average number of years students claimed to have been playing their instruments.
- Whether or not students started in a public school program: Most students (91 out of 101) who took the questionnaire indicated that they started in a public school program.
- Private lessons: Just less than half of the students who participated in the study (48 out of 101), took private lessons, and because most of these students chose to audition and made it, close to half of the students who were placed in the All-Region orchestra may have been taking private lessons. All students who made first chair in their sections claimed to be taking private lessons, and students who took private lessons tended to have a higher self-efficacy average than those

who did not. Also, all students in the higher self-efficacy sub-group took private lessons, and all but 2 students from the lower sub-group did as well.

- Whether or not students wanted to continue playing their instruments after high school: A large majority (85 out of 101) of the students who took the questionnaire indicated that they were interested in continuing to play their instruments after high school.
- Whether or not students owned their own instruments: Approximately three fourths (74 out of 101) of the students who participated in the study owned their own instruments. The major exception to this finding was with double bass students. Because of the size and cost of the instrument, it is not uncommon for students who play the double bass to use a school instrument, and most of the double bass players in this study did not own their own instruments.
- Amount of practice outside of orchestra: All of the students who took the audition indicated that they practiced more per week than the students who chose not to audition; students who made the orchestra tended to practice more than those who did not.
- Gender: Female students tended to practice only slightly more than male students, and when considering gender and self-efficacy, self-efficacy score averages were nearly the same across female and male students.

Musical Self-efficacy Scores for String Students:

The average self-efficacy score for all students who took the questionnaire ($N=101$) was 139.43, ranging from 79 to 180. When considering gender and self-efficacy scores, male students had an average self-efficacy score of 139.10, ranging

from 79 to 180, and female students had an average self-efficacy score of 139.70, ranging from 99 to 171. The two students in the study with the highest (180) and lowest self-efficacy scores (79) were both male students.

2. What is the relationship between string students' perceived musical self-efficacy and their ranked scores in a regional competition?

Research question two addressed the purpose: to measure the relationship between summed self-efficacy belief scores and performance achievement. The inverse relationship that was found ($r_s = -.37$) was statistically significant ($p = .001$) and explained 14% of the variance between the self-efficacy scores and the All-Region rankings ($r^2 = .14$). That is, there was a tendency for students with higher self-efficacy scores to also rank higher (having a lower ranking number) in performance achievement.

3. What are the deliberate music practice behaviors and beliefs of a sub-group of high and low self-efficacy string players?

Research question three addressed the purpose: to describe the practice behaviors and thoughts of high and low self-efficacy string students. Sixteen students from two of the high schools in the district were videotaped while practicing and were then interviewed. There were 8 students whose self-efficacy scores ranged from 99 to 120 and 8 students whose self-efficacy scores ranged from 148 to 173. All of the higher self-efficacy sub-group members but 1 auditioned and made the All-Region orchestra. Student L, from the higher sub-group, did not go to the audition. There were 2 students from the lower self-efficacy sub-group who did not go to the All-Region orchestra audition. One of these students, Student T, decided to audition for the freshman orchestra and the other, Student Y, did not go to the audition at all. The rest of the lower sub-group made the All-Region orchestra. Overall, the higher self-efficacy students that

auditioned placed higher in the All-Region orchestra than the lower self-efficacy sub-group students. Practice was observed with a researcher-designed observation form. The following section summarizes the students' behaviors in their scale practice and their etude and repertoire excerpt practice.

Scale practice. Observed string students practiced their scales differently, but there were some trends common among all students and also some distinctions between the two sub-groups. For example, all the students started at the beginning of a scale. Six out of the eight students in the higher self-efficacy sub-group started their scale practice in quarter notes. In the lower self-efficacy sub-group, half of the students also started with quarter notes, but the other half of the lower self-efficacy sub-group started with half notes. A majority of students from the higher self-efficacy sub-group slurred notes together at various amounts, such as two, three, four, six, eight, and twelve notes per bow. Three of the students from the lower self-efficacy sub-group practiced their scales with slurring variations as well, but did not slur as many notes together, practice as many slurred variations as the higher self-efficacy sub-group, or go in any particular order.

All of the higher self-efficacy sub-group students isolated and practiced portions of the scale, but only half of the lower sub-group did this. Each of the higher sub-group students also did something specialized in their scale practice, including focusing on vibrato, shifts, isolated finger patterns, or difficult string crossings. One student from the lower self-efficacy sub-group practiced with a unique technique of repeated spiccato notes, four separate strokes per pitch.

There was some similarity between the higher and lower self-efficacy sub-groups in how they practiced intonation, rhythm, or difficult slurred passages within their scale practice. Students from both groups repeated notes, octaves and portions of octaves, and students from both sub-groups slowed tempo down. Several students also incorporated different rhythmic variations, such as a dotted eighth sixteenth pattern.

Etude and repertoire practice. Three students from the higher self-efficacy sub-group attempted an initial run through of their etude excerpts, 1 of them playing the entire etude rather than just the excerpt before going back to isolate and practice anything. These students stated in their interviews that they liked to play through their repertoire before going back to correct isolated passages, therefore, getting an idea of where the problem areas might be.

All students in the higher self-efficacy sub-group attempted to begin their etude excerpt practice at performance tempo. Students K and M, the students with the highest and third highest self-efficacy scores, played through the etude excerpt at performance tempo. Both students also focused on musical phrasing and dynamics, and mentioned phrasing and dynamics in their interviews. These students were also ranked first chair in each of their sections.

Only one student out of all 16 sub-group participants did not start at the beginning of his etude and repertoire excerpts. He chose to start with a challenging section, even though he said that he started at the beginning during his interview. Six of the lower self-efficacy students started at the beginning, stopped immediately to isolate a problem, and used different methods to practice, such as varying the tempo, rhythm,

or bowing, or repetition of a note, motive, or measure as they played through the excerpt.

Students in the higher self-efficacy sub-group all went back to practice larger sections or areas that needed attention. They practiced half of an excerpt and then repeated that section, sometimes more than once, focused on three or more measures to practice them before going on to the rest of the excerpt, or isolated other large sections. Half of the students from the higher self-efficacy sub-group practiced this way fairly consistently compared to all other students.

Three of the students from the higher self-efficacy sub-group and 1 student from the lower self-efficacy sub-group played double stops slowly for intonation improvement. Another higher self-efficacy student compared some notes to others, including open strings instead of using octaves. Three other students from the higher self-efficacy sub-group also used repetition and a slower tempo to practice intonation, something they mentioned in their interviews. One of these students changed the angle of her bow and its distance from the bridge to help produce a clearer, more focused sound in order to hear and adjust her intonation. Five other students in the higher sub-group worked on pitch and intonation in other ways, such as using a scale to help find pitch or by using a tuner. Three students from the lower self-efficacy group all used slower tempi to practice intonation, but only 1 of the students mentioned it in his interview.

General practice techniques observed. The most common techniques used to practice rhythm and intonation, were repetition or tempo variations. Three students from the higher sub-group all attempted to incorporate dynamics, and made reference to this in their interviews. Two students from the lower sub-group also incorporated dynamics.

One of these students played the dynamics with extremes and the other only incorporated dynamics at the end of the practice sessions. To practice rhythm and difficult slurred passages, all of the students generally slowed down or used repetition. When asked about difficult slurred passages in their interviews both high and low sub-groups said they would slow down or play separate bows first.

One student from the higher self-efficacy sub-group used a metronome during all of his practice. The other students gave varying answers to the interview question asking about the use of a metronome. Half of the students from the higher sub-group said they did not like metronomes. One student from the higher sub-group said that metronomes might be useful and actually used her watch during the repertoire practice to help her find the tempo.

Another practice technique that was observed was the use of verbal comments during practice. The students who did this were from the lower self-efficacy sub-group. One student commented about the key signature, another admitted that she did not know what notes were in the upper register, while another commented that a note was not correct. Only 1 student used a pencil to mark in the music, and this student was also from the lower self-efficacy sub-group.

Conclusions and Recommendations

The musical backgrounds and experiences of high school string players were examined as well as their perceived self-efficacy related to playing their string instruments, how their self-efficacy might be related to their achievement in an All-Region competition, and how a smaller sub-group of higher and lower self-efficacy string students practiced. This investigation was done through a combination of a

questionnaire, interviews, and video-observation. However, the results are not generalizable to other situations, even if similar in nature; due to the fact that all participants were volunteers and the environment was controlled.

Research Question One

Musical background characteristics

Years playing. Though there was a wide range in the number of years students claimed to have played their instruments, averages were similar when looking at all students and those who had made the All-Region orchestra, or when looking at the self-efficacy sub-groups. Other research (Hallam, 1997a) has found that developing expertise may be important in performance achievement, and that practice strategy depends on level of expertise. The current study did not use comparative statistical analyses to examine years of study to support or contradict this past research. In addition, the ages of the subjects in this study and in Hallam's were different. Hallam's study used students aged 6 to 18, while the current study used high school string students.

However, if there was similarity between the self-efficacy sub-groups in average number of years playing, then maybe self-efficacy does not necessarily depend on developed expertise despite its possible connection to achievement. Therefore, string teachers might consider working on developing positive self-efficacy from the beginning of a student's music learning and at each level of development, rather than waiting until a student might begin to show any signs of negativity. It could be that self-efficacy in general may be connected to other personal or societal influences, such as parents, extended family, or peers. Csikszentmihalyi et al. (1993) found that students who were

considered exceptionally talented spent more time with parents and families than most other young people, and were encouraged to develop positive work ethics in their learning environments. Bandura (1997) suggested that when success has been attributed to hard work and effort rather than ability, self-efficacy can increase. String students who do not have a positive sense of musical self-efficacy may need additional encouragement and guidance in how to practice and develop good musicianship. It might also be important to assist students in establishing a strong sense of musical self-efficacy from the very beginning stages of their musical development.

Whether or not students started in a public school program. A majority of the students who participated in this study started in a public school program. In a nationwide survey, Gillespie and Hamann (1997) found that 84% of string programs begin string instruction in the fourth, fifth, or sixth grade, and that the number of students playing string instruments and beginning in the public schools had steadily increased since the 1980's.

Universities and collegiate programs that are training future string teachers may need to be aware of the large number of students starting in public school string settings so that they can support public school string teaching. One way that teacher-training programs could help public school string programs succeed is by helping future teachers as well as current teachers become more aware of the possible link between self-efficacy and achievement. Students often thrive in successful and good teaching environments; the better and more confident the teachers, the more positive that students may feel about their own capabilities. Stronger string education programs could be developed in university programs by increasing the number of experienced

faculty members who are hired, developing well-sequenced string education curricula, and making scholarship awards available to outstanding string students. These efforts could help in possibly increasing self-efficacy among teachers and students alike. Some universities have already begun to do so.

Smaller universities without string programs have attempted to start string programs and offer string education to music majors. Other smaller university music departments with string programs have begun hiring string education experts where there may not have been string educators before, while larger more established university string education programs have developed model string teacher-training programs. In 1998 the *American String Teachers Association* (ASTA) National Executive Board met for a planning retreat. Not only did the board want to increase the number of qualified string teachers, but they also wanted to find a way to help universities better train future string teachers. Through their efforts, the *National String Project Consortium* (NSPC) was created. The NSCP continues its efforts today and hopes to encourage more string players to be teachers in public schools by providing them with opportunities to teach early in their collegiate tenure. In a String Project, college students are given the opportunity to teach groups of young string students (typically third grade through middle school) under the guidance of university faculty as well as experienced master teachers (ASTA, 2008). Many string projects throughout the country are set up either with mixed instrumentation, heterogeneous group classes, or same instrumentation, homogeneous group classes, similar to how string teachers would be teaching in the public schools. Some String Projects include private instruction and chamber music in addition to the group classes, while others might also provide

theory instruction. Because the university student teachers are given constant feedback, assistance, and guidance from experienced string teachers, the hope is that the student teachers will have positive experiences and not only be better prepared, but also be more motivated to teach strings in the public schools.

Other suggestions to promote string teaching in the public schools have been made based on past research and organizational planning. In 1987 the Music Educators National Convention (MENC) Ad Hoc Committee on String and Orchestra Education was formed. One of the efforts of this committee was the development of a video tape that would hopefully influence students to teach strings. At the Wichita State University (WSU) String Symposium it was suggested that teachers always try to portray a positive attitude about teaching. Suggestions for the university level have also included making scholarships available specifically for string education students (Gillespie & Hamann, 1999) and making sure universities better prepare undergraduates to teach strings by providing and requiring more than one semester of string pedagogy or string methods for music majors, and encouraging string playing teachers to be supportive and helpful to non-string playing string teachers (Smith, 1995). New approaches to invigorating string education could include additional workshops and clinics within the school districts, or developing a mentoring program where non-string playing string teachers are assigned to string playing string teachers for additional guidance. Because teacher retention can be an issue, particularly among new teachers, other suggestions might include providing additional training in classroom management for both new and future string teachers, particularly for alternative certification string teachers or those who might be less likely to have had group class or classroom training. Also, providing more

mentors for new string teachers who might need additional guidance, help, or encouragement, could possibly help retain string teachers.

Private lessons. In the current study, students who took private lessons also tended to have high self-efficacy. Out of all the participants who auditioned for All-Region, almost half of them took private lessons and a majority of the students who wanted to continue to play their instruments after high school also took private lessons. Research has shown that help from expert private teachers as well as other support, such as parental and environmental, has been associated with musicians who have had success and exhibited positive results of deliberate practice (Ericsson et al., 1993; Davidson, Moore, Sloboda, & Howe, 1998; Lehmann & Davidson, 2002). Taking private lessons have also been found to be motivational for string students in particular (Hamann & Frost, 2000). Research regarding private lessons and band students found that students who took private lessons were also more likely to stay in their music programs (Stewart, 2005).

Music teachers might realize that private lessons can be beneficial, but when considering the possible link between private lessons and self-efficacy and then self-efficacy's possible importance to achievement and retention, string teachers might want to consider these aspects more carefully and help provide more opportunities for private instruction. Teachers could place a list of private instructors' names and phone numbers on the orchestra board, or talk to parents about the benefits of regularly scheduled private lessons. To combat the impression or situation where only the privileged are able to receive this type of training, teachers could find additional funding or grants to help students of lower socioeconomic status afford lessons, or find local university

students who might be available and qualified to teach private lessons for a more affordable rate. It may be possible to find a donor to give funds to provide a student in need with a semester or year of private study. Grants and programs can provide funds to entire schools to help pay for consultants to come in and give private or group lessons. Also, some orchestra directors allow students to have their private lessons once a week during class time to help students and private instructors with scheduling or facility difficulties.

Whether or not students wanted to continue playing their instruments after high school. A majority of the students who participated in the current study indicated on the questionnaire that they wanted to continue playing their instruments after high school. Not all music students are going to go on and become professional performers or music teachers; Gillespie and Hamann (1997) found that only 5% went on to major in music. However, string students who claim that they want to continue to play music after public school might want to become community orchestra members or fine arts supporters. Typically, there are playing opportunities for younger musicians to perform in groups outside of their public school programs before high school graduation, such as youth orchestras and summer music festivals or programs. But there are fewer opportunities for non-music majors after high school. Some smaller collegiate programs might provide these opportunities because they need the numbers to fill their ensembles. However, larger university programs might consider providing playing opportunities for non-majors as well, possibly even creating entire ensembles made up of non-majors or music minors. Creating and supporting more volunteer community orchestras would provide opportunities for students to continue playing after high school as well. These groups

could be started through partnerships with youth orchestras, university systems, or local businesses that want to promote the fine arts and support adult education.

The students who want to continue after high school might also choose to support fine arts financially, helping to retain string programs where funds are limited or decreasing, help build and grow string programs where there are none, or maybe help increase the success of programs that already exist. Developing string programs where students start in a public school system and want to continue after high school could benefit the arts communities at large and help string programs develop.

Whether or not students owned their own instruments. Most of the students in this study owned their own instruments. All but one bass player did not, which is not unusual. Two of the top achieving students did not own their own instruments: the student who placed first in the double bass section and the student who placed first in the viola section. Both of these students had high self-efficacy scores and had gone even further in competition, playing in the All-State orchestras. Both of these students have been provided with quality instruments, one through his school program, and the other through a private donor. It may be, then, that if school districts, orchestra programs, or private donors could help provide students with quality instruments, when they might not be able to acquire them on their own, students who have a strong sense of self-efficacy might be able to succeed and achieve their goals without limitations.

The fact that most students in the current study owned their own instruments could indicate that a majority of the students in the studied district may have been of a stable socioeconomic status. There was an observed dissimilarity regarding this aspect among schools within the district, but this aspect was not a research question in the

current study. There was one school in which the majority of students within that school did not own their own instruments. However, socioeconomic status was not a variable in this study, and both the pilot district and the main study's district in general had similar ethnic and socioeconomic distributions and both indicated that a majority of students owned their own instruments.

Gender. The current study found similar descriptive results when considering gender. Males and females had nearly the same self-efficacy score averages. This has not been typical in gender research, particularly regarding self-efficacy and music. Research in self-efficacy, music, and gender at the collegiate level (Nielsen, 2004) has found that it may depend on the program in which students are involved. Nielsen found that freshman male collegiate church music students had higher self-efficacy beliefs than the freshman female students, but in the collegiate music education program, the freshman female students were found to have higher self-efficacy beliefs than the freshman male students.

There may have been differences in Nielsen's (2004) findings between church music majors and music education majors, generally speaking, because the church music field has had a greater tendency to be male dominated, while the music education field has had a greater tendency to be female dominated. Over time and in some societies, females have been stereotyped as typical school teachers, particularly in elementary school music, where students often get their first experience in music. This early exposure to a female music teacher might make an impression upon students that music education is for females (Moisala, 1992).

In regard to collegiate freshmen majoring in music performance, Nielsen (2004) found that males had a higher sense of self-efficacy than females. Others have found similar results when considering gender and music performance (Moisala, 1992), and males typically have tended to have a higher sense of self-efficacy in general academic domains as well (Zimmerman, et al., 1992). According to Moisala (1992), due to society's tendency to treat males and females differently in music classrooms from an early age, males may have a higher sense of self than females in regard to performance, training, and development. Therefore, even though self-efficacy scores in this study were similar between males and females, and differences that were found in amounts of practice time between genders were minimal and only descriptive in nature, further research still needs to be conducted in this area, and educators may still want to be aware of the complicated issue of gender in the classroom.

Research Question Two

Self-Efficacy Scores Correlated to All-Region Rankings

Self-efficacy and achievement. This study considered high school string students separately from other music students. The positive relationship between performance ranking and musical self-efficacy when playing a string instrument could indicate the importance of understanding string students' musical self-efficacy. Past research has found significant relationships between self-efficacy and achievement, whether in the academic fields (Bouffard-Bouchard, 2001; Schulz, 2005) or in music research (McPherson & McCormick, 2006). The current study supports these findings in that the relationship between high school string students' self-efficacy scores and rankings in a high school All-Region orchestra competition were significantly correlated.

If self-efficacy is linked to student achievement, then the question arises as to whether it is possible to increase self-efficacy, and in so doing, possibly impact achievement as well. In researching how music students' self-efficacy might be strengthened, Davison (2006) found that certain musical activities, such as improvisation, helped to increase band students' musical self-efficacy. Improvisation has typically been thought of as an activity for traditional jazz instruments only and it has not been common for string teachers to use in their classrooms. However, in recent years improvisational methods for strings that use traditional jazz concepts have been developed and published (Grunow, et al., 2008; Sabien & Phillips, 2000; Wexler, 2000). Other methods that are being used are based more on creativity, even incorporating theatre concepts of conversation and drama (Music for People, 2008).

String teachers might also consider exploring additional creative ways in which to teach music, such as composition or alternative genres in the classroom. This might include singing and playing, movement, world music and music from other cultures, all to give students more exposure and opportunity to participate in unique and interesting musical activities. It is possible that these creative methods might improve musical self-efficacy (Davison, 2006).

General academia has raised self-efficacy levels when learning a new language by learning more about the history and background of the language itself (Wagman, 2005). Therefore, it is possible that learning about a piece's historical significance or development, aesthetic response, or a composer's biography might also help students' self-efficacy develop in a positive way. As teachers develop an understanding of the ways in which their students might learn best, some of these different activities could

also be geared toward certain learning styles and students' strengths or intelligences (Gardner, 1997). For example, if some students are particularly talented in dance and movement, or seem kinesthetically gifted, string teachers might encourage these students to be involved in a Strolling Strings or a Mariachi group, or even have them practice in small groups that play simple scales and music while moving around the room. These students could also do choreography to music that they are learning in their string class. String teachers of younger beginning groups often have their students do large flowing motions for learning concepts related to the bow and bow movement, such as taking scarves and moving them in flowing circular motions while keeping the shoulders and arms relaxed. This activity can encourage movement in the bow arm and can give young string students the opportunity to move freely and expressively. These diverse types of activities may allow students to find their niche, which may also make them more invested in the string program, and subsequently increase their motivation to learn.

String teachers may also want to consider the social aspects of playing an instrument. The social reasons for participation in programs might be the key to helping those students whose self-efficacy is lower than students who tend to practice and succeed with more ease. If researchers have found that the social aspect of participation in both areas is important for motivation (Hurley, 1992; Stewart, 2005), string teachers might consider using these social aspects to help encourage students to practice and stay in their programs. String teachers might consider additional activities in which string players could participate, including regular ensembles like string quartets

or trios that perform throughout the community, alternative groups, such as rock or jazz bands that include strings, Mariachi programs, or Strolling String groups.

These suggestions could be directed toward new or experienced classroom string teachers and orchestra directors. For new teachers it may help in developing a string program and keeping students motivated to stay in the program, practice, and achieve. For the experienced string teachers, these suggestions could help increase productivity in the classroom, retain quality students, or help an existing program grow. Teachers might want to consider what they think their students' self beliefs could be by observing them and talking to them after such performance activities as playing exams, concerts, or competitive programs and auditions; teachers could also discuss with students how they think that they might achieve in these activities before the activities happen.

A great challenge when asking students about their self-efficacy can be with the students whose self-efficacy does not match their achievement. There can be students who, though they are capable, do not have high self-efficacy. There might also be students who do not do well and might not be as capable, despite the fact that they have a high sense of perceived musical self-efficacy. It could be that teachers need to keep these students in mind and find ways to help them develop a more realistic view of their abilities. To learn about students' self-efficacies, teachers can ask students what they think their capabilities are and discuss these issues with them, or even give a short self-efficacy test either at the beginning of a school year or just prior to an event. This needs to be done with caution because as Bandura described (1997), for a person to achieve beyond her current level of ability, she must have a confident belief in one's

ability to not only succeed to the extent that one has in the past, but to have goals that go beyond levels already accomplished. However, Bandura also stated that a positive self-efficacy without the skills to back it up could be devastating.

Therefore, teachers might want to provide students with choices of different or unique activities that are within their capability, an activity that could be encouraging and beneficial but not too competitive. For example, a teacher could have students work on a project that might involve some aspects of playing, but also include some other learning components, such as composition, theatre, story telling, etc. Students in a small group could choose a theme and pick out favorite sections of a musical work to tell a story or that seem to be related to their theme. Then create and compose transitional segments between excerpts and perform the project for extra credit for the class. If students have a higher perceived sense of musical self-efficacy, then they might be motivated to work on such a project and feel confident in sharing it with their peers. If they do not have a high sense of perceived self-efficacy, but the theme is something they are interested in, it still might motivate them to participate and work toward a goal of completing the project. Therefore, rather than requiring all students to participate in one certain activity, such as an All-Region competition, as some string teachers might do, teachers could provide alternate activities and give students choices.

Research Question Three

Observed Practice Behaviors

Practice habits. Descriptive findings from this study indicate that students who had a higher sense of musical self-efficacy also tended to use more advanced practice techniques. This was determined based on observations across the two sub-groups in

their scale, etude, and repertoire practice. An observation form was used to gather data, and then interviews were conducted using an interview form.

When observation and interview data were reviewed, one observation was that the string students in this study did not always remember and describe their practice sessions accurately. This supported other research which also found that students were not always completely accurate in the interpretation of their practice, based on comparisons of interview data to observation data or practice log data (Geringer & Kostka, 1984; Hallam, 1997a; 2001; Madsen, 2004; Rohwer & Polk, 2006). Therefore, researchers have recommended that observation and practice reports be used to obtain more accurate results of deliberate practice behavior data (Hallam, 1997a), while others have used practice logs or journals to determine more accurate results than questioning alone (Geringer & Kostka, 1984; Wagner, 1975).

The practice techniques that the self-efficacy sub-group students from this study used were similar to Hallam's (1997a) six "task oriented strategies" (p. 100), and the practice habits of high and low self-efficacy sub-groups could be interpreted as confirmation of Hallam's advanced and simpler practice strategy levels. The students from the current study's higher self-efficacy sub-group used Hallam's advanced practice levels four through six more than the other students. These levels were defined by Hallam (1997a) as playing through material and either repeating short sections, level four; practicing large sections en route, level five; or playing all the way through the material first, then identifying trouble spots and practicing these passages in isolation, level six. Students from the lower self-efficacy sub-group of the current study tended to use practice levels two and three. Level two was defined by Hallam (1997a) as playing

material with no corrections, while level three was defined as playing the material through but stopping to correct single notes.

In the current study, the practice strategies that the higher sub-group used tended to be more thought provoking or cognitively engaging. Some of the cognitive strategies found to be different between the higher and lower self-efficacy sub-groups of the current study included slurring variations, rhythmic variations, dealing with corrections, tempi chosen, and thoughtful approaches to challenging techniques. When practicing scales, the higher self-efficacy sub-group did more slurring variations in a more structured manner; slurring 2 to 12 notes per bow. The lower sub-group did some slurring of notes per bow, but fewer notes, less variations, and not in any particular order. The higher sub-group also started each scale with quarter notes, while half of the lower sub-group started in half notes.

In regard to the etude and repertoire excerpts, some of the most obvious differences involved how students approached corrections. In the higher sub-group, three students attempted to play all the way through the etude before going back to make any corrections. Most of the other students made adjustments as they played through, but in the higher sub-group those adjustments were more strategic, such as going back to repeat large sections, and varying rhythm and bowing to practice those sections. Most students in the lower sub-group repeated and attempted to correct single notes or smaller motives or sections. In regard to overall tempi, students from the higher self-efficacy sub-group played excerpts closer to performance tempi, while most of the lower sub-group began excerpts slowly or slowed down immediately if they attempted to start faster.

The strategies used by the higher self-efficacy students matched Hallam's upper levels and required more thought and effort. This supports Neilson's (2004) finding that music students, who had higher self-efficacy, tended to use practice strategies that were more cognitively engaging. The lower self-efficacy sub-group tended to use Hallam's second two levels.

This study not only considered achievement in relation to self-efficacy, but described how students with higher and lower self-efficacy approached deliberate music practice. Using Hallam's (1997a) practice strategies as a model for simpler to more advanced tasks, the strategy levels that string students in the self-efficacy sub-groups used tended to be similar to their self-efficacy levels. Jorgensen (2002) found that individuals' values and goals as well as other motivational influences seemed to have an effect on their practice behavior, and Williamon and Valentine (2000) determined that the content and quality of practice was important in understanding how to prepare a successful performance. Williamon and Valentine discovered that segments practiced increased in length and complication as age and expertise developed. Hallam (1997a) also found that length of segment increased as defined levels of practice strategies increased, and that these levels matched in increased levels of expertise. The current study found similar increases in practice behavior and self-efficacy levels. Higher self-efficacy sub-group students tended to practice longer segments of excerpts and use more cognitively advanced strategies, and lower self-efficacy sub-group students tended to practice single notes, measures, or shorter motivic segments and use simpler cognitive strategies.

When helping students learn how to practice to achieve at a higher level, music educators first might want to make sure students have a good understanding of how to practice, especially younger less experienced string players. Teachers could make a chart of what successful practice is, such as suggesting that students play through a chosen section of a work first to find problem areas, choose at least one problem area within an excerpt and play that section slower and possibly with separate bows, making sure to deliberately change something in the practice segment to try and improve it. Since part of the practice instruction challenge is that some students cannot always determine the problem areas, the practice chart could also include typical problem areas that students encounter in certain repertoire to help them get started.

Students typically do not remember exactly how they practiced to either properly report it on any kind of practice log, or to describe it to their teachers. Teachers might have students make practice videos or practice in small groups for one another, or have practice partners in groups of two or three. When playing for one another, they might have a better chance of hearing the mistakes of a fellow student and eventually learning to hear their own mistakes, or helping each other learn more constructive practice habits, making suggestions to one another, or learning other practice techniques from one another. This small group practice might also motivate them if they were involved in string programs for the social aspect of playing in an ensemble.

Suggestions for Future Research

It could be beneficial for researchers to continue to investigate motivational aspects. Hurley (1992) concluded that string students' interests as well as motivational needs were important aspects of retention. Hurley also found that many students joined

beginning string classes for social reasons and recommended that “continuing motivation might be fostered through cooperative learning situations that stress effort in a community of students with similar interests” (p. 233). Future researchers could examine the social aspect of string playing by interviewing students regarding their involvement in chamber music and group practice. How does getting to play with others in small groups affect their musical self-efficacy regarding playing their string instruments or their interest in continuing to play their string instruments?

It might also be beneficial for retention and recruitment of school orchestras and other music programs, such as collegiate and community groups, to investigate how students who want to continue playing their instruments intend to do so. Some of these students might want to major in music, but that may be only a small percentage (Gillespie & Hamann, 1997). For the students who want to continue but not as music majors, it could be beneficial to know where and how they are thinking they might want to continue. Investigating these variables as well as the activities, make-up, and function of volunteer, community, and church groups, could help these students find ways to continue playing. There is currently a volunteer doctors’ orchestra in the Houston, Texas, area. Maybe groups such as these could be interviewed, studied, and its representatives invited to other communities to discuss its development, function, and success.

