



Deliberate Practice of High School Instrumentalists: A Theoretical Model

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Hamlin, P. J. (2014). Deliberate Practice of High School Instrumentalists: A Theoretical Model [University of Miami].

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DELIBERATE PRACTICE OF HIGH SCHOOL INSTRUMENTALISTS: A
THEORETICAL MODEL

By

Peter J. Hamlin

A DISSERTATION

Submitted to the Faculty
of the University of Miami
in partial fulfillment of the requirements for
the degree of Doctor of Philosophy

Coral Gables, Florida

May 2014

UNIVERSITY OF MIAMI

A dissertation submitted in partial fulfillment of
the requirements for the degree of
Doctor of Philosophy

DELIBERATE PRACTICE OF HIGH SCHOOL INSTRUMENTALISTS: A
THEORETICAL MODEL

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Deliberate Practice of High School Instrumentalists:
A Theoretical Model

(May 2014)

Abstract of a dissertation at the University of Miami.

Doctoral essay supervised by Professor Edward P. Asmus.

No. of pages in text. (204)

Musicians invest an extensive amount of time practicing their instruments to acquire and refine their skills as performers. They practice to enable complex physical, cognitive, and musical skills to be performed fluently with relatively little conscious control, freeing cognitive processing capacity for higher order processing (e.g., interpretation, communication, integration). A need exists for the development of theories for deliberate practice that can then be empirically tested. This study is designed to meet that need. Through examining previous theoretical models related to practice and the extant research on practice-relevant variables a latent variable model was specified. The sample ($N = 191$) consisted of high school band students. As a result of the exploratory factor analysis the model was respecified using the resulting 5 factors. A path analysis was conducted to test the new model. There was evidence that the observed data fit the hypothesized model. Results indicate that the strongest predictors of practice commitment were “orientations to practice” and “related to self.” The factor “orientation to practice” contains items pertaining to task usefulness/difficulty, the ability to get help and have resources available to aid in practicing, and a view that achievement is related to effort in contrast to ability or natural talent. Items related to self-efficacy and self-

reflection/metacognition measure “related to self.” The ability to listen critically and evaluate performance, being able to hear the sound of the music in one’s head, and the ability to monitor one’s thoughts and behaviors to regulate practice are critical to effective practice. Providing music that is attainable but challenging may also play a role in students developing and using their metacognitive skills. A recommendation for further study is enclosed.

ACKNOWLEDGEMENT

This dissertation and my Ph.D. could not have been completed without the help and support of a large number of people. It is the culmination of my professional career so far as a music educator.

I would like to convey my deepest gratitude to my advisor, Dr. Edward Asmus, for his encouragement, wisdom, patience, and his editing skill. Thank you for everything you have done for me. I would also like to thank the other members of my committee, Dr. Don Coffman, Dr. Stephen Zdzinski, Dr. Margaret Donaghue, and Dr. Heather Henderson. I would like to give special thanks to Dr. Stephen Zdzinski for all of his support and guidance throughout my Ph.D. studies. He has gone above and beyond to encourage and guide me. I would also like to give special thanks to the other members of the music education faculty, Dr. Don Coffman and Dr. Carlos Abril for all of their guidance. The University of Miami has an outstanding faculty and I am proud to be a product of their teaching.

I am forever indebted to my family for all of their support without which I would not be where I am today. Their unwavering support and selfless sacrifice will continue to serve as a model I will strive to follow. I am also thankful that I had the opportunity to meet my wife during my studies and I thank her for all the support she has shown me. I would also like to thank the other Ph.D. students in my cohort at the University of Miami. I will greatly miss the opportunities we have had to engage in discussion and contemplate our profession. You have been wonderful friends and colleagues.

TABLE OF CONTENTS

	Page
LIST OF FIGURES.....	vii
LIST OF TABLES	viii
CHAPTER 1 Introduction.....	1
Background	3
Deliberate Practice	3
Self-Regulated Learning	6
Effective Practice Acquisition.....	8
Need for the Current Study	9
Study Purpose.....	10
Theory	11
Model Development.....	12
Exogenous Variables.....	13
Endogenous Variables.....	14
Research Questions	19
CHAPTER 2 Literature Review.....	20
Previous Theory	20
Learner Characteristics.....	26
Demographics-Age.....	26
Prior Experience	27
Physical Environment	29
Social Influences	30
Parental Involvement.....	30
Teacher	33
Psychological Factors.....	34
Self-Efficacy.....	34
Motivation	37
Attribution Theory.....	38
Expectancy-Value Theory.....	40
Planning/Goal Setting	42
Task Difficulty	42
Goal Setting.....	43
Practice Strategies	46
Concentration	46
Practice Strategies	46
Metacognition/Self-Reflection.....	50
Metacognition.....	50
Assessment and Evaluation.....	52
Practice Commitment.....	53
Practice Frequency	54

Conclusion.....	55
CHAPTER 3 Method	56
Participants	56
Assessment Instruments	57
Variables.....	57
Exogenous Variables.....	57
Endogenous Variables.....	58
Data Collection Procedures.....	58
Data Screening	59
Data Analysis	60
Reliability	60
Correlation Analysis.....	60
Exploratory Factor Analysis.....	60
Structural Equation Modeling (SEM)	63
Research Questions	64
Summary	66
CHAPTER 4 Results.....	67
Accuracy.....	67
Missing Data	67
Normality	68
Outliers.....	69
Linearity	71
Multicollinearity and Singularity	71
Data Analysis	72
Correlation Analysis.....	72
Exploratory Factor Analysis.....	72
Path Analysis.....	86
Direct Effects.....	87
Indirect Effects	88
Summary	91
CHAPTER 5 Discussion	92
Exploratory Factor Analysis.....	93
Path Analysis.....	97
Limitations	100
Further Research	102
Conclusion.....	103

REFERENCES.....	105
APPENDIX A Survey Items and Their Sources.....	120
APPENDIX B Hips Survey.....	126
APPENDIX C Irb Approvals	134
APPENDIX D Correspondence and Assent/Consent Forms	138
APPENDIX E Descriptive Statistics.....	144
APPENDIX F Correlation Matrix.....	149
APPENDIX G Raw Data	170

LIST OF FIGURES

Figure 1. Latent Variable Model	18
Figure 2. Scree Test.....	73
Figure 3. Five Factor Model.....	86

LIST OF TABLES

Table 1 <i>Latent And Observed Variables</i>	11
Table 2 <i>Items Containing Outliers</i>	70
Table 3 <i>Eigenvalues And Total Variance Explained</i>	74
Table 4 <i>Eigenvalues And Total Variance Explained Eight Factor Solution</i>	75
Table 5 <i>Rotated Pattern Matrix Of Eight Factor Solution</i>	76
Table 5 <i>Rotated Pattern Matrix Of Five Factor Solution</i>	82
Table 6 <i>Eigenvalues and Total Variance Explained Five Factor Model</i>	84
Table 7 <i>Factor Correlation Matrix</i>	85
Table 8 <i>Direct Effects</i>	88
Table 9 <i>R-squared Values</i>	89
Table 10 <i>Five Factor Model Indirect Effects</i>	89

CHAPTER 1

Introduction

Creating and fostering a climate in which students have regular, meaningful, individual practice sessions is a big challenge for teachers. Students are extremely busy and it is hard to find time for individual practice. People lead fast paced, busy lives as is demanded in today's society. This can leave little time for individual practice. We must teach our students how to develop time management skills and effective practice strategies to maximize the effectiveness and likelihood of student practice.

As teachers we wish that all our students were intrinsically motivated to practice without needing to be reminded or having to use extrinsic motivators such as grades or rewards. We have all had students that are intrinsically motivated in this way and who practice just for the love of music and playing their instrument. This is not usually the norm, however. Teachers must have a repertoire of strategies and extrinsic motivators to encourage students to practice. Hopefully over time students will need less and less of these motivators on their way to becoming more mature and intrinsically motivated musicians who understand the importance of practice. Effective and efficient practice should produce consistent improvement that provides improvement and encouragement to students.

All students would benefit from specific instruction in how to establish an effective practice environment and how to use a repertoire of techniques and strategies in contextually relevant situations. Most teachers, students, and parents would not question the importance of practice in learning to play an instrument. Many music educators might agree on certain aspects of what constitutes effective teaching in the classroom.

There is less consensus on what constitutes effective practice and that a problem exists in what takes place between in school rehearsals or lessons and what is done at home. What is exactly meant when teachers tell students to practice carefully? What constitutes effective practice and do students understand what that means? These are important questions.

Kostka (2002) indicates that many teachers and students may not be communicating adequately about how to optimize practice to make it more effective and enjoyable. Kostka (2002) further states that teachers expect students to practice more than they actually are and that they assume their students are following a practice routine that uses their practice time efficiently. In addition, the majority of college-age music students said in the survey that they do not follow a routine, have not discussed effective practice procedures with their teacher, and do not have a regular practice time. Many students indicated that their practicing was "tedious but necessary" while music teachers used terms like "satisfying" and "relaxing" to describe their practicing.

Teachers should set goals for students' practice but also understand how students are practicing, what students are thinking, and how they manage their time. Other important factors that researchers have shown to contribute to deliberate practice are guidance from teachers, home environment, support from parents, and setting music as equal to other activities (Berg & Austin, 2006; Ericsson, Krampe & Tesch-Romer, 1993; Lehmann & Davidson, 2002). Practice and motivation are also important to practice and are not isolated from each other. They exist in a system of interdependent variables within the learning environment. These include informative and directive feedback, student/peer feedback, and influential concepts affecting beliefs. Smith (2003) found that

attribution beliefs, based on past successes or failures, were also influential. The purpose of this dissertation is to develop a better understanding of the variables and their relationships that impact high school band students' deliberate practice.

Background

There is an increasing volume of research over the past fifty years into different variables that may affect musical achievement and performance. Musicians invest an extensive amount of time practicing their instruments to acquire and refine their skills as performers. Musical achievement, an essential characteristic of successful musicians, is directly influenced by the amount of quality individual practice engaged in by a performer. Musicians practice to “enable complex physical, cognitive, and musical skills to be performed fluently with relatively little conscious control, freeing cognitive processing capacity for high order processing (e.g., communicating interpretation)” (Hallam & Barry, 2002, p. 155).

Deliberate Practice

The term “deliberate practice” was coined by Ericsson, Krampe and Tesch-Römer in 1993. They defined deliberate practice as an activity in which the participant attends completely to a task in an effort to improve performance. This definition distinguishes deliberate practice from informal practice by the high amount of effort and lack of immediate reward.

Deliberate practice emphasizes not just behavior but the role of cognition. “Deliberate practice differs from the mere experience of doing the task in...the mental attitude of the individual” (Ericsson, 2009, p. 13). “Genuine experts not only practice deliberately but also think deliberately” (Ericsson, Prietula & Cokely, 2007, p. 3).

Deliberate practice also underscores that improvement in performance is not correlated with automation resulting from pure repetition. By increasing the challenge of training, individuals can remain in the cognitive phase and keep engaging in deliberate practice to acquire and refine complex cognitive mechanisms that mediate how the brain and nervous system control performance (Ericsson 2009).

A coach or teacher who helps establish goals and designs activities and strategies to be used during deliberate practice is essential to student success. This will also help students to become more independent and learn to function with these tasks by themselves (Ericsson, 2007). Many times students are left on their own to do these tasks without that support. In addition to being effortful, deliberate practice is goal oriented and involves self-monitoring. A person engaged in deliberate practice actively searches for new and different methods of completing tasks. These remedial strategies and refinement of methods are “in response to errors and violated expectations” (Ericsson et al., 1993, p. 367).

Ericsson et al. (1993) conclude by stating that important elements that impact optimal learning and improvement of performance are motivation to attend to the task and exert effort to improve, the incorporation of preexisting knowledge, meaningful feedback to inform adjustments and revisions, and the opportunity for repetition. Ericsson et al. (1993) also concluded that the amount of time musicians spend engaged in deliberate practice is directly related to their level of achievement. Therefore, musicians should maximize the amount of time they spend engaged in deliberate practice.

Ericsson et al. (1993) recognize that deliberate practice is not easy. There are many constraints. These include: the resource constraint that considers available time,

energy and resources; the motivational constraint in that deliberate practice is not inherently motivating; and the effort constraint which acknowledges that deliberate practice is an effortful activity and can be sustained for only a limited time (Ericsson et al., 1993).

Presenting a similar understanding of deliberate practice, Sloboda, Davidson, Howe, and Moore (1996) introduce the terms of “formal” and “informal” practice. Formal practice is not defined clearly. It is described as playing technical exercises and preparing repertoire as well as the cognitive decision to break down pieces into difficult passages. This distinguishes it from “informal” practice activities such as “messaging about,” playing favorite songs, and improvising (Sloboda et al. 1996, p. 301).

Sloboda et al. (1996) supports “the existence of a strong positive relationship between practice and achievement in musical performance” (Sloboda et al., 1996, p. 306). They found a direct correlation between amount of practice and levels of achievement with the relationship being “strongest for formal task-oriented practice” (Sloboda et al., 1996, p. 306). Increasing achievement levels are a direct function of accumulated formal practice. Formal practice is parallel to the construct of deliberate practice. They found that it takes an average of 3300 hours of practice to achieve the highest grade level (8) (Sloboda et al., 1996). O'Neill and McPherson (2002) and O'Neill (1997) confirm these findings.