When considering gender, the current study’s descriptive data revealed a slight dissimilarity between female and male students regarding amount of practice time reported. The tendency was for females to practice more, but the difference was minimal, non-statistical, and descriptive only. It might be telling to investigate this

variable further, looking at gender as a comparative variable rather than just descriptive, possibly selecting equal numbers of males and females to see if there are any significant differences for self-efficacy, musical characteristics, or practice behaviors. The gender variable might also need further consideration in regard to societal influences, cultural values, and personal values.

Research looking at the relationship between string students' academic self-efficacy and their musical self-efficacy may help teachers understand how to help students learn. Determining if there is a relationship between these self-efficacy areas could help in the understanding of how students perceive themselves and how they might be motivated. A detailed investigation of whether their study habits are similar to or different from their practice habits could help direct appropriate and productive instruction.

Motivational influences and self-efficacy, as well as background characteristics and other possible influential aspects that might affect expertise and development could be important aspects to consider in future studies. Hallam (1997b) included some of these concepts into a three-tiered model designed to describe the components involved in deliberate music practice: presage, process, and product. Presage considers the student and the teacher, focusing on characteristics, background experience, level of skill, student learning capacities and motivation, and teaching methods. The process looks at the cognitive procedure and physical behavior of the activity involved in deliberate practice in music, while the product takes into consideration affective responses as well as quality of performance.

The current study investigated some of these aspects: self-efficacy, certain background characteristics, practice behavior, thought processes in retrospect of practice behavior, and achievement. Researchers could extend this study's current questionnaire to include asking students what they believe their skill level to actually be, asking students why they think they are capable or not capable, and correlating these concepts to how teachers might rate the students' skill levels. This might tell researchers whether or not teachers' opinions of their students' capabilities have any relationship to their students' perceived self-efficacy. A teacher questionnaire regarding teaching and professional experience could be included as well, both for private and orchestra directors. Descriptive research investigating students' self-efficacy, practice habits, and achievement, and teachers' experience, could help researchers understand descriptive trends about teachers and students.

If we now have a general understanding that self-efficacy may be related positively to success, then it might be important to not only educate music teachers about this finding, but also investigate the best means to increase self-efficacy. Davison (2006) investigated jazz students and found that improvisation activities raised their musical self-efficacy scores. A similar study could be done focusing on string students, using some jazz improvisational methods (Grunow, et al., 2008; Wexler, 2000), or non-traditional methods of creative musical activities that introduce improvisation (Music for People, 2008). In addition, other possible experimental studies investigating ways to improve self-efficacy would be valuable.

Researchers might consider investigating younger string students' musical self-efficacy, possible achievement, and their intent to continue, such as eighth grade middle

school string students who will be going on to high school. Researchers could investigate who of these students might want to continue and whether or not their self-efficacy was related to this retention data. A similar study to the current study could be done with a different ethnicity breakdown, either focusing on lower socioeconomic areas or higher socioeconomic areas and incorporating some musical background questions that other researchers have asked regarding family background and musical experience (Pitts, et al., 2000; Davidson, et al., 1996). This might help highlight the origin of students' self-efficacy and determine any possible connection to students' environments.

Another possible avenue of investigation could be a study looking at musical self-efficacy among string players, questioning their backgrounds, and observing and inquiring about practice behaviors, but with larger sample sizes that were more widespread, possibly national, and in addition, maybe with younger middle school students or older collegiate students to replicate the results among a more generalizable population.

The current study looked at individual high school string students preparing for an All-Region audition. Investigating students practicing for a solo competition might reveal more details in their individual practice habits. Another focus could be on how they practice in small groups. Observing them practice in their small ensemble groups and interviewing them individually and then as a group could help teachers better understand how students practice in groups and what their cognitive processes are during this type of practice behavior. Videotaped observation may be better and more accurate than just retrospective inquiry, but survey research used in order to include a

more widespread population could still yield informative results with large groups.

Considering any of this type of data alongside self-efficacy data could help determine how students' self-efficacy and deliberate practice might interact.

In conclusion, Bandura (1986) claimed that self-beliefs need to be considered when interpreting motivation for any human behavior or action, and that self-efficacy can be particularly important to human functioning in motivation and personal achievement. To help string students succeed, it may be beneficial to consider their self-efficacy and their achievement as well as their motivation, musical backgrounds, and their deliberate practice habits. Further research is needed in these areas, possibly focusing on an interaction effect of self-efficacy, achievement, and practice behaviors. Other research has led to the importance of practice habits (Hallam, 1997a; 2001; Rohwer & Polk, 2006), and combining the influence of self-efficacy could be enlightening in investigating what motivates students to not only practice, but to practice with intent and deliberateness that may lead to more successful achievement.

APPENDIX A
STRING STUDENT SELF-EFFICACY SURVEY

STRING STUDENT Questionnaire

SECT. I: Please answer the first 6 questions with an exact number or write YES or NO:

How many years have you been playing your instrument? _____

Did you start in a public school program? _____

Do you take private lessons on your instrument? _____

Do you plan to continue playing your instrument after high school in some way?

Do you own your own instrument? _____

How many hours per week (outside of orchestra) do you practice? _____

Please circle one: F – Female M - Male

SECT. II: Questions 1 through 18

This portion of the questionnaire is designed to gauge how confident you are at doing musical tasks on your string instrument. There is no right or wrong response to these questions. For each item there is a space to the right for you to write your response. Rate how **confident** you are that you can do each task **as of now**. Rate your degree of confidence by writing a number from 0 to 10 using the scale given below:

USE this SCALE to ANSWER
QUESTIONS 1 - 18

0 1 2 3 4 5 6 7 8 9 10

Certain I
Cannot
do at all

Moderatel
y
certain
I can do

Certain
that I
can do

Please rate your confidence regarding the following statements:

- | | Confidence Rating
(0-10) |
|--|-----------------------------|
| 1. I can overcome most problems I encounter when learning difficult music my teacher has given me. | _____ |
| 2. I can keep a steady beat when I am playing alone. | _____ |
| 3. I can play my string instrument in tune when performing with a small group. | _____ |
| 4. I can successfully do most things that are required in orchestra. | _____ |

5. Even when a musical task is very hard, I can work on the problem until I succeed. _____
6. It is easy for me to tell when other students are playing out of tune. _____
7. I can keep a steady beat when I am playing with others. _____
8. When learning new solo music, I can easily follow the marked bowings. _____
9. Overall, I can play my string instrument with a good tone. _____
10. I can vibrato well when playing a solo piece. _____
11. If I make a mistake I can continue playing without too much distraction. _____
12. Even when playing very softly or loudly, I can still play my string instrument with a good sound. _____
13. I can sight-read challenging orchestra music without stopping. _____
14. When I am reading music, I can play most rhythms correctly. _____
15. When playing in orchestra, I can follow the marked bowings correctly. _____
16. I can vibrato on my string instrument in most orchestra music. _____
17. Even when other students in my section are making mistakes, I can still follow the marked bowings correctly. _____
18. I can slur difficult rhythms into one bow. _____

APPENDIX B
PILOT VIDEOTAPE TRANSCRIBED

Pilot Videotaped Practice Sessions Transcribed

Higher Self-efficacy Pilot String Students

Student A

Student A was the first of the extreme self-efficacy scored students whose video data were collected successfully. Student A had the top self-efficacy score of 171 in the pilot study, out of a possible 180. Student A stated that he practiced 1 hour or more a week outside of class.

Student A tended to practice as he had claimed, and when asked how he decided what to practice first from the final exam repertoire, he answered, "I went to the hard parts to get to those first. Then I wanted to do the easy parts just in case." He did this in his practice session by starting at a difficult spot toward the beginning and tried to work through it rather than starting at the very beginning of the practice pages given. He encountered three trouble areas immediately, but only corrected two of them successfully. In one of these spots, he isolated the section and deliberately took a slightly slower tempo, playing the notes slightly longer and more on the string, enabling him to focus on correcting the general intonation of a section; and when asked how he could improve intonation during the interview, he answered, by "practicing very slowly."

Student A practiced connecting sustained notes between bow changes by repeating a slower half-note section and slowing even more at each bow change. As he practiced his legato stroke and his bow changes, he also worked on intonation. When asked what he was thinking about during his repertoire practice he claimed that he was focusing on his intonation and his bow, and he claimed that he was able to improve his bow stroke by stating, "I was able to make the bow move faster and lighter." He also

indicated that he was thinking about key signatures at the beginning of his practice sessions.

When asked about practice tempo, student A claimed that he wanted to start slower and then gradually speed up. It was not clear that he did this throughout the repertoire session. For example, in the scenario described above, he played a passage slower the second time and then did not go back to that section until much later, and then he practiced it two more times; once at his original tempo and then slower as he went back through the repertoire the last time.

When asked about practicing dynamics, student A claimed that he would try learning a piece first with a moderate dynamic then add more as he learned the piece better. For difficult slurred passages, he thought it best to start slow and then gradually speed up. In his practice session he demonstrated these practice techniques more during his second run through of the material, slowing down everything when he went back to review.

In his self-efficacy questionnaire, the item that Student A gave the lowest numbered response to was *number 6*, "If I make a mistake, I can continue playing without too much distraction," and he gave this response a 6 out of 10. He gave the other items an "8" or above. This seemed a contradiction to his practice behavior. He was actually able to play through sections and would go back to correct mistakes.

Student A stated that he spent most of his time on the shifts during his scale practice, but he stopped and started throughout the scale, not just where the shifts were. He did review his fingerings and think about where he was going to shift before

playing through each scale. This may have been what he remembered and may have been what he was referring to in his statement.

Student B

Student B had the next highest self-efficacy score of 161. Student B was not one of the most advanced players in the orchestra and did not take private lessons, but seemed determined to want to improve and indicated that she would like to continue playing her instrument after high school. Student B said that she did not practice outside of orchestra class as much as she thought she should. She began her repertoire practice session at the top of the first given practice page, but not at the very beginning as she had claimed in her interview. She started three measures into the repertoire where the main theme introduces a difficult rhythm and powerful bow stroke. She chose not to practice the easier entry notes.

Student B took some time to work on intonation in the upper register. When asked in her interview about how to practice intonation, she discussed working on scales and mentioned how the orchestra director had the class practice repetitively until problem spots were improved. She attempted to do this in her practice, repeating passages after she had stopped to work on problem areas. Even though she had difficulty when she tried to play passages in the higher register, student B adjusted and came back to a *center of pitch*, where a clear tonic note could be distinguished. In the questionnaire, she gave a “10” (certain that I can do) response to the item that read, “It is easy for me to tell that other students are playing out of tune.” Even at the end when she was showing signs of fatigue, she stopped and practiced a specific shift that was giving her trouble with intonation.

Student B practiced faster rhythmic sections by making sure to place the bow appropriately for different articulations. When asked what she was thinking about during her practice, student B commented that she had a great deal going on in her head, but that she was definitely thinking about playing all the correct notes, though she answered that she was not thinking about key signatures. She worked at a moderate tempo, adjusting it when necessary, which enabled her to make corrections as she went through the music. Student B also played the dynamics in her repertoire practice session, but when asked how she practiced dynamics in the interview she answered, “I don’t do that that often. I know I play my dynamics. I guess I just don’t practice them as much as I should.”

In her practice, student B worked in difficult slurred passages combined with difficult string crossings. She carefully slowed her tempo and grouped notes by string. She would play two notes in one slur on one string, stop and adjust her right arm, then play the next two notes on the next lowest string, but in the same bow direction. Therefore, she was practicing the slur into one bow, but slowly adjusting the string crossings and giving her body time to learn and memorize the muscle movements, making adjustments in her right arm and elbow for the string crossings.

Student B only worked on two-octave scales. She had never practiced applying different bowings to scales, such as adding two and then four notes per bow. Her lowest responses on the questionnaire regarded vibrato, continuing to play without distraction when making mistakes, and slurring difficult rhythms, but her overall score and high self-efficacy assessment of herself was demonstrated in her structured efforts at practice.

Student C

The third highest self-efficacy student videotaped, student C, had a self-efficacy score of 157. Student C indicated that she took private lessons and that she wanted to continue playing her instrument after high school. She also indicated that she practiced a great deal outside of orchestra class, claiming 14 hours a week.

Student C started her repertoire practice session in the same place as student B. When asked in the interview about where she wanted to begin her practice session, she stated that she chose the parts that the orchestra teacher focused on most in class, and where the class had trouble, thinking that the orchestra teacher might choose these sections for the test. As student C practiced, she played through large sections, stopping and going back over the smaller sections to which she may have been referring. She responded in the interview that she would slow everything down to correct specific pitches. She stopped and repeated passages slightly slower four different times to work on general intonation, particularly in the higher register.

Student C made deliberate efforts to practice where she was going to place her bow for certain passages, and she tried two melodic passages more than once. She talked about wanting to get the bowings right during her interview and attempted to adjust her breathing during the practice sessions as well as the level and balance of her elbow. She also added vibrato.

When asked what she was thinking about during her practice, student C mentioned wanting to improve her fingerings, bowings, and shifting. She did claim to be thinking of key signatures at the beginning of her practice, but was more concerned about tempo and keeping a steady beat. Student C said that she used a metronome at

home and explained that she needed to do so to avoid tapping her foot in concerts. Her approach to practice regarding tempo was similar to student A. Student A, though he claimed that he wanted to start slower, played slower towards the end of his practice session as he reviewed everything again so as to be able to stop and adjust things during his repeat of the material. Student C did the same and claimed to have done so. In one section, student C worked on a difficult shift that was combined with a complicated string crossing. She purposefully slowed down and practiced one motion or muscle movement at a time.

Student C was one of the only students who practiced the dynamics. She made reference to this in her interview as well. She also practiced difficult slurred passages. She claimed in her interview that she would start with smaller sections of just two or three notes slurred into one bow and then add more notes to a bow.

Student C's lowest responses on the questionnaire were in reference to her keeping a beat while playing with others, something she referred to in the interview; sight-reading; and playing difficult rhythms correctly. She did practice rhythmic passages during her videotaped session. During her scale practice, student C did the assigned one, two, and four notes per bow well, then added her own variations, such as starting on a different note for the slurred two, or slurring two then playing two separate and staccato. She also tried the initial assigned bowing several times at different tempi.

Lower Self-efficacy Pilot String Students

Student D

Student D had a self-efficacy score of 91; less than 100, but not the lowest score of the final 6 interviewed. Student D indicated that this was the first year she had not taken private lessons and she described her biggest weakness as having trouble with note-reading. She explained that she saw the notes on the page and knew where they were for the most part, but did not completely know all the note names. Instead, she explained that she adjusted to what she heard around her in class. She also sang a great deal during the interview to explain certain passages rather than using note names.

Student D started her practice session at the very beginning, which contained simple half notes, but talked about wanting to focus on the more difficult spots when asked in her interview where she wanted to begin her repertoire practice session. She did stop to make single note corrections, but she still played through some mistakes more so than students A, B, or C.

During student D's repertoire practice session she had trouble with intonation, played some incorrect pitches and lost control of her bow. Occasionally her bow would bounce uncontrollably. She did stop and make efforts to fix intonation in three places and wrong pitches in two places, but was not completely successful. However, in one particular passage, she took out the tremolos that were in the passage and played long tones to work on her intonation. This approach to her practice did help, but her bow continued to bounce rather than stay in the string. In her interview, student D indicated that she wanted to focus on playing in tune and getting all the dynamics and difficult

rhythms. However, she was not always successful and was not always aware of her intonation problems or the dynamics. Also, even though student D claimed that she wanted to try and follow her teacher's tempo when practicing, she practiced at slower tempi. She did make reference to this in her interview when claiming that she took tempi that felt comfortable to practice.

Student D's interview took additional time. She elaborated a great deal, did not clearly articulate her answers, and took time in between questions, therefore time did not allow for the final four questions to be addressed. Student D's lowest scored items on the questionnaire were in regard to keeping a steady beat, playing difficult rhythms, and successfully playing everything that was required in orchestra. Her highest scored item was the statement that referred to being able to hear if other students were playing in tune. She did try to adjust her intonation; sometimes even playing by ear rather than reading the notes. However, her problems playing in tune may have been magnified by her lack of note knowledge in some of the higher registers, particularly where she was having extreme difficulty and playing incorrect pitches as well as out of tune notes. Student D struggled with some rhythmic passages and the different bowing variations during the scale practice session.

Student D did not completely understand how to play the scales. When asked about where she wanted to start her scale practice session, she discussed how scales were difficult for her and that she felt she had missed out on learning note-reading and comprehension. This student seemed well aware of her weaknesses and probably answered the self-efficacy survey accurately.

Student E

Student E had a self-efficacy score of 60. She mentioned in her interview that she used to take private lessons but was not currently taking lessons. As she began her practice sessions she seemed uncomfortable. She played an “A” but did not check her other open strings to tune, and when she began playing the music she played it very timidly. She gained confidence as the practice session went on, but always looked slightly bored or unemotional.

Like student D, student E claimed that she chose the sections that the teacher worked on in class to focus on in her practice session. She, too, started at the very beginning and seemed to just play through the pages given, and did not do specific tasks to improve errors. Student E had trouble with intonation in the upper register, and she abruptly went from section to section, tending to go back and repeat the things she felt confident doing rather than focusing on her problem spots. She did stop and make adjustments to correct pitch twice, neither was successful. She tried each measure again, made no changes, and then continued. However, in one attempt to correct her articulation she was successful. She adjusted where she placed her bow on the string and the passage improved. She also had difficulty creating a good tone in the faster, more exciting passages. Her tone improved during the melodic passages, but it was one of the weakest aspects of her playing and an item she scored low on her self-efficacy questionnaire.

In her interview, student E admitted to being worried about the final exam and claimed that she wanted to prepare for it, but she admitted that she was thinking about not wanting to play this repertoire anymore, rather than focusing on improvement.

Student E was not thinking about key signatures either, and she played her scales so fast as to not be able to successfully master the different bowings.

Student E began her repertoire practice at a moderate tempo and answered in the interview that she wanted to start slower and then speed up. She did do this, but did not slow down greatly when attempting to make corrections. She also played everything at one moderately loud dynamic and answered in the interview that she did not practice dynamics, stating that not practicing dynamics was a bad habit she had developed.

In her questionnaire, student E answered two items with the response, *certain I cannot do at all*. These items were regarding sight-reading and slurring difficult rhythms into one bow. When asked how she might practice difficult, slurred passages, she responded, “Oh, that was bad. I had to break it up. Like play the slur and then stop, play the next one and then stop, just so I would have that in my mind, like what fingers were suppose to go in what slur, and what notes.” This technique was her way to practice the difficult slurred passage.

When practicing the scales, student E stopped to check notes with her open strings, but as she worked on the scales she played through mistakes and out of tune notes without making any effort to make corrections. This student seemed aware of some practice techniques, and though she attempted many of them, she not follow through, ultimately practicing her mistakes as she repeated spots in the repertoire or parts of the scales.

Student F

Student F had a self-efficacy score of 45, one of the lowest self-efficacy scores of the entire group surveyed. He did not take private lessons. For his repertoire practice

session he started at the very beginning of his practice pages and played a repeated rhythm section pizzicato, changing tones only occasionally, and making little adjustments in tempo, dynamics, or phrasing. Student F was playing from an altered part that the teacher wrote out for him. He could play through it, but it was not difficult, and he did not understand how to practice beyond repeating the section that he knew. He stopped twice, making no adjustments or corrections. Then he continued on until he came to a different section and stated, "I don't know this other part." In the interview, student F stated that he wanted to practice the easy parts first and then go to the hard, but he never made it to the hard parts.

Student F's pizzicato passage consisted of almost the same pitch throughout and he generally played it in tune, but when he had to change pitch three different times, his intonation was not good. The notes were flat and he made no effort to correct these intonation problems. During his one-octave scale practice he played the wrong note twice even after going over the scale and he played the first finger *E note* consistently out of tune twice. He talked about taking his time when practicing for intonation, and when asked about how he might improve intonation, he suggested that if his teacher were to write down the specific notes he was missing as he played through a passage, then he could go back and focus on correcting the wrong notes better. His answer was in regard to wrong notes rather than playing out of tune.

Student F practiced a one-octave, D major scale for his scale practice session and spent a great deal of time coordinating the bow and the left hand. By the end, he played two notes per bow, but he was not able to do so without specific guidance

indicating to him when to change the bow. However, during the interview he claimed that the scale was easy for him to do.

Trends with the High and Low Self-efficacy Students

When taking into consideration all 6 of the students videotaped, the 3 highest self-efficacy scored students all indicated that they would like to continue studying their instruments after high school, and the lower 3 indicated that they did not want to continue; there was a definite division between the two groups. All 6 students owned their own instruments, but the lower 3 did less practice outside of school. The 3 high self-efficacy students claimed the following amount of practice outside of orchestra: 1 or more hours per week; not as much as she thought she should; and 14 hours per week outside of school. Only 1 student from the lower extreme claimed to practice outside of school. Student D claimed that she practiced for 3 hours a week.

When asked how they decided what to practice first in their practice sessions, students A and D stated that they would choose the hardest parts first, but student D, from the lower self-efficacy group, actually started at the very beginning and began to play through the music. Student A, the student with the highest self-efficacy score, went straight to a difficult section. Student B, also part of the high group, stated that she started at the beginning, but she actually skipped the first two measures and played at the first difficult motive found in measure three. Students C and E claimed to have chosen parts that the teacher worked on in class, but student C basically started where student B started and then went through the music, and student E started at the very beginning. Student C also did more successful starting and stopping at difficult sections for improvement than student E.

Observation data were analyzed in conjunction with the interview data and questionnaire responses for students A through F. In other deliberate practice research using observation, Hallam (1997) spelled out six levels of “task orientation strategy” (p. 100):

- 1) Task requirements incomplete
- 2) Material played through, no corrections
- 3) Material played through, single notes corrected
- 4) Material played through, short sections repeated
- 5) Material played through, large sections practiced en route
- 6) Material initially played through, difficult passages identified and practiced in isolation

These levels or categories of strategy approach were easily identified among the 6 students observed in this study, compared here in order of increasing self-efficacy scores. Student F, the student with the lowest self-efficacy score, could be identified as using strategy level one. He was not able to complete the assigned pages. He did play through a small portion of the material that he could perform, but made no effort to correct mistakes. Student E utilized strategy levels two and three. Her usual approach was playing through with no corrections, level two, but five different times she did stop to fix single notes, particularly in the scale practice. She also repeated and improved a short section once, level three. Student D did more correcting and short section practice than student E, and twice seemed to repeat sections to work on them, strategy level four. But she left many uncorrected pitches and intonation problems, and often focused on fixing only one note in a section.

Student C, who used strategy levels three and four, was still playing through some mistakes, but student B used a variety of practice approaches, and although she was not a student who took privately or knew her three-octave scales, she followed through with several practice techniques, using strategies four and five. Student A, the student with the highest self-efficacy score, used strategy six. He started his practice at a difficult passage that was toward the beginning of the assigned pages, and then overall played through his assigned pages at one tempo, skipping some easier spots that were not necessary to practice, though he did look at some of them “just in case,” as he claimed. He did stop and fix, using strategies three through five during his initial run through of the repertoire material, but then he went back and played through difficult passages again, slower and with more deliberate isolation strategy in his practice, strategy level six.

Analyzing the 6 students measured in the pilot study, the following table (Table 4) indicates how they related to Hallam’s (1997a) list of task-oriented strategy levels:

| Students in order by extreme and ascending self-efficacy scores: | Strategy levels (Hallam, 1997) used most: |
|--|---|
| F self-efficacy score of 45 | 1 and 2 only |
| E self-efficacy score of 60 | 2, some of 3 and 4 |
| D self-efficacy score of 91 | 2 and 3, some of 4 |
| C self-efficacy score of 157 | 3 and 4, some of 2 |
| B self-efficacy score of 161 | 4 and 5, some of 3 |
| A self-efficacy score of 171 | 6 and some of 3-5 |

Table No. 4. Comparison of High and Low Self-Efficacy Pilot String Students to Hallam's Strategy Levels

APPENDIX C
PILOT INTERVIEW DATA TRANSCRIBED

Pilot Interview Data Transcribed

STUDENT A

1. INTERVIEWER: How did you decide where to start or what to practice first from the given repertoire?
STUDENT A: I went to the hard parts to get those out of the way first. Then I wanted to do the easy parts just in case.
INTERVIEWER: How did you decide where to start or what to practice first from the given scale?
STUDENT A: I decided to practice the shifts most of the time.
2. INTERVIEWER: What were you thinking while you were practicing the repertoire?
STUDENT A: About intonation and bow style. You should think about the sound you're making and try to count.
INTERVIEWER: Anything in particular you were able to improve?
STUDENT A: Yes, I was able to make the bow move faster and lighter.
INTERVIEWER: What were you thinking while you were practicing the scales?
STUDENT A: I was thinking about intonation overall. What notes to slur and when to change the bow.
3. INTERVIEWER: Do you ever practice independently with a metronome?
STUDENT A: Yes.
INTERVIEWER: Why?
STUDENT A: To keep time with it.
INTERVIEWER: Why would you choose not to practice with a metronome some of the time?
STUDENT A: To concentrate on intonation and notes without it.
4. INTERVIEWER: How did you decide what tempo you were going to use during your practice session?
STUDENT A: I wanted to start slower then gradually speed it up.
5. INTERVIEWER: You didn't get a chance to warm up at all before this practice session did you?
STUDENT A: No, I came straight from another class.
6. INTERVIEWER: How do you practice dynamics?
STUDENT A: I try to learn the music at one steady, moderate dynamic at first, then add more dynamics as I learn the part better.
7. INTERVIEWER: How do you practice difficult slurred passages?
STUDENT A: I start slow then speed it up.

8. INTERVIEWER: How do you practice to improve intonation?
STUDENT A: Practicing very slowly. Sliding fingers into correct positions and possibly using a tuner.
9. INTERVIEWER: Were you at any point during this practice session thinking about key signatures?
STUDENT A: Yes, at the very beginning.

STUDENT B

1. INTERVIEWER: When you were first looking at 007 and I said we would practice for 10 minutes thinking about the final, what did you decide to practice first?
STUDENT B: Just the beginning I guess. Start at the beginning.
INTERVIEWER: What about the scales?
STUDENT B: The scale?
INTERVIEWER: What did you practice first in the scales?
STUDENT B: Just playing and starting the scales.
2. INTERVIEWER: What were you thinking when you were practicing 007?
STUDENT B: Don't mess up. But yeah, lots of stuff [was] going through my mind.
INTERVIEWER: Could you tell me something more specific?
STUDENT B: Just get all the notes in tune.
INTERVIEWER: What about when you were practicing the scales?
STUDENT B: Well it's just, I guess it's just second nature, not something you really have to think about. I'm sure you have to think about where you put your fingers and everything. It's harder than it looks. It's hard sometimes playing all the notes exactly right for scales.
3. INTERVIEWER: When you're at home practicing, do you use a metronome?
STUDENT B: No.
INTERVIEWER: Have you ever used a metronome when you're practicing?
STUDENT B: Not at home, I never had a metronome before.
INTERVIEWER: What about here?
STUDENT B: Yes.
INTERVIEWER: Why do you use a metronome?
STUDENT B: Well, the only time I use a metronome is when we're in a group. But [when] I'm by myself... I don't use a metronome because I don't have one and I guess I feel like I can play it without one.
4. INTERVIEWER: What tempo did you decide to use when you were beginning your practice session?
STUDENT B: I'm not sure. Just the original tempo I guess. Not the exact original, just a little slower than [the] original. I'm not sure. I just started playing.
INTERVIEWER: Why did you decide to go a little slower?
STUDENT B: If I did, then it [would] make it a little easier.
INTERVIEWER: What about at the end of your practice session, tempo-wise?

STUDENT B: Uh, tempo-wise? Well just play at a speed I'm more comfortable at. That's all.

5. INTERVIEWER: How much time did you take to warm up before this practice session?

STUDENT B: Since you were in here with the other girl?

INTERVIEWER: Yes, ok...

STUDENT B: The whole class.

6. INTERVIEWER: How do you practice dynamics?

STUDENT B: I just, I don't do that that often. I know I play my dynamics. I guess I just don't practice them as much as I should.

7. INTERVIEWER: What about difficult slurred passages?

STUDENT B: Honestly, I don't know. I don't know if I play, I mean I know how to slur. I don't know if I [have] played a difficult slurred passage before. Maybe.

8. INTERVIEWER: How could you practice to improve your intonation?

STUDENT B: Well, I could just keep doing my scales, over and over. And just work on my fingerings and Mr. Bustos makes it very repetitive. He makes you do it over and over again. He doesn't make you stop until he thinks you're doing it right.

9. INTERVIEWER: During any of your practice time, were you thinking about key signatures?

STUDENT B: I guess not, no. It was [not] on my mind unless he keeps on bringing it into our heads "Don't forget key signatures. Don't forget. Don't forget." But I do.

INTERVIEWER: When you come across F sharps or B flats, do you just think more of the individual note?

STUDENT B: Yes.

STUDENT C

1. INTERVIEWER: How did you decide where to start or what to practice first from the 007?

STUDENT C: I chose the parts by what he focused on most in class and by which part I was having the most trouble with. Like with the tremolos in the beginning, I figured he might do those because we were having trouble with those in class.

They're really not tremolos, they're double bows. And also I know he won't do the [sang notes] cause it's just too basic.

INTERVIEWER: What about the scale?

STUDENT C: The scale, it helps me to... It was getting used to these [sang notes] at 63 and going up into the octaves at about sixth position. So it helps with... so that you get the fingering for 33 when you go [sang notes].

2. INTERVIEWER: What were you thinking while you were practicing the piece?

STUDENT C: In this particular piece I was practicing, I was thinking about which dynamics to do and which ones to change because he made a little tweak to some of them and I didn't write some of them down. So I was trying to remember and trying to get the bowings right and their accents on some of these that go [*sang notes*].

INTERVIEWER: What about when you were practicing the scale, the last 2 scales, what were you thinking?

STUDENT C: Oh, I was thinking, *how can I use this in the music and how can I make this better because I'm not doing so well right now.*

INTERVIEWER: Can you be more specific about how you can make it better?

STUDENT C: How can I make it better? By fingering, bowing, and shifting.

3. INTERVIEWER: When you are practicing at home, do you use a metronome?

STUDENT C: Yes.

INTERVIEWER: Why did you use a metronome?

STUDENT C: To help me with the beat. So I can get use to it in my head. That way I don't have to tap my foot cause sometimes I tap my foot too loud and I catch myself, oh, I'm not suppose to do that. Cause in concerts you can hear it on the floor.

INTERVIEWER: And why might you choose not use a metronome?

STUDENT C: Not use a metronome? So that, that's a really good question... So that you could play with the music and see what you could make of it and sound like what it's not suppose to sound like... and what it's suppose to sound like. To maybe concentrate on notes and intonation without it.

4. INTERVIEWER: How did you decide what tempo you were going to take when you began practicing?

STUDENT C: OK, in the piece they use moderately fast and slow rock tempo; so I wanted to choose not a fast pace but not like a really boring pace. So I chose moderate but slower than moderate. You know, in the middle of those two so that I could go a little bit faster. So it was moderately fast and slower at the slow up tempo so I would only have to adjust a little bit.

INTERVIEWER: So when you were finishing the practice, did you change your tempo at all? Did you do the tempo different than that when you ended the practice session?

STUDENT C: Yes, a little bit. I slowed it down a little bit more so that I could fix whatever note it was; so that I could tune it.

5. INTERVIEWER: Did you warm up before we did this?

STUDENT C: A little bit.

6. INTERVIEWER: How do you practice difficult slurs?

STUDENT C: Break it up into smaller sections. I start with 2 or 3 to a bow and then add.

7. INTERVIEWER: How do you practice dynamics?

STUDENT C: Slow the bow, then speed it up.

8. INTERVIEWER: How do you practice intonation?
STUDENT C: Slow everything down and work on the shifts.
9. INTERVIEWER: Were you thinking about key signatures?
STUDENT C: Only when I first began practicing.

STUDENT D

1. INTERVIEWER: When you were looking at 007, how did you decide where to start to practice first?
STUDENT D: At the parts that were like the hardest to me. I just think that he would pick like the hardest for a test. So I got [to] 62, it goes up [to a] higher position and I struggle with that part so I wanted to practice that part just in case he did choose it and then like at the beginning, the [*sang notes*] you know and like that has to be dead on; so I felt like I really needed to really practice that. And then like around 84, the [*sang notes*] it's a "kinda" different beat. I thought maybe he might like do that one as well. It's a little faster and some what harder. It's "kinda" like counting a little bit.
INTERVIEWER: What about on the scale?
STUDENT D: [*Laughter*] Well, I've always "kinda" done bad at scales 'cause I always forget. Things that I have lacked from orchestra "is" being able to learn about the linking notes better. I just "kinda" learned how to see them on the music and I "kinda" know where they are. I don't know exactly the names of them and I do feel bad that I missed out on that part. I might have been closer to orchestra if I knew more about that. "Kinda" like I'm hearing that he's (having a) class next year and I wish I had been able to do that. So like in scales, I always struggle. Like when we're doing it in class, I always have to listen to other people because I'm not confident enough to think that I know it for sure; so I've always got to struggle. So once I "kinda" get it. Once you tell me or if I hear like a beat or something, I can get it.
2. INTERVIEWER: What were you thinking about when you were playing 007?
STUDENT D: Just making sure that I really nailed those really high notes like around the part that [*sang notes*] you know, that has to be like really in tune. Just know that I have to be in tune. I was just really thinking of that a lot... The rhythm and getting the dynamics. I know he really likes dynamics so like I "kinda" was thinking about that and just getting them.
INTERVIEWER: What about while you were playing the scale?
STUDENT D: Just thinking about OK, OK. I "gotta" go back you know to elementary. *OK what is this?* Going back to A, B, C, D just trying to memorize it a little bit more. Even with math stuff, I like the easy math. I still have to "kinda" do it on my hands. Stuff like that I can't really remember and stuff. So I "kinda" have to remember my stuff like A, B, C, D, E. OK that is just thinking I really need to learn my scales.

3. INTERVIEWER: When you're practicing at home, do you use a metronome?
STUDENT D: No, I should cause I know that I [should].
INTERVIEWER: How do you think that that would help you?
STUDENT D: Cause it would help me keep the beat. I know when I'm practicing by myself I don't. I just "kinda" go to like the hard places. I just take whatever speed and I know that's bad; but when I get back to school though, I take his speed and like I'll listen to the other people. Like, how they're playing it; and then when I hear them, it's like I can play it. I'm really good if I hear something then I can "kinda" do the same thing. If you play me a rhythm and give it to me, like I can do it pretty good. But like at home, I should use a metronome. I just, I even have one cause I used to take private lessons and she gave me one. I tried to use it and it "kinda" frustrated me.
INTERVIEWER: When would it be good to not use one?
STUDENT D: "Cause" you can maybe like "free style" it. I mean take it at your own speed. I mean not like, maybe go slower. Not really keep a beat at all just to get notes correctly for you to sound them out. Like I was doing that a little bit earlier. It's just so you don't actually have to keep a beat. Just turn it off and say OK. Like 16th notes. I "wanta" make them all quarter notes or something.
4. INTERVIEWER: How did you decide what tempo you were going to begin the practice session?
STUDENT D: I've been just taking...I "kinda" remember his tempo he's been taking. I didn't go to the Evening for Strings (concert). So I didn't know the exact tempo that he took it; but just in practice like when we took it slower, the comfortable the speed, I remembered it and so I don't think I kept the tempo very much. I tried to like, I use my toe as my tempo. And I just "kinda" took a speed I feel comfortable with.
5. N/A
- 6.– 9. We ran out of time and I was not able to ask this student the additional four *new* questions. Her interview took much more time than I had anticipated during the first four questions.

STUDENT E

1. INTERVIEWER: How did you decide where to start or what to practice first?
STUDENT E: I just "kinda" picked the parts that he usually picked when we would practice it in class. You know, like the first places he would go to. I just picked those and "kinda" worked on them.
INTERVIEWER: What about when you were practicing the scales?
STUDENT E: I was sitting there and I just did whatever felt comfortable. I "kinda" did what I used to do in my lessons when I used to take lessons. I would "kinda" go through it slowly just to figure it out, then speed it up, and then try out all the different bowings and just see if I could do it on each one.

2. INTERVIEWER: What were you thinking about when you were practicing the *007*?
 STUDENT E: Well, I was thinking about the final 'cause I was "kinda" stressing over the middle part and I was thinking that I really want to stop playing this song 'cause I really don't like it any more...
 INTERVIEWER: What about the scales?
 STUDENT E: I was surprised that I could... that it was as clear as it was because I thought I was going to be a little rusty because I don't usually warm-up [with] scales or anything like that, so I was just trying to see what I could do with it.
3. INTERVIEWER: When you're practicing at home, do you use a metronome?
 STUDENT E: No.
 INTERVIEWER: What about here at school?
 STUDENT E: Only when... not when I'm practicing by myself.
 INTERVIEWER: Do you think it would be a good idea to do that?
 STUDENT E: Yes, probably, but usually I get frustrated with metronomes.
 INTERVIEWER: How could it help?
 STUDENT E: It'd probably stop me... there's a lot of parts in songs that I think I "kinda" do my own thing because I think that's how its suppose to sound. But then it's really not. Cause if I've heard the song before, if it's like a popular song, I'll try and go with my head. With the words and not the beat. The metronome might clear that up a little bit.
 INTERVIEWER: Why would you purposefully not use a metronome?
 STUDENT E: The style of the music is supposed to be like... more... I can't think of the word, but it's not supposed to have like a... it's supposed to flow more maybe? [If] you wouldn't be thinking in your head one, two, three, four [it] might flow a little easier.
4. INTERVIEWER: How did you decide what tempo you were going to use when you began to practice?
 STUDENT E: I just start it out slow just to get it back into my brain, to get it back into my memory. But then I try to speed it up to the tempo that we played, whatever we played it in the concert and stuff.
 INTERVIEWER: What about the scale's tempo?
 STUDENT E: That I started slow. Well I thought it was slow; but I don't think it was really that slow, just to get it back into my memory. I tried to speed it up, but then my fingers got a little crazy.
5. INTERVIEWER: Question 5 doesn't apply to you because you didn't get a chance to warm-up.
 STUDENT E: NR
6. INTERVIEWER: When you're practicing, how do you practice your dynamics?
 STUDENT E: I usually don't. That's a bad habit of mine. I was just thinking about it right now. That I should probably work on that more; but I was never a big fan of dynamics unless I heard somebody screaming [about] it in my ear.

7. INTERVIEWER: What about difficult slurred passages?
STUDENT E: Oh, that was bad. I had to break it up. Like play the slur and then stop, play the next one and then stop, just so I would have that in my mind. Like what fingers were suppose to go in what slur, and what notes.
8. INTERVIEWER: When you're practicing your scales, how do you improve your intonation?
STUDENT E: Spending more time on each individual note like starting on whole notes maybe and getting it in tune and then playing the whole thing with whole notes, and then half notes, and then quarter notes and speeding it up. That's what he and I used to do during my lessons. I just didn't remember that right now.
9. INTERVIEWER: Did you think about key signatures at all?
STUDENT E: Not really. When I really start playing the song, I do. But with these, like I played the song so long I think it's a muscle memory. I don't really have to think about it. It just happens. I don't know if that's good or not.

STUDENT F

1. INTERVIEWER: When you were looking at 007, how did you decide what to practice first?
STUDENT F: To practice the easy part first, and just go from there, and then after that go to the hard
INTERVIEWER: And what was your reasoning for that?
STUDENT F: Because I think... Because to me it helps me more if I learn the easy part first and go to the hard part so... Then maybe I can practice the hard part a little bit better...
INTERVIEWER: And what about in the scale (*I elaborate to explain the question further*)?
STUDENT F: I guess like... I don't know... I'm "out-a" words.
2. INTERVIEWER: What were you thinking about while you were practicing the final [exam] music?
STUDENT F: I was thinking like it was "gonna kinda" be really hard, I guess. And I was gonna mess up on a couple of the notes, I guess.
INTERVIEWER: What about during the scale?
STUDENT F: Yeah, like it was really easy for me to do.
3. INTERVIEWER: When you're practicing individually by yourself, do you ever use a metronome?
STUDENT F: No.
INTERVIEWER: OK. When do you use a metronome?
STUDENT F: Never
INTERVIEWER: Except in class?
STUDENT F: Yes, except in class.

INTERVIEWER: Do you think it's good to use one?

STUDENT F: Yeah.

INTERVIEWER: And why?

STUDENT F: Because it helps me to like... if I'm lost and... I don't know... if I'm like playing a part that has like a beat to it and when I hear the beat from the metronome it helps me get back into the beat.

INTERVIEWER: So why would you not use one?

STUDENT F: I just never got one.

INTERVIEWER: Do you think there's anything positive about not using one?

STUDENT F: It won't annoy you all the time.

4. INTERVIEWER: How did you decide what tempo to take the 007 final [exam] music?

STUDENT F: Tapping my foot two times.

INTERVIEWER: Did you start and end the practice session in the same tempo?

STUDENT F: Sometimes, not all the time, I would mess up so...

INTERVIEWER: So it changed?

STUDENT F: Yeah. I guess the hardest thing for me is to keep the beat sometimes.

5. INTERVIEWER: How much time did you get to warm up before we did this?

STUDENT F: Two or three minutes I guess... I came back from taking a test...

6. INTERVIEWER: How do you practice dynamics?

STUDENT F: Look at a board, then I guess the teacher tells me, you know, what "kinda" [dynamics (*He mispronounces the word*)] by point[ing] it out... by that way...

INTERVIEWER: How do you specifically practice them on your instrument?

STUDENT F: Honestly... not all the time, but I guess like, when he's helping me he tells me how to do it...

7. INTERVIEWER: What about difficult slurred passages? How would you practice a difficult slurred passage in your music?

STUDENT F: I guess I would take my time on it... "kinda" do a little better on it?

INTERVIEWER: OK.

STUDENT F: 'Cause like if I hear something, but if someone tells me to like, you know, like patterns and stuff, I listen but then, like, when I get to it, it goes like one ear, you know...?

8. INTERVIEWER: Did you think about the key signature at all when you were playing?

STUDENT F: No.

9. INTERVIEWER: How can you improve pitch and intonation when you're practicing?

STUDENT F: By myself, or...?

INTERVIEWER: Yeah, by yourself...

STUDENT F: I guess, like, if someone would write it down then, stuff and then, on a piece of paper, and, like, I took my time n' look at it, then I would get better at it,

instead of, like, 'cause like, if someone tells me... someone like... 'cause sometimes my teacher tells me, you know, "do that..." and I do listen, but then sometimes it's just like, I like really don't pay attention, but if like, he writes it down, I like, it focuses like... I [get] concentrated on that one thing, so... I can do it when it's like on paper or something like that...

(It was extremely difficult to understand the student's answer and transcribe the student's comments from the section above.)

INTERVIEWER: More specifically then, if I wanted to help you with your pitch in a certain piece you were working on, and I had a copy of the same piece and I circled all the pitches you were having trouble with, you could go back and practice it better?

STUDENT F: Yeah, exactly.

APPENDIX D
ALL-STATE REPERTOIRE

All-State Repertoire

Texas All-State Etudes for 2007-2008, taken from the Texas Music Educator's

Association website:

<http://www.tmea.org/>

Updated 6/13/2007

VIOLIN:

Kreutzer: *Forty-Two Studies or Caprices for the Violin*; (Singer), Schirmer
#32 (Andante)

[One bow per measure]

Tempo: Quarter note = 66-72

De Beriot: *The First Thirty Concert Studies for the Violin, Op. 123*; (Berkley), Schirmer
#20 (Allegro)

Tempo: Quarter note = 70-76 (play as détaché)

Errata:

Measure 23 - Second to last note should be C Natural (6/8/2007)

Measure 28 - 11th note should be D Flat (6/13/2007)

VIOLA:

Campagnoli: *41 Caprices, Op. 22*; (Herrmann), Peters Edition
#3

Tempo: Dotted quarter note = 66-72

Errata:

Measure 15 - 14th note should have a Natural Sign (D Natural) (6/13/2007)

Measure 20 - 9th note should be B Sharp, 15th note should be B Natural (6/13/2007)

Mazas: *Etudes Speciales, Op. 36, Bk 1*; (Mogill), Schirmer (updated 4/19/2007)
#27

[First Page Only, play through end of m. 51]

Tempo: Quarter note = 82-88

Errata:

Measure 32 - The p should be on the second sixteenth note. (6/13/2007)

Sixteenth note grace notes should be played before the beat. (6/13/2007)

Eighth note grace notes should be played on the beat. (6/13/2007)

CELLO:

Schroeder: *170 Foundation Studies for Violoncello, Vol. III*; Fischer
#155 [Merk, op. 11, No. 16]
[Adagio only, play through the end of m. 54]
Tempo: Quarter note = 70-76

Duport: *Twenty-One Etudes for the Violoncello, Book 1*; (Schulz), Schirmer
#9
[Play through the end of m. 96 only]
Tempo: Quarter note = 96-100
Errata: The first note in measure 53 should be a C natural. (5/15/2007)

BASS:

Sturm: *110 Studies, Op. 20, Vol. 1*; (Zimmerman), International Music Company
#30
Tempo: Quarter note = 80-88

Lee: *12 Studies, Op. 31*; (Zimmerman), International Music Company
#12
Tempo: Quarter note = 66-70; Trills begin on lower note

APPENDIX E
OBSERVATION FORMS

OBSERVATION FORMS

Higher Self-Efficacy Sub-Group (Students K through R)

STUDENT K

(Self-efficacy score of 173)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student K played the two octave scale from the beginning, repeating the tonic notes in quick quarter notes twice without mistake. He started at the top of the scale and played down the two octaves to attempt to improve the shifts, then played the whole scale again.

ETUDE: He started at the beginning of the etude and played it all the way through before going back over anything.

REPERTOIRE EXCERPTS: Student K also started at the beginning of the first excerpt he chose and played it up to tempo, repeating the first half of it three times before going on and finishing it, and then he worked on the second half of it. After that he played all the way through the excerpt at tempo. For the second excerpt he took a similar approach, working on slightly more content than the first half of the excerpt, then going back and playing the entire excerpt all in tempo and repeating it and choosing some other sections on which to focus.

2. Were any attempts made at corrections?

SCALE: Yes, he repeated the scale going down in pitch again to clean up the shifts.

ETUDE: Yes after an initial run through of the etude excerpt. During the second run through he seemed to be even more focused on musical ideas, phrasing, and dynamics. He kept going through it and over it, repeating large sections and the entire etude.

REPERTOIRE EXCERPTS: He seemed to know the excerpts well enough to play through them at tempo. However, he did correct a mistake in the second excerpt he chose during the second time he played through this excerpt. He also practiced the fast quarter notes that were in the repertoire at half tempo to double check them.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: He kept repeating the scale in quarter notes, varying the tempo, first with quarter notes, then eighth notes. He also varied the rhythm, and then played the scale with extremely fast repeated sixteenth notes. After that he went back to slower quarter notes again. Next he played the repeated two sixteenths again even faster and then went back to the quarter, playing them quickly enough to feel like eighths. He incorporated an arpeggio after each scale about every other time, usually only one octave, but twice in both octaves. When playing the

second octave the first time, he slowed down to correct intonation and adjust. After this he played the scale in three octaves in slower quarter notes, still repeating the tonic notes and then playing the arpeggio in all three octaves. ETUDE: He was able to practice the etude excerpt in tempo through most of the etude excerpt practice session.

REPERTOIRE EXCERPTS: In the first excerpt, Student K played everything up to tempo, but in the second excerpt he took one section at half tempo to check his notes, then went back and played them in tempo again and in context.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: Yes, the second octave arpeggio was repeated to practice intonation.

ETUDE: No, Student K was practicing in larger sections and playing through the etude excerpt.

REPERTOIRE PRACTICE: He worked on the quarter notes in the second excerpt, but there were several measures of this motive and he practiced four measures of this phrase at the half tempo. Also, anything that may have been corrected was done so when the entire excerpt or a large portion of the excerpt was repeated.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: Yes, the entire scale was practiced over and over again in quarter notes in two octaves.

ETUDE: Yes, Student K practiced the etude excerpt in larger sections and played through the music mostly, playing the entire etude.

REPERTOIRE PRACTICE: Yes, he repeated the first half of each excerpt to practice them and then repeated both excerpts in their entirety. In the second excerpt practice he even went past the marked section and played through to the very end of the phrase. He also took one section in the second excerpt, four measures of the quick quarter notes, slowed them down to half tempo and played through them for practice before going back over the whole excerpt.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: Shifts were focused on in the arpeggio practices and then he also focused on quick and separate bowings in the very fast version of the scale.

ETUDE: He seemed to be playing through the etude excerpt more than focusing on specific technical aspects. However, he was doing certain technical aspects well and did seem aware of them as he did repeat the etude. For example, he made an adjustment to a shift and it was smoother, cleaner and more accurate in the second play through of the etude even though he did not isolate the shift itself. He also focused on musical aspects (see answer to Question two).

REPERTOIRE PRACTICE: Student K was attempting to play through the repertoire for the most part, from beginning to end, beyond the excerpts. He worked on musical phrasing and the technical aspects involved in creating musical dynamics.

7. How was intonation practiced?

SCALE: He slowed down to a certain extent and kept repeating notes that he wanted to adjust intonation.

ETUDE: It wasn't necessarily isolated but phrases were repeated and large sections focused on in musical phrasing and dynamics.

REPERTOIRE PRACTICE: Mostly through repetition. However, in the second section of the second excerpt he did slow down to check his pitches in the quick excerpts.

8. How was rhythm practiced?

SCALE: He played the scale in one rhythmic variation, a dotted eighth sixteenth version.

ETUDE: Student K played through the excerpt once without stopping, then played through it and large parts of it again to repeat and practice it, focusing on musical phrasing as well as dynamic contrast. Rhythm was mostly already in place.

REPERTOIRE PRACTICE: He repeated large sections of the excerpts and the excerpts as a whole in tempo. He slowed down the quick quarter notes for note practice in the second excerpt but did not seem focused on rhythm.

9. Was a metronome used? If so, how?

NO

10. How were dynamics practiced?

ETUDE: He drastically changed the amount of bow and he was using and he repeated the entire etude excerpt. And it seemed as though he was focused on playing the dynamics in an extreme manner, extra loud or soft, during this second version of the scale.

REPERTOIRE EXCERPT: He played all the dynamics and worked hard to exaggerate them.

11. How were difficult slurred passages practiced?

SCALE: He slurred the scale in one version.

ETUDE: He played through the etude excerpt and portions of it several times, therefore, with repetition.

REPERTOIRE PRACTICE: There really were not any in the bass excerpts. Only one place where there was a down, up, up bowing that was awkward. For this he repeated it twice in tempo.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: Yes, in a way. He played through the scale once without any problems before going over it several more times with different variations and before adding an octave.

ETUDE: Yes, he seemed to be focused on phrasing and dynamics.

REPERTOIRE EXCERPTS: Yes, in the second excerpt he played through the first half, then the entire excerpt, then he took four measures of the quick quarter notes at half tempo.

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

No

15. OPEN COMMENT: Student K knew the repertoire well enough to play through it at tempo well and without difficulty. He even played past the marked section of the excerpt to finish the complete phrase in the second excerpt he chose to practice.

STUDENT L

(Self-efficacy score of 163)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student L started at the beginning of the scale, playing quarter notes in a moderate tempo. He played the first two octaves in tune, then did not remember his fingering for the top octave and missed the top four pitches, playing "G" to "A" out of tune and then "B" to "C" incorrectly (ti to Do was not recognizable). He went back to the beginning of the scale three more times before remembering the fingering and playing the correct pitches.

ETUDE: First, he had a false start. He began timidly, then stopped, plucked his string with his left hand nervously, then began again. Next he started at the beginning the etude excerpt and continued playing through, stopping to correct mistakes or slowing down to make adjustments as he attempted to play through. Therefore, constantly adjusting the tempo or repeating small passages during his initial run through.

REPERTOIRE EXCERPTS: Student L started at the beginning of the first excerpt and repeated six of the measures to practice them. He practiced the next section of the same excerpt twice before starting the next excerpt of the first piece in the first repertoire practice session. He took time to carefully find each pizzicato chord. He started at the beginning of an excerpt for the second practice session, but was stopping and starting right away, attempting to make intonation adjustments and slowing down more and more each time.

2. Were any attempts made at corrections?

SCALE: Yes, Student L played the scale four more times from the beginning, attempting to remember the fingering for the top octave. Once he did remember and played it correctly, he went back and isolated the top four pitches, practicing the fingering and the notes that he had trouble playing in tune.

REPERTOIRE EXCERPTS: Yes, Student L repeated the first section of the first excerpt, checked his pizzicato chord, and then repeated the second section of the first etude twice. When playing the dotted eighth note sixteenth pattern in the first two excerpts of the first practice piece, Student L slurred the notes legato together rather than playing them hooked (notes still played in the same direction and played with a stopped space between them, not legato) as they are written. He played the first four measures of the second excerpt twice, attempting to correct wrong pitches the second time. When practicing the second half of the second excerpt in the first piece, he stopped and repeated one measure to correct pitches three times before playing the whole section again slower. He started at the beginning of an excerpt for the second practice session, but was stopping and starting right away, attempting to make intonation adjustments and slowing down more and more each time. He stopped and fixed pitches in the slower melodic excerpt he chose to practice.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: Yes, he began the scale with quarter notes in a moderate tempo. Once this version of the scale was corrected, he moved on and slurred two eighth notes together. Next he varied the rhythm and articulation.

ETUDE: Student L began close to perform tempo, but then immediately slowed down when he encountered a problem and needed to work on a section.

REPERTOIRE EXCERPTS: He played through most of the first two excerpts from the first piece in a moderately fast tempo. He did slow down when working on the coordination between the bowing and left hand for the eighth notes and two sixteenth notes pattern. When repeating the first excerpt he chose in the second session, he kept playing slightly slower, making more and more adjustments to intonation and pitch as he went.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: Yes, after he isolated and repeated the top four notes of the scale to correct them once he had remembered the fingering.

ETUDE: Yes, several. The section repeated the most was a fast section with extreme string crossings in a spiccato articulation. This was repeated about five times.

REPERTOIRE PRACTICE: Yes, in the first practice session, Student L repeated the two different measures separately that had dotted eighth sixteenth notes in them. Yes, in the second practice session he repeated the first measure of the first excerpt he chose three times before going on to finish the excerpt.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: Not necessarily, but the entire scale was repeated six different times with different variations.

ETUDE: Yes, in general he seemed to practice sections as he played through the etude, slowing down in spots to work on things, and then continuing on in the etude.

REPERTOIRE PRACTICE: Yes, Student L worked on large parts of each excerpt: the first six measures and the last two measures of the first excerpt, the first four measures, the four measure pizzicato section, and the four measure bowed section with eighth notes and two sixteenths. He also attempted to play through the excerpts as well. When Student L practiced the second piece's excerpts, he repeated large sections two and three measures long, isolating certain things such as the slow melodic themes and ideas and then repeating just the fast note sections.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: He did work on his fingering in the top half of the top octave of the three octave scale. He also played the scale with a "short-long" rhythmic variation that helps coordinate left finger agility, probably a sixteenth note, dotted eighth pattern.

ETUDE: Student L worked the most on the spiccato string crossings but also focused on the awkward bowing that followed that section with quick slurs and separate bows over string crossings. He slowed this section down to correct it.

REPERTOIRE PRACTICE: Student L focused on pitches in the upper register when practicing the dotted eighth sixteenth note sections of the repertoire. He also attempted to improve the double stops and he slowed down to work on the awkward coordination between the bowing of eighth notes and two sixteenths.

7. How was intonation practiced?

SCALE: Basically with repetition only.

ETUDE: Slowly but it was not always corrected.

REPERTOIRE PRACTICE: Mostly through repetition, as he played the notes in the upper register more than once. He did slow tempo down in two excerpts for pitch.

8. How was rhythm practiced?

SCALE: He incorporated a rhythmic variation that was similar to a sixteenth, dotted eighth note, a “short-long” feel that helps develop better coordination and left finger agility.

ETUDE: Yes, he slowed down two sections it seemed because he was having trouble coordinating the rhythm, the bowing, and the left hand.

REPERTOIRE EXCERPTS: He repeated passages and slowed down one passage in the first repertoire excerpt practice session.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

They were not.

11. How were difficult slurred passages practiced?

SCALE: He slurred two eighths together in the second version of his scale practice.

ETUDE: There was one passage that was a difficult combination of slurs and separate bows over string crossings and he slowed the tempo down to work on this. He also repeated it three times.

REPERTOIRE PRACTICE: He repeated the hooked dotted eighth sixteenth note passages in the first piece, but did not work on the hooked articulation.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: Yes, he played through the scale three times trying to remember his fingering. He had trouble playing the last four notes correctly, but played the scale three complete times as he tried to remember the fingering. Then he went back, isolated and practiced the fingering for those four notes.

ETUDE: No, he practiced everything as he played through the etude initially.

REPERTOIRE EXCERPTS: Yes, he went back over the eighth note, two sixteenth note passages slowly after playing through the excerpt in large parts, and then he played through it as a whole.

13. Did the student write anything in the music during the practice session?

No

14. Did the Student Lo any kind of singing, counting out loud, or non-instrument practice?

SCALE: Student L stopped and seemed to be thinking about his fingerings or the music several times in his practice. He even spoke out loud about the fact that he could not remember the exact fingering.

ETUDE: NO

REPERTOIRE PRACTICE: Yes, he did make one comment to himself and adjusted his music stand before going on to the second excerpt.

15. OPEN COMMENT: Student L did not seem extremely motivated or completely engaged; he almost seemed disinterested. However, he was very relaxed as he practiced. He also was not always sure of fingerings or correct pitches, but he continued trying and attempting to improve.

STUDENT M

(Self-efficacy score of 161)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student M started at the beginning of the scale, played two notes per bow, four per bow, eight per bow, twelve per bow and sixteen; then she varied the rhythm. She did not stop until she attempted to vary the rhythm. She had to repeat the first three notes, regrouping the slur of the first three notes in the rhythmic variation.

ETUDE: Student M started at the beginning of the etude excerpt, made two stops and quickly repeated a few notes to correct before going on and finishing her first run through of it.

REPERTOIRE EXCERPTS: Student M started at the beginning of all four excerpts she chose for both repertoire excerpt practice sessions, but did not play straight through them. She stopped and fixed problems and repeated motives, notes and measures as she played through them.

2. Were any attempts made at corrections?

SCALE: She made no attempts at correction until she played the rhythmic variation (dotted eighth sixteenth notes slurred together). During this variation she stopped twice and corrected notes. After this she played fast separate notes and corrected the first four notes of the first octave. After this she went back to two notes per bow, adding more vibrato, and making sure that the vibrato was continuous from note to note. During this version of the scale, she went back once to the top of the scale to correct the top three notes, focusing on intonation and the first shift down the scale. In her last version of the scale she played eight

notes to a bow in a repeated eighth note, two sixteenths rhythmic pattern and she stopped to correct the top portion of the scale again.