Deliberate practice, which leads to high musical achievement, is dependent not only upon the quantity but also the effectiveness and content of each practice session (Byo & Cassidy, 2008; Costa-Giomi, 2003; Duke, Simmons and Cash, 2009; Ericsson, Krampe & Tesch-Romer, 1993; Gagne, 1999; Madsen, 2004; Madsen & Geringer, 1981;

Miksza, 2006b; Williamon & Valentine, 2000). Available resources and motivation are also important to successful practice (Ericsson, Krampe & Tesch-Romer, 1993; Hallam, 1997a; Hurley, 1992). In addition, research has investigated other relevant variables including problem identification, strategy planning, imagery and self-assessment during their practice sessions (Hallam, 2001b; Nielsen, 1997, 2004). Ericsson and Lehmann (1996) suggest that contrary to the belief that expert performance is highly automatized most performance includes planning, reasoning, and anticipation. Harnischmacher (1997), states that "experts generally agree that motivation, starting age, prior experience, supervision, and meta-knowledge of practice influence the quality of practice of sub-experts" (Harnischmacher, 1997, p. 71).

Research in other domains, such as math, chess, and sports skill acquisition, corroborates that quantity of practice alone will not ultimately lead to the development of exceptional skill (Baltes & Kliegl, 1992; Bower & Hilgard, 1981; Chase & Ericsson, 1982; Gagne, 1970; Kliegl, Smith, & Baltes, 1989, 1990). Instead, performance skill has been directly related to the quality of "deliberate practice" (Krampe & Ericsson, 1995; Ericsson & Charness, 1994).

Self-Regulated Learning

Playing a musical instrument requires a great deal of autonomy, especially in situations where it is up to the student to decide when and where to practice, or whether, or how, to avoid new, difficult, or unlearned repertoire (O'Neill & McPherson, 2002). Theories of self-regulation provide an important framework from which to examine music practice. Zimmerman (1986), a leader in self-regulation research, describes musicians engaged in self-regulated learning as: "Metacognitively, motivationally, and

behaviorally active participants in their own learning process.” According to this view, for a skill to be mastered, the learner must behaviorally apply cognitive strategies to a task, within a contextually relevant setting.

Among the goals of teaching are to provide students with the ability to learn musical skills and concepts and to regulate their own behavior and thoughts independently of the teacher. Students need a mixture of supervised learning and opportunities to practice learned skills and concepts as well as the use of effective regulation strategies. Self-regulation includes planning and goal setting, using learning strategies, and self-evaluating (Jorgensen, 1995, Zimmerman 2000, and Hewitt, 2001). Many teachers fail, however, to teach these skills of self-regulation (Zimmerman, Bonner, & Kovach, 1996).

Multiple modes of metacognition are engaged in self-regulation. Zimmerman (2002) states that self-regulation of learning involves the self-awareness, self-motivation, and behavioral skill to implement knowledge appropriately and the selective use of specific processes that must be personally adapted to each learning task. Expert musicians demonstrate high levels of metacognition as they identify their strengths and weaknesses, choose appropriate learning strategies, and monitor their progress (Chaffin & Imreh, 2001; Hallam, 1997; Nielsen, 1997). Novice musicians often exhibit fewer of these characteristics, which result in slower musical progress. Students’ practice frequently lacks a systematic plan, moving from one section to another with no obvious reason and without noticeable improvement in performance (McPherson & Renwick, 2001; Pitts, Davidson & McPherson, 2000). Oare (2006) and Leon-Guerrero (2004) found that students were able to cognitively identify a variety of practice strategies. The

students in Oare's (2006) study, however, demonstrated they lacked the ability to effectively use these strategies in their practice.

Effective Practice Acquisition

The environment influences and shapes the practice behaviors of musicians. Environmental or context variables account for the practice setting and factors related to curriculum, teaching methods, teacher characteristics, peer interactions, and parental support. There is a direct relationship between the behaviors associated with practice and the performance environment. The culture and societal characteristics found within the practice setting impact the learning environment of students (Hallam, 1997b). Musicians that understand the value of deliberate practice and who find music and playing their instruments successfully to be of importance often times have more motivation to exert the effort and time necessary to practice effectively.

Effective deliberate practice needs to be taught and is not an innate skill that novice musicians often possess. Therefore, it is important for music teachers to provide instruction in appropriate practicing techniques (Barry & McArthur, 1994; Ericsson, Krampe & Tesch-Romer, 1993; Jorgensen, 2003; McPherson, 1995; McPherson, Davidson & Pitts, 2000). Lehmann and Davidson (2002) state that, "learning to practice is in itself a skill that needs to be acquired. Therefore, teachers should take great care to teach their students how to practice correctly." Teachers need to provide instruction and supervision of student practice providing individual feedback and training in effective practice techniques (Ericsson, Krampe & Tesch-Romer, 1993).

In a follow up study, McPherson (2005) concludes that, "Despite the importance for children to develop an armory of task-appropriate strategies to aid their performance,

evidence suggests that school teachers do not sufficiently emphasize this in their teaching, particularly during the early years of schooling." Barry and McArthur (1994) found that most teachers, "always or almost always discuss the importance of practice and specific practice techniques with students," however, Kostka (2002) found that although the teachers in her survey stated they taught practice strategies, only 67% of their students reported that practice strategies were ever discussed.

Researchers continue to study this disconnect between what should be and what is being taught. One possibility is that there is a lack of information about what constitutes effective practice and how strategies should be used. Examining further the practice of musicians and developing theories of deliberate practice may provide information that could be used to inform the practice habits of musicians (Ericsson & Lehman, 1997; Geiersbach, 2000; Hallam, 2001a & 2001b; Nielsen, 1997, 1999, 2001 & 2004).

Need for the Current Study

Researchers have developed a variety of theoretical frameworks to investigate and explain musical practice. Theories that have been developed and used to inform practice research include social-psychological (Hallam, 1997b, Jørgensen, 2003), epistemological development (Hallam, 1995b), descriptions of cognitive memory processes (e.g., Chaffin, 2007; Duke & Davis, 2006), self-regulation theory (e.g., McPherson & Zimmerman, 2002), and a theory of the acquisition of musical expertise (e.g., Lehmann & Ericsson, 1997). These theoretical bases are each drawn from related disciplines outside of music such as cognitive psychology (e.g., Chase & Simon, 1973; Walker, 2005), educational psychology (Pask, 1976; Perry, 1970; Zimmerman, 1986), motor skill development (Fitts & Posner, 1967), and a general theory of the acquisition of expertise (Ericsson, 1996).

Music education researchers could also benefit from theoretical foundations built on evidence from research within music education.

Research that investigates the impact of deliberate practice and the acquisition of expertise, self-regulation, and students' evaluations of their own performance suggest that intentional, effortful practice has a significant effect on musical achievement. In addition, practice research into self-regulation, attribution theory, and self-efficacy indicates the importance of students' reflections and teacher evaluations.

There is a need to continue to develop, refine, and empirically test theories of deliberate practice. This dissertation is designed to meet that need. The first step of this study is to create a latent variable theoretical model of deliberate practice based on time sequence, logic, and previous research. The newly created model will then be empirically tested. A measurement instrument is developed that is designed to quantify the observed variables in the identified model. The data analysis will include examining the correlation matrix and performing an exploratory factor analysis. If needed, the model will be respecified to reflect the sample data. The model will then be tested using structural equation modeling (SEM) techniques. Other theories of practice have been developed but this will be one of the first times that one has been tested empirically. This addresses a major need within research into individual deliberate practice by applying mainstream and foundational constructs of music education research.

Study Purpose

This study aims to create a theoretical model of deliberate practice. Through examining previous theoretical models related to practice and the extant research on practice-relevant variables, eight variables were extracted and identified. These eight

latent variables were combined into one model in order to examine their relationships in the area of deliberate practice. Table 1 below displays the eight latent variables and the measured variables used to quantify them.

Table 1
Latent And Observed Variables

Student Characteristics
Demographics
Prior Experience
Physical Environment
Environmental Characteristics
Social Influences
Family Context
Teacher Characteristics
Peer Influence
Psychological Factors
Motivation
Self-efficacy
Planning/Goal Setting
Preview/planning
Setting Goals
Practice Strategies
Concentration
Practice strategies used[mental/physical]
Metacognition/Self-Reflection
Self-Reflection
Practice Commitment
Practice Frequency
Commitment

Theory

“A theory is a coherent set of hypothetical, conceptual, and pragmatic principles forming the general frame of reference for a field of inquiry” (Foley, 2003, p.934). In this study the theory is designed to provide that frame of reference for individual

deliberate practice. A theory allows for a set of concepts or constructs, which may seem apparently diverse, to be unified (Darity, 2008).

Theories play an important role within the social sciences. To the extent that a theory allows one to make predictions, it provides some measure of control over the social world. In addition, some theoretical assumptions are needed to guide exploratory research, or even observation, since otherwise there are potentially an infinite number of things that might be relevant. Studies often allow for the calculation and interpretation of correlations. A theory gains support when it is able to make reasonable precise predictions about the strengths of those correlations. Theories in the social sciences are useful when they help isolate the mechanisms that underlie behavior. Work in path analysis and SEM plays an important role in testing theories that are developed (Darity, 2008).

Model Development

Prior theories related to deliberate practice and previous research on the variables extracted from them are presented in the second chapter. The specification of the theoretical latent variable model used in this study is described in this section. Theoretical specification is based on time precedence, researcher logic, and previous research.

There are a variety of prior theories related to deliberate practice. Jorgensen (2004), Hallam (1997a), and McPherson and Zimmerman (2002) each structure their theories into three stages that form a basis for the creation of my model. Jorgensen (2004) divided practice into distinct phases labeled: (1) planning and preparation, (2) the executive phase, and (3) the evaluation phase. Each uses its own type of strategies.

Hallam (1997a) also developed a theory of practice that is divided into three separate phases entitled presage, process, and product. Practice is also seen as being influenced by outside factors usually not under the musician's control. Zimmerman (1998, 2008) also has a theory of practice and self-regulation that is explained as a cycle in three phases: forethought, performance control, and reflection. These theories provide the foundation for the identification of the model used in this study.

Exogenous Variables

Important to these theories of practicing and self-regulated learning is the physical environment. "Physical environment" is listed as an exogenous variable and is placed early in the model because in large part it is outside of the musician's control and is the setting in which the other processes and behaviors take place. To achieve effective and efficient practice it is important that musicians take control of the physical environment. The practice setting should be free from distraction and have all of the necessary materials and equipment. McPherson and Zimmerman (2002) describe how self-regulation impacts effective practice. Their dimensions of self-regulated practicing include the physical environment.

"Social influences" include the home environment, parental support, and teacher characteristics. They are important for effective practice and musical achievement but are also difficult to control and manipulate. Deliberate practice is directly influenced by the cultural, social, and historical contexts in which the learning activities take place (Zimmerman, 1989). Ericsson (2007, 2009) underscores the importance of a teacher who will also help establish goals and design strategies to be used during deliberate practice.

Endogenous Variables

In the model specification for this study, each of the exogenous variables has a direct effect on the latent variable “psychological factors.” “Psychological factors” are measured using the observed variables of self-efficacy, motivation, and locus of control.

Hallam (1997a) in his theory of practice suggests that learner characteristics in the presage phase involve self-esteem or self-efficacy and motivation. These are also psychological constructs involved in Zimmerman’s theory on self-regulation. In my model these are grouped together into the latent variable entitled “psychological factors.”

Bandura (1982) believed that the individual developed self-efficacy from the sources of personal experiences, observation of others, and external influences. Therefore, it is directly affected by the physical environment and social influences in the model. Psychological factors, then, have a direct effect on the latent variable “planning/goal setting”. “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). Therefore, motivation and self-efficacy are placed together to measure the latent variable “psychological factors.”

“Psychological factors” have a direct effect on the behaviors and cognitive processes of practice. Hallam’s (1997a) presage phase is similar to the planning/goal setting variable in this study’s model. Hallam believes that the presage phase involves and is impacted by these psychological constructs so, therefore, a direct effect is found within the model. In addition, 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. “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). 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. 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 on a certain plan of action despite failures or difficulties along the way.

The next three latent variables are directly related to the three phases of practice outlined in the theories above. They are “planning/goal-setting”, “practice strategies”, and “metacognition/self-reflection.” “Planning/goal-setting” has a direct effect on “practice strategies,” which then has a direct effect on “metacognition/self-reflection.” McPherson and Zimmerman (2002) describe his three phases as a cyclical process in which feedback obtained from prior performance helps learners to adjust their performance and establish future goals. These feedback loops allow learners to adjust to factors related to the environment, their own behavior, and their cognitive and affective states. The model for this study uses a similar feedback loop. The difference is that instead of “metacognition/self-reflection” directly feeding back on “planning/goal-setting” it is first run through “psychological factors.” The behaviors and cognitive processes of practice further influence motivation and self-efficacy that then feedback to “planning/goal-setting.”

The latent variable for “planning-goal setting” consists of the observed variables planning, task difficulty, and goal setting. Each of these prior theories expresses the importance of the planning stage of practicing. This includes choosing music that is appropriate, assessing the requirements of the task, planning practicing sessions, and setting both long and short-term goals.

The construct of flow is a theory that explains the importance of task difficulty and its importance to deliberate practice. It is important that the difficulty of the task match the skill level of the performer. This impacts all stages of practice and is crucial for continued motivation (Csikszentmihalyi et al., 1993). If the task is too difficult students will become frustrated and if the task is too easy they may become bored, decreasing motivation.

Establishing specific goals for learning is a key component of both self-regulation and deliberate practice. Many researchers have found strong positive correlations between goal setting, motivation, and performance achievement (Barry and McArthur, 1994; Ericsson, Krampe & Tesch-Romer, 1993; Geiersbach, 2000; Pitts, Davidson & McPherson, 2000; Lehmann, 2003). Ericsson, et al. (1993) states that setting goals for improvement is highly predictive of self-efficacy. Students who do not set goals are less likely to develop effective practice strategies. They are also more likely to attribute failures to sources outside of their control, such as level of ability. Setting goals is important as they enhance motivation, self-efficacy and self-evaluations of progress (Schunk, 1995).