ETUDE: Student M made many quick stops and repetitions to regroup and correct as she played both the entire etude excerpt and portions of the etude excerpt over and over again.

REPERTOIRE EXCERPTS: Yes, Student M stopped and fixed notes immediately after starting each excerpt, correcting the double stops (notes played simultaneously over two strings) in the first excerpt and repeating the dotted eighth sixteenth note passages that were hooked (bowed two and two but not legato). She also repeated the very fast double notes in the third excerpt she was practicing in the second session. She did not slow down, but kept repeating this fast passage, playing it five times through at tempo.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: She played the scale several different ways: two notes per bow, four, eight, twelve, sixteen, separate quickly, slowly with vibrato (two slow eighth notes per bow), and two repeated rhythmic variations (dotted eighth, sixteenth and an eighth with two sixteenths).

ETUDE: No, she played the etude at basically the same quick, almost performance tempo throughout.

REPERTOIRE EXCERPTS: She played the excerpts mostly in performance tempo, but repeated parts of them and all of them several times.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: Yes, the top three notes of the third octave. She had trouble with this portion of the scale more than once and practiced it three times.

ETUDE: Yes, Student M stopped many times to correct and repeat small sections, notes, or motives, such as the difficult shift after the first note, the grace notes in the second measure and measure eleven, the bowing in measure five, the passages with two slurred notes and string crossings every two notes, and the articulation in the separate spiccato bowing that is slurred two, separate two.

REPERTOIRE PRACTICE: Yes, Student M repeated single notes, double stopped notes, motives, or single measures, all still in tempo to correct problems before continuing. She also focused on the double notes in the second repertoire excerpt practice session and repeated this passage five times, and then went back and played it two more times. She also worked on the slower melodic passage in the second excerpt of the second piece by repeating it three times, focusing on tone and volume, so she repeated one measure where she was having trouble pulling the sound with a full bow in a fortissimo without crunching the sound.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: The scale itself was practiced several times.

ETUDE: Yes, the second half of the etude excerpt is mostly fast sixteenth notes and though the bowing and articulation change, she practiced this whole section together three times at least.

REPERTOIRE PRACTICE: Yes, Student M worked on several large sections. She usually repeated large sections or the entire excerpt. For example, she repeated the double stop sections of the first two excerpts from the first piece several times, focusing on the angle of the bow, etc. Then she repeated the eighth note sixteenth passage from the second excerpt of this piece. She also worked on the slower melodic passage from the second piece and worked on getting a better tone as well as pitch. She then practiced the fast repeated notes from this excerpt and played it through by section several times, then played the excerpt as a whole.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: Vibrato was practiced with a slower version of the scale, making sure the vibrato was connected between each note; fast notes were practiced slurred and with separate bows; and bowing was practiced with different versions of the number of notes per bow and different rhythms.

ETUDE: For the left hand she focused on the grace notes in two of the measures. For left hand and right hand coordination, she focused on the awkward bowing and left hand issues where the bowing was either separate, slurred two separate two, or slurred two repeated, all with different types of string crossings. For example, for the separate bowed sixteenths and one of the slurred two, separate two bowed articulations, each note is on a different string.

REPERTOIRE PRACTICE: Student M practiced the double stops by repeating them and focusing on the angle of the bow. She repeated the dotted eighth sixteenth note pattern several times correcting pitches and articulation. She worked on tone and intonation and bow control for the slower melodic passage in the second piece.

7. How was intonation practiced?

SCALE: By repeating the notes and slowing down the bow.

ETUDE: Basically by repetition. She did not seem to focus on that as much as left and right hand coordination.

REPERTOIRE PRACTICE: She repeated the double stops more than once and adjusted the angle of her bow, which affects intonation in double stop passages. She also repeated the dotted eighth note passage that goes up into the higher register to make sure intonation was accurate. Student M also worked on intonation in the slower melodic passage of the second piece's first excerpt, where she had trouble pulling a good sound with fortissimo and in tune. She changed the angle of her bow and right arm, and adjusted the distance from her bridge, then tried three more times and adjusted it.

8. How was rhythm practiced?

SCALE: By varying the rhythm with and without slurs.

ETUDE: Mostly through repetition.

REPERTOIRE PRACTICE: By repetition.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

ETUDE: They were played through and incorporated in the etude. She did practice and seem to try and focus on the contrasts between pianos and fortes.

REPERTOIRE EXCERPTS: Student M seemed well aware of the dynamics and attempted to exaggerate them as much as possible. In the excerpt of the second piece, she was having trouble controlling her bow while trying to play fortissimo and she repeated this and tried three times, adjusting her bow angle, right arm, and distance from her bridge.

11. How were difficult slurred passages practiced?

SCALE: Different slurred versions of the scale were practiced (see answer to question three).

ETUDE: Mostly through repetition as she played through the etude excerpt in either portions of the etude excerpt or as a whole.

REPERTOIRE PRACTICE: Mostly through repetition.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: Not necessarily. She only had trouble with the top portion of the top octave during certain versions of the scale and after she had practiced it more than once without problems.

ETUDE: To some extent. She stopped and quickly went back to repeat three different things before getting all the way through the etude excerpt the first time. Once she did get through the etude excerpt she went back and played it in sections, repeating certain areas that needed attention.

REPERTOIRE EXCERPT: Student M practiced certain motives or repeated certain notes while playing through the excerpts. She did not play through without stopping first. She seemed to just fix problems as she went, making adjustments quickly as she played everything in tempo.

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

No

15. OPEN COMMENT: Student M did a great deal of stopping and repeating, all in the same continuous concentrated tempo. It seemed as though she was playing, stopping, thinking, correcting, and trying again, giving herself more opportunities to try and to repeat (Duke and Henninger, 2002).

STUDENT N

(Self-efficacy score of 155)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student N started at the beginning of the scale, played all three octaves in separate quarter notes at a moderate tempo. Then she slurred four and continued to vary from there.

ETUDE: She started at the beginning of the etude excerpt, but immediately stopped to correct a spot, and worked on three areas by repeating each section and slowing things down before continuing.

REPERTOIRE EXCERPTS: Student N started at the beginning of the first excerpt in a moderate tempo, played half of it, then repeated the first half again slightly slower and more deliberately before continuing. In the second piece she started at the beginning of an excerpt, attempting to play it at tempo. She stopped and repeated sections and worked on things within this run through.

2. Were any attempts made at corrections?

SCALE: Yes, in her version of the scale that slurred each octave together, playing one eighth note then six sixteenth notes, she corrected the pitches and repeated this version. She also worked on correcting intonation in the arpeggio. In another version of the scale she changed the fingering by shifting on the "G" string rather than the "A" string. In this version, she practiced the shift three times, and worked on smoothing out the shift, as well as improving the intonation.

ETUDE: Yes, she immediately stopped and worked a difficult section involving awkward string crossings in both the left and right hand, which ultimately resulted in awkward coordination issues between the two hands. Then she worked on the very next section of difficult octaves, practicing it note for note in separate bows, then in double stops (two notes played simultaneously on two strings).

REPERTOIRE EXCERPTS: Yes, Student N played through the first half of the first excerpt and then started over, repeating the first half again slightly slower before going on to finish the excerpt. When she came to the section in the second half of the excerpt that was in a much higher register, she slowed the tempo to practice the pitches note for note, repeated the high notes three times slowly, then went back one measure and repeated this section two more times

before continuing. She approached the notes in the high register this way each time and once by playing a scale to help find the notes. In the second piece and practice session, she stopped and worked on the coordination between the slurred notes and the left hand, repeating this section of the excerpt five times, and then she went to the next section and played the double sixteenth notes almost at tempo. When she struggled in one place, she repeated the motive and kept going. The next section was an awkward slurred passage that she also repeated and slowed down to a practice tempo. But she kept going back to the double sixteenths to repeat the whole section, not just the slurred section until the fourth time.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: Yes, Student N began the scale at a moderate tempo playing quarter notes separately, then slurred four to a bow, and then she slurred each octave together, playing each version faster. After that she varied the rhythm and fingerings.

ETUDE: She began the etude at a moderately slow tempo, slowed down to a note for note practice tempo when she worked on sections, then went back and attempted to play through it again slightly faster than the first tempo.

REPERTOIRE EXCERPTS: Yes, when she went back to repeat the first half of the first excerpt again. This time she played it slightly slower and then when she isolated the notes in the upper register she slowed down playing note by note to practice and review the pitches, then she played that section once in another slow tempo. She also slowed down a passage that slurred four notes at a time after playing fast double sixteenth notes separately.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: Yes, she repeated a section of the scale in the version where she was slurring each octave together, she repeated a part of the arpeggio, and she worked on a shift when she changed her fingering.

ETUDE: Yes, she worked on several places like this. The first big shift and notes played in the high register were approached three or four times slowly, then she went back and put them into context in a quicker tempo until it was corrected. She also took the measure with difficult octaves and practiced it slowly, once note for note, then in double stops (two notes played simultaneously on two different strings). She went back more than once to this section, making sure it was in tune.

REPERTOIRE PRACTICE: Yes, she isolated and practiced the measures containing notes in the upper register in two separate sections of the etude. She missed two notes in another section later in the excerpt that she repeated and corrected as well. She repeated the slurred two section five times, slowing down slightly, the double sixteenth note section several times and included the slurred four note section that later was isolated by itself and slowed to an appropriate

practice tempo. However, she turned the page and went on to another excerpt in this piece before the slurred four passage was ready. Next she played another slurred two section slowly, focusing on the string crossing and left and right hand coordination.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: The entire scale was repeated, but yes, Student N worked on a variation that slurred each octave into one bow (one eighth, then six sixteenths). She carefully played this version of the scale three different times, first very slowly and then more confidently by the third time.

ETUDE: Yes, in general she seemed to want to practice sections as she played through the etude, slowing down in spots to work on things, and then continuing on in the etude. Sometimes she would go back to the beginning of a section, but usually she wanted to continue.

REPERTOIRE PRACTICE: Yes, she repeated the first half of the excerpt and practiced the last half of it as well as a large section, repeating that section as a whole after reviewing all the notes in the upper register and two other notes that were a problem. She stopped and practiced three larger sections in the second excerpt she was practicing.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: She practiced a shift on the "G" string after changing the fingering and tried it three times, working on smoothing out the shift and fixing the intonation. She also isolated fingerings on each string and played the finger pattern within the key of the scale on each string.

ETUDE: She isolated one shift and practiced it slowly, repeating in three times before continuing. She also practiced the octaves, playing them separately then in double stops slowly until they were in tune.

REPERTOIRE PRACTICE: She did practice the difficult dotted eighth sixteenth passage through repetition of the excerpt, but the real focused practice was on the notes in the upper register. In the second piece and repertoire excerpt session, she slowed down and isolated a difficult note passage, slowing it down and repeating it.

7. How was intonation practiced?

SCALE: By slowing the tempo down, isolating a shift, and practicing finger patterns on each string. She also isolated each octave towards the end of her practice and certain pitches within each octave.

ETUDE: Slowly (see answer to question six).

REPERTOIRE PRACTICE: Student N used a scale in one instance to help her find the notes in the upper register that she was practicing. She also slowed

down and isolated or repeated all the pitches that she was having trouble playing in tune.

8. How was rhythm practiced?

SCALE: Student N played the scale initially in moderate quarter notes, then slurred four faster notes together. After that she changed the rhythm to make it an eighth followed by six sixteenths.

ETUDE: She did not seem to be focusing on rhythm as much as pitch.

REPERTOIRE PRACTICE: Mostly through repetition of the excerpts. Her main focus seemed to be notes and intonation.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

They were not.

11. How were difficult slurred passages practiced?

SCALE: She slurred in several notes to a bow (see answers to questions six or eight).

ETUDE: Rather than difficult slurred passages, there was an awkward passage for left and right hand coordination with complicated string crossings. For this section she slowed down, took her time and repeated the section.

REPERTOIRE PRACTICE: Slowing the tempo down. In the first excerpt she was working on, she slowed the tempo down and spent a great deal of time finding notes through the scale and practicing the string crossings without the slurs.

Then she went back and slowly added the slurs and exaggerated the string crossings. In the second excerpt, still in the first piece and first repertoire excerpt practice session, she slowed the section of legato slurs down to a very slow practice tempo and isolated the difficult string crossings by playing them slowly with the slurs, then speeding it up. In the second piece and practice session the excerpt began with fast string crossings, slurring two notes over string crossings. She realized that though she could play all the notes, she was not able to keep the tempo fast and steady, so she slowed it down, focused on her right arm, and gradually sped up the tempo. She repeated this section five times before continuing.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: Yes, when she was practicing the arpeggio, she played it once, and then went back over it three times adjusting intonation and correcting a pitch. She also

played the scale for the last time focusing on intonation in each octave, isolating each octave and certain pitches in each octave.

ETUDE: No. She began working on a difficult section immediately as she attempted to play through the etude excerpt.

REPERTOIRE EXCERPTS: Not necessarily. She did more stopping and starting as she practiced and attempted to play through the excerpt.

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

No

15. OPEN COMMENT: Student N seemed to use several practice strategies that might indicate an awareness of how to practice or that her private teacher has carefully showed her what steps to take to practice. She also seemed well aware of pitch. She usually attempted to correct intonation problems and any wrong pitch issues. Student N sat down for part of her practice sessions.

STUDENT O

(Self-efficacy score of 154)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student O started at the beginning of the scale, varying the tempo and rhythm and number of notes per bow.

ETUDE: He started at the beginning in a slow and moderate tempo, stopping to improve a spot within the third measure.

REPERTOIRE EXCERPTS: He started at the first difficult spot in the first excerpt with the metronome, stopping after one measure to adjust the metronome's beat subdivision. He played more than two excerpts: one in the first five minutes and sections from two in the second five minutes.

2. Were any attempts made at corrections?

SCALE: Student O checked and adjusted the top note in the first play through of the scale, and in the different rhythm variations of the scale, the incorrect pitches were corrected at the top both times. However, some intonation problems were not always corrected. Though he did immediately stop in the beginning to fix a string crossing issue.

ETUDE: Yes, he immediately stopped to fix a difficult shift and then sped up the tempo and metronome.

REPERTOIRE EXCERPTS:

He began to isolate and practice two measures right away.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: Student O changed tempo each time he played through the scale. After playing three octaves in a slow speed with two notes per bow, he sped up the tempo and played four notes per bow or slur, then used a varied rhythm, and then kept playing it faster, playing the scale about 12 times in total, though not each time was complete.

ETUDE: He started slow and at a moderate tempo with the metronome and then after one correction in the third measure, he upped the metronome tempo.

REPERTOIRE EXCERPTS: He started slower and immediately sped up the metronome four times for the first two measures, varying the rhythm and bowing to practice those measures, and using repeated notes.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: Yes, esp. in one of the varied rhythm versions of the scale. He fixed the top of the scale where he played incorrect pitches; he also repeated the top half of the top octave for pitch. In the beginning he repeated the fifth and sixth notes to correct a string crossing issue within a slur.

ETUDE: Yes, he repeated three different measures several times: one to fix a shift and intonation, one to work on articulation, and one to work on fast repeated notes.

REPERTOIRE EXCERPTS: Yes, he immediately chose to practice the two measures slower, then faster with different rhythms and playing it with double notes.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: The scale as a whole was repeated and he also repeated the bottom two octaves several times in a quick tempo with a short spiccato articulation.

ETUDE: Yes, one spot in the etude that was more than a measure had a difficult run within it and he repeated this spot, slowing down once, playing it with double notes once, and then playing through it again.

REPERTOIRE EXCERPTS: The section that he worked on with a tuner for intonation was a larger section of an excerpt.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: Student O worked on slurring two, four, and more than four notes to a bow. His attempt at eight notes to a bow was never completed or accurate. He

immediately stopped in the beginning of his scale practice to improve a string crossing issue from a fingered note to an open string within a slur.

ETUDE: A difficult shift in the third measure was practiced by repeating it, and then the tempo was adjusted to a faster tempo.

REPERTOIRE EXCERPTS: It was difficult to tell, but in the lyrical section he seemed to be aware of shifting and in the faster passages he did work on slurs and coordination between fast notes and bow changes.

7. How was intonation practiced?

SCALE: It was not always addressed, but it was practiced at least four times by repeating the notes slightly slowly.

ETUDE: Tempo was slowed down and notes were repeated.

REPERTOIRE EXCERPTS: Yes, he used a tuner to play the repeated peak note in a lyrical passage that he was having trouble reaching in position. He played it through with the tuner sounding that note, and repeated the passage four different times. Then he played through it without the tuner.

8. How was rhythm practiced?

SCALE: He played through the scale with two varied rhythms slurring the rhythms into one bow for four notes.

ETUDE: Certain passages were slowed down and repeated.

9. Was a metronome used? If so, how?

SCALE: Yes, he played with it through the entire scale practice as he increased the tempo of the scale, starting with a quarter note, equal to 60 beats per minute.

ETUDE: Yes, he used it throughout, starting at a moderately slow tempo, then immediately deciding to take it a little faster, though still under performance tempo. He had the metronome set to click a strong beat on the down beat of each measure and then weaker beats for the rest of the measure. He turned it off on occasion to work on certain passages. In one section, he repeated each note four times fast and took out the slur playing with the metronome.

REPERTOIRE EXCERPTS: Yes, he started at a moderate tempo and immediately began to speed up the first two measures, varying the rhythm and bowing for practice.

10. How were dynamics practiced?

They were not.

11. How were difficult slurred passages practiced?

SCALE: He slurred two notes per bow for the three octaves, then four, and then varied rhythms with four notes per bow. He also played several notes per bow in

a quick straight rhythm (eight notes per bow and more, but not a consistent number).

ETUDE: Yes, he stopped to work on a passage with awkward slurs and difficult left hand coordination by turning off the metronome, playing fast repeated notes without any slurs and repeating this exercise several times, then varying the rhythm as well.

REPERTOIRE EXCERPTS: taking the slurs out and doubling notes.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: In the rhythm variation, the top half of the third octave was isolated and repeated.

ETUDE: No

REPERTOIRE EXCERPTS: No

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

SCALE: No

ETUDE: No

REPERTOIRE EXCERPTS: Yes, he tapped on his cello with the metronome while looking at the music. He also adjusted his in-pin and his position, sitting up taller, which changes the bow placement on the string for a cellist.

15. OPEN COMMENT:

SCALE: Student O practiced the scale at least 12 times, varying the tempo, rhythm, number of notes per bow, and articulation. He had one moment of playing through the scale several times with quick tempi, using different bow articulations, varying slurred and separate bows, and varying the rhythm slightly, just to play through the scale a little out of control. Then as he calmed down to approach it with ease again, the five minute timer went off.

ETUDE: Student O seemed to use a repeated note method of practice the most, whether it was with separate bows or with slurs.

REPERTOIRE EXCERPTS: He used a metronome for most of his practice; all but a lyrical excerpt. Sometimes he went slower after going faster rather than always speeding up, esp. if he had trouble staying exactly with the metronome in one try. As he played through another excerpt at the end of his practice, he repeated things, stopping to fix things immediately. In these short practice segments he did not play all the way through anything.

STUDENT P

(Self-efficacy score of 153)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student P started slowly at the beginning of the scale, playing quarter notes with half notes on each tonic. Then she sped up, slurring faster notes into one bow.

ETUDE: She started at the beginning and did one run through of the etude excerpt before going back to practice anything.

REPERTOIRE EXCERPTS: Student P started at the beginning of the first excerpt but with a unique practice variation; playing slowly, with separate bows all sixteenth notes instead of the dotted eighth single sixteenth as it is written. Then she played it as written in tempo until she arrived at the notes in the upper register where she slowed down again. During the second piece and repertoire excerpt practice session, Student P started at the beginning of the excerpt and varied the tempo as she went, depending on what she wanted to practice. She started slow and deliberate then sped up. She repeated one small section from the beginning, a section where the notes are slurred by two over string crossings before going into fast repeated sixteenths.

2. Were any attempts made at corrections?

SCALE: No, she kept going in her routine. The only scale she repeated was the very quick one with three octaves up in one bow and down the scale in another bow.

ETUDE: Yes, after one run through of the entire All-Region etude excerpt, she went back to the first section that was difficult for her and worked on intonation, especially the octaves.

REPERTOIRE EXCERPTS: Yes, she proactively worked on the rhythm and articulation for the dotted eighth sixteenth note section, and then she stopped and played note by note in the upper register. Next she played the next section slowly as well, working on the alternation between the four notes to a bow in the upper positions with string crossings alternating with fast double sixteenth notes. Yes, she adjusted tempo to correct and fix problems. She repeated the section where every two sixteenth notes are slurred over string crossings and the next measure contains repeated double sixteenths. The alternation between these two bowing types is difficult and so she played this passage slower and more deliberately.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: The first time Student P played the three octave scale, she took a moderate tempo in separate bow quarter notes, with half notes at all the tonic pitches. Then she sped up the tempo, slurring four notes, six, eight, twelve, and finally playing the entire three octave scale very quickly in two bows. She played

it three more times after that, once in moderately slow and in separate quarter notes, and then she played the scale in two different variations.

ETUDE: Student P's initial run through of the etude excerpt was not in a perfectly steady tempo, but when she went back to work on three different sections she slowed the tempo down drastically to a note for note practice tempo. She took the third section and played through it three times, gradually speeding up the tempo, and then she tried the sections she worked on slightly faster and played it through to the end. She sped through the section she could play very quickly before she came to the end and the timer went off.

REPERTOIRE ETUDES: She started at a slower practice tempo playing four sixteenths per beat rather than a dotted eighth sixteenth pattern. Once she went over this section in tempo and in context, she slowed down to a very slow note for note practice tempo in the upper register, and though she attempted to play through these passages more than once at a moderate tempo, the upper registers always slowed her down. She also slowed down to work on the passage that alternated between slurring four notes and four notes with fast double sixteenth notes. In the second piece and repertoire practice session it was a similar passage where sixteenths were slurred by two for a measure and then doubled and separate for a measure. Student P slowed down to work on this passage and the alternation between the slurs and the separate notes.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: No

ETUDE: Yes, after her initial run through of the etude excerpt, she went back and worked on three different sections. The sections happened to be one after the other in the music, and so she worked on each one playing the first slowly, focusing on coordination between left and right hand (string crossings and fingerings), then she practiced the octaves of the second section diligently as double stops (two strings together simultaneously) and very slowly at least three times, then she worked on the final smaller section by playing through it slowly once and then gradually speeding it up.

REPERTOIRE PRACTICE: Yes, she took the small section in the upper register and in the upper positions and isolated them and practiced them. In the second piece and repertoire excerpt practice session the beginning was isolated and first measure practiced, then the first two and then the first phrase. She worked on the sixteenth notes slurred by two in the first measure, then the double sixteenths in the second measure and then the alternation between the two.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: The entire scale was repeated ten different times.

ETUDE: Yes, after the initial run through of the etude excerpt, she went back and worked on one large section that contained three smaller ideas within it. She

worked on each one independently, and then she played them all together slightly faster through to the end. As she played to the end, she sped up one section to get through it, but slowed one section down to practice it before finishing.

REPERTOIRE PRACTICE: Yes, she practiced the opening section of the first excerpt with separate bows in straight sixteenth notes rather than hooked (two notes played in the same direction but not slurred or legato) dotted eighth sixteenth notes as written. In the second piece and repertoire excerpt practice session, Student P worked on the first large section of the excerpt after isolating single measures by repeating this first section. She also slowed down and worked on a similar section later in this piece where four eighth notes were slurred together for a measure then sixteenths played separately. She played this section more than once gradually speeding up the tempo.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: She repeated the scale several times starting moderately slow with one note per bow, then slurring groups of four, six, eight, and twelve notes per bow, and then playing the entire three octaves in two bows. Next she practiced left hand agility by playing one pitch to the next in a rhythmic, trill-like variation. It seemed to be made up of four quick eighths then four sixteenths and two eighths, all slurred between two notes of the scale before moving on to the next two notes of the scale; between notes "G" and "A", then "A" and "B," etc.

ETUDE: After the initial run through of the etude excerpt, she went back to a difficult section of left and right hand coordination and played it slowly (see answer to question four), and then she practiced the difficult octaves as well as two other left hand coordination sections.

REPERTOIRE PRACTICE: The dotted eighth note pattern was practiced first (see answer to question two) and the notes in the upper register were focused on for intonation. Student P slowed down to practice slurred passages in the second repertoire excerpt session, slurred two and slurred four notes. She also focused on pitches in the upper register and the coordination between left and right hand with awkward string crossings by slowing down.

7. How was intonation practiced?

SCALE: She focused on two shifts that were affecting her intonation in the scale.

ETUDE: She worked on the octaves first by playing them as double stops (two strings together to check intonation).

REPERTOIRE PRACTICE: Student P slowed down to work on the upper register notes. She slowed down the tempo and repeated passages.

8. How was rhythm practiced?

SCALE: Student P started her scale slow with quarter notes then slurred she four, six, eight, and twelve notes per bow in a very rhythmic fashion, playing what seemed to be eighths, sixteenths, and triplets in 12/4 time. Then she played what felt like thirty-second notes to have the whole scale in two bows. However, she did not turn on a metronome. She also did a very rhythmic variation for finger agility toward the end of her scale practice. It seemed to be made up of four quick eighths then four sixteenths and two eighths, all slurred between two notes of the scale before moving on to the next two notes of the scale.

ETUDE: She played through the entire etude excerpt at different tempi depending on what she felt she needed to improve, so it was difficult to determine, but she seemed focused on rhythm as well as left hand, right hand coordination in her isolated practice of the section after the double stops.

REPERTOIRE PRACTICE: For the first excerpt Student P played all sixteenth notes instead of the dotted eighth sixteenth pattern that is written in the part, practicing the accuracy of the placement of the single sixteenth note. She also slowed down and repeated patterns and passages.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

ETUDE: Student P played the dynamics in her initial run through of the etude excerpt.

REPERTOIRE EXCERPTS: She also incorporated them when practicing the excerpts or running through the excerpts a final time.

11. How were difficult slurred passages practiced?

SCALE: She slurred in several notes to a bow (see answers to questions six or eight).

ETUDE: Was not necessary. It was more related to difficult string crossings and she did so by slowing down the tempo and repeating the difficult string crossing passages more than once.

REPERTOIRE PRACTICE: She slowed down and practiced diligently, paying attention to string crossings and her right arm.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: NO.

ETUDE: Yes, she played once through the entire etude excerpt, not completely in the same tempo, but all the way through, and then went back to the first section that gave her trouble and worked on three sections.

REPERTOIRE EXCERPTS: Not necessarily. She did more stopping and working as she attempted to play through the excerpts.

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

SCALE and REPERTOIRE PRACTICE: No

ETUDE: She did pause once for about 15 seconds and look at the music before going on to practice the next isolated section, possibly studying what to focus on next.

15. OPEN COMMENT: Student P seemed to use several practice strategies that might indicate an awareness of how to practice or that her private teacher has carefully showed her what steps to take to practice. However, she did not always correct intonation problems, tone quality issues, or tempo issues. She did note play through in one steady tempo.

STUDENT Q

(Self-efficacy score of 153)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student Q began by playing the scale in separate quarter notes.

ETUDE: She started at the beginning of the etude excerpt but immediately began repeating notes, motives, and measures to correct. She also adjusted tempo and checked pitches with open strings as well as other fingers to create tuning octaves or intervals.

REPERTOIRE EXCERPTS: Student Q started at the beginning of her first chosen excerpt playing it slow and deliberately. She attempted to play through the entire excerpt, but stopped just before a more difficult section in a higher register and slowed down the tempo, stopped and played through the next section that was similar to the beginning, then stopped and played the next difficult double note section even slower, almost note for note, still playing it with the double/repeated note rhythm as it was written.

2. Were any attempts made at corrections?

SCALE: She immediately checked the notes where the different positions were and where the shifts were by playing each tonic pitch with the open "G." Then she worked on the top octave scale and tuned the top note.

ETUDE: Yes, she immediately was making adjustments and corrections: starting at a slow practice tempo, matching pitches to open string and other notes to

create octaves or practice intervals, slowing down even more for string crossings and left hand/right hand coordination issues.

REPERTOIRE EXCERPTS: Yes, during the first excerpt, she stopped twice to slow down and play the notes in the upper register more deliberately, and adjusted the pitch on several notes to correct intonation.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: First she played the scale in quarter notes, worked on intonation, then played four notes per bow faster than the separate quarter notes. She did not make it all the way up this version of the scale before starting over. She played several other version of the scale after this, two in the same tempo varying the rhythm only, and then two that were faster.

ETUDE: She began slow, but slowed down even more immediately to isolate and practice motives and certain articulations and ideas as she played through. She would adjust tempo as she played through depending on what needed the most work or adjustment.

REPERTOIRE EXCERPTS: See the answer to the first question for the first excerpt.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: Yes, she repeated the top portion of the top octave to correct.

ETUDE: Yes, she repeated notes and small motives immediately during her first run through attempt, making adjustments right away to correct.

REPERTOIRE PRACTICE: Yes, she deliberately slowed down in two separate measures to practice them more carefully. She also isolated some upper register pitches and adjusted them.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: The entire scale was repeated eight different times and the top octave itself more than once as an isolated section, as well as smaller portions of it.

ETUDE: Yes, as she attempted to play through the etude excerpt, immediately stopping to make adjustments, twice her adjustment practice was for two larger sections, more than just a motive or measure to correct. She did this once by going back to the beginning to play the first half of the first phrase again and the second time by going back over the last few measures again.

REPERTOIRE PRACTICE: Yes, she focused on the sections that had the dotted eighth, sixteenth note rhythm as she played through the etude.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: She worked on the notes in the upper register as well as the notes where she would be shifting. She also practiced the scale with different bowings and articulations, playing it slower and faster with different rhythms: separate quarters, four notes slurred together faster than the quarters, two rhythmic variations, faster separate notes, and then the arpeggio.