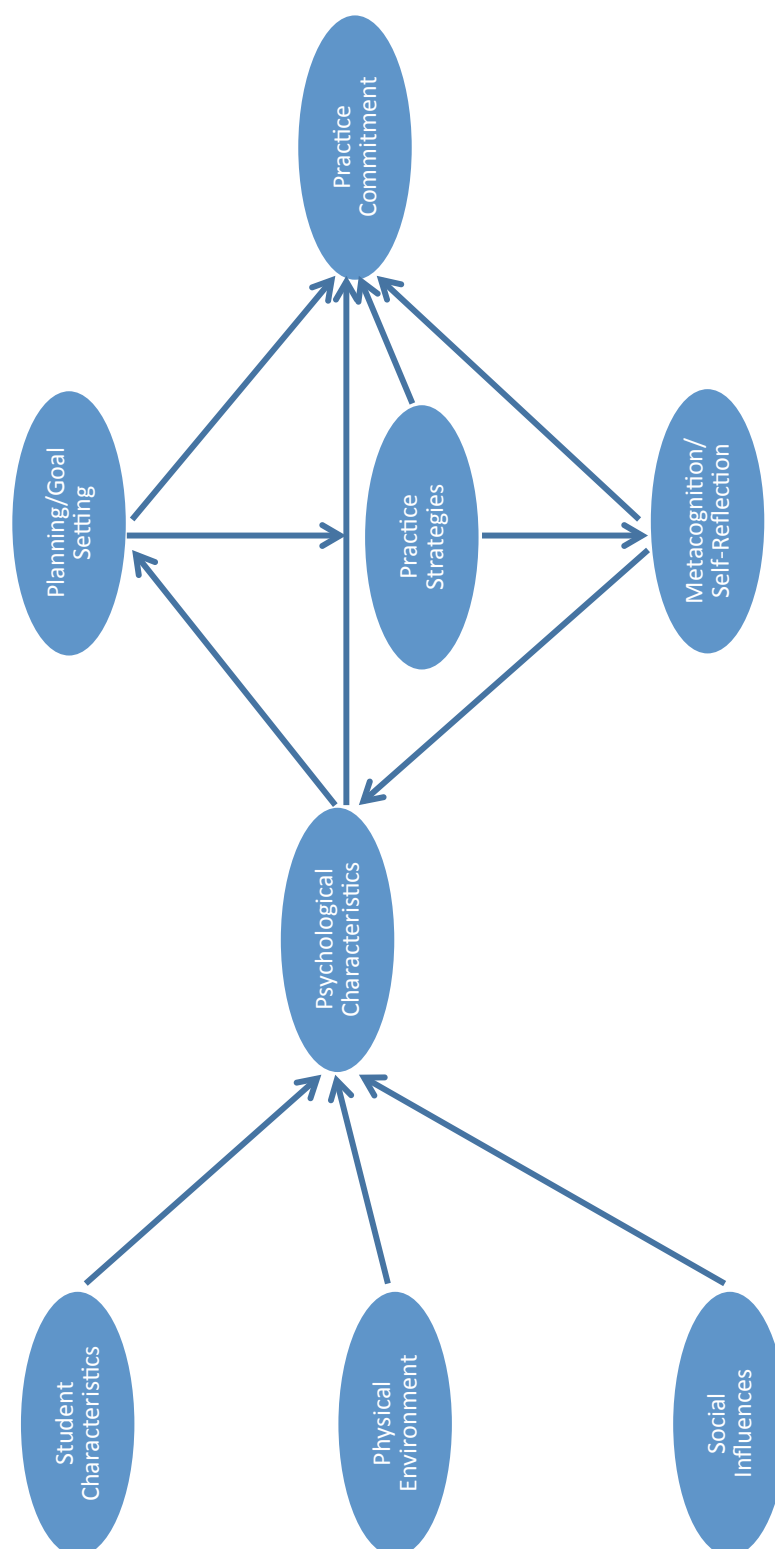
“Planning/goal-setting” has a main effect on the latent variable entitled “practice strategies.” Prior theories emphasize the importance of strategy use and concentration on

the act of practicing. This includes having a repertoire of practice strategies and knowledge of when it appropriate to use them. Zimmerman in his theory also states the importance of maintaining concentration in maintaining effective practice. Madsen and Geringer (1981) found that those who were consistently more attentive and focused during their practice sessions were more effective in increasing their level of performance. Lammers and Kruger (2006) found that students who practiced more reported more planning and concentration.

The variable “practice strategies” has a main effect then on “metacognition/self-reflection.” The final phrase of the theories above contains an element of metacognition and self-reflection. This involves the ability to monitor and observe one’s own behavior and thought processes, assess their efficacy, and redirect learning to maintain effective and efficient practice.

In the theoretical model proposed here the latent variables “psychological factors”, “planning/goal-setting”, “practice strategies”, and “metacognition/self-reflection” each have a direct effect on “practice commitment”. A learner’s commitment to practice is critical in developing musical achievement. The time spent engaged in quality practice has been shown to enhance the musical skills and concepts necessary for musical success. The frequency with which one practices is one measure of practice commitment. A graphic of the model specified for this study is displayed in Figure 1.

Figure 1. Latent Variable Model



Research Questions

Research questions include:

1. Do the measurement items load highly onto separate factors? If so how and what is their relationship to the constructs in the a priori model?
2. Is there evidence that the data collected fits the a priori model developed for this study?
3. What is the influence of student characteristics, physical environment, and social influences on psychological factors?
4. What is the influence of psychological factors on planning/goal-setting?
5. Are there main effects from planning/goal-setting to practice strategies to metacognition/self-reflection leading back to psychological factors creating a cyclical feedback loop?
6. What are the influences of psychological factors, planning/goal-setting, practice strategies, and metacognition/self-reflection on practice commitment?

Chapter 1 outlines the background, need, and purpose of this study. Chapter 2 will outline the major theories already developed in relation to musical practice and provide a research-based argument for including these variables in the current study. Chapter 3 will provide a summary of the methodology used to carry out the present study. This will include the selection of participants, creation of the measure, the procedures used, and how the appropriate statistical procedures will be carried out.

CHAPTER 2

Literature Review

This chapter is a review of research that informs this study's aim to create a theoretical model of deliberate practice. Through examining previous theoretical models related to practice and the extant research on practice-relevant variables, eight variables are extracted and identified. These eight variables will be combined into one model in order to examine their interdependence in the area of deliberate practice. The eight variables are "student characteristics", "physical environment", "social influences", "psychological factors", "planning/goal setting", "practice strategies", "metacognition/self-reflection", and "practice commitment."

Previous Theory

Jorgensen (2004) identified practice strategies musicians could use in their individual practice. He thought of practice as divided into three distinct phases: (1) planning and preparation, (2) the executive phase, and (3) the evaluation phase. Each uses its own type of strategies. The planning and preparation stage involves the selection of strategies to help plan practice and set goals. The executive phase involves the act of practicing. This includes the use of strategies such as slowing down the tempo, breaking the music into small parts, and silent practice. In the final phase, Jorgensen suggested musicians use strategies to aid in the evaluation of their own practice. These might include listening to a recording of the practice session, assessing the overall quality of performance, and determining the effectiveness of the strategies used during the executive phase. Progressing through these phases, musicians become more metacognitive about their practice, which allows them to recall learned strategies and

regulate their behavior. This improves the effectiveness and efficiency of the practice session with the goal of improving performance.

Hallam (1997a) also developed a theory of practice that is divided into separate phases. Hallam's theory views practice as a multi-faceted activity which is influenced to a certain degree by outside factors not under the musicians control and which take place over time. Hallam's theory is divided into three separate phases that include presage, process, and product.

The presage phase involves all the influences existing prior to the initiation of practice. These influences include learner characteristics, the learning environment, and task requirements. Learner characteristics are those qualities that the learner brings to the practice session which include level of expertise, motivation, and self-esteem. The learning environment includes elements that affect practice but are primarily out of the musician's control. These include teacher characteristics, the school's philosophy toward learning, the home environment, and parental support. Task requirements are informed by the music to be practiced, the characteristics of the instrument, and performance goals.

In the process phase, Hallam theorized that practice could be divided into two kinds of strategies: task-oriented strategies and person oriented strategies. Task-oriented strategies are those that affect the actual performance of the music, such as playing slower or breaking the music into sections. Person-oriented strategies are those that make the process of practice more effective, such as going to a quiet room or setting goals prior to a practice session.

The product stage includes all of the potential outcomes that come from practice. These might include a new quality of performance, a new level of expertise, or improved

communication with the intended audience. This process is cyclical as all of these outcomes influence the presage stage of the next practice session. This theory provides a structure for practice that can be used by both teachers and students.

Related to deliberate practice, McPherson and Zimmerman (2002) describe self-regulation as a cyclical process in which feedback obtained from prior performance helps learners to adjust their performance and establish future goals. These feedback loops allow learners to adjust to factors related to the environment, their own behavior, and their cognitive and affective states.

Zimmerman (1998, 2008) also has a theory of practice and self-regulation that is explained as a cycle in three phases: forethought, performance control, and reflection. Forethought refers to the thought processes and personal beliefs that precede efforts to engage in a task and that influence subsequent learning. There are two sub-categories of forethought: task analysis and self-motivational belief. Task analysis may begin by setting goals and planning strategies. Students who set clear goals and strategically plan their practice sessions themselves are more likely to: gain pleasure and feel confidence in their abilities, focus their efforts as they learn, work harder, and persist in receiving instruction even after they have been confronted by difficulties. The second vital component of forethought is self-motivation. A person's willingness to engage in and sustain a self-regulatory effort will depend largely on the level of self-motivation.

Performance/volition control involves those learning processes that affect concentration and performance. This phase has three components that enable learners to optimize performance: strategy-control, self-observation, and volitional-control. The first of these, the strategy-control processes, entails such strategies as self-instruction, imagery,

attention-focusing, and task strategies. The second chief component of the performance/volition-control process is self-observation. A musician may, for example, choose to tape-record a practice session or performance and then listen to the tape as a way of assessing improvement (McPherson & Zimmerman, 2002). Finally, in this second phrase, self-regulated learners may show better concentration on their task or adopt strategies for better volition.

The third phase of self-regulated learning is self-reflection. Self-reflection entails two processes that are: self-evaluation and self-reaction (Bandura & Cervone, 1986). Once learning has occurred, self-reflection influences that learner's reactions and subsequent responses to the learning experience. Feedback obtained from prior performances helps the learner to adjust performance and future efforts. Given that such self-reflections often lead to forethought, these three stages can be seen as comprising a self-regulatory cycle.

These theories of practice are all similar in that they break the process of practicing into three phases. Hallam (1997a) states that the presage phase involves all the influences present prior to the initiation of practice. These influences include learner characteristics, the learning environment, and task requirements. Learner characteristics are those qualities that the learner brings to the practice session which include gender, age, and level of expertise or prior experience.

Drawing upon the work of Bandura (1977, 1986), Zimmerman (1989, p. 330) also makes the distinction among personal, behavioral and environmental determinants of self-regulated learning. Each of these determinants impact the three phases described in Zimmerman (1998)'s model above. This process is also a cyclical activity where learners

adjust their performance and successive efforts through three self-oriented feedback loops: behavioral self-regulation, environmental self-regulation, and covert self-regulation (Zimmerman, 2000a).

The first process in this cyclical activity is behavioral self-regulation. This involves self-monitoring one's performance processes or methods of learning. Environmental self-regulation has to do with observing the practice environment and making adjustments to it for optimal learning, such as finding a quiet place. Covert self-regulation is a result of monitoring one's affective and cognitive states and consciously makes an effort to focus or concentrate on the task at hand. The way in which one monitors the three sources of self-regulation behaviors can influence the effectiveness of strategic adjustments and affect beliefs about one's own abilities. Adjustments of these types of self-regulation in learning are necessary because personal, behavioral, and environmental factors are constantly changing (Zimmerman, 2000).

The four-component model of self-regulated learning was developed by Garcia and Pintrich (1994). The authors of this model propose two general organizing constructs: knowledge/beliefs and strategies of self-regulation, considering them in the domains of cognition and motivation. Crossing the domains and constructs gives a two-by-two matrix that forms four cells: cognitive knowledge/beliefs, (meta)cognitive strategies, motivational knowledge/beliefs and motivational strategies. Research using this model (Fritz & Peklaj, 2011) explores the relationship between motivation and cognition, which are both necessary to self-regulation.

McPherson and Zimmerman (2002) in their chapter in the *New Handbook on Music Teaching and Learning* propose another theory of self-regulation. They describe

how self-regulation, with its roots in Bandura's Social Cognitive Theory, is relevant to understanding how musicians develop effective practice habits. They describe the dimensions of self-regulated practicing as (a) motive (e.g., work through distractions, parental influence, self-motivation), (b) method (e.g., task-oriented strategies, mental strategies, self-instruction), (c) time management (e.g., planning, management, concentrate focus on tasks), (d) behavior (e.g., metacognition, self-evaluation/monitoring), (e) environment (e.g., physical structure), and (f) social factors (e.g., parental involvement, siblings, peers, help-seeking).

Miksza (2012) in his recently published review of the literature on practicing proposes a new theory. His theory is a sketch of an instructional theory of practicing that highlights variables important for further research and/or instructing a musician in how to practice. The essential components of the proposed theory are intended to represent the primary variables that are mostly directly relevant to learning efficient and effective approaches to practice, and include: choice, intentionality, action, achievement outcome, and rest and recovery.

Choice refers to the students' decision to practice, which may in some cases be impacted by their teacher's expectations (e.g., requiring amounts of time to practice, practice assignments). Intentionality refers to the degree of purpose (e.g., deliberate, formal practice) that a student brings to practice. A student's evaluation of his or her own strengths and/or weaknesses as well as a teacher's assessment of what needs to be improved may impact degree of intentionality. Action is simply what takes place during practice and is influenced by a student's "repertoire" of practice strategies available as well as a teacher's instruction, or lack thereof, on how to practice. The achievement

outcome component is hypothesized to be most directly related to the action undertaken in practice, often results in some form of formal or informal teacher evaluation, and has an impact on a student's self-perceptions (i.e., reflection). Rest and recovery is included as the final component in this somewhat linear description. Individual differences, such as motivation orientation, cognitive style, and personality, are hypothesized to interact with student disposition and behavior at each step in the process.

Finally, Miksza's model can also be seen to operate on a developmental continuum in that greater proportions of student and/or teacher direction would be expected to be influential at various points in development, that is, as students become more sophisticated and independent in their practice. Miksza states that the ultimate outcome of his theory is that it intends to highlight the process of developing effective practice habits and not simply gaining performance competence.

Learner Characteristics

Demographics-Age

Williamson and Valentine (2000) identified age as one variable that helped determine that the quality of practice had just as an important an influence on a successful performance as did the amount of time spent practicing. Harnischmacher (1997) concludes, "Musicians tend to develop useful practice strategies relatively late" (Harnischmacher, 1997, p. 72). His research suggests four developmental stages of practicing: Activity Phase, ages 8 to 10 which is characterized by a "playful component"; Adoption, ages 11 to 12 where "the child adopts an externally imposed work ethic"; practicing, during the stage of Assimilation, ages 13 to 14, becomes a "chore and integrated into the daily schedule"; from the ages of 15 to 18 is the stage of Identification

where “the student reflects on the self-orientation of practice, and the increased quality and economy of practice plays a more important role” (Harnischmacher, 1997, p. 72).

Research indicates that productive individual learning in a practice room is a skill that is developed over time, with experience and guidance. Because of this knowledge, it is assumed that many young musicians will not yet have the tools they need in order to develop deliberative practice skills. Austin and Berg (2006), in their study of 224 sixth grade band and orchestra students, found results indicating that inexperienced instrumentalists “generally do not use a strategic approach to practice” (Austin and Berg, 2006, p. 551). This finding was consistent with earlier studies of McPherson & Renwick, 2001; Pitts et al., 2000b.

Prior Experience

In deliberate practice research, Hallam (1997a) found that the evolution of practice strategies is “more closely related to development of expertise than chronological age” (Hallam, 2001a, p. 20). Hallam (1997a), in her study comparing approaches to instrumental music practice of novices and experts, notes, “considerable musical knowledge is necessary for some strategies to be adopted effectively. This is only acquired as expertise develops. Knowledge of strategies alone will be insufficient for effective learning” (Hallam, 1997a, pp. 99 – 100). Hallam (1998) agrees that time spent practicing may be more a result of acquiring expertise and not a predictor of it.

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. Rohwer and Polk (2006) observed that students did not always use the strategies that they referred to in their interviews possibly because students' skill levels were not advanced enough to go beyond the basic ability to perform with both correct rhythm and correct notes.

Gruson (1998) did a study directly relating the variable prior experience with the development of practicing. In the first part of Gruson's (1988) study, results indicated that, as students gained musical skill, "errors, repeated notes, and pauses tended to decrease with competence while self-guiding speech, total verbalizations, playing hands separately, time spent on each piece and, particularly, repeating sections increased as music level increased" (Gruson, 1988, p. 101). The second part of Gruson's study found that "changes in practicing behavior were far more significant between music levels than between practice sessions of individual pieces" (Gruson, 1988, p. 107). Another important finding derived from interview data was that "more experienced students were able to conceptualize their practicing behavior in a more differentiated and abstract manner. They described more practicing strategies and these strategies were found to be more cognitively complex" (Gruson, 1988, p. 107). Growth in practice efficacy "appears to be accompanied by a metacognitive awareness of one's own practicing" (Lehmann, 1997, p. 174).

In discussing the results of the study, Gruson (1988) explains the causality of changes in practicing behaviors occurring "as individuals acquire competence as musicians" (Gruson, 1988, p. 106), as being brought about by "many, many hours of

practicing involved in mastering a new music level” (Gruson, 1988, p. 107) and the result of “increasing skill on a cognitive level” (Gruson, 1988, p. 108).

Lehmann and Davidson (2002) wrote an introduction to the research on skill acquisition in the *New Handbook of Research on Music Teaching and Learning*. Both writers concurred that optimized practice was attribute to the advancement of musical skill. Furthermore, they postulated that it was imperative that the applied studio teachers provide a self-guided system to the developing musician to promote efficiency and quality of practice. In summary, the literature exploring the growth of effective musical practicing (Barry & Hallam, 2002; Gruson, 1988; Hallam 1997a, 2001a) attributes its development to increased musical “knowledge” and “expertise.”

Physical Environment

Important to these theories of practicing and self-regulated learning is the physical environment in which the learning takes place. It is crucial that the learner take control of the physical environment to ensure that it is conducive to effective and efficient practice. This includes having all of the necessary materials and equipment as well as being free from distraction.

Environmental self-regulation has to do with observing the practice environment and making adjustments to it for optimal learning, such as finding a quiet place. In order for an academic skill to be mastered, the learner must behaviorally apply cognitive strategies to a task, within a contextually relevant setting. This usually requires repeated attempts to learn, because the quest for mastery involves the coordinating of personal, behavioral, and environmental components.

Social Influences

The learning environment includes many factors that are important for effective practice and musical achievement but they are often difficult to control or manipulate. These include home environment, parental support, and teacher characteristics. Current educational thinking views learning as a constructive process. In other words, knowledge is constructed via interactions between individuals and their experiences and is deeply influenced by the cultural/social/historical contexts in which the learning activities take place (Zimmerman, 1989).

Parental Involvement

Hoover-Dempsey, Battiato, Walker, Reed, DeJong, & Jones (2001) conclude that parental involvement in their children's homework is related to student achievement, as well as, the development of personal attributes such as self-regulation and self-efficacy that are conducive to achievement. Findings on parent involvement, summarized in Hoover-Dempsey et al.'s (2001) review of the research, provide insight into some of the ways in which parents get involved with their children's homework. Many of these have a direct parallel to parental involvement with music practicing.

To aid their children many parents use meta-strategies that are "designed to create a 'fit' between the child's skill levels and task demands" (Hoover-Dempsey et al., 2001, p. 203). Breaking up a homework task into manageable parts is one example. Parents guide their children from what they know to what they are capable of learning. Parents also use meta-strategies to help develop the child's learning processes and self-awareness. "Such activities may focus on helping the child assume developmentally appropriate independence for managing learning tasks. Parents' activities in this category may also

enhance the child's self-management skills (e.g., for coping with distractions) and the child's skills in regulating emotional responses to homework and related learning tasks" (Hoover-Dempsey et al., 2001, p. 203). Again citing the research, Hoover-Dempsey et al. (2001) state, "Parental involvement has also been linked to effective student work habits and the development of self-regulation, both of which are critical to effective student assumption of responsibility for learning outcomes" (Hoover-Dempsey et al., 2001, p. 205). Children who are at the age when many begin formal music training, grades 2 and 3 in school, "tend not to view homework as their own responsibility (Warton, 1997, cited in McPherson & Davidson, 2006, p. 344). These children understand the importance of homework but also need to heavily rely on parents for reminders and checks. "Many parents will continue to remind their child to do his or her homework for however many years it takes" (McPherson & Davidson, 2006, p. 344). Consistent with the research on parental involvement in school homework, the literature relating to musical practicing is unequivocal in finding that musicians who are most successful, not only in performance achievement, but also in continuing their studies, had parents who were highly involved in their children's practicing from an early stage (Davidson et al., 1996; Davidson et al., 1995; Driscoll, 2009; Faulkner et al., 2010; O'Neill, 1997; Pitts et al., 2000a).

The greatest challenge for parents of young musicians is being versatile (Creech, 2010). That is, the parent needs to be sensitive to what is effective proximity to the learner. While closely supporting the child through his or her learning, the parent also wants to leave space to nurture independence. This rapport is constantly in flux and changes over time with more support in early learning and the allowance for autonomy as learning progresses. In her study of 337 parents and their children in the context of violin

lessons, Creech (2010) concludes: positive outcomes may be achieved when parents: (1) elicit their children's views regarding appropriate parental involvement, (2) negotiate with their children over practicing issues, within parameters set by the teacher, (3) provide a structured home environment for practice, (4) take an interest in promoting good teacher-pupil rapport, (5) communicate with the teacher in relation to the child's progress and (6) remain as a supremely interested audience (p. 29).

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.

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.

Teacher

Ericsson et al. (1993) conclude that the necessary conditions for optimal learning and improvement of performance are motivation to attend to the task and exert effort to improve, the incorporation of preexisting knowledge, meaningful feedback to inform adjustments and revisions, and the opportunity for repetition (Ericsson et al., 1993, p. 367). Ericsson (2009) states the importance of a coach or teacher who will also design activities to be used during deliberate practice. This is significant since many students they are left on their own to do these tasks.

Effective practice is a skill that needs to be taught and is not innate in novice musicians. Therefore, it is important for music teachers to provide instruction in appropriate practicing techniques (Barry, 1994; Ericsson, Krampe & Tesch-Romer, 1993; Jorgensen, 2003; McPherson, 1995; McPherson, Davidson & Pitts, 2000). Lehmann and Davidson (2002) state that, "learning to practice is in itself a skill that needs to be acquired. Therefore, teachers should take great care to teach their students how to practice correctly." Teachers need to provide instruction and supervision of student practice providing individual feedback and training in effective practice techniques (Ericsson, Krampe & Tesch-Romer, 1993).

Reflecting the results of Ericsson et al.'s (1993) study, Lehmann and Ericsson (1997) made suggestions to schoolteachers on how to incorporate certain features of expert performers' practice into the learning environments of students. Lehmann and Ericsson discussed the benefits of supervised practice. As it is not always possible to provide supervised practice in a classroom setting, they also suggested the use of practice partners to allow students to supervise each other. Lehmann and Ericsson felt practice

partners would also help students to set goals and receive immediate feedback on their performance. They believed it was important to allow students to set some of their own performance goals as a way of instilling goal setting.

Barry (2007) conducted a study to determine the relationship between student-teacher interactions in college applied music lessons and subsequent individual student practice. Teachers and student completed questionnaires to indicate practice activities they advocated. Barry compared questionnaires and videos and determined, like researchers investigating younger musicians (Austin & Berg, 2006; Leon-Guerrero, 2008; Lisboa, 2008; Rohwer & Polk, 2006), both teachers and students advocated more strategies than were actually used in lessons or practice. Strategies teachers used most in lessons were counting out rhythms, singing, visualization and practicing at a slow tempo. Barry concluded that teaching style, what teachers actually did and asked their students to do during the lesson, had more influence upon students' practice than what teachers merely said.

Psychological Factors

Hallam (1997a) also states that learner characteristics in the presage phase involve self-esteem or self-efficacy and motivation. These are also psychological constructs involved in Zimmerman's theory on self-regulation. In my model these are grouped together into the latent variable entitled "psychological factors."

Self-Efficacy

Self-efficacy represents an individual's perceived assessment of having the relevant technical or musical skills to organize and apply to a given task (Maehr et al., 2002; Conroy et al., 2007; Ormrod, 2008). Self-efficacy judgments concerning academic

tasks are developed by one's evaluating their personal "capabilities, skills, and knowledge to master school-related tasks" (Maehr et al., 2002, p. 357). A social cognitive theory of human functioning, developed by clinical psychologist, Albert Bandura (1977) examined the influential role of self-efficacy on individual differences in persistence. Bandura (1982) believed that the individual developed self-efficacy from these sources: personal experiences, observation of others, and external influences. According to Maehr et al. (2002), self-efficacy in music was the "explicit judgments of having particular technical or musical skills necessary to perform or learn a specific piece of music" (Maehr et al., 2002, p. 357) or in reference to "some type of goal" (Maehr et al., 2002, p. 357). Since then, the measurement and application of self-efficacy on human effort have been well documented across the domains in education, health, sociology, management, and sports (Beck, 2008).

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.

Replicating a previous study in 2003, McPherson and McCormick (2006) measured the self-efficacy of 686 musicians, between 9-19 years, one day prior to their

music examinations. They concluded that personal self-efficacy was necessary for achievement in the performance-based examinations. McPherson and McCormick suggested that studying self-beliefs might further assist music researchers to better understand the process of how self-assurance was developed when students encounter challenging tasks during musical study. Judgments of self-efficacy also determine how much effort people will expend and how long they will persist in the face of obstacles. When overcome with difficulties people who have serious doubts about their capabilities slacken their efforts or give up altogether, whereas those who have a strong sense of efficacy exert greater effort to master the challenges (McPherson and McCormick, 2006, pp. 122–123).

Bandura (1995) suggests that there are four major ways in which efficacy beliefs are developed or influenced. "The most effective way of creating a strong sense of efficacy is through *mastery experiences*" (Bandura, 1995, p. 3). A second way of acquiring strong self-efficacy is through observational learning. In witnessing the success of a peer in a similar situation, efficacy beliefs can be developed or advanced. Both exposure to modeled behavior (performance) and enactive experiences especially influence one's feelings of their own self-efficacy (Zimmerman, as cited in Zimmerman & Schunk, 1989). This "social persuasion" is a third way that Bandura recognizes as a means to attain strong feelings of self-efficacy. Finally, "physiological and emotional states" (Bandura, 1995, p. 4) play a role in individuals assessing their abilities. "Mood ... affects people's judgments of their personal efficacy. Positive mood enhances perceived self-efficacy; despondent mood diminishes it" (Kavanagh & Bower, 1985 as cited in Bandura, 1995, p. 4).