ETUDE: She focused on intonation a great deal by checking certain pitches with other pitches. As she practiced in this manner she also isolated and worked on certain shifts. She practiced bowing with repetition.

REPERTOIRE PRACTICE: Student Q worked on the bowing by isolating the bowing and rhythm without the left hand on open strings only, and she practiced difficult notes in the upper register.

7. How was intonation practiced?

SCALE: Student Q played all the tonic notes of the three octaves with the open strings and with each of the other tonic notes (note "G") as well as by repetition.

ETUDE: She often checked pitches with either open strings or other close pitches in easy to adjust or Perfect intervals. She slowed down as well and use repetition.

REPERTOIRE PRACTICE: Slowing down the tempo and isolating certain pitches, comparing those pitches to other more confident notes, or just playing them in slow long tones and adjusting them.

8. How was rhythm practiced?

SCALE: By using two different rhythmic variations and several different bowing options: first separate bows with straight quarters, then slurring four eighths, and then a dotted eighth rhythm with a hooked bowing (playing two notes in the same direction but with a slight articulation between them rather than legato or completely slurred together) as well as separate in a slower tempo.

ETUDE: She slowed down at certain passages and used repetition.

REPERTOIRE PRACTICE: Student Q slowed down, counted to herself while nodding/bouncing gently in rhythm and looking at the music. She also isolated the rhythm and bowing and practiced both without the left hand, using open strings only. She also took the slur out twice to practice the rhythm in separate bows rather than slurred (see also answer to question six).

9. Was a metronome used? If so, how?

REPERTOIRE EXCERPTS: No, but she did use her watch for the last third of her practice session and watched the second hand while counting to herself, then while playing with it.

10. How were dynamics practiced?

They were not.

11. How were difficult slurred passages practiced?

SCALE: She slurred four notes per bow and then slurred the scale with different rhythmic variations, separate and slurred notes slower and faster.

ETUDE: She adjusted tempo as needed to practice certain sections.

REPERTOIRE PRACTICE: Slowly and by repeating them. She also practiced the rhythm without the slurs twice.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: Yes, she played the tonic pitches all with the open "G" string after an initial run through of the scale. She also repeated the top portion of the top, third octave of the scale after an initial run through.

ETUDE: No. She began working correcting notes, certain motives and small passages immediately, even before she completed the first measure.

REPERTOIRE EXCERPTS: No, she attempted to play through initially but did most of her practice while playing through.

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

SCALE: No

ETUDE: No

REPERTOIRE PRACTICE: Yes, she took off her watch, but never stopping her concentration. After she looked carefully at her watch, she looked back at the music, counted to herself and nodded/bounced gently in time, as she placed the watch on the stand and then looked at it again for timing.

15. OPEN COMMENT: Student Q did some unique practice techniques, such as using her watch for a metronome. She also varied her bowing quite a bit to learn the dotted eighth sixteenth passage.

STUDENT R

(Self-efficacy score of 148)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student R started at the beginning of the scale but immediately made corrections in the first octave. She also started with a variation, playing a quarter, eighth, eighth note in separate bows.

ETUDE: Student R started immediately by varying the rhythm, playing two slower notes, then four quicker ones rather than straight eighths as it is written. She did this for about six measures. As soon as she went into the higher, more difficult register, she went back to the beginning and played those measures again with straight eighth notes.

REPERTOIRE EXCERPTS: Student R started at the beginning of the first excerpt and stopped to work on upper register notes repeated in a quick sixteenth note motive after the first eighth measures. After this she skipped over a few difficult notes, and then worked on a section with difficult upper register notes, but quickly and without slowing down much. In the second repertoire excerpt practice session Student R started at the beginning of an excerpt, but stopped and started a great deal. She started at a very quick tempo and had to slow down immediately to be able to play all the notes correctly and coordinate the awkward bowing of slurring two by two over string crossings. Then when she got to the section with fast separate sixteenths in a difficult left hand pattern of some repeated notes and some scale notes, she was again too fast.

2. Were any attempts made at corrections?

SCALE: Yes, she immediately stopped and checked her left hand in the first octave, though she did not always correct intonation when necessary after that.

ETUDE: Yes, in her second attempt of playing through the etude excerpt, after the rhythmic variation she tried, she slowed down some at the higher and more difficult register and then played double stops (two notes simultaneously on two strings) for the octave passage. However, she did not complete the double stop exercise (she did not get through the entire octave section with double stops) until later, before going back to playing the octave section quickly with separate notes and separate bows.

REPERTOIRE EXCERPTS: Yes, she worked on notes in the upper register by slowing down and repeating those notes and playing those measures. For the last section, she also (see the end of the answer to question one) she tried to fix several places where she was having trouble.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: Student R began the scale at a moderate tempo, playing a quarter then two eighth notes all in separate bows. Then she slurred four to a bow in the same general tempo. She played one octave up the scale of the quarter, eighth, eighth note again before going on to a sixteenth, and then slurring eighth notes into a bow. She played a faster version in separate bows next, slowing down as she descended in the scale and was having trouble with left and right hand coordination. Then she went back to two notes per bow. After that she played an eighth, eighth quarter note version in a quicker tempo than the quarter, eighth, eighth version but still in separate bows.

ETUDE: She tended to play everything rather quickly, but did slow things down that she wanted to work on or correct. Nothing was a constant steady tempo. Some sections were played very fast.

REPERTOIRE EXCERPTS: Student R played through the first part of the first excerpt in tempo, stopped for the difficult notes in the upper register and did slow down eventually to work on accurate pitch and adjusting intonation. She also repeated two passages that were separate notes, starting slow and gradually speeding up. However, almost everything seemed faster than necessary at this practice stage. In the final section she was practicing, she was playing too fast (see the end of the answer to question one). She slowed down but not in a slow steady practice tempo. Her practice tempo was more of an unsteady tempo that seemed to be as fast as she could play the notes in any section, rather than slowing it down to a steady tempo throughout for practice.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: Yes, she played the first octave again immediately to check her intonation. After that only the entire scale was repeated in different variations.

ETUDE: Yes, initially she repeated the first third of the etude excerpt. First she played it in a rhythmic variation, then went back and played it straight. As she did she went on to the next section and worked on the octaves, playing double stops for a few of them, and then repeating the sections more than once as written. She also repeated the chromatic section that comes after the difficult octaves more than once and the whole last section of the etude excerpt.

REPERTOIRE PRACTICE: Yes, she repeated two small motives in the first excerpt where fast double notes were played in separate bows. She also worked on three places in the last excerpt she was practicing that were small motives in need of correction. For the first two she repeated it over and over again, not really slowing down much, but the third one she did finally slow down to where she could truly hear and adjust the pitch properly.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: The entire scale was repeated in several variations. She played separate bows a quarter, eighth, eighth, variation and turned it around. She played two notes per bow as well as three and eight notes per bow. She played the scale in thirds, playing the tonic, going up a third, then back to Re, up a third, etc. ("G" to "B" then "A" to "C"). She did this in fast separate bowed notes.

ETUDE: Yes, she repeated the whole last third of the etude excerpt three times, speeding up each time.

REPERTOIRE PRACTICE: Yes, she practiced the first part of the first two excerpts more than once. For the final repertoire excerpt practice session, she repeated large sections of the excerpts, focusing on sections as they changed by articulation.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: Left hand in the first octave, but after that initial correction she seemed to just be playing the scale over and over again in the different variations.

ETUDE: She practiced the octaves, playing a few in double stops then repeating that section as it was written. She did go directly back to this section and played almost all of the octaves in double stops after her last run through of the last section, just before the end of the etude practice session.

REPERTOIRE PRACTICE: Student R worked on double notes by repeating the awkward passages and she worked on the bowings by slowing down some and repeating different sections of the excerpts. She also worked on the awkward coordination between the left and right hands in the opening of the excerpt for the second practice session where notes were slurred by two over string crossings. She kept repeating this section several times. She also focused on notes in the upper register.

7. How was intonation practiced?

SCALE: She seemed to practice it only in the initial octave and start of this practice session. Once she began working on the different variations, she seemed to just play through them, making no specific corrections.

ETUDE: It seemed that when it was acknowledged that it needed correction it was done so by slightly slowing down tempo and repetition.

REPERTOIRE PRACTICE: She did slow down three different times to practice intonation, but in two other instances she just seemed to play with longer and louder bows, only distorting the tone.

8. How was rhythm practiced?

SCALE: She varied the rhythm in her different versions of the scale (see answer to question five).

ETUDE: Using rhythm as a way to vary practice and help with coordination.

REPERTOIRE PRACTICE: She slowed down some and repeated passages. She played the dotted eighth sixteenth note passages loud and confident and repeated them, but repetition was her only method to practicing this rhythm.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

They were not; everything was loud though.

11. How were difficult slurred passages practiced?

SCALE: She slurred in several notes to a bow (see answers to question five).

ETUDE: Rather than difficult slurred passages, there was an awkward passage for left and right hand coordination with complicated string crossings. For this section the passage was repeated.

REPERTOIRE PRACTICE: She did slow down some, and she repeated the section where the notes were slurred two by two over string crossings.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE and ETUDE: No

REPERTOIRE EXCERPTS: She worked on things as she played through the repertoire.

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

No

15. OPEN COMMENT: Student R seemed to get tired and though her scale variations continued to change and become more complicated, sometimes her concentration seemed to lessen and her intonation suffered toward the end of the scale practice session. She also seemed to always rush through things, playing things very fast and loud, and hurrying to finish or play it at tempo before she might have been ready to do so.

Lower Self-Efficacy Sub-Group (Students S through Z)

STUDENT S

(Self-efficacy score of 120)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student S started at the beginning of the scale playing slow quarter notes, holding a longer note (approximately a half note) at the second octave tonic. She played eighth notes in separate bows.

ETUDE: Student S started three measures into the etude excerpt at a moderate tempo, then took a new tempo twice as slow at the octaves and played them once with double stops (two notes played simultaneously on two separate strings) before going back and playing them separate again, all slowly.

REPERTOIRE EXCERPTS: Student S started the first excerpt very slowly, playing from the beginning in a note for note practice tempo, taking out any slurs or double eighth notes before playing through the excerpt as it was written. She worked on another excerpt within the first five minutes, starting at the beginning of the excerpt. For the second repertoire excerpt session, she also started at the beginning, but rather playing all the way through the excerpt first or starting with the isolated motives to practice, and then she divided it into three sections. She played each section, isolated a motive needing practice and worked on it before playing through the next section.

2. Were any attempts made at corrections?

SCALE: No, not at first despite playing several wrong notes and out of tune notes. She began to correct problems once she started slurring the notes together, but even then she did not correct all the mistakes.

ETUDE: Yes, Student S began to practice the octave section immediately, first with double stops, then separately and slowly, playing in groups of four notes with pauses in between. She also repeated one difficult motive slowly that was in the upper register to practice it.

REPERTOIRE EXCERPTS: She did practice slowly first before attempting to run through the first excerpt, but no corrections were actually made until she began practicing the second excerpt. She also worked on three areas in the second repertoire excerpt session.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: She played the scale slow with half notes on the tonic pitches and slow quarters. Next she played faster, separate eighth notes, and then she did a rhythmic variation, before slurring eight to a bow. She played very fast (what seemed like sixteenths) separate notes before going back to slow quarter notes again, and then played slow, long eighths, two bows per pitch.

ETUDE: She slowed down for the sections that she practiced as she played through the etude excerpt.

REPERTOIRE EXCERPTS: Student S started the first excerpt playing note for note very slowly before playing through the excerpt. Then she practiced the second excerpt at a moderate tempo, slowed down some isolated sections and went back and practiced the entire excerpt under tempo. She slowed down for each of the three sections she focused on in the second repertoire session as well.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: Only when practicing the scale in slurs did she attempt to make corrections and repeated a section of the scale with the second slurred group of eight notes.

ETUDE: She practiced one motive in the upper register by slowing down the tempo, repeating it, and adjusting the intonation.

REPERTOIRE EXCERPTS: Yes, in the first excerpt she began by isolating and practicing a motive, and in the second excerpt she started by attempting to play through the excerpt, but stopped to isolate and practice three different motives for different reasons. One was for pitch and left hand issues, another was for string crossings in combination with slurs, and another was for bowing and rhythm. During the second repertoire session, she broke the excerpt up into three large sections, played through the section fairly slowly and deliberately, went back over an isolated part of the section in an even slower note per note practice tempo. And each part practiced was only a small motive or part of a measure.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: Student S repeated the entire scale in different variations seven times.

ETUDE: Yes, this is how she practiced the etude excerpt. The octave section of the etude is two measures long, a larger section than one motive or measure.

REPERTOIRE EXCERPTS: The motive that Student S practiced for rhythm and bowing in the second excerpt was continued throughout a larger phrase that she played slowly as she practiced the motive. During the second repertoire session, she broke the excerpt up into three large sections, played through the section fairly slowly and deliberately, went back over an isolated part of the section in an even slower note for note practice tempo.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: By varying the approach to the scale she was incorporating different bowing techniques, such as slurring several notes to a bow, playing fast separate notes, and playing a rhythmic variation in separate bows. She did not focus on any one fingering or shift in her practice.

ETUDE: The octaves were practiced.

REPERTOIRE EXCERPTS: In the second excerpt she worked on the articulation and bowing of the dotted eighth note pattern as well as the awkward coordination between the left hand and separate bowings. (Also see the answer to question four). For the second repertoire practice session Student S worked on bowing, articulation and rhythm.

7. How was intonation practiced?

SCALE: only once did she attempt to make any correction, and though intonation was improved, it seemed the section was repeated and practiced for the bow coordination needed to slur several notes to a bow.

ETUDE: Student S practiced the intonation of the octave section by playing double stops and then slow notes in groups of four with pauses in between, then slowly as written.

REPERTOIRE EXCERPTS: She practiced intonation by practicing very slowly in the beginning of the first excerpt practice session (she worked on two excerpts in the session), and focused more on rhythm and bowing in the second excerpt practice session. She did not have as much trouble with intonation in the second session.

8. How was rhythm practiced?

SCALE: She used one rhythmic variation in her scale and she played quarters, half notes, and eighth notes and sixteenth notes.

ETUDE: Student S used a rhythmic variation to practice the octave section of the etude.

REPERTOIRE EXCERPTS: Student S worked on the rhythm in the second excerpt by taking the slurs or changing it to separate bows for the dotted eighth note rhythm. In the second practice session of repertoire excerpts, she slowed down to a practice tempo to work on adjusting between the different bowing articulations and rhythms.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

They were incorporated as she played through parts of the excerpts.

11. How were difficult slurred passages practiced?

SCALE: Yes, she did isolate and practice the slurred version of the scale that she used.

ETUDE: Slurs were not necessarily a focus.

REPERTOIRE EXCERPTS: She practiced these sections by taking out the slurs and playing them separately and slowly.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: Only for the slurred version that she did of the scale. She played eight notes per bow, played through it once, then went back and worked on the section that she had trouble slurring over the string crossings and changing her bow.

ETUDE: No, she practiced sections as she played through the etude.

REPERTOIRE EXCERPTS: When practicing the excerpts in the second repertoire excerpt session she ran through sections of the excerpt, went back to

isolated spots to practice them in each section before going on to the next section.

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

No

15. OPEN COMMENT: Student S did not make any efforts to correct wrong notes or intonation problems during her scale practice, but her intonation did improve through mere repetition. She focused on improving intonation in the octave section of the etude.

STUDENT T

(Self-efficacy score of 116)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student T started at the beginning of the scale, but stopped and paused after the first octave. When she had trouble with the second half of the second octave she started over again at the beginning of the first octave and then played it faster, slowing down at the trouble spots.

ETUDE: She started at the beginning of the etude excerpt very slowly, stopping twice within the first minute and going back to the beginning three times within the first two minutes.

REPERTOIRE EXCERPTS: Student T started at the beginning of the first excerpt, but caught herself immediately and verbally corrected herself and tried the first half of the first excerpt again before going on to the second half. For the second repertoire practice session, she began the excerpt very slow with pizzicato practice (the music was written to be bowed). She only played the first phrase before going back and bowing the entire excerpt very slowly, taking out the double notes (the excerpt was written as quarter notes with a slash to play two eighths note per pitch).

2. Were any attempts made at corrections?

SCALE: Yes, she corrected the pitches she was missing in the upper octave, but only after starting over. First she played the scale in half notes, stopped when she could not play the correct pitches in the second octave, and went back to the beginning of the scale and played quarter notes this time, slowing down at the second octave and correcting two of the pitches. However, not all of the problems were adjusted before she began a rhythmic and bowed variation of the

scale, and when she played a quarter, eighth, eighth note pattern, she played the scale correctly going up in this pattern, but played wrong notes and out of tune notes when coming down the scale in this pattern without any attempt at corrections.

ETUDE: Yes, Student T played three measures then stopped and started at the beginning again to correct a trouble section. She worked on the first phrase of the etude excerpt, repeating the opening motive three times, correcting the upper notes carefully by playing in a slow note for note tempo and using pizzicato to practice the fingering without the bowing. She did go on into the next section for a few measures, but then went back to the opening repeating the first motive and phrase again, but finally playing all the way through the first phrase just before the five minutes was up.

REPERTOIRE EXCERPTS: Yes, she had played the opening of the first excerpt, which was written as pizzicato, stopped and corrected herself verbally, then played it again repeating one measure before going on to the second half of the first excerpt. In the second half of the first excerpt, it changes to arco and she used the bow, but then practiced this section pizzicato to work on correcting pitches. She went back and forth like this between bowing the notes and playing them pizzicato for practice – they were not written to be played pizzicato in the second half of the first phrase. Once she played through the entire first excerpt without stopping, she played a second excerpt within the first five minute repertoire excerpt session, which was all pizzicato. She only had time to play through it and repeat two measures before time was up.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: She began the scale in what felt like moderate half notes, then played separate quarter notes, and then played a quarter, eighth, eighth note pattern. She played the scale correctly going up in this pattern, but played wrong notes and out of tunes when coming down the scale in this pattern. Next she slurred two eighth notes together. She did two more variations, one rhythmic and one slow in whole notes that she did not get to finish before the time was up.

ETUDE: She worked on the etude excerpt in generally the same slow tempo, playing some notes very slowly in a note for note practice tempo.

REPERTOIRE EXCERPTS: Student T's tempo was fairly steady through her first repertoire excerpt practice. It was a moderate practice tempo and she stayed rather steady in that tempo even while switching to pizzicato practice or changing to the second excerpt of the first repertoire excerpt practice session. In the second repertoire excerpt practice session, she started very slowly, took out the double notes (defined in question one) and bowed quarter notes only before going back and playing it as written and slightly faster.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: Student T did attempt to fix her incorrect pitches and her out of tune pitches in three different instances. One time she focused on the latter half of the second octave of the scale.

ETUDE: Yes, she did practice at least three small sections within the first phrase and one in the second phrase slowly, but the very first motive was repeated five different times in total.

REPERTOIRE EXCERPTS: Yes, there was a measure that she repeated in the first half of the first excerpt and then two motives in the second half. There was pattern with two sixteenths and then three eighth notes that she worked on and then a pattern with just an eighth note and two sixteenth notes. In the second repertoire excerpt session she repeated three different notes, but other repeated things were large sections.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: She did repeat the scale more than once, but not entirely. She stopped before completing the first two octaves and went back to the beginning.

ETUDE: Not exactly, but she did seem to be focused on the first phrase, attempting to go through it as she started it over more than once.

REPERTOIRE EXCERPTS: Yes, Student T played through the second half of the first excerpt more than once, which was three measures long, and she played through the entire second excerpt of the first five minute repertoire excerpt session twice. During the second repertoire excerpt session, she began by playing the first part of the excerpt pizzicato, then repeated that portion with the bow before going back and playing the entire excerpt.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: By varying the approach to the scale she was incorporating different bowing techniques, such as slurring two notes to a bow or playing two rhythmic variations in separate bows. She did not focus on any one fingering or shift in her practice.

ETUDE: Typically the upper register notes were a focus as well as two places where she had to shift to get to those notes.

REPERTOIRE EXCERPTS: The bowing and fingering coordination for the patterns mentioned above in the answer to question four (two sixteenths and three eighth notes and then an eighth and two sixteenth notes) were practiced with and without the bow. Also, the change from one pattern to the next was practiced. The double notes in the second repertoire practice session's excerpt were taken out to practice left hand without the complication of the right hand.

7. How was intonation practiced?

SCALE: She attempted to correct intonation once and actual wrong pitches twice.

ETUDE: Student T practiced notes slowly and note by note, but she also used pizzicato to play the notes and fingerings, or find the pitches before going back over them with the bow.

REPERTOIRE EXCERPTS: Student T seemed to work more on note learning than intonation by playing things pizzicato when she may have felt uncomfortable bowing the notes. She did correct two out of tune notes as well with the bow by playing them in long tones. The double notes in the second repertoire practice session's excerpt were taken out to practice left hand without the complication of the right hand.

8. How was rhythm practiced?

SCALE: She used one rhythmic variation in her scale. She played it in half notes, quarter notes and eighth notes, as well as two rhythmic patterns: a quarter eighth, eighth note pattern with a separate bowing and then bowed "down, up-up." This means that the bow went to the right in one direction for the quarter note and then to the left and in the other direction for the two eighth notes hooked and played with a space between the notes rather than slurred and played legato together.

ETUDE: Repetition, but it was not a focus of this practice session.

REPERTOIRE EXCERPTS: Student T played everything in a moderate tempo that made phrasing and rhythm accuracy possible. She played through things more than once and used both pizzicato and bow. The double notes in the second repertoire excerpt session's excerpt were taken out to practice left hand without the complication of the right hand, then the double notes were added to practice the rhythm of the eighth notes.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

They were not.

11. How were difficult slurred passages practiced?

SCALE: She played a slurred eighth note version of the scale.

ETUDE: She played through the phrase slowly and without the bow to make sure she had the pitches down before adding the bowing.

REPERTOIRE EXCERPTS: There were none.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: Only in the first attempt at the second octave. However, she did not make it all the way through before going back to the beginning to try again.

ETUDE: No

REPERTOIRE EXCERPTS: No

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

ETUDE: Yes, she stopped and looked at the music for a moment.

REPERTOIRE EXCERPTS: Yes, she looked carefully at the music and corrected herself out loud, reminding herself of the flat notes in the key signature.

15. OPEN COMMENT: Student T did not end up auditioning for the top All-Region group. She took an audition for the freshman group and so her data for her questionnaire will not be compared to the All-Region rankings. But her practice techniques seemed mature. For example, during her etude practice she seemed to be focused on the first phrase and once she practiced several issues within that phrase she was able to play through it.

STUDENT U

(Self-efficacy score of 114)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student U played the scale from the beginning, all three octaves without stopping in quarter notes. Then he played it eight notes per bow.

ETUDE: He started at the beginning but stopped and practiced the first measure in isolation immediately.

REPERTOIRE EXCERPTS: He started at the beginning of the first excerpt, immediately making attempts to correct pitches, but tried to play all the way through the excerpt before going back to practice the section in the middle. In the second five minutes he actually worked on more than one excerpt, playing through both of them, but making adjustments and repeating some things as he went at a moderate practice tempo, slowing down more when necessary.

2. Were any attempts made at corrections?

SCALE: Yes, Student U played the scale a second time with pizzicato only, then he played it six to a bow only going up, repeated the scale and played it eight to a bow correcting one particular note as well as a shift that he repeated. Next he repeated the bottom octave before going on to work on the top octave and then

playing through the whole scale again. Then he played the scale quickly in separate bows, repeating the second octave three times. After that he played through the scale at two to a bow.

ETUDE: Yes, immediately Student U worked on the first measure and practiced it slowly note for note, then with double stops on each second note played (double stops are notes played simultaneously on two strings). He also used double stops to practice the octave section and the middle section of the etude excerpt. He also practiced these sections this way.

REPERTOIRE EXCERPTS: Yes, in the first excerpt he chose, he attempted quick little adjustments during his initial run through and then he immediately went back to work on the most difficult section of the excerpt, which contained large leaps, resulting in difficult shifts within slurs over awkward string crossings. In the second five minutes of repertoire excerpt practice, he played through two excerpts, practicing small and large sections as he went, making adjustments and corrections as he played through the excerpts.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: Student U played the scale in several different tempi. First, with separate quarter notes played at a moderate tempo, slurring six and eight to a bow, playing the scale quickly and separately, then he played it four notes to a bow and two notes per bow.

ETUDE: He played most of the etude excerpt close to performance tempo. He did slow down to play the double stops and he slowed the tempo to make adjustments and to correct three different places where he was repeating the passages and having trouble going into the higher register. Then he sped back up slightly to finish the etude excerpt and went back to the beginning again at a quick tempo, playing all the way through. He stopped once after going back a few measures and starting from there to finish, again at the quicker but never truly steady tempo.

REPERTOIRE EXCERPTS: In the first excerpt, Student U tried to play a steady and moderate tempo in his initial run through, but then slowed down to a meticulous practice tempo when working on the difficult string crossings and left hand leaps and shifts in the middle of the excerpt. His tempi fluctuated quite a bit during his second five minutes of repertoire excerpts because he was practicing sections as he played through two excerpts.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: Yes, he repeated each octave at different times in different versions and tempi of the scale. He also stopped and corrected a pitch in one place as well as the intonation in two or three spots.

ETUDE: Yes, as he repeated larger portions of the etude excerpt and the etude excerpt itself. He repeated one measure at one point to correct it in two places

where notes were out of tune. He also isolated the difficult octave passage in the middle of the etude excerpt and used double stops to work on it.

REPERTOIRE PRACTICE: Yes, he repeated the difficult middle section of the first excerpt at least five times slowly, attempting to ease the string crossings, correct the pitches and improve intonation in the shifts and leaps. He also repeated the third measure at least three times, which contained fast double notes with higher pitched left hand issues. Therefore, two notes played in single bows per pitch quickly. Yes, in the second complete excerpt he played, he repeated the last motive, which was just less than a measure, four times to correct intonation. He also repeated three spots within the etude once to make sure it was correct and then he repeated two spots three or four times in the final excerpt that he played through.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: The scale itself was repeated several times in several different versions and tempi.

ETUDE: Yes, the etude excerpt itself was repeated more than once and larger sections of the etude were repeated, slowed down and then played again faster and more in context.

REPERTOIRE PRACTICE: This was done more with smaller sections, and once he practiced the middle section several times, he seemed to be working on larger sections as he was playing through the entire first excerpt. In the final two excerpts he did more practicing as he played through rather than going back after a run through. Things he repeated were smaller sections. He slowed down in two different larger sections, obviously practicing those places with determination.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: Twice Student U stopped to practice a specific shift and make sure it was accurate. He also worked on the left hand by repeating each octave in isolation with slurs and he did play the scale with a rhythmic variation.

ETUDE: Student U slowed down to a practice, note for note tempo, to coordinate the string crossings, bowing articulations, and left hand issues better. He also used double stops to work on the intonation in the difficult octave passage.

REPERTOIRE PRACTICE: Student U was attempting to improve his shifts for the difficult leaps in the middle section of the first excerpt. He was also practicing the string crossings in that same passage slowly to try and get through this section with more ease. He played through some shifts more carefully and slowly in the last excerpt as well.

7. How was intonation practiced?

SCALE: With repetition and by slowly going over a shift and each octave of the scale in isolation.

ETUDE: By slowing down the tempo to play awkward string crossings and left issues more easily. He also used double stops to work on the intonation in the difficult octave passage.

REPERTOIRE PRACTICE: Slowing down the tempo and listening to himself more with slight pauses in between attempts at improvement or repetitions. He played everything under tempo.

8. How was rhythm practiced?

SCALE: He played the scale in different tempi, slurring six, eight, four and two notes per bow as well as playing it separately and by playing it with one rhythmic variation.

ETUDE: By repetition and slowing down in certain passages.

REPERTOIRE PRACTICE: He slowed everything down and also worked on doubled notes, and things were approached under tempo.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

They were not.

11. How were difficult slurred passages practiced?

SCALE: He slurred six, eight, four and two notes per bow in that order, as well as played the scale with separate bows at both a moderate tempo and quickly.

ETUDE: With repetition and by slowing down.

REPERTOIRE PRACTICE: Slowly down and by repeating them. He seemed to carefully place his bow at each string level.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: Yes, he did isolate a shift and each octave.

ETUDE: He practiced them more as he played through the etude excerpt, slowing down in those sections.

REPERTOIRE EXCERPTS: Yes, Student U attempted to do so. He did play through the excerpt the first time at a fairly moderate tempo, making a quick and small adjustment or two, but he played through it before going back over certain passages very slowly or choosing spots that needed attention.

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

SCALE: Yes, he stopped thought for a moment and then practiced the scale pizzicato.

ETUDE: No

REPERTOIRE PRACTICE: No

15. OPEN COMMENT: This student seemed to want to practice and play the excerpts better, and pure determination may have helped him succeed. However, his approach was not always as careful as it could have been, not always fixing or adjusting every intonation issue or pitch problem.

STUDENT V

(Self-efficacy score of 113)

1. Where in the repertoire does a student begin each practice session?

SCALE: She started at the beginning of the scale playing slow quarter notes, holding a longer note (approximately a half note) at each tonic.

ETUDE: She did start at the beginning of the etude excerpt. She stopped after four measures, but then kept going very slowly.

REPERTOIRE EXCERPTS: She started at the beginning of each excerpt, immediately stopping to fix problems and repeating motives.

She attempted to play through the first excerpt, but stopped at least 10 different times to fix small motive sections smaller than one measure at three different spots. For the second repertoire excerpt practice session, she started at the beginning of the *Russian Eastern Overture* excerpt but was immediately repeating two different measures at least five times each at the same tempo, not changing much.

2. Were any attempts made at corrections?

SCALE: a slight adjustment to one out of tune note.