Consistent with previous studies (Pintrich, 1999; Pintrich and De Groot, 1990) musicians with high self-efficacy are more likely to be engaged cognitively and metacognitively while learning a piece of music than students who doubt their capabilities to achieve a goal (Nielsen, 2004). Nielsen (2004) investigated learning strategies of advanced music students and determined the relationship between their self-efficacy beliefs and the strategies they actually employ during practice. Nielsen's study found that students with higher self-efficacy were more involved in trying to learn the practice material well than students with lower self-efficacy. In general, the higher a student's self-efficacy, the more cognitively engaged the student tended to be when practicing.

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.

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.

Another important motivating factor in instrumental music practice is enjoyment. Hyllegard and Bories (2008, 2009) found in two related studies that students who enjoy practicing are more likely to be successful. Schatt (2011) explored high school band students' perspectives of practice, and attempted to ascertain their attitudes toward practice and how their attitudes affected practice motivation. Schatt determined that internal perceptions of ability and effort correlated highly with attitudes toward practice. Based on these findings, teachers could make assumptions that if students are given sufficient positive reinforcement to uphold their self-perceptions, they may find practicing to be more fun.

Attribution Theory

Attribution theory is based on what a person retrospectively attributes to the cause of a success or failure (Weiner, 1974). 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).

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" (Asmus, 1985, p. 6). Among these internal categories, the majority of responses were interpreted as effort-related.

Asmus suggested that this be applied to education by encouraging teachers 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.

Expectancy-Value Theory

Expectancy-value theory considers a person's incentive developed through the anticipation of an outcome and the value placed on that expected outcome (Atkinson, 1964). While attributions are considered causal influences related to motivation, motivation in expectancy-value theory is controlled by expectations of outcomes and the importance of those outcomes that 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 students' perception of their capabilities to achieve in present

activities or it may be related to skills and activities that the student believes to be useful and important for future expectations (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. Therefore, an argument of 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.

Motivation has long been an important area of interest in music education. 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 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 incentives (Hallam, 1997a; Harnischmacher, 1997).

Planning/Goal Setting

Each of the theories described earlier expresses the importance of the planning stage of practicing. This includes choosing music that is appropriate, assessing the requirements of the task, planning practicing sessions, and setting both long and short-term goals.

Task Difficulty

The construct of flow is a theory that explains the importance of task difficulty and its importance to deliberate practice. Csikszentmihalyi et al. (1993) notes, “a deeply involving flow experience usually happens when there are clear goals and when the person receives immediate feedback on the activity. In everyday life, and all too often in classrooms, individuals don’t really know what the purpose of their activities is, and it takes them a long time to find out how well they are doing” (Csikszentmihalyi et al., 1993, p. 14). Also needed for the flow experience is “the balance between the opportunities for action in a given situation and the person’s ability to act” (Csikszentmihalyi et al., 1993, p. 14). Flow is when a performer becomes “completely involved... to the point of *losing track of time and of being unaware of fatigue and of everything else but the activity itself*” (Csikszentmihalyi, Rathunde & Whalen, 1993, p. 14). “Flow leads to complexity because, to keep enjoying an activity, a person needs to find ever new challenges in order to avoid boredom, and perfect new skills in order to avoid anxiety” (Csikszentmihalyi et al., 1993, p. 15).

After examining flow theory in 394 high school students “who possessed a superior grasp of their domains” (Csikszentmihalyi et al., 1993, p. 43), the researchers note in their conclusions: “Perhaps the most important finding is that when students

experience flow while working on their talent, the likelihood that they will keep on developing their gift increases significantly” (Csikszentmihalyi et al., 1993, p. 218).

Crucial to continued motivation in light of setting musical goals is maintaining a balance between the skill level of the musician and the challenges being addressed (Csikszentmihalyi et al., 1993). Students who set, or have set for them, goals which, given their skill level, they cannot achieve, will become frustrated or anxious. Goals that are achieved too easily without much effort create the potential for boredom, even apathy (Csikszentmihalyi, 2004). In both cases, the motivation for learning is diminished. The result of manipulating skill and task difficulty and finding the right balance is “a concentrated feeling of total immersion in an activity defined as flow” (Csikszentmihalyi, 1990, cited in Austin et al., 2006, p. 216).

Goal Setting

Establishing specific goals for learning is a key component of both self-regulation and deliberate practice. Many researchers have found strong positive correlations between goal setting and motivation and performance achievement (Barry and McArthur, 1994; Ericsson, Krampe & Tesch-Romer, 1993; Geiersbach, 2000; Pitts, Davidson & McPherson, 2000; Lehmann, 2003). Pitts, et al. (2000) found that students accomplish more and enjoy themselves more when they practice to accomplish goals rather than for a required amount of time.

Setting goals is important as they enhance motivation, self-efficacy, and self-evaluations of progress (Schunk, 1995). Schunk (2001) states that effective goals are specific, proximal, and appropriately challenging. Effective goal setting requires that learners set a long-term goal, which then can be divided into short-term and attainable

sub-goals, monitor progress and assesses capabilities, adjust the strategy and goals as needed, and set a new goal when the present one is attained. This process of setting goals enhances motivation by encouraging positive self-efficacy and helping students to attribute progress to stable factors within their control.

Lehmann (1997) wrote an overview on how expertise is developed in music through optimized practice. Goal setting and the evaluation of goal outcomes were viewed as most significant when striving for efficient practice. Miksza (2007) wrote on the importance of the quality of practice. Students who were more organized in their practice tended to achieve at a higher rate, therefore, instructors should ensure that students be equipped with focused goals. Deci et al. (1994) suggested focusing on goals that were intrinsic in nature to encourage engagement and competence. Bandura (1997) posited that individuals were more likely to adhere to goals when those goals were designed from their self-interests. The more the goals were self-set, the more effort a student would be willing to fully commit to pursue them.

Specificity might be the key when identifying attainable goals, including the amount of effort required in achieving them. Specific goals might have a motivating effect by cultivating positive attitudes towards the required tasks to achieve them (Bryan & Locke, 1967). Subgoal-based planning was allowing musicians to develop expertise using problem-solving activities that focus on small, manageable, short-term areas of study at a given time (Chaffin & Lemieux, 2004). The use of proximal subgoals helped to provide incentives on smaller, attainable goals for immediate and present action (Bandura, 1997; Bandura & Schunk, 1981).

Geiersbach (2000) investigated the practice of advanced music students to determine the thoughts and actions used to improve performance. Geiersbach discovered participants with goals in mind before playing tended to spend time reflecting on their own playing and spent more time in uninterrupted play. These participants who spent time reflecting on their own play tended to develop goals based on those reflections, thus creating a pattern of flowing, uninterrupted practice. These participants' practice resembled that of the advanced students from other studies (Duke et al., 2009; Hallam, 1997b, 1998, 2001; Nielsen, 1999a, 1999b, 2004; Slaboda et al., 1996; Williamon & Valentine, 2000). On the other hand, participants who did not set goals prior to practice often had trouble deciding what to practice and therefore spent less time reflecting and had more interrupted practice. These participants did not have any structure to their practice and often spent time simply repeating music without making any corrections, much like the less advanced students from other reports (Austin & Berg, 2006; Hallam, 1997b; Jardaneh, 2007; Leon-Guerrero, 2008; Lisboa, 2008; McPherson & Renwick, 2001; Pitts et al., 2000; Rohwer & Polk, 2006). Geiersbach concluded, like Jorgensen (2004) and Nielsen (1999a, 1999b, 2004), that musicians should use planning, reflection and metastrategies in their practice to make it more efficient.

Hallam (2001) also found that planning correlated positively with task efficiency. The better the practice routine was planned, the more successful it was. Oare (2007) observed students engaging in a four-part cycle: motivation, goal setting, strategy use, and self-assessment. Oare found that students with intrinsic goal orientations were more effective than students with extrinsic goal orientations, and he also theorized that greater specificity in goal setting would help improve their efficiency.

Practice Strategies

Prior theories of deliberate practice emphasize the importance of strategy use and control involved in the act of practicing. This includes having a repertoire of practice strategies and knowledge of when it appropriate to use them. Zimmerman in his theory also states the importance of maintaining concentration in maintaining effective practice.

Concentration

Hallam (2001) 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. Lammers and Kruger (2006) found that students who practiced more reported more planning and concentration.

Practice Strategies

Jorgensen (2007) defined practice strategies as “consciously applied” thoughts and behaviors during practice through which musicians “select, organize, integrate, and rehearse new knowledge and skills” (Jorgensen, 2007, p. 85). The correlation between the process and accomplishment of deliberate practice and successful performance is a multivariable relationship. A review of the literature shows it is difficult to name one variable that would account for most of the variance. To investigate this possibility researchers, have studied musicians’ different strategies and approaches to deliberate practice.

Researchers conclude practice is a skill that does not come naturally through exposure to music, but instead effective practice strategies need to be taught by music teachers (Leon-Guerrero, 2008; Lisboa, 2008; McPherson and Renwick, 2001; McPherson, 2005; Miksza, 2007; Pitts, Davidson and McPherson, 2000). Despite the call from many researchers for educators to teach their students more efficient practice strategies, evidence suggests younger students do not always incorporate learned strategies into their own practice (Austin & Berg, 2006; Jardaneh, 2007; Leon-Guerrero, 2008; Lisboa, 2008; Rohwer & Polk, 2006). Various researchers have investigated effective strategies for use in deliberate practice. Hallam (1997a) categorized students' practice strategies according to level of expertise: Strategy level 1: Task requirements incomplete; Strategy level 2: Material played through, no corrections; Strategy level 3: Material played through, single notes corrected; Strategy level 4: Material played through, short sections repeated; Strategy level 5: Material played through, large sections practiced en route; Strategy level 6: Material initially played through, difficult passages identified and practiced in isolation.

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.

Nielsen (1999) wrote a classification of learning strategies during practice identifying two categories: (a) primary and (b) support strategies. Primary strategies referred to selecting and organizing relevant learning materials in relation to existing knowledge, and support strategies referred to concentration, managing anxiety, and efficiency. Austin and Berg (2006) postulated approaches to practice could be divided into four categories: those who simply did run-throughs, those who stopped for errors only, those who remediated errors, and those who were analytically proactive (characterized by jumping around in the score to target certain spots). Those who were analytical made the most significant gains, and there was a correlation found between articulated techniques and improvement. The study demonstrated that strategy use is a function of cognitive understanding.

Smith (2002) identified seven principal components underlying practice behaviors: (a) Mental practice, no instrument; (b) Organization of practice, record keeping; (c) Identifying and changing musical elements; (d) Repetition and drill, no variation; (e) Whole to part, analysis; (f) Prioritization and monitoring; and (g) Organization of practice planning. The reliability coefficients calculated for each component were found to be low (e.g., $\alpha = .20$ to $.63$). Therefore, the author suggests that these components be considered only as preliminary indicators of possible practice strategy categories.

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.

When considering studies across all ability levels, patterns begin to emerge regarding the development of musicians over time. Musicians at the beginner and intermediate levels tend to use a limited range of strategies in their practice, do not use many planning strategies, have not yet developed the ability to choose and regulate their practice strategies, and lack the ability to create a mental image of the music they are trying to create (Austin & Berg, 2006; Hallam, 1997b, 2001; Jardaneh, 2007; Leon-Guerrero, 2008; Lisboa, 2008; McPherson & Renwick, 2001; Pitts et al., 2000; Rohwer & Polk, 2006). As musicians develop, they begin to use a wider variety of practice strategies, plan their practice and develop metastrategies to assist them in their practice (Hallam, 1997b, 1998, 2001; Miksza, 2007; Rohwer and Polk, 2006; Sloboda et al., 1996; Williamon & Valentine, 2000). By the time musicians reach advanced and expert levels of performance, they have highly developed practice skills and are able to regulate practice strategies to address problems (Barry, 2007; Chaffin et. al., 2010; Chaffin & Imreh, 2001; Duke et al., 2009; Geiersbach, 2000; Nielsen, 1999a, 1999b, 2004). Advanced and expert musicians also appear to have a mental image of the music from the beginning of their practice that regulates their practice from the earliest sessions through performance (Chaffin et. al., 2010; Chaffin & Imreh, 2001; Nielsen, 1999a, 1999b, 2004). Less clear is which practice strategies are most effective at improving performance. Because musicians' practice strategies change as they develop, there is also question of which practice strategies are most appropriate for which level of performer.

Researchers have shown advanced and expert musicians have a wealth of practice strategies at their disposal, but because of lack of data, it is still unclear which of these strategies are most effective at improving performance (Barry, 2007; Chaffin et. al., 2010; Chaffin & Imreh, 2001; Duke et al., 2009; Geiersbach, 2000; Hallam, 1997b, 1998, 2001b). Teachers should be encouraged to teach a diverse repertoire of practice strategies and work with students to guide them in appropriate context specific strategy use.

Metacognition/Self-Reflection

Each of the theories above also contains an element of metacognition and self-reflection. This contains within it the ability to monitor and observe one's own behavior and thought processes, assess their efficacy, and redirect learning to maintain effective and efficient practice.

Metacognition

A successful musician “requires considerable metacognitive skills in order to be able to recognize the nature and requirements of a particular task” (Hallam, 2001b, p. 28). Hallam (2001b) states that successful musicians must be able:

To recognize the nature and requirements of a particular task; to identify particular difficulties; to have knowledge of a range of strategies for dealing with these problems; to know which strategy is appropriate for tackling each task, to monitor progress towards the goal and, if progress is unsatisfactory, acknowledge this and draw on alternative strategies; to evaluate learning outcomes in performance contexts and take action to improve as necessary in the future (Hallam, 2001b, p. 28).

Metacognition increases a student's capacity for self-regulated learning.

“Metacognitive efforts to monitor and control concentration and affect, in conjunction with the application of effective cognitive strategies serve learning efficiency as well as

effectiveness...and gives them special status in maintaining the system's *efficiency*"

(Corno, 1986, p. 334). There are several definitions of metacognition such as "cognition about cognition" and "knowing about knowing." J. H. Flavell first used the word "metacognition" in 1976 defining it as:

Metacognition refers to one's knowledge concerning one's own cognitive processes or anything related to them, e.g., the learning-relevant properties of information or data. For example, I am engaging in metacognition if I notice that I am having more trouble learning A than B; if it strikes me that I should double check C before accepting it as fact (p. 232).

Wang, Haertel, and Walberg (1993) conducted research over a fifty-year period involving the study of twenty factors likely to affect students' academic abilities. Their findings show a reasonable consensus of the most significant influences on learning. At the top of their list was "metacognitive processes." They observe that "a student's metacognitive processes – that is, a student's capacity to plan, monitor, and, if necessary, re-plan learning strategies – had the most powerful effect on his or her learning" (p. 78).

Hallam (1997a) concludes in her study that professional musicians demonstrated an extensive use of metacognitive abilities. They were self-aware of their strengths and weaknesses, had extensive knowledge about the tasks that needed to be completed and what was required to do so, and had a repertoire of appropriate strategies for use in appropriate situations. This is the case not only for musical skills and concepts but also with learning itself such as concentration, monitoring oneself, and self-evaluation.

Schraw (1998) posited that metacognitive knowledge was teachable. He reported specific studies in which instruction on metacognitive skills contributed towards an improvement in learning. Ross, Green, Salisbury-Glennon, and Tollefson (2006) wrote a theoretical framework of metacognitive self-regulation based upon the past research on

the relation of self-regulation to achievement. Ross et al. (2006) summarized that the adjustment of one's strategies during self-monitoring was a metacognitive process. The refinement of strategies was crucial to excel academically. Conscious changes were made to instructional strategies as the ability to self-monitor improved.

Assessment and Evaluation

Assessment of progress provides feedback that describes the quality of student work, avoids comparison with others, and leads to the production of new goals. Stiggins (2001) promotes an assessment paradigm where students are involved as the primary assessor. Student-involved assessment is used as a tool to provide direction, communicate progress, and convey a sense of ownership over one's own learning. Students who take part in the assessment process develop greater self-efficacy, attributing outcomes to their effort during the learning process. This focus on assessment promotes the skills necessary for self-regulated learning.

Chappuis and Stiggins (2002) assert "students become self-directed learners by developing their self-assessment skills." Assessment provides learners with descriptive feedback they can use to shape future efforts (Lehmann & Ericsson, 1997; McPherson & Zimmerman, 2002). This type of self-assessment is important in the theory of self-regulation as students develop self-efficacy and the self-regulatory processes of forethought, volitional control, and reflection (Schunk & Zimmerman, 1994; McPherson & Zimmerman, 2002).

Schunk (1983) observes that students who have the capability to detect subtle progress in their learning will increase their levels of self-satisfaction and their beliefs in their personal efficacy to perform at a high level of skill. Schunk (1994) and Zimmerman

(1998) also found self-recording significantly enhanced self-regulation. McPherson and Zimmerman (2002) claim that students are inclined to evaluate their performances according to one of four criteria: mastery, personal improvement, normative criteria, or collaborative criteria. Students who are mastery oriented tend to be more motivated in their practice because they generally feel a stronger sense of control over their own learning.

Even though it is important for students to self-assess, young musicians tend to have difficulty assessing accurately (Hewitt, 2001). Self-assessment, like other skills, develops with experience and maturity (Hallam, 1997, in McPherson & Zimmerman, 2002). Young musicians who have not yet developed strong aural schemata are often unaware of their own errors, while more experienced musicians are more aware of their strengths and weaknesses, know more about the nature and purposes of different tasks, and adopt a larger range of strategies to meet their needs (Barry & Hallam, 2002). Bauer (2008) concluded the ability to diagnose problems and develop solutions was an important step in musicians' development and suggested teachers use an evaluation measure to help improve students' metacognition.

Practice Commitment

A learner's commitment to practice is critical in developing musical achievement. The time spent engaged in quality practice has been shown to enhance the musical skills and concepts necessary for musical success. The frequency with which one practices is one measure of practice commitment.

Practice Frequency

There are differences in research of the correlation between quantity and quality of practice related to musical achievement. Some researchers have found the amount of practice on an instrument is positively correlated to musical achievement (Ericsson et al., 1993; Sloboda, 1994; Sloboda et al., 1996; O'Neill, 1997; Jorgesen, 2002). Wagner (1975) sought to increase the amount of practice time with the participants in his study with the use of practice reports. While the musicians in the study did indeed increase the amount of time they spent practicing, there was no improvement in performance over the eight-week period of the study. Zurcher (1975) had similar findings. There is also research that reports the quality of one's practicing is more important than the quantity of time spent practicing (Duke, Simmons, and Cash, 2009; Gruson, 1988; Hallam, 2001; Hallam, 1997a; McPherson, 2005; Miksza, 2007; Pitts et al., 2000a; Pitts et al., 2000b; Rohwer & Polk, 2006; Williamon & Valentine, 2000).

Williamon and Valentine (2000) concluded that the content of deliberate practice by musicians at high skill levels could vary significantly. The researchers determined that the findings in their study "do not confirm the prediction that quantity of deliberate practice is significantly correlated to quality of performance and, hence, go against the monotonic benefits assumption" (Williamon & Valentine, 2000, p. 370). While the researchers certainly do not deny the importance of deliberate practice, their results demonstrate that "the relationship between quantity and quality is not as robust for situations in which performers are preparing for a specific performance" (p. 370).

Williamon and Valentine (2000) state, "Ericsson et al.'s definition of deliberate practice

appears to be too global. It simply does not account for possible differences in the content and quality of each performer's deliberate practice" (p. 371).

Research into self-reported practice time and actual time indicates that there are discrepancies in practice behaviors, self-reported efficiency, and performance achievement of young instrumentalists. Several researchers have studied the difference in self-reported practice versus actual practice time. The consistent result is that self-reported time spent in practice was over-reported when compared to actual time spent (Madsen and Yarbrough, 1975, Geringer and Kostka, 1984; Madsen, 2004; Miksza, 2007).

Conclusion

This review of literature explored previously developed theory and extant research into the variables extracted for use in this study. Researchers have developed a variety of theoretical frameworks to investigate and explain musical practice. Teachers should set goals for students' practice. They should also understand how students are practicing, what students are thinking, and how they manage their time. A learner's commitment to practice is critical in developing musical achievement. The time spent engaged in quality practice has been shown to positively influence and enhance the musical skills and concepts necessary for musical success.

CHAPTER 3

Method

The present study's goal is to create a theoretical model of deliberate practice. Through examining the extant research on practice-relevant variables, eight variables were extracted and identified. These eight variables were combined into one model in order to examine their relationships to the area of deliberate practice. The eight variables are "student characteristics", "physical environment", "social influences", "psychological factors", "planning/goal setting", "practice strategies", "metacognition/self-reflection", and "practice commitment."

To answer the research questions, a latent variable model was constructed to assess the a priori model. Structural equation modeling (SEM) is generally a priori, which means that the researcher must specify a model in order to conduct the analysis. The model's specification has its basis in theory, results of previous studies, and educated guesses that reflect the researcher's knowledge and experience. SEM will be used to analyze the latent variable model (Kline, 2011). It provides a technique for measuring latent constructs and testing research questions designed to explore the relationships among variables and latent constructs (Kline, 2011).

Participants

The population of interest for this study consists of high school woodwind, brass, and percussion students in high school. Woodwind, brass, and percussion students in grades 9 – 12 enrolled in a band class in schools within the States of Florida and New York were invited to participate in the study. The sample ($N = 191$) consisted of 90 woodwind, 74 brass, and 27 percussion students. Males comprised 35.6 percent and

females 64.4 percent of the sample. The age of the students was one 13 year old, twenty-eight 14 year olds, forty-nine 15 year olds, thirty-eight 16 year olds, forty-three 17 year olds, and thirty-one 18 year olds, and one nineteen year old. They averaged 4.71 years of experience on their instrument and 4.80 years of experience in a school ensemble.

Thirty-five percent of students have taken some private lessons.

Assessment Instruments

The measure used in this study was a survey aimed to assess responses to the eight variables. This instrument is referred to as the Hamlin Instrumental Practice Survey (HIPS). The survey consists of 66 questions. Questions in the current survey have been adapted from diverse research studies. Appendix A outlines each of the subscales used to measure the observed variables and which studies the items are adapted from. The HIPS survey as finally developed and formatted is provided in Appendix B.

Variables

The eight variables in the originally specified model for this study were selected from previous models and other research developed in the area of deliberate practice and self-regulation. Each of these eight latent variables was measured using one or more observed variables. For entry into SPSS for analysis the variables were coded as described below.

Exogenous Variables

Exogenous variables include “student characteristics”, “physical environment”, and “social factors.” “Student characteristics” were largely a measure of demographic data and were coded on the scale implied in the item. Gender was coded as a dummy variable (Male = 0, Female = 1). “Physical environment” consisted of one observed

variable, environmental characteristics. “Social factors” were measured using three observed variables that include parent involvement, peers, and teacher characteristics. Each item in these subscales was measured using a Likert type scale and is recoded to where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

Endogenous Variables

Endogenous latent variables included “psychological factors”, “planning/goal setting”, “practice strategies”, “metacognition/self-reflection”, and “practice commitment.” The latent variable “psychological factors” included the observed variables motivation and self-efficacy. “Planning/goal setting” consisted of planning, task difficulty, and goal setting. The latent variable “practice strategies” was measured using the observed variables concentration and practice strategy use. “Metacognition/self-reflection” was measured using one observed variable, self-reflection. The latent variable “practice commitment” was measured by the observed variable commitment. Each of these variables was also measured using a Likert type scale and is recoded so that 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

Data Collection Procedures

To answer the research questions and develop the theoretical model, each variable must be quantified. The items were measured using the Hamlin Instrumental Practice Survey (HIPS). The University of Miami Institutional Review Board as well as all applicable school district review boards approved the research protocol for this study. See Appendix C for copies of these IRB approvals. Individual band directors were contacted through email to elicit their school’s participation. All woodwind, brass, and

percussion students in grades 9 – 12 who were enrolled in a band class in those schools were then invited to participate in the study.

The details of the study were communicated to each student in the participating schools through the use of an introductory letter distributed by the researcher or the school's band director. In addition, a parent/guardian consent form and a student assent form were distributed to each student. Students became participants in the study with the return of the appropriate required consent/assent forms. Each school district, music teacher, and student was free to choose whether or not they would participate in the study with no implied or explicit consequences. Appendix D provides the introductory letter to band directors, student invitation letter, the consent and assent forms, and the standardized script.

Each participant took the HIPS Survey that was administered by the researcher or their respective band directors. A script was used to communicate the directions on how to take the survey during its administration. The data was collected using a paper survey that was distributed and collected during the same session. The researcher was available to answer questions at the time of each administration of the measure either in person or by phone.

At the conclusion of data collection at each location, the researcher picked up the completed surveys. No information was retained that would link any data to a particular school or participant.

Data Screening

Examining the data and eliminating any potential problems is essential to running the analyses. Researchers should screen the original data before creating a matrix

summary or a raw data file (Hair, Black, Babin, Anderson, & Tatham, 2006; Kline, 2011; Tabachnick & Fidell, 2013). Therefore this data was screened for accuracy, missing data, multivariate normality, univariate normality, outliers, linearity, and multicollinearity and singularity.

Data Analysis

Reliability

A reliability analysis was used to examine the internal consistency of the entire measure and each of its variable subscales to determine if the results of the measure used in this study are stable and replicable. An alpha coefficient of greater than .70 is considered to be reliable and internally consistent (Kline, 2011).

Correlation Analysis

The correlation matrix was studied to examine if there are associations between the factors or latent variables. McMillan (2000) indicates that correlations of .10 to .30 are considered weak, between .40 and .60 is a moderate relationship, and .70 and greater is considered strong.

Exploratory Factor Analysis

Exploratory factor analysis (EFA) can be used to detect the latent factor structure of variables and to help validate a measure through the demonstration that items load on the same factor (Tabachnick & Fidell, 2013). The validity has been established through its basis in previous research and is strengthened through the use of factor analysis.

Exploratory factor analysis was selected to extract factors or components from the items used in this study's measure. EFA is one of the most frequently used methods of factor

extraction. It attempts to reproduce the maximum variance in the sample data, rather than that of the population (Thompson, 2004)

The technique of factor analysis has three main uses. The first is to understand the structure of a set of variables. The second is to construct a questionnaire to measure an underlying variable and the third to reduce a dataset to a more manageable size while retaining as much of the original data as possible. The existence of clusters of more highly correlated coefficients between subsets of variables suggests that those variables could be measuring aspects of the same underlying dimension. Those dimensions become the factors. Factor analysis attempts to explain the most amount of common variance using the smallest number of explanatory constructs (Tabachnick & Fidell, 2013).

Factor loadings reflect the relationship of each variable to the factor. Ideally, variables are correlated highly onto one factor only. The factor matrix has columns that represent the factors and the rows the loadings of each variable onto each factor. The major assumption of factor analysis is that these factors represent real-world phenomena, the nature of which must be guessed at by inspecting which variables have high loads on the same factors. Next, we can create composite scores for each individual on a particular factor.

Not all factors are retained in the analysis. The eigenvalues represent the substantive importance of each factor; so only those with large eigenvalues are retained. Conventionally, the inflection point on the scree plot is used as the cutoff point for selecting factors. This is where the slope changes dramatically. Once factors have been extracted, it is possible to calculate to what degree variables load onto these variables.

Most loadings will load on all factors making interpretation difficult. Factor rotation is used to more clearly discriminate among factors (Tabachnick & Fidell, 2013). Two common methods of factor rotation are orthogonal and oblique rotation (Thompson, 2004). Promax and direct oblimin are two techniques for oblique rotation. An oblique rotation, direct oblimin, will be used for this study.