ETUDE: In her initial run-through, Student V stopped twice, but no corrections were actually made. After that she went back to the beginning again and stopped after three measures, made no corrections but went back to the beginning to try again. This time she slowly made it through the same spot that stopped her and made the correction. Corrections were made in this slow manner throughout her etude practice.

REPERTOIRE EXCERPTS: Yes, in the first excerpt she was attempting to play through the entire excerpt, stopping to correct three places about 10 different times (two or three different times each). In the second excerpt she stopped to

work on two different measures, several times, repeating the measures and adjusting the length of bow and right elbow. This excerpt had all quick slurs with quick left finger/note changes that needed coordination practice.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: She played the scale first slow with half notes on the tonic notes and slow quarters, then faster repeated eighth notes, and a slightly quicker “short-long” rhythm variation.

ETUDE: Everything was slow and meticulous.

REPERTOIRE EXCERPTS: None – excerpts were all practiced at a moderate tempo.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: No

ETUDE: Yes, in the beginning of the excerpt she repeated a small motive until she corrected it and then later in the etude she went back and repeated a measure three times until she could play through it.

REPERTOIRE EXCERPTS: Yes, in the first excerpt three different motives were repeated and in the second excerpt it was two measures.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: Student V repeated the entire scale in the same manner (playing a half note at each tonic and then quarter notes) three times, then she started at the top of the scale in the same tempo and rhythm and repeated coming down the scale.

ETUDE: She kept repeating the first section of the etude several times.

REPERTOIRE EXCERPTS: No

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: She started at the top of the scale and worked on shifting down from the top octave. Her fourth complete run through of the scale was practicing with spiccato eighth notes, four strokes per pitch.

REPERTOIRE EXCERPTS: She worked on coordination between the quick slurs and fingerings in the second excerpt.

7. How was intonation practiced?

SCALE: Occasionally she seemed aware of out of tune notes and made slight adjustments, and she did start at the top of the scale once to work on coming down, which is where she had had the most difficulty with intonation.

ETUDE: She said out loud that she was not sure of some of the pitches in a higher register, and played slowly to try and figure these notes out.

REPERTOIRE EXCERPTS: She worked on correct pitches in both excerpts by repetition, but not actual intonation.

8. How was rhythm practiced?

SCALE: She varied the rhythm as she played through the scale several times, beginning with quarter notes, but half notes on the tonic pitch, then faster eighth notes with a shorter repeated note articulation. She had just started a "short-long" rhythmic variation when the timer went off.

ETUDE: She played through the etude excerpt slowly.

REPERTOIRE EXCERPTS: The repetitive rhythm in the first excerpt (dotted quarter eighth) was continuous as she played through the excerpt, but she did not seem to be focused on the actual rhythm.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

They were not.

11. How were difficult slurred passages practiced?

SCALE: She did not do any slurring.

ETUDE: She played through everything slowly.

REPERTOIRE EXCERPTS: She seemed to adjust the amount of bow that she was using, and she seemed to adjust to the level of her right elbow.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: Yes, after playing the scale three times, she went back and practiced coming down the scale.

ETUDE: Yes, in a way. She attempted to make an initial run through of the etude excerpt, but had difficulty doing so without stopping. Once she got through most of the excerpt, she did go back and work on a difficult section in a higher register where she was having trouble.

REPERTOIRE EXCERPTS: No

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

SCALE: She adjusted her shoulder rest.

ETUDE: She asked herself, "What is that supposed to be?" in a section that was in the higher register of the instrument. She was aware that she was not sure and spent time trying to figure it out.

REPERTOIRE EXCERPTS: Yes, she was constantly adjusting her shoulder rest during the second excerpt and was physically adjusting her neck, shoulder and right arm. Then her right elbow seemed more flexible and in better motion for the difficult slurs. She also stopped three times in the first excerpt, twice in the second excerpt and just looked at the music, possibly making a mental note.

15. OPEN COMMENT: Student V does not take private lessons and did not always know how to fix things, but she made efforts none-the-less when she knew it was not correct. However, she was not always aware that it was not correct and did not always correct her intonation problems.

STUDENT W

(Self-efficacy score of 110)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student W started at the beginning of the scale, slowly in half notes.

ETUDE: He started at the beginning of the etude excerpt, attempting to play through it once.

REPERTOIRE EXCERPTS: He started at the beginning of the first excerpt, working and correcting as he went, repeating and slowing down the first six measures before continuing. He started the second excerpt in the beginning as well. He stopped immediately began making adjustments and held out the double stopped notes. He started at the beginning of the excerpt he chose for the second repertoire excerpt practice session and repeated it three times. He worked on the first half of the next excerpt repeating it twice and then focused on the second half practicing it in a variety of ways.

2. Were any attempts made at corrections?

SCALE: Not immediately. But then he went back to play only the top octave, and seemed to be focused on correcting intonation by playing that octave very slowly, speeding up the tempo, then going to the lower octave.

ETUDE: Yes, during his first attempt to play through the etude excerpt, he stopped several measures in with a mistake and went back to the beginning. Then he isolated and repeated a certain motive to practice it.

REPERTOIRE EXCERPTS: Yes, Student W repeated the first six measures of the first excerpt and then repeated the first four measures of the second excerpt, using long tones to help with the double stops. In the excerpt of the second

repertoire session, Student W repeated the entire excerpt three times and each time he played the middle section more than once, adjusting pitch and tone to fix intonation. During the last excerpt he practiced, he corrected one note in the lower register of the first half of that excerpt when it was repeated, then he practiced the second half in a variety of ways and made several corrections, including correcting wrong pitches, out of tune notes, and awkward string crossings by playing it as written with the double notes (two eighths for every pitch) and with single quarter notes slower then faster.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: Student W played through the scale once slowly in half notes, then isolated the top octave and sped up the tempo gradually. He played the upper octave four times, the first time very slowly and deliberately for intonation, then sped up to a faster tempo before going to the lower octave again to play four notes to a bow, slightly faster than the original tempo twice through the scale.

ETUDE: Yes, he started in what was close to performance tempo, but when he slowed to practice the bowing in one section, he played much slower until he seemed to have the coordination down.

REPERTOIRE PRACTICE: For the first two excerpts in the first repertoire excerpt practice session, Student W slowed down to practice pitches, especially in the double stops where he held the notes out long. During the excerpts for the second repertoire session, Student W slowed down to repeat several pitches in the upper register in the middle section of the excerpt. He also slowed the tempo down in the final excerpt as well, practiced the double notes as single notes (playing quarter notes rather than two eighth notes for every pitch as written) and gradually took it faster.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: No just the scale.

ETUDE: Yes, he isolated and repeated a motive that had a quick shift and quick grace notes following the shift. He repeated the grace notes, playing them four times and the shift three times before going on in the etude. He paused again in the same section that stopped him, slowed down ever so slightly, but played through it to finish the etude.

REPERTOIRE PRACTICE: Yes, a motive in the upper register of the middle of the third excerpt, the first in the second piece, and three notes to correct one pitch in the beginning section of the last excerpt. In the first two excerpts he did repeat single tones and double stops.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: He did repeat the top octave four times before playing through the scale again.

ETUDE: Yes, a section that had a difficult string crossing and spiccato articulation in an upper position. Also, as he was making an attempt to play through the etude excerpt the second time, he did stop to work on the shift in the initial part of the phrase, repeating the shift three times and the quick grace notes that followed four times.

REPERTOIRE PRACTICE: Yes, the first six measures of the first excerpt and the first four measures of the second excerpt were repeated. The third excerpt itself was repeated three times and the first half of the last excerpt was repeated twice. Then the second section of the final excerpt, which is fast double notes played in a scale like passage, was repeated several times as it was practiced in double notes and as single quarter note pitches in different tempi.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: He did work on a shift in the top octave of the scale, and then he played the scale four notes to a bow twice and then went back and played two notes per bow.

ETUDE: He worked on a quick and difficult shift in the initial phrase by repeating it three times. He also worked on a complicated, slurred and separate combination bowing later in the etude but slowing down and meticulously focusing on the bow direction.

REPERTOIRE EXCERPTS: Double stops were tuned and adjusted in the first two excerpts. Notes in the upper register were worked on and double notes were slowed down to work on them more accurately in the last two excerpts.

7. How was intonation practiced?

SCALE: Slowly. He repeated the top octave very slowly, corrected the intonation, then gradually sped that octave up over four plays.

ETUDE: He corrected a shift that was affecting intonation and slowed the tempo.

REPERTOIRE PRACTICE: He slowed down and even held out notes in some cases to check tuning, especially in the double stop sections.

8. How was rhythm practiced?

SCALE: He played the scale in half notes, one note per bow. Then he played the scale in faster quarter notes and four notes per bow before slowing back down to slower quarters, two notes per bow.

ETUDE: He slowed the tempo and worked on the bow coordination, ultimately helping the rhythm.

REPERTOIRE PRACTICE: He slowed down the tempo when he repeated certain passages.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

They were exaggerated as much as possible in the repertoire excerpts.

11. How were difficult slurred passages practiced?

SCALE: He did slur four notes per bow and then two.

ETUDE: Slowing the tempo down and repeating the passage to help coordinate the complicated slurred and separate bowing combination with the left hand.

REPERTOIRE PRACTICE: He did not practice them in the excerpts.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: Yes, he did play through the scale once and then isolated the top octave to practice it, repeating it four times before going to the beginning of the scale again.

ETUDE: Yes, he attempted to play all the way through the etude once, but stopped towards the end where he had problems. He went back to work on the section that needed attention after that initial attempt. He practiced the shift and quick grace notes in the first phrase, then he worked on the quick spiccato section, and finally, he isolated the complicated bowing.

REPERTOIRE EXCERPTS: Not necessarily. He did not play all the way through an excerpt before going back and repeating a section and focusing on a section to practice it.

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

SCALE: No

ETUDE: He did say out that he needed to try again and demonstrated some signs of frustration out loud.

REPERTOIRE PRACTICE: He made one comment out loud before correcting and repeating a passage.

15. OPEN COMMENT: He was very slow and careful in his scale practice. With the etude he seemed determined to play through it at least once, but wanted to make

sure he did so correctly and in tempo, going back to correct things as well as doing some practice while trying to play through it.

STUDENT X

(Self-efficacy score of 105)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student X started at the beginning of the scale in slow quarters from his open C string and immediately adjusted a note when he got through the first octave, checking his note with his open C string.

ETUDE: He started at the beginning of the etude slowly, playing through it with pauses and stops.

REPERTOIRE EXCERPTS: Student X started at the beginning of one excerpt slowly and then immediately sped up without any correction. He did the same thing for the second excerpt he chose to practice.

2. Were any attempts made at corrections?

SCALE: Yes, Student X immediately adjusted the note at the first octave of his scale checking it with his open C string. He also repeated and corrected three notes in the upper register.

ETUDE: Yes, he stopped three times and checked notes, twice with an open string and once just by repeating the note. He started the etude over again before completing it, pausing and stopping in some of the same places, but also new and different places.

REPERTOIRE EXCERPTS: Yes, he attempted to correct several pitches in the middle of the first excerpt. No difference was obvious before he continued, until later. In the second repertoire practice session and excerpt he chose, he practiced a section with slurred by two string crossings (a measure in 4/4 of eighth notes slurred every beat over string changes). This passage is also difficult because it starts up bow and he focused on this concept. He also slowed down to practice the double stops immediately following and attempted to tune these notes.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: Student X started the scale slowly in quarter notes (or faster half notes), then sped up to faster quarter notes. He played it with separate eighth notes and then with slurred two eighth notes.

ETUDE: He took his time and then slowed down even more when necessary. His tempo varied depending on what he needed to fix. If he could play it, he sped up playing a more steady tempo, but if he needed to work on something he paused, slowed down to a note for note practice tempo to work on things.

REPERTOIRE PRACTICE: He started the first excerpt he chose slowly, but then immediately sped up without correction. Once he found it difficult, he slowed

back down again; resulting in an unsteady tempo. In his second excerpt he varied the tempo, slowing down to focus on catching a difficult bowing that starts up bow (see also answer to question two) and he sped back up to try it faster. He also slowed down for the double stops. He rushed through some of the excerpts extremely quickly until he came to another place that slowed him down.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: Yes, in the faster play through of the scale in separate eighth notes, he missed several pitches in the upper register and octave and then played just six notes of that octave slightly slower and corrected the pitches. Also, he did not always finish the scale before repeating it again.

ETUDE: Yes, but only once as he paused during his play through of the etude or in his repeat of the etude. He did not take a motive and repeat it several times in a row.

REPERTOIRE PRACTICE: Yes, in the middle of the first excerpt he attempted to correct several pitches. In particular case, he checked with his open string and repeated the four notes surrounding that pitch with the slurred pattern three times with no change, then three more and corrected it. When he went back to put the motive into context, he missed it again and did the same procedure, repeating the same four notes and checking one with an open string. Then he stopped to breathe and regroup. In the second excerpt he worked on the motive and individual measures that contained the slurred eighth notes every beat over string crossings (see answer to question two).

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: Yes, parts of the scale and the entire scale were repeated after his initial run through in slow quarters.

ETUDE: Yes, in the initial part of the etude.

REPERTOIRE PRACTICE: He seemed to be taking the beginning section as one large practice session in the first excerpt that he practiced. In the second excerpt that he practiced he played a large section of three measures three times and repeated the entire excerpt as well, still focusing on the slurs.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: It was difficult to tell for sure, but he did seem to check one of his shifts.

ETUDE: He worked on intonation and adjusted pitch for one difficult shift, matching it to his open string.

REPERTOIRE PRACTICE: The slurs in the first excerpt he chose were a focus of practice as well as the second excerpt (see answer to question two).

7. How was intonation practiced?

SCALE: Slowly. He also checked two notes with his open strings and he repeated a section of the scale slower than was in the upper register to correct the intonation problems.

ETUDE: Yes, he checked and attempted to adjust his pitch on three occasions, twice with his open string and once by repeating and holding the note.

REPERTOIRE PRACTICE: He made several attempts to correct intonation in one section, checking the out of tune pitch with his open string.

8. How was rhythm practiced?

SCALE: Student X started the scale slowly in quarter notes (or faster half notes), then sped up to faster quarter notes. He played it with separate eighth notes and then slurred two eighth notes.

ETUDE: He played with a slow and steady pace to start the etude.

REPERTOIRE PRACTICE: The rhythm was fairly straight in the first excerpt, mostly eighth notes, but slurred every two notes, over the beat, so he seemed to be incorporating the awkwardness of that rhythm in practicing the slurs slowly in a few spots.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

They were not.

11. How were difficult slurred passages practiced?

SCALE: When he incorporated slurs in the scale practice, as he went up the scale he played straight eighth notes, two per bow, but as he came down that same run through of the scale, he repeated each initial note (C slurred to B, then B repeated and slurred to A, then A repeated and slurred to G, and so forth through all three octaves).

ETUDE: Slowly; the opening of the etude has a sextuplet and his slow and steady pace gave him time to coordinate the left hand evenly with the bow changes.

REPERTOIRE PRACTICE: He would start each time slowly and then speed up, always slowing down for the difficult string crossings in the slur-two bowing over the beat. He practiced the slurred eighth notes in several different tempi.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: Student X always seemed to be aware of the trouble he was having in the top octave, and repeated the entire top octave as well as a note or two, or a large section of the top octave to help correct it. And this was done through out the scale practice, after his initial slow quarter note play through of the three octave scale.

ETUDE: No. However, he did attempt to play through the etude excerpt twice, and he paused and stopped in different places in the second run through. It was difficult to tell though if this was intentional or accidental.

REPERTOIRE EXCERPTS: No

13. Did he write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

SCALE: No

ETUDE: No

REPERTOIRE PRACTICE: No, but he did stop and look at the music for 20 seconds after working diligently on one section; then he started at the beginning of the excerpt again.

15. OPEN COMMENT: Three different times during the scale practice, he seemed to lose the center of pitch. He would go ahead and play almost through to the end of the scale in this manner, and then go back to start again before completely finishing, usually finding his center of pitch again. Overall Student X's practice had an interesting patient and steady continuum.

STUDENT Y

(Self-efficacy score of 101)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student Y started slowly at the beginning of the scale, playing half notes. She included the arpeggio.

ETUDE: She started the etude repertoire excerpt at a passage several measures in and worked on the pitches slowly.

REPERTOIRE EXCERPTS: She started at the beginning of each excerpt, slowly and carefully; immediately stopping to fix problems and repeating motives.

2. Were any attempts made at corrections?

SCALE: Yes, she stopped and adjusted one pitch in the scale and two pitches in the arpeggio in the initial run through. She also made a correction in her slurred bowing when she played the scale with two notes per bow. She corrected three

different pitches during the arpeggio and one during the two-note slur that she played over the beat, and two shifts during the regular two-note slur play through.
ETUDE: Yes, she was slowly going note by note for the first three minutes and was correcting every pitch she had trouble with at this very slow tempo, repeating some pitches, slowing others, checking some with open strings, and making adjustments.

REPERTOIRE EXCERPTS: Yes, she immediately slowed down and stopped repeating a motive 5 different times slowly, making a note (to mark a fingering); when she went onto the next measure, after repeating the first motive two more times, she stopped again to attempt to clean up the next motive. She also repeated shifts and notes in the upper register in the second excerpt.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: Student Y started the scale slowly in half notes then sped up to quarter notes, then eighth notes slurred (one note played, then slurring two, which gives the feeling of playing slurs over off-beats and is more challenging than just straight eighth notes). Then she played it twice with two-note slurs.

REPERTOIRE PRACTICE: In the first practice session she was learning notes and bowings, so the tempo was very slow. In the second repertoire excerpt she played at a note for note slow tempo.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: No, only single notes.

ETUDE: Yes, notes were corrected initially and in the last minute of practice she repeated some small motives to fix the pitches and rhythm as well as string crossings.

REPERTOIRE PRACTICE: Yes, this was done constantly throughout the practice session as she was learning notes.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: The entire scale was repeated.

ETUDE: No

REPERTOIRE PRACTICE: No

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: She stopped to fix two shifts going up the scale as she slurred two notes in a regular beat pattern.

ETUDE: She did isolate a section that had notes bouncing back and forth between octaves. She worked on this section note by note, seeming to work on the shifts, string crossings, and difficult octaves.

REPERTOIRE PRACTICE: She worked on fingerings, including one shift in the first excerpt and four difficult shifts very slowly in the second excerpt. She spent two out of the five minutes practicing a difficult bowing in the first excerpt, using large amounts of bow and slightly slipping off the string.

7. How was intonation practiced?

SCALE: She focused on two shifts that were affecting her intonation in the scale.

ETUDE: She practiced notes slowly, isolating some and repeating them, and in the octave section she slowly went from one note in one octave to the other, checking with open strings occasionally.

REPERTOIRE PRACTICE: She practiced a passage in the upper register, note by note and then slowly, slowing down the shifts as well as she went through the measure.

8. How was rhythm practiced?

SCALE: Student Y started the scale slowly in half notes then sped up to quarter notes, and next eighth notes slurred (one note played, then slurring two, which gives the feeling of playing slurs over the beat and is more challenging than just straight eighth notes). And then she played the scale with straight eighth notes, slurring two.

ETUDE: Slowly. She seemed to be focused more on note learning and reading than rhythm, but one section had rhythms that she was slowly going through.

REPERTOIRE PRACTICE: It was not

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

They were not.

11. How were difficult slurred passages practiced?

SCALE: See answer to question eight under scale section.

ETUDE: She worked on the string crossings in the octave passage slowly.

REPERTOIRE PRACTICE: She took a two measure passage very slowly, using large amounts of bow.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

No. Most of Student Y's practice involved practicing while paying through.

13. Did the student write anything in the music during the practice session?

SCALE: No

ETUDE: No

REPERTOIRE PRACTICE: Yes, twice. She immediately marked fingerings in the first practice session and she made another marking in the second practice session.

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

SCALE: No

ETUDE: No

REPERTOIRE PRACTICE: No, but she stopped once, put her instrument down, and just looked at the music for 30 seconds.

15. OPEN COMMENT: This student's bow often slipped out of contact with the string, and no effort was made to adjust or correct this.
This student did not attend the All-Region try-outs.

STUDENT Z

(Self-efficacy score of 99)

1. Where in the repertoire does a student begin each practice session?

SCALE: Student Z began the scale slow in half notes, repeating the tonic notes. She slurred some notes together but played most of the three octave scale separate. She did repeat one note to correct it as she was playing through the scale and then she played it in separate quarter notes.

ETUDE: She started at the beginning of the etude excerpt and attempted to play through it at one tempo. She had to slow down to half tempo for the last half of the excerpt however to get through it until the very end. Then she tried playing through the entire excerpt again at tempo, but still had to play the second half at half tempo.

REPERTOIRE EXCERPTS: Student Z repeated the first excerpt she chose three times. She paused after the first and looked through her music. She began her second chosen excerpt at the beginning, played all the way through it, and then went back to the fast section to work on the double notes (two separate bowed notes played per pitch; written as a quarter note with a slash mark to indicate eighth notes). In the third excerpt she chose, she took her time getting ready and then played through it from the beginning. In the excerpt she chose for the second five minute session, she started in the beginning, but did not play all the way through without stopping. She stopped and worked on measure six,

repeating it three times slowing down once, and then went on to continue playing through the excerpt.

2. Were any attempts made at corrections?

SCALE: Yes, she corrected a note in the third octave by repeating it and adjusting it as she played through the scale. Then she slowed down the end of the faster quarter note version to play the last four notes slow and with a full tone. While playing a short articulation version she corrected another pitch in the second octave.

ETUDE: Yes, she stopped and played the difficult section with awkward coordination between the left hand and the bowing articulation much slower, at half tempo the first time and slower the second time, adjusting her right arm to practice the string crossings. The third time she played it very slow.

REPERTOIRE EXCERPTS: Yes, she immediately corrected one wrong note toward the end of the excerpt and repeated the last three measures of the excerpt. She also worked on the end of the phrase in the first excerpt she played, attempting to end the phrase correctly. In the second excerpt she chose, she played through it once without stopping, then went back to work on the difficult fast double notes. In the third excerpt she corrected pitches, not all but some, and intonation. Same as question two: In the excerpt she chose for the second five minute session, she started in the beginning, but did not play all the way through without stopping. She stopped and worked on measure six, repeating it three times slowing.

3. What, if any, tempo variations might have been used to help with practice?

SCALE: Student Z played the scale in half notes, quarter notes (detaché, short staccato, and legato), and slurring eight to a bow, and therefore playing it much faster than before. She also played it with quick double notes and separate bows, two notes per pitch.

ETUDE: Student Z attempted to play through the etude excerpt at tempo, but slowed down to half tempo in the section where she could not play it as quickly, where the coordination between the string crossings and bowing articulations as well as the left hand. The second time she played through it she slowed down only a little.

REPERTOIRE EXCERPTS: For the first excerpt Student Z played the same tempo three times, close to performance tempo, but slowed down slightly to work on the end of the phrase. She played the tempo and rhythm incorrectly in the beginning of the second chosen excerpt, then slowed down slightly for the quick double notes (this excerpt is in a time signature of 2/1 and awkward to count or feel). She did speed the double notes up later. In the second five minute session she slowed down within the first play through to work on corrections immediately. Also, in the second five minute session she played through middle section twice and the final section of this excerpt five times, getting slower all but the last time where she played it at tempo.

4. Were any small sections repeated for correction, such as one motive or measure?

SCALE: No

ETUDE: Yes, she stopped and worked on the measure that has two notes slurred at the beginning of it and then all separate spiccato after to work on coordination.

REPERTOIRE PRACTICE: Yes, Student Z immediately repeated the last three measures, focusing on correcting one note in the first of those measures. Same as question two: In the excerpt she chose for the second five minute session, she started in the beginning, but did not play all the way through without stopping. She stopped and worked on measure six, repeating it three times, and then went on to continue playing through the excerpt.

5. Were any large sections, beyond a measure, practiced as the material was played through?

SCALE: Yes, she repeated the scale several times in different ways, as she varied the scale, she kept going back and repeating it in the slower legato quarter note version as well, playing the scale twelve times total.

ETUDE: Yes, she slowed down in the section with difficult coordination between the bowing and left hand sixteenths every time she attempted to play through it, each time going a little faster in that section.

REPERTOIRE PRACTICE: Student Z repeated the final three measures to correct one note in one measure and then went on to play through the excerpt again. She also started the second excerpt she chose at the quick double note section and played it through to the end three times in row. In the second five minute session she played through the middle section twice and the final section of this excerpt five times, getting slower all but the last time where she play it at tempo.

6. What technical aspects were practiced, such as shifting, difficult bowings, or difficult fingerings?

SCALE: She varied the bowing and tempo of the scale as she played it. She played it separate fast, slow, legato, staccato, and with double notes, then she slurred eight to bow, then two and separate two.

ETUDE: Both difficult bowings and difficult fingerings were practiced as she attempted to play through the etude excerpt more than once.

REPERTOIRE PRACTICE: Student Z worked on the up, up bowing toward the end of the excerpt by playing the excerpt three times. In the second excerpt there were some shifts that she practiced by repeating the passage. Student Z prepared her left hand in the high register for the third excerpt and worked on one shift to help correct pitch. The middle section of the excerpt she chose for

the final five minute session was pizzicato and the bowing was rather complicated for the final portion of this excerpt.

7. How was intonation practiced?

SCALE: She repeated two notes while playing through the scale and she slowed down the end of one scale version and focused on tone and intonation.

ETUDE: Repetition.

REPERTOIRE PRACTICE: Yes, in the third excerpt she chose to work on, she played through it a second time to adjust intonation. She took her time and slowed things down when necessary for intonation practice.

8. How was rhythm practiced?

SCALE: She played the scale in several versions, playing it in half notes, quarter notes, slurring eight notes quickly together, then varying the bowing with two notes slurred and then two notes separate.

ETUDE: Repetition.

REPERTOIRE PRACTICE: Repetition.

9. Was a metronome used? If so, how?

No

10. How were dynamics practiced?

Student Z seemed to be making an effort to end the phrase gently in the first repertoire excerpt.

11. How were difficult slurred passages practiced?

SCALE: No

ETUDE: She slowed down as well as repeated the etude excerpt several times.

REPERTOIRE PRACTICE: In the first excerpt there were awkward ties over the bar line in combination with two up, up strokes in a row. She practiced this by repeating it. In the final excerpt there was a difficult slurred section that she played in context several times, isolated and repeated slowly several times.

12. Were difficult passages identified and practiced in isolation after an initial run through of the repertoire?

SCALE: No

ETUDE: No

REPERTOIRE EXCERPTS: Yes, one note was corrected at the end of the phrase. In the second excerpt she chose, she repeated several measures of the quick double notes three times after an initial run through of the entire excerpt. In

the final excerpt practice she worked on the difficult bowing and rhythm, the pizzicato, and the slurred passages.

13. Did the student write anything in the music during the practice session?

No

14. Did the student do any kind of singing, counting out loud, or non-instrument practice?

SCALE: No

ETUDE: No

REPERTOIRE PRACTICE: She did stop, adjust her music, possibly considering going on after playing through the first excerpt once, then she placed the music on the stand again and continued practicing the first excerpt she chose. In the third excerpt she chose, she stopped and adjusted her left hand, in the upper positions and she played pizzicato to check her pitch before going through this excerpt a second time.

15. OPEN COMMENT: Student Z did care about her sound as she worked on ending the phrase at the end of the first chosen excerpt, but not much changed other than the corrected note as she played that first excerpt three times. If anything, the articulation was not as clear the last play through as it was the first.

APPENDIX F
MAIN STUDY INTERVIEW DATA TRANSCRIBED

Main Study Interview Data Transcribed

STUDENT K

(Double Bass Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude, repertoire excerpts, or scale?
STUDENT K: At first I started with the Region part, the excerpt from the part, then I started at the beginning (of the entire etude, not just the excerpt) because I also have to practice that for All-State... It helps to actually play the whole piece because you can feel what that sections is supposed to be like with the other parts; other music and sounds before and after. I started at the beginning of the piece for the excerpts as well.
2. INTERVIEWER: What were you thinking/focusing on while you were practicing?
STUDENT K: For the etude I was focusing on mostly tone and how I like, display the music, "emotional-wise." I mean I worry about intonation and everything, but to me, the more important thing is actually conveying what the piece of music is [trying to portray].
STUDENT K: Well, the excerpts were really easy.
STUDENT K: For the scale? It was actually a little fun because at first I thought it was going to be boring to do a scale over and over for five minutes, so just started, like, I was doing random things; double timing the notes, etc...
3. INTERVIEWER: Why did you decide to use or not use a metronome?
STUDENT K: I don't like metronomes. Well, I find them annoying and repetitive. Playing w/an orchestra maybe, but not when alone – phrasing, etc... expressiveness...
4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?
STUDENT K: I play the first note and whatever happens, happens... I look at whatever the notation is, tempo marking and take that into consideration, but it's kind of an inner thing...
5. INTERVIEWER: How much time did you take to warm up before each practice session?
STUDENT K: Not today (didn't have a chance). I may play through something once or play scale.
6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?

STUDENT K: When I do, I get into it. It helps – express the music. If you were to practice dynamics, what could you do?

If I want to play louder, more pressure on the bow and if I want to play softer, then I release the pressure and play more towards the fingerboard.

7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?

STUDENT K: There wasn't any really. [But] I will play it slowly at first then gradually get faster and faster.

8. INTERVIEWER: How did you practice intonation?

STUDENT K: When I hear a wrong (or out of tune) note, it depends because sometimes I do it differently, but sometimes I might sustain it and fix it... Or... if I'm playing a piece and I mess up and I play a wrong (or out of tune) note I start over at the beginning until I get that note right.

9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?

STUDENT K: I know what key it's in, so I don't really think about it when I'm playing; it's just kind of stuck in my head and my fingers know where to go. Unconsciously my fingers know where to go.

10. INTERVIEWER: How successful or not successful do you think your practice sessions were?

STUDENT K: I think they were very successful; because "I'm practicing and...perfect practice makes perfect" When I get it right and perfect... I know I will be ready for a competition.

STUDENT L

(Violoncello Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude, the repertoire excerpts, or the scale?

STUDENT L: I pretty much just started from the beginning, and then when I hit a rough spot I would go over that.

2. INTERVIEWER: What were you thinking about/focusing on while you were practicing?

STUDENT L: I was doing fingerings for some of the difficult spots to make it easier. I was thinking about all the uh... the key signature and all the naturals [and] accidentals.

3. INTERVIEWER: Why did you decide to use or not use a metronome?

STUDENT L: I kinda use myself as metronome. Other than that I really don't know the tempo it should be going at... Sometimes [I use a metronome] to get the beat down. Once I do that, then I'll take the metronome away...

4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?
STUDENT L: I just kinda took a guess... I kinda heard these songs before... And – *Allegro*... just over the years I have [learned] a tempo for that.
5. INTERVIEWER: How much time did you take to warm up before each practice session?
STUDENT L: None [because of coming straight from orchestra].
INTERVIEWER: What about typically at home, and what do you do?
STUDENT L: 5 minutes – scales and etudes
6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?
STUDENT L: I just go to extremes... forte [versus] piano is really small.
7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?
STUDENT L: Would slow it down and just work it out.
8. INTERVIEWER: How did you practice intonation?
STUDENT L: I just went over it slowly trying to get what my ear thought was right.
9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?
STUDENT L: Yes. I've grown to know remember and if I don't get it I'll start over again, a passage.
10. INTERVIEWER: How successful or not successful do you think your practice sessions were?
STUDENT L: Moderate...

STUDENT M

(Violoncello Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude, repertoire excerpts, or scale?
STUDENT M: Actually what I do is I first practice the first the whole thing and then the spots that I have trouble on, I just practice those more ... I prefer just playing the whole thing through once before I start working on my trouble spots.
2. INTERVIEWER: What were you thinking/focusing on while you were practicing?
STUDENT M: Well, basically just focusing on having a good tone, and honestly I was just enjoying myself.

3. INTERVIEWER: Why did you decide to use or not use a metronome?
STUDENT M: Well, first of all I don't have a metronome with me right now, but when I usually practice, I use a metronome if I feel like I'm rushing or my beat is shaky or irregular. And also, for slow practice, I have to use a metronome; otherwise I start rushing.
4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?
STUDENT M: Usually I practice a little bit slower than what I would actually do, because usually when performing or something, I'll go faster... so I try to practice a little slower.
5. INTERVIEWER: How much time did you take to warm up before each practice session?
STUDENT M: I was already warmed up for this one because I had already been playing. But normally I tune and then I'll play a scale or something. Maybe like a few minutes or so.
6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?
STUDENT M: Look at the dynamics in my part and I try to incorporate them. And my cello teacher likes to add dynamics in and I'll make sure to do those too.
INTERVIEWER: Is there something you can do specifically on your instrument to make them even better?
STUDENT M: Adjust the bow speed, bow weight, contact point, etc...
7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?
STUDENT M: Didn't have any... Should I talk about them in general?
Well, if I have those kinds of things, what I'll do is I'll practice it slow and I'll practice it separate, like all the notes are separate first and make sure you get all the shifts...
8. INTERVIEWER: How did you practice intonation?
STUDENT M: If I have an intonation issue, I'll usually just practice it slower and I'll listen specifically for the intonation... Because usually when I practice I'm not paying attention to how in tune my notes are.
9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?
STUDENT M: No, usually I only think about the key signature when I'm first getting the music.
10. INTERVIEWER: How successful or not successful do you think your practice sessions were?

STUDENT M: Well, see when I practice at home I usually don't spend more than a few minutes on region music because I'm focusing on other music... So these sessions where I was forced to practice region music... I was able to catch things that might occur in an audition or something and that wouldn't have happened at home because I don't spend this much time on region music at home, [so] it helped me.

STUDENT N
(Violin Student)

1. INTERVIEWER: How did you decide where to start practicing in the etude, excerpts, or even the scale?
STUDENT N: Usually I start at the beginning of the piece and go through it, and then see where the problems are... Go back to where I messed up and from there I try to fix all the mistakes.
2. INTERVIEWER: What were you thinking about or focusing on while you were practicing?
STUDENT N: Intonation; Like having all the notes in tune, and the distance between fingers and positions (she demonstrates with her left hand on the fingerboard with her violin in her lap). But mostly playing in tune. I try to memorize where the fingers go so that the next time I won't make a mistake.
3. INTERVIEWER: Why did you decide to use or not use a metronome?
STUDENT N: Because I don't like playing with the metronome. [But] I play with the metronome at the end after I have the piece perfect. With the metronome I can't really follow when I don't have perfect; it's hard to go with the metronome.
4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?
STUDENT N: I began by playing the notes slowly, like that's how to start, and then throughout the practice session I try to speed up the tempo if I get the notes right...
5. INTERVIEWER: How much time did you take to warm up before each practice session?
STUDENT N: I came straight from class to orchestra...
At home it depends. Sometimes I do it for 30 minutes. I play scales for... but if I don't have that much time to practice I just go straight to the music.
6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?
STUDENT N: If I want to play loud I put more pressure and go closer to the bridge ... I guess it's mostly like where the bow goes, like the location of it on the strings.

7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?
STUDENT N: I played it slowly, and then I tried to figure out what goes wrong when I play it fast and I try to fix it.
8. INTERVIEWER: How did you practice intonation?
STUDENT N: When I hear the notes I know if it's flat or sharp... if I'm not familiar with the piece I may not know if it is in tune... depends on the situation...
9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?
STUDENT N: Not really...
10. INTERVIEWER: How successful or not successful do you think your practice sessions were?
STUDENT N: Not very good. Why? Well because there was a time constraint ... I try to go through the piece...

STUDENT O

(Violoncello Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude?
STUDENT O: I started at the beginning... well, it was the easiest place to start.
INTERVIEWER: What about the excerpts?
STUDENT O: I actually started practicing them here at Clark in June...
INTERVIEWER: Why did you pick the excerpts that you chose?
STUDENT O: I chose the most challenging out of all of them and I also went in order... I started with the more challenging ones and worked my way to the easier ones.
2. INTERVIEWER: What were you thinking/focusing on while you were practicing?
STUDENT O: the music...
INTERVIEWER: In what way?
STUDENT O: I was most worried about the rhythm and the spiccatos; well, not spiccatos, I should say brush strokes in the sixteenth notes – my up strokes, the up bows, they didn't have as much force as my down bows so it was uneven and I wasn't directing most of the weight into the instrument... I was directing it more horizontally than vertically and I needed to focus more on that.
INTERVIEWER: What about in the excerpts, what were you thinking?
STUDENT O: I was thinking more about the music and how it should sound in musical terms and the composer – whether it should be heavy or light and style of music; and I was also worried about the rhythm because I'm always off on the sixteenth notes.

INTERVIEWER: Ok. What were you thinking about when you were practicing your scale?

STUDENT O: I was trying to work on my bow, to keep it straight, and the contact point as I moved up on the fingerboard as my string length got shorter. It's kinda hard to do it when I don't have a mirror in front of me; that's what I usually practice in front of. And intonation in the high notes when coming back down... 'cause I have a habit of lifting my fingers when I'm up there...

3. INTERVIEWER: Why did you decide to use a metronome?

STUDENT O: my teacher makes me... It helps with rhythm; once you have your rhythm down, everything else comes. In my opinion, intonation and rhythm are the primary things that you need to look at... And I've gotten better at rhythm since I've been studying with him, and metronomes help with everything because if you're not counting right then your not... it just sounds weird..."

4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?

STUDENT O: I thought about my previous practice session and what I was missing or what I wasn't doing right, so I started at a slower tempo in order to catch my mistakes, and go back and repeat the places where I messed up and try different ways to make it sound better. So, I started off at a slower so I could think about it as I was playing, then as I got better at the phrase I would speed up the metronome until I'm at full tempo.

5. INTERVIEWER: How much time did you take to warm up before each practice session?

STUDENT O: These practice sessions I only had 5 minutes. And when I'm practicing at home I practice scales out of the Galamian Scale routine book; I practice the scale itself for about 15 minutes w/metronome on 52. I do two notes per bow, then I start doing eighth and sixteenth notes per bow and then it goes on from there, and then I have a rhythm part of the book and I play the rhythms with the scales, and I practice that for about another 15 minutes.

6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?

STUDENT O: I wasn't practicing any dynamics... I have a bad habit of not reading my dynamics all the time... Right now I wasn't worried about the dynamics even though I should have been... But for the second excerpt I knew it was piano...

INTERVIEWER: How did you create that piano?

STUDENT O: applying less bow weight. People have the misconception of playing closer to the fingerboard, but when you also have a shorter string length you can't do that... so you have to... it's not always playing closer to the fingerboard, that also changes the color of the piece, so you have to lessen your bow pressure... so you also have to be conscious of your string length.

7. INTERVIEWER: How did you practice any difficult slurred passages in the All-

Region etude, repertoire excerpts, or scale?

STUDENT O: The etude is probably the most difficult out of all the stuff. Slurs? Actually there aren't many slurs but there were a lot of ties. When ever I'm practicing slurs it depends on the bow speed that I'm using, and so if it is a slow bow speed, I'll move closer to bridge and if it faster bow speed I'll move closer to the fingerboard and so I have to be conscious of the string length."

8. INTERVIEWER: How did you practice intonation?

STUDENT O: ...I did use the "A" on here [points to tuner] for one of my excerpts... 'cause it always had the high 'A' that I always thought was flat, and it was. Also, if there's an open string next to a note... if I'm playing a D on the 'A' string, I can play it with the open 'D' if I think it's out of tune. I can also listen to the notes that come before and after it... And sometimes I practice with a tuner, but then I also think about the key that my piece is in and [can] place notes higher or lower than they actually are.

9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?

STUDENT O: Yes, I always think about key signatures. In Russian Eastern Overture I already knew the key and was watching out for accidentals.

10. INTERVIEWER: How successful or not successful do you think these short practice sessions were?

STUDENT O: I couldn't get a lot done because, yeah, it was only 5 minutes – could have gotten more done if I'd taken more smaller sessions instead of just trying to get through it all.

STUDENT P
(Violin Student)

1. INTERVIEWER: How did you decide where to start practicing in the etude, excerpts, or even the scale?

STUDENT P: I run through it once; and so any problems areas I go through them and then I go back and I do it over again.

2. INTERVIEWER: What were you thinking about or focusing on while you were practicing?

STUDENT P: Intonation and the rhythm.

3. INTERVIEWER: Why did you decide to use or not use a metronome?

STUDENT P: I don't think it really helps me. I've tried using it, but it doesn't really make a difference...

INTERVIEWER: Why is that?

STUDENT P: I usually play by feeling; an internal metronome for me...

INTERVIEWER: What benefits might it have?

STUDENT P: Helps you not to rush.

4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?
STUDENT P: Like for the etude, I tried to play each note clearly so it was slightly slower. I hadn't even tried speeding up until the sectional person came, because my teacher told me not to speed up yet because I needed to get intonation first. So I tried that when he came and it was interesting... I was actually surprised that I could speed up.
5. INTERVIEWER: How much time did you take to warm up before each practice session?
STUDENT P: I usually do five minutes of scales and double stops. (Teacher has her do them.)
6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?
STUDENT P: I haven't tried any with the etude yet, but *The Montagues and the Capulets* I tried to get more bolder. I tend to be timid beginning.
INTERVIEWER: How do you physically practice that in the music?
STUDENT P: Like in *The Montagues and the Capulets* I try to retake so there is more of an accent.
7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?
STUDENT P: I did it separately for the notes first and then tried to slur it.
8. INTERVIEWER: How did you practice intonation?
STUDENT P: If I think a note is wrong, I try to do it a position below it... And sometimes I use my tuner... or harmonics...
9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?
STUDENT P: My teacher pointed them out to me at beginnings, but I never really registered it.
10. INTERVIEWER: How successful or not successful do you think your practice sessions were?
STUDENT P: Practice is practice. Any little bit helps because I've been really busy... Practice is good.

STUDENT Q
(Violin Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude?

STUDENT Q: Since I've been playing it for a while – I kinda know like my trouble spots as it is... I have most of the notes and the rhythms and that kind of stuff, but it's certain shifts and stuff, so I'll just keep doing it slowly, and I know exactly which ones need to work on... I didn't used to practice like this, but when they say practice that parts you don't know as well and practice slowly, well it actually works! So I started working out the kinks...

2. INTERVIEWER: What were you thinking/focusing on while you were practicing?

STUDENT Q: Today, I was focusing on *The Montagues and the Capulets*, the dotted eighth sixteenth pattern. I can do it when I am really consciously thinking about it, but when I'm not, I start doing triplets, and shifts. I can do the shifts, but when I do them you can really hear the slide...

3. INTERVIEWER: Why did you decide to use or not use a metronome?

STUDENT Q: I like metronomes because they keep you on beat... Because if you don't have an internal clock you can start speeding up without consciously realizing it. But on the other hand I don't like metronomes... because I don't feel like... I feel like it makes music too technical... [Music is] expressing emotions and stuff like that...

I actually never practice with a metronome unless my teacher or Mrs. L says, specifically "this spot" practice with a metronome... It ends up helping...

4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session

STUDENT Q: I tend to start slowly and then progress the speed, because that actually works... It's funny because they tell you things... then you do it and it actually works.

Or I start off at a comfortable place, not the actual tempo I'm going to take it, but at a speed where I can play everything... I tend to take things [slower] than when I'm with the orchestra.

5. INTERVIEWER: How much time did you take to warm up before each practice session?

STUDENT Q: However long we were in orchestra I guess...

INTERVIEWER: What about typically?

STUDENT Q: Oh, probably about half an hour – I just fiddle around... exercises, string crossing, tetrachords

6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?

STUDENT Q: I actually haven't started practicing dynamics yet... Because dynamics are like the easiest thing for me to get... It's easier to make it that way once you have everything else.

7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?

STUDENT Q: I practiced it separately.

8. INTERVIEWER: How did you practice intonation?

STUDENT Q: If it's a high note – an octave or two below to get that in my head first. Sometimes I bring my tuner... but it's really slow; it doesn't pick it up very quickly, so by the time you change notes it's just telling you what your last note was, or something like that...

9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?

STUDENT Q: No; I guess once you know the music you don't really consciously think about it... only when I've just gotten the piece and once you know the piece, you know what the notes should sound like.

10. INTERVIEWER: How successful or not successful do you think your practice sessions were?

STUDENT Q: I think they were actually pretty successful – last year I didn't practice at all – This year I've actually tried... I feel a lot more confident this year.

STUDENT R
(Violin Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude, the repertoire excerpts, or even the scale?

STUDENT R: I usually like to play through it first then find my weaker spots and go over my weaker spots.

2. INTERVIEWER: What were you thinking/focusing on while you were practicing?

STUDENT R: Mostly my intonation – reaching the high notes and fingerings.

3. INTERVIEWER: Why did you decide to use or not use a metronome?

STUDENT R: Because I don't like the metronome; I can never work with it... I need it but I have timing and it always messes me up... Sometimes I do [practice with it].

4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?

STUDENT R: I usually use different tempos. Sometimes I'll try to play it the tempo I'm used to playing it – Or I'll play it up to speed and then slow it down to work on some few parts and then try to speed it up again.

5. INTERVIEWER: How much time did you take to warm up before each practice session?

STUDENT R: [She came straight from orchestra class].

INTERVIEWER: What do you typically do at home?

STUDENT R: I don't usually practice very much at home. [But] when I know I'm going to practice I usually practice for about an hour. I usually do my easier stuff first to warm up my fingers and then move on to harder stuff.

INTERVIEWER: How long do you do that?

STUDENT R: For about 15 minutes I would guess...

6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?

STUDENT R: I don't think there was very many dynamics in here... But sometimes I really don't remember them. I [usually] practice that during orchestra.

INTERVIEWER: What could you do on your instrument to specifically practice dynamics?

STUDENT R: A lot with the bow and my pressure on the bow and how it was... if it was closer to the fingerboard or closer to the bridge.

7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?

STUDENT R: I usually kind of break it down, and if it is like six, first I'll do separated and then two, do two notes in a slur and then start moving up to the full slur.

8. INTERVIEWER: How did you practice intonation?

STUDENT R: I have a fairly decent ear and if there's a note that I can't seem to find, I'll try it with a lower octave.

INTERVIEWER: Do you ever use a tuner?

STUDENT R: No. I've done that once to find a note, but no.

9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?

STUDENT R: Yes; also the accidentals...

10. INTERVIEWER: How successful or not successful do you think your practice sessions were?

STUDENT R: I think they were pretty... They were successful. There was a fingering in Russian Easter Overture that I discovered that helped me a lot.

STUDENT S

(Violin Student)

1. INTERVIEWER: How did you decide where to start practicing in the etude, excerpts, or even the scale?

STUDENT S: The part I have the most trouble on... the part that I practice slowest

2. INTERVIEWER: What were you thinking about or focusing on while you were practicing?

STUDENT S: What my teacher told me in our last session. It's a lot about posture, keeping relaxed; my bowing and stuff. And also fingerings and little exercises he tells me to do; different rhythms – varying the rhythm to practice that way (She sings straight eight notes, then a repeated dotted eighth sixteenth rhythm to give an example).

3. INTERVIEWER: Why did you decide to use or not use a metronome?

STUDENT S: I guess because sometimes it distracts me when I'm concentrating on the notes. Or like my posture, I'm not really focusing on the final results yet...

4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?
STUDENT S: I did them kinda slow 'cause I want to make sure my mind has time; it's better to get all the right notes then practice it fast and get 'em all wrong. That's what my teacher's always telling me.
5. INTERVIEWER: How much time did you take to warm up before each practice session?
STUDENT S: The 5 minutes that you gave us... (She is referring to the scale practice session. She came directly from orchestra.)
INTERVIEWER: What about typically?
STUDENT S: Sometimes I practice open strings for a few minutes to like get the bowing, but I don't usually do a lot of scales. Not unless I have to.
6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?
STUDENT S: I played them... My focus isn't really on the dynamics yet; it's more like getting the notes...
INTERVIEWER: If you were to practice dynamics, what would you do physically on your instrument?
STUDENT S: To make it louder you have to make the bow heavier and I play longer (with more bow)... And then lighter; sometimes I get a little off the string when I play softer.

And you have to move your bow toward the bridge... to make it louder.
7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?
STUDENT S: Slowly, then I tried to figure out was wrong when I play it fast and I try to fix it.
8. INTERVIEWER: How did you practice intonation?
STUDENT S: Well, when I did it wrong I didn't completely start all over, I would just kind of start from the measure or a good starting point... that particular portion...

Sometimes I would just play it again. Sometimes I would take it a little bit slower.
9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?
STUDENT S: In the music, but not really like, at random.
10. INTERVIEWER: How successful or not successful do you think your practice sessions were?
STUDENT S: Not very successful; just 'cause it takes me a lot longer than five minutes to really be able to get into it. It was just kinds like, really shallow...

STUDENT T
(DOUBLE BASS STUDENT)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude, excerpts or even scale?
STUDENT T: Well, first I would try and do a run through and then go back to the spots where I had a lot of trouble.
2. INTERVIEWER: What were you thinking/focusing on while you were practicing?
STUDENT T: Trying to find the note fast, especially when I was shifting; and intonation.
3. INTERVIEWER: Why did you decide to use or not use a metronome?
STUDENT T: I decided not to use a metronome because I'm really just practicing for the first time these songs, and so I didn't want to be a stickler about my tempo until I can actually get the notes in tune.
4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?
STUDENT T: I didn't really think about tempo I was doing; whichever was most comfortable for me.
5. INTERVIEWER: How much time did you take to warm up before each practice session?
STUDENT T: I just took that five minutes...
INTERVIEWER: What about normally?
STUDENT T: Normally I'll do about ten minutes and I'll do a couple of scales that have to do with the piece I'm doing, and then I'll do a warm-up; kind of like what Mrs. N (orchestra director) has us do.
6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?
STUDENT T: For now I just did mezzo forte, and if it had like pianissimo, I would sort of show the different...
INTERVIEWER: How would you do that?
STUDENT T: With my bow I would go higher on the fingerboard and wouldn't put as much weight on my bow.
7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?
STUDENT T: I would go over it a couple of times; and normally what I do is I'll just focus on those notes that I'm slurring; and then first I'll do is I'll break it up slowly. Then when I take it faster & faster I begin to slurring them.
8. INTERVIEWER: How did you practice intonation?
STUDENT T: First finding the note, so I can recognize where it is on my bass and then just keep on running over that measure – and getting familiar with where I'm going to put my finger...
9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?
STUDENT T: No.
INTERVIEWER: Why?
STUDENT T: 'Cause it's not a habit of mine. I need to work on that.

10. INTERVIEWER: How successful or not successful do you think your practice sessions were?

STUDENT T: I think they were successful; now I recognize what the song is supposed to sound like... and I can have it in my head...

STUDENT U
(Violin Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude, repertoire excerpts, or scale?

STUDENT U: I start on the etude because it was a familiar kind of sound... I just started right at the beginning. I tried to play through it at least once.

2. INTERVIEWER: What were you thinking/focusing on while you were practicing?

STUDENT U: Some of its distraction; sometimes I get distracted and look away; I need to pay more attention... Like now, when I was working *Russian Easter Overture*, because I was more familiar with it I could "journeying away" to a certain extent.

3. INTERVIEWER: Why did you decide to use or not use a metronome

STUDENT U: Habit. The teacher that I'm with now really emphasizes [counting]. [But] it's not a habit for me... I usually don't use [the metronome].

4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session

STUDENT U: I guess I could say that I am a violinist that learns by ear, so when I play it in the orchestra and if she (orchestra director) sets a tempo, I pretty much keep it the same. And there were times when I'm drilling [that I take a slower tempo].

5. INTERVIEWER: How much time did you take to warm up before each practice session?

STUDENT U: No. I don't do that. When I did the scale... But today I just went right into it. Doing [scales or etudes] in the beginning, that can help, but truly I've not been good about doing a warm-up.

6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?

STUDENT U: When I'm going through for the first time I usually don't... I don't notice dynamics, but I notice when I'm playing at school or in [Youth Orchestra], and can learn from that.

7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?

STUDENT U: I can apply that to when I'm working on scales and my teacher has me do four to a bow or three to a bow or five to a bow... Doing it my head, I can't; I'm forced to write stuff down... Working with different slur combinations... it helps, I'm sure.

8. INTERVIEWER: How did you practice intonation?

STUDENT U: *Montagues and Capulets* has really hard pitches and accidentals – I first have to hear it I guess. That’s one of the things I think I do have. I have an ok ear. I can check it and fix it. If I was playing it out of tune, I would play it in 1st position...

9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?

STUDENT U: No; I guess once I’ve heard it – this is when I need to play sharps or flats...

10. INTERVIEWER: How successful or not successful do you think your practice sessions were?

STUDENT U: Here I felt – I was working on good technique because I was being videotaped... I think playing this stuff in orchestra and then being pulled aside, I think it was more effective.

STUDENT V
(Viola Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude, excerpts or even scale?

STUDENT V: Ok. Well, for the region I picked the part that I needed the most work on, so I could practice it more because if I went home I would probably not. I only did two parts of the *Russian Eastern*...

For the scale I go all the way up on the C string and then the D string...

2. INTERVIEWER: What were you thinking/focusing on while you were practicing?

STUDENT V: I was thinking... “Oh God, someone’s going to hear this!” I don’t really know if I think while I’m playing; I think I just play. I look and I just do it; I’m kinda weird like that... When I’m playing I’m either just doing the notes or thinking about something completely irrelevant. I was thinking, “Should I start practicing in October?” – thinking about that in my mind [and planning out my practice].

INTERVIEWER: But that’s still thinking about practicing...

STUDENT V: Yeah... But it’s not the music...

3. INTERVIEWER: Why did you decide to use or not use a metronome?

STUDENT V: I never use a metronome. I was never taught that way... It’s probably because I grew up with music, because my dad played the piano... and I started when I was four. I was just practice and I learned more just to listen to it and try to tell how I’m doing by listening to it.

4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session

STUDENT V: I almost always go the same tempo that I know is the right tempo unless there’s just a measure that I’m trying to figure out, then I slow it down...

5. INTERVIEWER: How much time did you take to warm up before each practice session?

STUDENT V: None.

INTERVIEWER: What about normally?

STUDENT V: Typically I don't. I tune... Does that count?

6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?

STUDENT V: Oh. I could start paying attention to that. I don't really do that... 'Cause the whole not thinking thing.

INTERVIEWER: But if you were to practice dynamics how would you do that, specifically on your instrument?

STUDENT V: Press harder; I could use longer bows.

7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?

STUDENT V: What I usually do to actually get the slurs is I just play it and practicing it and practicing it until I know it without the slurs and then I just add in the slurs.

8. INTERVIEWER: How did you practice intonation?

STUDENT V: I guess it would help to know what it is supposed to sound like.

'Cause I don't really know... The last time that I heard this was during string camp, which was the first week of summer and Mrs. N (orchestra director) gave us the CD of how it's supposed to sound, but it doesn't play for some reason...

INTERVIEWER: What else? Was there something you did in your practice sessions?

STUDENT V: If I messed up I did it again.

9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?

STUDENT V: I was thinking about it. I'm not sure if it followed through. I was thinking about it before, not during...

10. INTERVIEWER: How successful or not successful do you think your practice sessions were?

STUDENT V: The etude; not at all. The Region excerpts – not really; for some reason I was having an off day I guess. Like, I was practicing in there and it sounded a thousand times better. Why didn't I do that before? There were people around me listening; it should have been the same as [with the camera]. The scale, too; that wasn't that great. Maybe it was just that day [or days] or this room...

STUDENT W

(Violoncello Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude, repertoire excerpts, or scale?

STUDENT W: For the etude; if I remember right I started on the 16th note passage and so, worked through because I think that's the area they probably might ask for... That's probably the area that needs to be worked over the most,

because it needs to be clean and up to speed a little bit. It's faster than the rest of the beginning of the excerpt.

[Repertoire] I wanted to run through stuff and then if I found something wrong I stop on that one and I fix whatever I thought was wrong... I ran through stuff and once it was ok I ran through something else.

[Scale] I don't really remember; I probably did the upper octave and worked through that. I probably did different rhythms and bowings... I don't usually spend 5 minutes on a scale.

2. INTERVEIWER: What were you thinking about or focusing on while you were practicing?

STUDENT W: Intonation; probably not rhythm now because I've worked on it already... getting more precise; style... putting all that stuff into there... My private teacher has me practice on these things, too.

3. INTERVEIWER: Why did you decide to use or not use a metronome?

STUDENT W: Not use one because I didn't have one. If I had something I'd probably go through stuff slow, but I usually keep the tempo about the same. I usually keep a steady beat internally so it's ok... Occasionally when there's passages to work over; at the beginning. When I have them down and I want to up the speed I go a couple notches [at a time]; that's what I use it for.

4. INTERVEIWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?

STUDENT W: Since I decided to run through stuff – I wanted to play it at the tempo I'm going to play it at region, and then if there's things that are wrong, depending on what they are, say intonation or rhythm or not getting the stuff right, then I slow it down. If it's just intonation then I usually run through the sections that are wrong.

5. INTERVEIWER: How much time did you take to warm up before each practice session?

STUDENT W: [Not much because he was coming out of orchestra.] Typically sometimes it's a scale, sometimes I just go right in and that's my warm-up right there.

INTERVEIWER: How much time is that typically?

STUDENT W: Not much at all, I'd say less than 5 [minutes]. I can't tell you honestly what it is; I don't really keep track.

6. INTERVEIWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?

STUDENT W: I guess you do it with your playing. I know I didn't focus on that – That's kind of one of the last things... I know I didn't get to it in any of these 5 minute sessions...

Once the rhythms down and I've got it ok... then start focusing on other things... You want it to be double forte here and piano here...

INTERVEIWER: What do you need to do typically on your instrument to practice those things?

STUDENT W: Move up and down; my teacher calls them channels. You move closer to the bridge to get louder...

7. INTERVEIWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?

STUDENT W: Not a whole lot of slurs in this repertoire; not sure – going for notes sometimes I do separate bowings. But then when I up the tempo and I have the notes, I try to get all the slurs. I haven't really come across a whole lot of tough stuff, I guess... So I'm not sure how I would practice that.

8. INTERVEIWER: How did you practice intonation?

STUDENT W: You check references that you know, like first position, open strings; check it against everything and make sure your cello is in tune...

9. INTERVEIWER: Were you at any point during the videotaped practice sessions thinking about key signatures?

STUDENT W: No. Flat out, probably no. In the beginning of course it helps... Like if I had just starting touching the music, then I might say, ok, what key is this?

Do some scales... major and minor; mark stuff... getting intonation.

10. INTERVEIWER: How successful or not successful do you think your practice sessions were?

STUDENT W: On a scale of one to ten?

INTERVEIWER: Sure.

STUDENT W: Not that great; Probably just ran through it... there were some things my teacher went over just a few days ago that I need to work... probably be like a 4, I guess. *The Montagues and the Capulets* I'd say is pretty good, I'd say it's a 7 or 8 – we're working on having accents in and doing short, tight vibrato at the beginning of the note I guess was able to accomplish goals; *Russian Easter Overture*, we changed a couple fingerings in the high solo passage, so and it's really easy, it's not that bad – did go over it...overall a 6.

STUDENT X

(Viola Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude, repertoire excerpts, or scale?