The Kaiser-Meyer-Olkin (KMO) coefficient measures sampling adequacy (Kline, 2011). It is the ratio of the squared correlation between variables to the squared partial correlation between variables. It ranges between 0 and 1. Values of between 0.5 – 0.7 can be considered mediocre, .07 – 0.8 good, 0.8-0.9 great, and greater than 0.9 superb.

The test variables should correlate well ($r > .3$). Bartlett's test of sphericity should be significant ($p < .05$). This test tells us whether our correlation matrix is significantly different from an identity matrix (Kline, 2011). If it were an identity matrix, then it would mean that all variables are perfectly independent from one another or that all correlation coefficients are zero. If no variables correlate, there are no clusters or variables to find.

Variables should correlate quite well with each other. As they should measure the same underlying dimension, then we would expect them to correlate with each other. The correlation matrix can be visually scanned and items with correlations less than 0.3 can be considered for elimination. In addition, the correlation matrix should be examined for any correlations greater than 0.8. Those items can also be considered for elimination.

The anti-image covariance and correlation matrix tables provide information similar to that of the KMO table. The KMO values for individual variables are produced on the diagonal of the anti-image correlation matrix. These values should be above 0.5.

Values below 0.5 should be considered for elimination. The off-diagonal elements represent the partial correlations between variables. These should be low.

Structural Equation Modeling (SEM)

Structural equation modeling (SEM) is a multivariate technique of data analysis intended to determine if the theoretical relationships of the specified model are supported by the data (Kline, 2011). In general, there are six steps for conducting the analysis: (1) specify the model, (2) check the identification status of the model, (3) measure the variables in the model, (4) estimate the model, (5) consider modifications to the model, and (6) accurately and completely summarize the results (Kline, 2011).

The model has been specified a priori based on theory extracted from previous literature. The next step in estimating the model is to make sure the model is theoretically identified. An identified model is one for which each of the estimated parameters has a unique solution. To determine whether the model is identified or not, a comparison was made of the number of data points to the number of parameters to be estimated (Kline, 2011). In short, there must be more known pieces of data than unknowns to be estimated.

Next, the relationship between the variables in the model was estimated. Model data fit indices were calculated to provide evidence for the degree of consistency between the model and the data. The chi-square exact fit test, CFI (comparative fit index), TLI (Tucker-Lewis index), RMSEA (root mean square error of approximation) and $CI_{90\%}$, and the SRMR (standardized root mean square residual) were calculated and interpreted to determine model data fit (Kline, 2011). A non-significant chi-square score leads to accepting the hypothesized model and indicates the overall goodness-of-fit of the

hypothesized model to the sample data (Kline, 2011). CFI and TFI scores greater than 0.95 indicate a good fit, a score between 0.90 and 0.95 indicates an adequate fit, and a score below 0.90 indicates a poor fit (Kline, 2011). An RMSEA score below 0.05 indicates a close fit of the model, a value between 0.05 and .08 indicates a reasonable fit, and a value greater than 0.10 a poor fit of the model in relation to the degrees of freedom (Kline, 2011). The standardized root mean square residual (SRMR) value of less than 0.08 suggests a good fit of the model to the observed data and a value above 0.08 a poor fit of the predicted model to the observed data.

Misfit in the data was also explored to determine where it has occurred using the appropriate modification indices. Alternative models may be explored and statistically compared to the a priori theory. The direct, indirect, and total effects were analyzed and implications discussed. Regression type beta weights were given and interpreted. The results were then be accurately and completely summarized to answer the research questions.

Research Questions

The following research questions are posed and methods for addressing them are:

1. Do the measurement items load highly onto separate factors? If so, how and what is their relationship to the constructs in the a priori model?

An exploratory factor analysis (EFA) was conducted to answer this research question to see how the items in the study align together. The factors that are extracted were then examined and related back to the constructs outlined in the literature review. The differences between the results of the factor analysis and the variables specified in the latent variable model were explored.

2. Is there evidence that the data collected fits the a priori model developed for this study?

Structural equation modeling techniques were used to test how well the hypothesized model fits the observed data. Fit indices were also interpreted for this model and the misfit examined.

3. What is the influence of “student characteristics”, “physical environment”, and “social influences” on “psychological factors?”

To answer this research question total, direct, and indirect effects were presented and interpreted. Regression type beta weights highlighted causal relationships and signified the strength of the interaction.

4. What is the influence of “psychological factors” on “planning/goal-setting?”

Similar to the previous research question, total, direct, and indirect effects were presented and interpreted. Regression type beta weights were presented to explore causal relationships.

5. Are there main effects from “planning/goal-setting” to “practice strategies” to “metacognition/self-reflection” leading back to “psychological factors” creating a cyclical feedback loop?

This research question is designed to test particular direct effects within the model, specifically the occurrence of a feedback loop. To answer this question the main effects were presented and interpreted to examine the direction and strength of the relationships.

6. What are the influences of “psychological factors”, “planning/goal-setting”, “practice strategies”, and “metacognition/self-reflection” on “practice commitment?”

Total, direct, and indirect effects were given and interpreted. Causal relationships were explored using beta weights.

Each of these research questions was designed to more fully examine the relationship between the latent variables in the predicted model. For this study, it may be determined that the resulting factors from the factor analysis favor running an observed path analysis rather than a latent variable model.

Summary

This chapter reiterated the purpose of the research and presented the design of the study in addition to providing details as to how the research questions would be addressed. The sample includes woodwind, brass, and percussion students in grades 9-12. The HIPS survey was administered and descriptive statistics presented to ensure the assumptions for the statistical analysis have been met. An exploratory factor analysis was performed to analyze the latent structure of the data. The model was respecified. Using structural equation modeling, the model was tested to determine the fit of the observed data to the hypothesized model. The results of these procedures are presented in Chapter 4.

CHAPTER 4

Results

The purpose of this dissertation is to develop a better understanding of the variables and their relationships that impact high school band students' deliberate practice. The results of the data analysis will be presented in this chapter. Prior to running the primary analyses, the items on the HIPS survey were examined for accuracy, missing data, multivariate normality, univariate normality, outliers, linearity, and multicollinearity and singularity.

Accuracy

The first step was to check the data for accuracy. Since it is somewhat difficult to proofread a large data file, the descriptive statistics and graphic representations of the variables were examined to locate any potential errors (Tabachnick & Fidell, 2013). The dataset was inspected through the use of descriptive statistics for accuracy. Out of range values, plausible means and standard deviations, and univariate outliers were examined to locate any potential problems (Tabachnick & Fidell, 2013). The examination of the descriptive statistics and the graphic representations of the 66 items indicated that data entered into the data file were accurate. The descriptive statistics are found in Appendix E.

Missing Data

Missing data is a common issue and a real concern in data analysis. Most missing data occur because of issues beyond the researcher's control. In this case, it occurred when participants did not answer all of the survey questions. Missing data influences the results of the analysis based on the amount and pattern (Tabachnick & Fidell, 2013).

The pattern of missing data is the most key factor. If the data is not-missing-at-random (NMAR) (Little & Rubin, 1987) it will affect the generalizability of the results, where data that is not systematically missing and scattered randomly proves to be a less serious problem. Any missing data in the student surveys for this study was evaluated and inspected by the above principles.

Of the 202 data surveys collected, 11 were omitted from the study due to significant numbers of unanswered questions. Of the remaining 191 surveys, thirty-one cases had missing data. A specific pattern of missing data was not detected in these cases. Each case had less than five missing answers to the 66 items on the measure. Cohen and Cohen (1983) suggest that the existence of more than 10% missing data should cause concern. Due to the size of the sample and little missing data the data set was left intact (Hair et al, 2006).

Normality

Structural equation modeling (SEM) techniques are based on the assumption of multivariate normality. Multivariate normality indicates that all of the univariate distributions are normal, the joint bivariate distributions of any pair of variables are normal, and the linear combinations of variables are normally distributed (Kline 2011; Tabachnick & Fidell, 2013). It is not always very practical to test all aspects of multivariate normality, however many instances of multivariate normality can be detected by the inspection of univariate distributions (Kline, 2011). For this study, I inspected univariate normality to meet this assumption.

Univariate normality was analyzed using skew and kurtosis (Bollen, 1989). The standardized skew index equals 3.0 (z-score); greater than 3.0 indicates positive skew;

and less than -3.0 indicates negative skew (Tabachnick & Fidell, 2013). The standardized kurtosis index equals 10.0 (z-scale) and kurtosis index greater than 20.0 may be a high peaked distribution (Kline, 2011), although there are fewer consensus about the kurtosis index.

In the current sample, minimal skew and kurtosis were detected. The skew indexes of the 66 items ranged from -3.13 to 3.17. Only two values were outside the range -1.64 to 1.76. “Age” had a skew of -3.13 and “How many years have you taken private lessons?” had a skew of 3.17. The kurtosis indexes of the 66 items ranged from -0.97 to 20.20. Most of the kurtosis indexes were between -2 and 2, except for “I keep a written record of my practice goals” (2.01), “Length of your practice session in minutes” (4.72), “Typical number of your practice sessions per day” (20.20), “Typical amount of individual practice per day” (3.92), “When I am successful at learning or performing a piece of music, I feel it is because of my effort” (2.33), “I feel most successful when I do something I could not do before” (4.43), “age” (20.04), and “how many years have you taken private lessons” (10.37). Each of the items retained in the final factor analysis for this study had a unimodal, symmetrical, and normal distribution.

Outliers

An outlier is a data point that is very different from the rest (Tabachnick & Fidell, 2013). Outliers represent violations of the normality assumption and can alter results. A univariate outlier is a case that is different on the score of one variable while a multivariate outlier is a case with a different score on multiple variables.

Outliers can be detected using a variety of methods. Box plots of the 66 items were examined to detect potential univariate outliers. In addition, individual scores were

saved as z-scores. Z-scores below -3 or above 3 were determined to be outliers. Items containing outliers are presented in Table 2.

Table 2
Items Containing Outliers

Item	#
I keep a written record of my practice goals	2
Length of your average practice session in minutes	2
Typical number of your practice sessions per day	2
Typical amount of your individual practice per day in minutes	3
I enjoy practicing interesting music even if it means giving extra effort	1
I think the music I practice is useful for me to learn	2
When practicing, I try to determine which concepts I don't understand well	5
When I get a piece of music, I am confident that I will learn to play it	1
When I am successful at learning or performing a piece of music, I feel it is because of my effort	4
I feel most successful when I do something I could not do before	3
Age	2
How many years have you taken private lesson	9
My parents observe me when I practice at home	1
I listen carefully to my teachers practice advice	2
My parents overall attitude toward music is positive	4

The analysis was run with and without the outlier cases. The results indicated that the outliers had no significant effect on the results. A small number of outliers can be expected in data with a large sample size (Tabachnick & Fidell, 2013). Therefore no data

transformation was performed and a small number of outliers were retained for the analysis.

Linearity

Multivariate normality implies that the relationships between variables are linear. Differences in skewness indicate that there is the potential of curvilinearity for some pairs of variables. Linearity for pairs of variables can be assessed by the inspection of bivariate scatterplots. If the inspection of each bivariate scatterplot is impractical, it is acceptable to random spot check plots to meet this assumption (Tabachnick & Fidell, 2013).

Bivariate scatterplots were randomly inspected to determine if the data met the assumption of linearity. Ten scatterplots were selected and checked for multivariate normality and to determine if the relationships between the items were linear. The results of the random scatterplot inspection indicated the linearity assumption was met in the study sample.

Multicollinearity and Singularity

Multicollinearity and singularity occur when variables are highly correlated with each other. Multicollinearity happens when variables are highly correlated ($> .9$) and singularity occurs when the variables are correlated equal to 1 indicating they measure the same construct. Bivariate multicollinearity and singularity can be examined by inspecting the correlation matrix (Kline, 2011; Tabachnick & Fidell, 2013). The examination of the correlation matrix indicated that there was neither multicollinearity nor singularity. The results indicated that all variables in the study were not too highly

correlated or redundant. Therefore, no transformation of the related variables was necessary in the study sample.