STUDENT X: I usually start with the parts that I have the most trouble with. A warm-up... I will usually start with a scale; then I will go into the parts that I need to practice and then go and run through it try to smooth it out.

2. INTERVIEWER: What were you thinking about or focusing on while you were practicing?

STUDENT X: Usually I focus on getting the intonation correct first... by going slower. I don't focus on tempo as I do intonation first, and then when I have the notes down then I will go back focus on the rhythms and then try and speed it up.

3. INTERVIEWER: Why did you decide to use or not use a metronome?

STUDENT X: I don't know. Typically metronomes sound... I can never get with it... I don't like 'em. There's a new one that coming out that I do like; the pulsing one and I want to get one of those. I've tried it and I like it. I don't like the beeping... I will use a tuner to check notes. If it's a really slow piece I will use a metronome to make sure I don't speed up.

4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?

STUDENT X: I start with something slow to double check the notes and then I'll speed it up a little, check the rhythm and then I continually progress speeding it up a little until I feel comfortable, getting a good amount of notes, getting the rhythm right... to a playable tempo.

5. INTERVIEWER: How much time did you take to warm up before each practice session?

STUDENT X: 15 minutes or so; usually I spend 20 to 30 minutes – scales rhythms and arpeggios, shifting exercises...

6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?

STUDENT X: The way I usually do dynamics, and this is how I've been taught, is right before you crescendo you get quieter so it's more noticeable...

INTERVIEWER: What do you do on your actual instrument to practice those things?

STUDENT X: Play closer to the bridge when you want it louder. And if I want it quieter, I'll move a little bit away and lighter on the bow.

7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?

STUDENT X: I play it without the slurs; then I will play odd rhythms, like slur every three, play this one, slur the next, repeat and then I'll go back and play it with the slurs and speed it up from there...

8. INTERVIEWER: How did you practice intonation?

STUDENT X: [Uses a tuner at home sometimes.] I'll match it with a note that I know I have in tune,,, like an open string or first position for reference or a harmonic.

9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?

STUDENT X: Yes; look at the key signature before, maybe the fingering that I need and look over it to see if there's shifting... Finger patterns in the shifts...

10. INTERVIEWER: How successful or not successful do you think your practice sessions were?

STUDENT X: On a scale of 1 to 10, probably about a 7. It's good to go over it. I probably need a little bit more time to work on things.

STUDENT Y
(Violin Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude, excerpts or even scale?
STUDENT Y: I usually choose the hardest part – to get it out of the way so I can have the easier stuff afterwards. The hardest part was the intonation; how high it is.
2. INTERVIEWER: What were you thinking/focusing on while you were practicing?
STUDENT Y: I was trying imagine the sounds in my head... I would think of the lower ones and the higher ones, like the octaves
3. INTERVIEWER: Why did you decide to use or not use a metronome?
STUDENT Y: I was just practicing the intonation. I wasn't really working on the beat yet, and for the etude there's not much rhythm work in there.
4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session?
STUDENT Y: I just go slow because I have to in order to get the right notes, and once I get them I just go a little faster each time.
5. INTERVIEWER: How much time did you take to warm up before each practice session?
STUDENT Y: [She came straight from orchestra]
INTERVIEWER: What would you do normally then?
STUDENT Y: I'll play a couple of scales; easy arpeggios to get your mind set...
6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?
STUDENT Y: I didn't practice the dynamics...
INTERVIEWER: Why is that?
STUDENT Y: I hadn't gotten in some of the more basic stuff yet.
INTERVIEWER: If you were to practice the dynamics what could you do?
STUDENT Y: Sometimes I like to color code the paper, like highlight – red would be the loudest – yellow the softest – so you can see it...
7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?
STUDENT Y: First I do them with separate bowings and then slur them afterwards...
8. INTERVIEWER: How did you practice intonation?
STUDENT Y: I imagine it. [I think] from playing the scales so much that you kinda know how it's supposed to sound... so you can sing it in your head.
9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?
STUDENT Y: Yes, because of the half steps and the whole steps... I was thinking the sharps in there.
10. INTERVIEWER: How successful or not successful do you think your practice sessions were?

STUDENT Y: They seem... not really good... I just the music... I haven't been able to practice at all this year, so it's not going too well. If I had put more thought into it instead of just playing, I could have made more use of my time...

STUDENT Z

(Violoncello Student)

1. INTERVIEWER: How did you decide where to start practicing in the All-Region etude, repertoire excerpts, or scale?
STUDENT Z: I like starting from the beg at first, and I try to play it through all the way, the best that I can, then go back and focus on points that I had trouble with or places where I messed up.
2. INTERVIEWER: What were you thinking/focusing on while you were practicing?
STUDENT Z: I was focusing on how well I can play it now – and I how well I think I can play it after I practice it in the future with the time that I have until auditions.
3. INTERVIEWER: Why did you decide to use or not use a metronome?
STUDENT Z: Well, I don't have a metronome, but I think I can keep rhythm pretty well and I don't like to be set to a particular rhythm when I'm practicing. I have one at home... But I don't like setting myself to a rhythm because I try to play it faster sometimes or I slow down if I'm having trouble with it...
4. INTERVIEWER: How did you decide what tempo you were going to use to begin, engage in, and end each videotaped practice session
STUDENT Z: I tried to start at a medium speed; just to gauge how well I could play it. And if I thought I could play it faster I would play it faster, and if I had trouble with it, slower...
5. INTERVIEWER: How much time did you take to warm up before each practice session?
STUDENT Z: Just orchestra. At home, sometimes I don't warm-up; sometimes I just start playing...
6. INTERVIEWER: How did you practice any dynamics in the All-Region etude or repertoire excerpts?
STUDENT Z: I try not to focus on dynamics and crescendos and stuff like that until I can play the rhythms and the notes first...
INTERVIEWER: Is there anything you can do specifically to practice those things once you've learned the notes?
STUDENT Z: Sometimes I circle them or highlight them to make them more noticeable. And I play... I just make sure that I know where they are and change my bow.
INTERVIEWER: How?
STUDENT Z: If it's louder I'll play more forcefully with more pressure and if it's softer I'll lighten up.

7. INTERVIEWER: How did you practice any difficult slurred passages in the All-Region etude, repertoire excerpts, or scale?
STUDENT Z: Any time I come across a difficult passage, I usually just slow down... Sometimes I play it really slowly and then gradually get faster.
8. INTERVIEWER: How did you practice intonation?
STUDENT Z: If I missed a few notes I'd go back and make sure I know what the notes sound like so I can play it right the next time.
9. INTERVIEWER: Were you at any point during the videotaped practice sessions thinking about key signatures?
STUDENT Z: Yes, well, I usually just look at it once and then I will know what to play unless it changes. And if the key signature changes, I'll circle it and make sure I know where it is.
10. INTERVIEWER: How successful or not successful do you think your practice sessions were?
STUDENT Z: I improved, so I think they were at least a little bit successful.

APPENDIX G

APPROVED SCRIPT READ TO STUDENTS

Approved Script Read to Main Study Students:

Explaining self-efficacy and the string student self-efficacy study

Jennifer Cahill Clark, a PhD student from UNT and professor from UTSA, would like to invite you to help with a special project. She is investigating how you believe in your capability to play your string instrument as well as your musical backgrounds. If you would like to participate, I will be giving you an important consent form that you will need to get signed by your parent or guardian. I want to let you know that by no means will participation in this project affect your grade in orchestra. Your participation is truly on a volunteer basis, and no one will receive any form of favoritism from either Mrs. Clark or me. We would truly appreciate your help and time, but do not want you to feel obligated in any way. Next week I will take up the consent forms and those of you who choose to do so will be invited to fill out a questionnaire asking you about your belief in your ability to play your primary string instrument, along with a few other questions about your musical experiences, such as whether or not you take private lessons or how long you've been playing your instrument.

APPENDIX H
QUESTIONNAIRE DIRECTIONS

Questionnaire Directions Read to Student Participants

Thank you for agreeing to participate in the first part of this string education study. You have been given two forms. Place your name and the number of your questionnaire on the answer-sheet, but do not put your name on the questionnaire. There are several different types of questions on the questionnaire. There is one question asking for your gender, four questions asking you for yes or no responses, two questions asking you to give a specific number in years or hours, and then the self-efficacy questionnaire portion. When filling out this portion, read the directions carefully and remember that '0' is if you believe that you 'cannot do at all' and '10' is if you are 'certain that you can do'.

APPENDIX I
PILOT EXPLANATION AND DIRECTIONS

Explanation and Directions Read to Students
For the Pilot

I am Jennifer Cahill Clark and I would like to invite you all to help me with a special project. I am investigating how you believe in your capability to play your string instrument. If you would like to participate, I will be giving you an important consent form that you will get signed by your parent or guardian. I want to let you know that by no means will participation in this project affect your grade in orchestra, either negatively or positively. You do not have to participate. It is truly on a volunteer basis, and no one will receive any form of favoritism from either [your orchestra teacher] or me. I would truly appreciate your help and time, but do not want you to feel obligated in any way. Next week I will take up the consent forms and those of you who choose to do so will be invited to fill out a questionnaire asking you about your belief in your ability to play your primary string instrument. Once those questionnaires are complete, I will ask a small number of you to fill out another consent form to participate in the second portion of the study. You will be asked to videotape three 15-minute practice sessions, practicing scales specific to your instrument, which I will explain later (for example, violins will work on G Major three octaves and C Major three octaves, while violas will practice C Major three octaves and F Major three octaves), and a small segment of your current orchestra repertoire. I will also interview you after each practice session to ask you about what you were thinking during your practice sessions. Once the study is complete, all information will be kept confidential and no one's name or identification will be used in any way. Thank you so much for your time.

REFERENCES

- Anderson, E. L. (1994). The effect of parental involvement on academic achievement. *Dissertation Abstracts International*, 55 (02), 251A. (UMI No. 9418757)
- Arnold, J. A. (1997). A comparison of attributions for success and failure in instrumental music among sixth-, eighth-, and tenth-grade students. *Update: Applications of Research in Music Education*, 15 (2), 19-23.
- Asmus, E. P. (1985). Sixth graders' achievement motivation: Their views of success and failure in music. *Bulletin of the Council for Research in Music Education*, 85, 1-13.
- Asmus, E. P. (1986a). Achievement motivation characteristics of music education and music therapy students as identified by attribution theory. *Bulletin of the Council for Research in Music Education*, 86, 71-85.
- Asmus, E. P. (1986b). Student beliefs about the causes of success and failure in music: A study of achievement motivation. *Journal of Research in Music Education*, 34, 262-278.
- Asmus, E. P. (1994). Motivation in music teaching and learning. *Quarterly Journal of Music Teaching and Learning*, 5 (4), 5-32.
- American String Teachers Association (2008). *National String Project Consortium*. Retrieved March 27, 2008, from <http://www.astaweb.com/stringproject.html>.
- Atkinson, J. W. (1964). *An introduction to motivation*. Princeton, NJ: Van Nostrand.
- Austin, J. R. (1988). The effect of music contest format on self-concept, motivation, achievement, and attitude of elementary band students. *Journal of Research in Music Education*, 36, 95-107.
- Austin, J. R., & Berg, M. H. (2006). Exploring music practice among sixth-grade band and orchestra students. *Psychology of Music*, 34, 535-558.
- Austin, J. R., & Vispoel, W. P. (1998). How American adolescents interpret success and failure in classroom music: Relationships among attributional beliefs, self-concept and achievement. *Psychology of Music*, 26, 26-45.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1990). Self-regulation of motivation through anticipatory and self

- reactive mechanisms. In R. A. Dienstbier (Ed.), *Nebraska Symposium on Motivation: Vol. 38. Perspectives on motivation* (pp. 69-164). Lincoln: University of Nebraska Press.
- Bandura, A. (1995). *Self-efficacy in changing societies*. New York: Cambridge.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A. (2006). Guide for creating self-efficacy scales (Revised).
In F. Pajares, & T. Urdan (Eds.), *Self-efficacy beliefs of adolescences* (pp. 307-338). Charlotte, NC: IAP.
- Barry, N. H. (1992). The effects of practice strategies, individual differences in cognitive style, and gender upon technical accuracy and musicality of student instrumental performance. *Psychology of Music, 20*, 112-123.
- Bong, M., & Clark, R. E. (1999). Comparison between self-concept and self-efficacy in academic motivation research. *Educational Psychologist, 34*, 139-153.
- Bouffard-Bouchard, T. (2001). Influence of self-efficacy on performance in a cognitive task. *The Journal of Social Psychology, 130*, 353-363.
- Bruenger, S. D. (1999). The relationship of selected personal investment behaviors to the meaning non-select choir members attach to their choral experience (Doctoral dissertation, University of North Texas, 1999). *Dissertation Abstracts International, 60* (09), 3299A. (UMI No. 9945791)
- Bruser, M. (1999). *The art of practicing: A guide to making music from the heart*. New York: Bell Tower.
- Chandler, T. A., Chiarella, D., & Auria, C. (1988). Performance expectancy, success, satisfaction, and attributions as variables in band challenges. *Journal of Research in Music Education, 35*, 249-258.
- Ciabattari, W. S. (2004). Motivating high school students to practice: A comparison of student and teacher perceptions. *Contributions to Music Education, 31* (2), 43-55.
- Cole, J., & Denzine, G. (2004). "I'm not doing as well in this class as I'd like to": Achievement motivation and personality. *Journal of College Reading and Learning, 34* (2), 29-44.
- Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1993). *Talented teenagers: The roots of success and failure*. Cambridge: University Press.
- Da Costa, D. (1999). An investigation into instrumental pupils' attitudes to varied,

- structured practice: Two methods of approach. *British Journal of Music Education*, 16, 65-77.
- Davidson, J. W., Moore, D. G., Sloboda, J. A., & Howe, M. A. (1998). Characteristics of music teachers and the progress of young instrumentalists. *Journal of Research in Music Education*, 46, 141-160.
- Davidson, J. W., Howe, M. A., Moore, D. G., & Sloboda, J. A. (1996). The role of parental influences in the development of musical ability. *British Journal of Developmental Psychology*, 14, 399-412.
- Davison, P. D. (2006). The role of self-efficacy and modeling and improvisation: The effects of aural and aural/notated modeling conditions on intermediate instrumental music students' improvisation achievement (Doctoral dissertation, University of North Texas, 2007), *Dissertation Abstracts International*, A 68 (02). (UMI No. 3254179)
- Duke, R. A., Flowers, P. J., & Wolfe, D. E. (1997). Children who study piano with excellent teachers in the United States. *Bulletin of the Council for Research in Music Education*, 132, 51-84.
- Duke, R. A., & Henninger, J. C. (2002). Teachers' verbal corrections and observers' perceptions of teaching and learning. *Journal of Research in Music Education*, 50, 75-88.
- Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychology Review*, 100, 363-406.
- Gagné, F. (1999). Nature or nurture? A re-examination of Sloboda and Howe's (1991) interview study on talent development in music. *Psychology of Music*, 27, 38-51.
- Galamian, I. (1985). *Principles of violin playing and teaching* (3rd Ed.). Ann Arbor, MI: Shar Music.
- Gardner, H. (1997). *Frames of mind: The theory of multiple intelligences*. New York: Basic.
- Geringer, J. M., & Kostka, M. J. (1984). An analysis of practice room behavior of college music students. *Contributions to Music Education*, 11, 24-27.
- Gillespie, R., & Hamann, D. (1997). The results are in! A survey on the status of orchestra instruction in public schools. *American String Teacher*, 47 (4), 45-49.
- Gillespie, R., & Hamann, D. L. (1999). Career choice among string music education

- students in American colleges and universities. *Journal of Research in Music Education*, 47, 266-278.
- Grunow, R. F., Gordon, E. E., Azzara, C. D., & Martin, M. E. (2008). *Jump right in: The instrumental series for band, string, and recorder classes*. Chicago, IL: GIA.
- Gruson, L. M. (1988). Rehearsal skill and musical competence: Does practice make perfect? In J. A. Sloboda (Ed.), *Generative processes in music: The psychology of performance, improvisation, and composition* (pp. 90-112). Oxford: Oxford University.
- Hallam, S. (1997a). Approaches to instrumental music practice of experts and novices: Implications for education. In H. Jorgensen & A. C. Lehmann (Eds.), *Does practice make perfect? Current theory and research on instrumental practice* (pp. 89-108). Norway: Norges Musikkhøgskole.
- Hallam, S. (1997b). What do we know about practice? Toward a model synthesizing the research literature. In H. Jorgensen & A. C. Lehmann (Eds.), *Does practice make perfect? Current theory and research on instrumental practice* (pp. 179-239). Norway: Norges Musikkhøgskole.
- Hallam, S. (1998). The predictors of achievement and dropout in instrumental tuition. *Psychology of Music*, 26, 116-132.
- Hallam, S. (2001). The development of metacognition in musicians: Implications for education. *British Journal of Music Education*, 18, 27-39.
- Hamann, D. L., & Frost, R. S. (2000). The effect of private lesson study on the practice habits and attitudes towards practicing of middle school and high school string students. *Contributions to Music Education*, 27 (2), 71-93.
- Harnischmacher, C. (1997). The effects of individual differences in motivation, volition, and maturational processes on practice behavior of young instrumentalists. In H. Jorgensen & A. C. Lehmann (Eds.), *Does practice make perfect? Current theory and research on instrumental practice* (pp. 71-88). Norway: Norges Musikkhøgskole.
- Hewitt, M. (2001). The effects of modeling, self-evaluation, and self-listening on junior high instrumentalists' music performance and practice attitudes. *Journal of Research in Music Education*, 49, 307-322.
- Howe, M. A., & Sloboda, J. A. (1991). Young musicians' accounts of significant influences in their early lives. 2. Teachers, practising and performing. *British Journal of Music Education*, 8, 53-64.
- Hurley, C. G. (1992). Student motivations for beginning and

continuing/discontinuing string music instruction: A preliminary investigation (Doctoral dissertation, University of Wisconsin-Madison, 1992). *Dissertation Abstracts International*, 53 (08), 2727A. (UMI No. 9224155)

Jorgensen, H. (1997). Time for practicing? Higher level music students' use of time for instrumental practicing. In H. Jorgensen & A. C. Lehmann (Eds.), *Does practice make perfect? Current theory and research on instrumental practice* (pp. 123-140). Norway: Norges Musikkhøgskole.

Jorgensen, H. (2002). Instrumental performance expertise and amount of practice among instrumental students in a conservatoire. *Music Education Research*, 4, 105-119.

Kemp, A. E. (1981). Personality differences between the players of string, woodwind, brass, and keyboard instruments, and singers. *Bulletin of the Council for Research in Music Education*, 66-67, 33-38.

Lehmann, A. C., & Davidson, J. W. (2002). Taking an acquired skill perspective on music performance. In R. Colwell & C. Richardson (Eds.), *The new handbook of research on music teaching and learning: A project of the Music Educators National Conference* (pp. 542-560). New York: Oxford University Press.

Lehmann, A. C. (1997a). Acquired mental representations in music performance: Anecdotal and preliminary empirical evidence. In H. Jorgensen & A. C. Lehmann (Eds.), *Does practice make perfect? Current theory and research on instrumental practice* (pp. 141-164). Norway: Norges Musikkhøgskole.

Lehmann, A. C. (1997b). The acquisition of expertise in music: Efficiency of deliberate practice as a moderating variable in accounting for sub-expert performance. In I. Deliege & J. A. Sloboda (Eds.), *Perception and cognition of music* (pp. 161-187). Hove, East Sussex: Psychology Press.

Lehmann, A. C., & Ericsson, K. A. (1997). Research on expert performance and deliberate practice: Implications for the education of amateur musicians and music students. *Psychomusicology*, 16, 40-58.

Madsen, C. K. (2004). A 30-year follow-up study of actual applied music practice versus estimated practice. *Journal of Research in Music Education*, 52, 77-88.

Madsen, C. K., & Geringer, J. M. (1981). Effects of a distraction index on improving practice attentiveness and musical performance. *Bulletin of the Council for Research in Music Education*, 66-67, 46-52.

Madsen, C. K., & Yarbrough, C. (1975). The effect of experimental design on the

- isolating of dependent and independent variables. In C. K. Madsen, R. D. Greer, & C. H. Madsen, Jr. (Eds.), *Research in music behavior: Modifying music behavior in the classroom* (pp. 226-243). New York: Teachers College Press.
- Margolis, H., & McCabe, P. P. (2004). Self-efficacy: A key to the motivation of struggling learners. *Clearing House*, 77, 241-247.
- McCormick, J., & McPherson, G. E. (2003). The role of self-efficacy in musical performance examination: An exploratory structural equation analysis. *Psychology of Music*, 31, 37-51.
- McPherson, G. E. (2000-2001). Commitment and practice: Key ingredients for achievement during the early stages of learning a musical instrument. *Bulletin of the Council for Research in Music Education*, 147, 122-127.
- McPherson, G. E. (2006). Advocacy as a means for changing beliefs about music education. In MENC (Ed.), *International Music Education Policy Symposium: Final Papers* (pp. 1-5). Reston, VA: Music Educators National Conference.
- McPherson, G. E., & McCormick, J. (1999). Motivational and self-regulated learning components of musical practice. *Bulletin of the Council for Research in Music Education*, 141, 98-102.
- McPherson, G. E., & McCormick, J. (2006). Self-efficacy and music performance. *Psychology of Music*, 34, 322-336.
- McPherson, G. E., & Pitts, S. E. (2000). Models of success and failure in instrumental learning: Case studies of young players in the first 20 months of learning. *Bulletin of the Council for Research in Music Education*, 146, 51-69.
- Moisala, P. (1999). Musical gender in performance. *Women & Music - A Journal of Gender and Culture*, 3, 1FF.
- Multon, K. D., Brown, S. D., & Lent, R. W. (1991). Relation of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology*, 38 (1), 30-38.
- Music for People (2008). Retrieved April 5, 2008, from <http://www.musicforpeople.org/>
- Nielsen, S. G. (1999). Learning strategies in instrumental music practice. *British Journal of Music Education*, 16, 275-291.
- Nielsen, S. G. (2001). Self-regulating learning strategies in instrumental music practice. *Music Education Research*, 3, 155-167.
- Nielsen, S. G. (2004). Strategies and self-efficacy beliefs in instrumental and

- vocal individual practice: A study of students in higher education. *Psychology of Music*, 32, 418-431.
- Norman, M. (2003). *The James Bond theme* (V. Lopez, Arranger, & J. Barry, Theme composer). New York: Alfred. (Original work published 1962 and original theme composed by J. Barry)
- O'Neill, S. A. (1997). The role of practice in children's early musical performance achievement. In H. Jorgensen & A. C. Lehmann (Eds.), *Does practice make perfect? Current theory and research on instrumental practice* (pp. 53-70). Norway: Norges Musikkhøgskole.
- O'Neill, S. A., & McPherson, G. E. (2002). The developing musician. In R. Parncutt & G. McPherson (Eds.), *The science and psychology of music performance: Creative strategies for teaching and learning* (pp. 31-46). New York: Oxford.
- Pacey, F. (1993). Schema theory and the effect of variable practice in string teaching. *British Journal of Music Education*, 10, 91-102.
- Palmer, D. (2005). A motivational view of constructivist-informed teaching. *International Journal of Science Education*, 27, 1853-1881.
- Pietsch, J., Walker, R., & Chapman, E. (2003). The relationship among self concept, self-efficacy, and performance in mathematics during secondary school. *Journal of Educational Psychology*, 95 (3), 589-603.
- Pintrich, P. R., & Schunk, D. H. (1996). *Motivation in education: Theory, research, and applications*. Englewood Cliffs, NJ: Merrill.
- Pitts, S. E., Davidson, J. W., & McPherson, G. E. (2000). Models of success and failure in instrumental learning: Case studies of young players in the first 20 months of learning. *Bulletin of the Council for Research in Music Education*, 146, 51-69.
- Priest, T. (2001). Using creativity assessment experience to nurture and predict compositional creativity. *Journal of Research in Music Education*, 49, 245-257.
- Prokofiev, S. (1937). *Montagues and Capulets*. New York: Carl Fischer. (Extracted from S. Prokofiev's ballet *Romeo and Juliet*, Original work published 1935-1936)
- Renwick, J. M., & McPherson, G. E. (2002). Interest and choice: Student selected repertoire and its effect on practicing behavior. *British Journal of Music Education*, 19, 173-188.
- Rimsky-Korsakov, N. (1989). *Russian Eastern Overture*. New York: Nieweg/Bradburd.

- Rohwer, D. (2002). Understanding practice: An investigation and applications. *International Journal of Music Education, 40*, 15-25.
- Rohwer, D., & Polk, J. (2006). Practice behaviors of eighth-grade instrumental musicians. *Journal of Research in Music Education, 54*, 350-362.
- Sabien, R., & Phillips, B. (2000). *Jazz philharmonic*. Van Nuys, CA: Alfred.
- Sansone, C., & Smith, J. L. (2000). Interest and self-regulation: The relationship between having to and wanting to. In C. Sansone & Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 341-372). New York: Academic.
- Schmidt, C. P. (2005). Relations among motivation, performance achievement, and music experience variables in secondary instrumental music students. *Journal of Research in Music Education, 53*, 134-147.
- Schmidt, C. P., Zdzinski, S. F., & Ballard, D. L. (2006). Motivation orientations, academic achievement, and career goals of undergraduate music education majors. *Journal of Research in Music Education, 54*, 138-153.
- Schunk, D. H. (1994). Self-regulations of self-efficacy and attributions in academic settings. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp. 75-100). Hillsdale, New Jersey: Lawrence Erlbaum.
- Schunk, D. H., & Cox, P.D. (1986). Strategy training and attributional feedback with learning disabled students. *Journal of Educational Psychology, 78*, 201-209.
- Schulz, W. (2005, April). *Mathematics self-efficacy and student expectations. Results from PISA (Program for International Student Assessment) 2003*. Paper presented for the annual meeting of the American Educational Research Association, Montreal.
- Sloboda, J. A. (1994). Music performance: Expression and the development of excellence. In R. Aiello & J. A. Sloboda (Eds.), *Musical perceptions* (pp. 152-169). New York: Oxford University Press.
- Sloboda, J. A., & Davidson, J. (1996). The young performing musician. In I. Deliège & J. Sloboda (Eds.), *Musical beginnings* (pp. 171-190). New York: Oxford University Press.
- Sloboda, J. A., Davidson, J. W., Howe, M. J. A., & Moore, D. M. (1996). The role of practice in the development of expert musical performance. *British Journal of Psychology, 87*, 287-309.

- Sloboda, J. A., & Howe, M. J. A. (1991). Biographical precursors of musical excellence: An interview study. *Psychology of Music, 19*, 3-21.
- Smith, B. P. (2002). The role of selected motivational beliefs in the process of collegiate instrumental music practice (Doctoral dissertation, University of Michigan, 2002). *Dissertation Abstracts International, 63*, 536A. (UMI No. 3042170)
- Smith, B. P. (2003). Motivation to learn: What is it and how can I get it? *American String Teacher, 53* (4), 68-73.
- Smith, B. P. (2005). Goal orientation, implicit theory of ability, and collegiate instrumental music practice. *Psychology of Music, 33*, 36-57.
- Smith, C. M. (1995). The status of undergraduate string teacher education in American colleges and universities. *Journal of Research in Music Education, 43*, 139-156.
- Smith, C. M. (1997). Access to string instruction in American public schools. *Journal of Research in Music Education, 45*, 650-662.
- Stewart, J. L. (2005). Factors related to students' decisions to continue in band. *Contributions to Music Education, 32*(1), 59-74.
- Stipek, D. (1998). *Motivation to learn: From theory to practice* (3rd Ed.). Boston: Allyn and Bacon.
- Wagman, J. C. (2005). The effects of an inquiry-internet research project on motivation, self-efficacy, and academic autonomy in heterogeneously grouped high school Latin students. (Doctoral dissertation, Capella University, 2005). *Dissertation Abstracts International, 66* (01), 135A. (UMI No. 3162731)
- Wagner, M. J. (1975). The effect of a practice report on practice time and musical performance. In C. Madsen, R. Greer, & C. Madsen (Eds.). *Research in music behavior: Modifying music behavior in the classroom* (pp. 125-130). New York: Teachers College Press.
- Watkins, J. G., & Farnum, S. E. (1954). *The Watkins-performance scale: A standardized achievement test for all band instruments*. Winona, MN: Hal Leonard Music.
- Wexler, M. (2000). A survey of improvisation methods for strings. *American String Teacher, 50* (3), 66-69.
- Weiner, B. (1974). *Achievement motivation and attribution and theory*. Morristown, NJ: General Learning.

- Weiner, B. (1986). *An attributional theory of motivation and emotion*. New York: Springer Verlag.
- Williamon, A., & Thompson, S. (2004). Psychology and the music practitioner. In J. W. Davidson (Ed.). *The music practitioner: Research for the music performer, teacher and listener* (pp. 9-23). Burlington, VT: Ashgate.
- Williamon, A., & Valentine, E. (2000). Quantity and quality of musical practice as predictors of performance quality. *British Journal of Psychology*, 91, 353-376.
- Wood, R., & Bandura, A. (1989). Social cognitive theory of organizational management. *The Academy of Management Review*, 14, 361-384.
- Woody, R. H. (2001). Learning from the experts: Applying research in expert performance to music education. *Update: Applications of Research in Music Education*, 19 (2), 9-14.
- Yassir, S. (2006). Adult Learners and Academic Achievement: The Roles of Self Efficacy, Self-Regulation, and Motivation. ERIC: ED 491441.
- Zdzinski, S. F. (1996). Parental involvement, selected student attributes, and learning outcomes in instrumental music. *Journal of Research in Music Education*, 44, 34-48.
- Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal settings. *American Educational Research Journal*, 29, 663-676.