Data Analysis

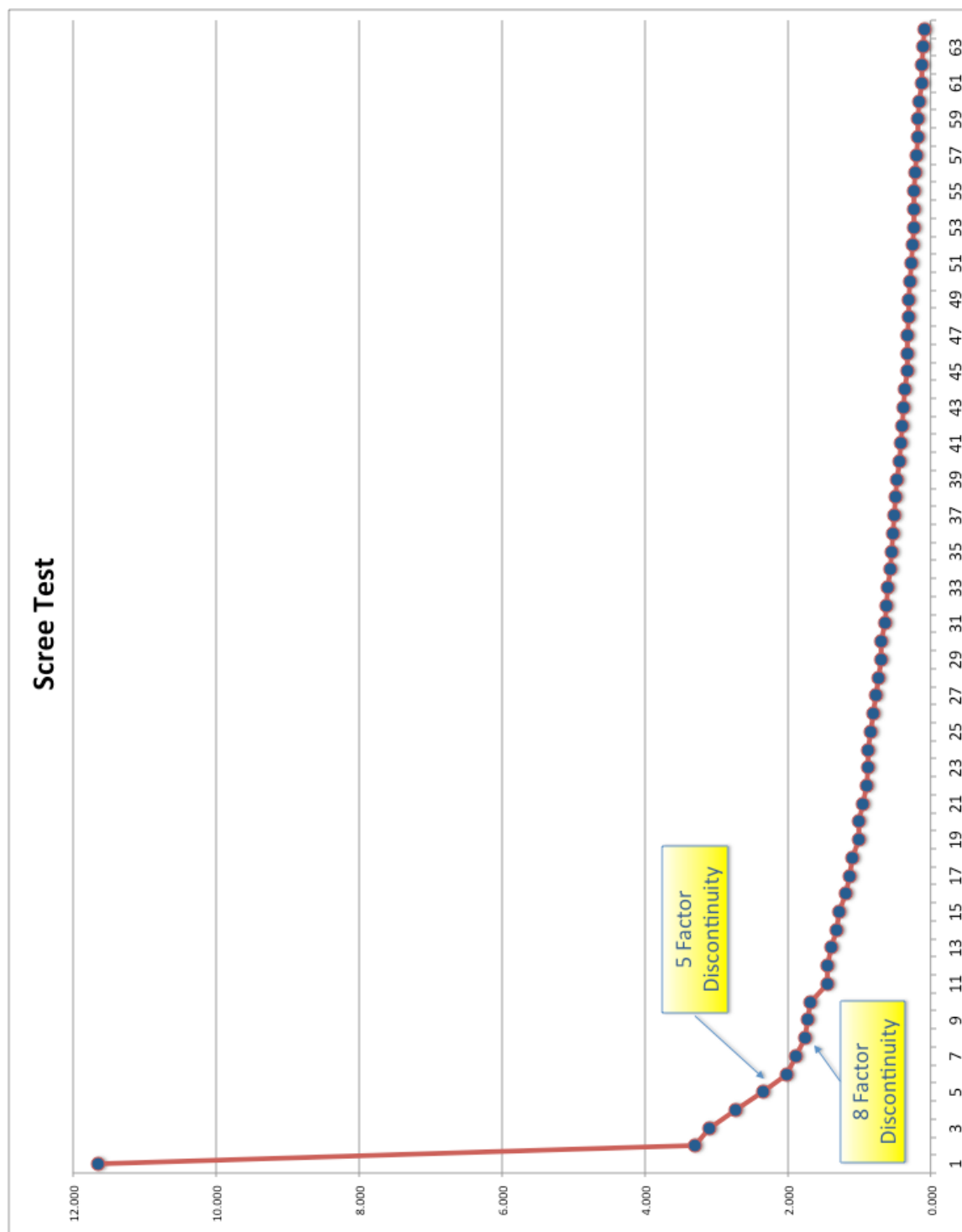
Correlation Analysis

The correlation matrix was analyzed to look for associations between the factors or latent variables. McMillan (2000) suggests that correlations of .10 to .30 are considered weak, between .40 and .60 is a moderate relationship, and .70 and greater is considered strong. A $p < .05$ was used as the criterion to determine if the degree of association was significant. Appendix F displays the correlation matrix for each of the items in the measure. Correlations significant at the $p < .05$ level are marked with an asterisk (*) and those found to be significant at the $p < .01$ level are marked with two asterisks (**). Two items were inversely scored for the remainder of the analyses. They were “I find it hard to stick to a practice schedule” and “I often feel so lazy or bored that I quit before I finish what I planned to do.”

Exploratory Factor Analysis

An exploratory factor analysis (EFA) using the principal axis factoring procedure was conducted on the 66 items with an oblique rotation (direct oblimin). The goal of an EFA is to find the latent structure of the dataset by uncovering common factors. Therefore, an EFA accounts for shared variance.

Figure 2. Scree Test



The EFA produced 20 components with eigenvalues greater than 1.00, which explain 69.55% of the variance (Table 3). The scree plot (Figure 2) indicated retaining 5, 8, or 10 components. As the Hamlin Instrumental Practice Survey (HIPS) was created to measure the 8 latent variables specified in the hypothesized model, 8 components were retained. The EFA was conducted again fixing the number of factors to 8. These 8 factors explained 44.97% of the variance (Table 4). The factor loadings for these 8 variables are displayed in Table 5.

Table 3
Eigenvalues And Total Variance Explained

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	11.650	18.203	18.203
2	3.301	5.159	23.361
3	3.088	4.825	28.186
4	2.735	4.273	32.459
5	2.349	3.670	36.129
6	2.018	3.153	39.282
7	1.886	2.946	42.228
8	1.756	2.744	44.972
9	1.726	2.697	47.669
10	1.689	2.640	50.308
11	1.451	2.268	52.576
12	1.436	2.243	54.820
13	1.392	2.175	56.995
14	1.324	2.068	59.063

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
15	1.280	1.999	61.063
16	1.183	1.849	62.912
17	1.130	1.766	64.677
18	1.095	1.711	66.388
19	1.012	1.582	67.970
20	1.010	1.578	69.548

Table 4
Eigenvalues And Total Variance Explained Eight Factor Solution

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
Orientations to Practice	11.65	18.203	18.203
Prior Experience	3.301	5.159	23.361
Parent Involvement	3.088	4.825	28.186
Motivation	2.735	4.273	32.459
Practice Strategies	2.349	3.670	36.129
Related to Self	2.018	3.153	39.282
Practice Commitment	1.886	2.946	42.228
Teacher	1.756	2.744	44.972

Table 5
Rotated Pattern Matrix Of Eight Factor Solution

	Factor							
	Orientations to Practice	Prior Experience	Parent Involvement	Motivation	Practice Strategies	Related to Self	Practice Commitment	Teacher
I think the music I practice is useful for me to learn.	0.665	-0.015	-0.046	-0.015	-0.064	-0.024	0.056	-0.198
When I am successful at learning or performing a piece of music, I feel it is because of my effort.	0.563	-0.177	-0.028	-0.113	0.054	0.144	0.111	0.062
When I have a problem or there is something I do not understand, I ask for help.	0.533	0.096	0.128	0.027	0.028	-0.046	-0.024	-0.235
I spend time in each practice session reviewing the music.	0.528	-0.028	0.161	0.082	0.027	0.035	-0.155	-0.042
I will work hard at learning a piece of music even if I don't really like it.	0.512	-0.014	-0.059	0.193	0.128	0.049	0.041	-0.259
I feel most successful when I do something I could not do before.	0.492	-0.050	0.177	0.070	0.037	0.019	0.104	0.250
I enjoy practicing interesting music even if it means giving extra effort.	0.470	0.000	-0.043	-0.026	-0.179	0.249	0.256	0.065
Even when the music is dull or uninteresting, I keep practicing until I get it.	0.446	-0.035	-0.024	0.025	0.193	0.189	0.176	-0.158
I listen carefully to my teachers practice advice.	0.412	0.021	-0.142	0.066	0.030	0.201	0.095	-0.194
I have expectations of achievement and growth from my practice sessions.	0.408	-0.063	0.058	0.074	0.006	0.282	0.230	-0.069
When practicing, I try to determine which concepts I don't understand well.	0.383	-0.121	0.103	0.225	-0.088	0.118	0.242	0.105
I prefer practicing music that is challenging so I can learn new things.	0.376	0.016	0.089	0.044	-0.201	0.146	0.265	0.077

	Factor							
	Orientations to Practice	Prior Experience	Parent Involvement	Motivation	Practice Strategies	Related to Self	Practice Commitment	Teacher
When I am practicing, I often stop playing and think about how the music should sound.	0.336	-0.078	0.109	0.174	0.014	0.178	0.037	0.235
When practicing, I try to relate the material to what I already know.	0.306	-0.060	0.093	0.255	-0.218	-0.028	0.228	0.027
I practice the hardest passages first and then work on others.	0.303	0.183	0.018	0.179	0.007	-0.176	0.246	-0.083
Lessons with my current teacher include instruction on how to practice effectively.	0.274	-0.022	-0.045	0.110	-0.057	0.166	0.084	-0.261
Whether or not I succeed in music has little to do with my practicing.	-0.242	-0.051	0.111	0.063	-0.033	-0.015	-0.015	-0.109
I look over the music before practicing.	0.200	-0.185	0.151	0.191	-0.075	0.007	0.127	-0.042
How many years have you played your primary instrument?	-0.103	0.890	0.120	-0.034	0.195	0.010	0.039	0.031
How many years have you played in a school music ensemble?	0.065	0.864	0.049	0.036	0.212	-0.211	0.092	0.019
Your age.	0.085	0.404	-0.263	-0.141	-0.088	0.148	-0.019	-0.111
How many years have you taken private lessons?	-0.102	0.295	0.178	0.082	-0.049	0.185	0.073	0.003
I get bored if the music is too easy.	-0.072	0.279	0.027	0.187	-0.162	0.005	-0.194	0.156
My parents expect me to do my best in music.	-0.092	0.107	0.688	0.151	-0.029	0.094	-0.035	0.132
My parents are supportive if I am having problems.	0.228	-0.020	0.633	-0.122	0.065	-0.079	-0.026	-0.115

	Factor						
	Orientations to Practice	Prior Experience	Parent Involvement	Motivation	Practice Strategies	Related to Self	Practice Commitment
My parents ensure that I do sufficient practice at home.	0.027	-0.176	0.614	0.029	-0.005	0.129	0.011
My parents overall attitude toward music is positive.	0.172	0.160	0.613	-0.063	-0.027	0.049	-0.074
My parents observe me when I practice at home.	-0.028	-0.206	0.595	0.088	-0.107	0.007	0.046
My parents play an instrument or sing in a musical group.	-0.082	0.085	0.365	-0.118	-0.023	-0.060	0.044
Did either parent or other family member ever play a musical instrument or sing?	0.027	-0.006	-0.254	0.089	-0.036	-0.001	0.050
An important reason I practice my music is so that I don't embarrass myself.	-0.012	-0.018	-0.104	0.625	0.130	-0.099	-0.023
I practice because I want to play better than other players.	-0.019	0.072	0.012	0.527	-0.260	0.202	-0.035
I practice because I want my teacher to think that I am a good musician.	0.109	0.005	-0.176	0.487	-0.013	-0.026	-0.144
My practice time is often spent playing simply for fun with no specific musical or technical goal in mind.	0.085	0.002	-0.012	-0.036	0.526	0.062	0.039
It is important for me to choose the music I learn.	-0.066	-0.046	-0.004	0.097	-0.424	-0.019	0.138
I play a piece through from the beginning and, even if there are errors, move on.	-0.140	0.163	-0.046	0.087	0.415	-0.029	0.029
I mark my music regularly as a part of practicing.	0.138	-0.036	0.109	0.247	0.348	-0.022	-0.040
I'm confident I can do an excellent job in my practicing.	0.154	0.015	0.034	-0.015	-0.023	0.580	0.015

Factor							
Orientations to Practice	Prior Experience	Parent Involvement	Motivation	Practice Strategies	Related to Self	Practice Commitment	Teacher
It is easy for me to remain focused on my music when practicing alone.	0.017	0.027	0.217	-0.075	-0.073	0.539	0.102
I sometimes forget what I had originally planned to work on when practicing.	-0.037	-0.011	0.000	-0.078	0.340	0.430	0.139
I usually have a plan of what I need to practice most before I begin my practice session.	0.128	-0.063	0.000	0.232	0.163	0.430	-0.026
I often feel so lazy or bored when I practice that I quit before I finish what I planned to do.	0.168	0.025	0.012	-0.219	0.164	0.412	0.318
I set up the practice room and my materials a certain way before I begin practice sessions	-0.084	-0.079	0.070	0.217	0.125	0.398	0.069
I am in control of my practice environment and make sure I am away from distractions.	0.046	-0.025	0.067	0.195	-0.039	0.396	0.288
When I get a piece of music, I am confident that I will learn to play it.	0.379	0.297	-0.039	0.008	-0.133	0.383	0.042
I listen critically and evaluate my performance to make sure I understand the material and am performing it correctly.	0.241	-0.069	0.071	0.119	-0.048	0.368	0.269
I find it hard to stick to a practice schedule.	-0.011	0.031	0.007	-0.219	0.085	0.346	0.340
I feel I am aware of my own strengths and weaknesses as a musician.	0.144	0.073	-0.018	0.001	-0.021	0.339	-0.176
							0.044

Factor							
Orientations to Practice	Prior Experience	Parent Involvement	Motivation	Practice Strategies	Related to Self	Practice Commitment	
						Teacher	Teacher
I believe I have musical ability.	0.173	0.226	0.042	0.135	-0.243	0.322	-0.032
I usually practice in the same location.	-0.038	-0.003	-0.056	-0.059	-0.049	0.113	0.049
Typical amount of your individual practice per day in minutes.	-0.061	-0.017	-0.176	0.025	0.094	0.103	0.093
Keeping practice time is the most important thing in my schedule.	0.147	-0.093	0.120	-0.105	-0.163	-0.086	-0.288
Often, I record my playing to identify good and bad aspects.	0.068	-0.194	0.031	-0.077	-0.063	0.115	-0.148
Length of your average practice session in minutes.	0.019	0.001	-0.036	-0.054	0.076	-0.050	0.106
I plan my practice time into my weekly schedule.	0.112	-0.155	0.054	0.034	-0.166	0.179	-0.187
Typical number of days per week on which you practice.	0.136	0.166	0.075	-0.211	0.026	0.083	-0.037
Typical number of your practice sessions per day.	0.023	0.065	-0.025	0.047	-0.200	-0.051	-0.063
I feel motivated to practice.	0.266	-0.079	0.080	-0.039	-0.104	0.317	-0.213
I use two or more shorter practice sessions rather than one longer one.	0.132	0.058	0.093	0.161	-0.072	0.042	0.017
I use a Whole/Part/Whole practice strategy where I isolate a phrase or unit, break it down into smaller parts, and then recombine it.	0.041	0.025	-0.021	0.270	0.227	0.055	-0.059
When practicing, I often try to perform for a classmate or friend.	0.044	-0.045	-0.039	-0.009	-0.261	0.036	-0.569

	Factor							
	Orientations to Practice	Prior Experience	Parent Involvement	Motivation	Practice Strategies	Related to Self	Practice Commitment	Teacher
When practicing, I often try to perform for a classmate or friend.	0.044	-0.045	-0.039	-0.009	-0.261	0.036	-0.030	-0.569
My teacher sets specific time requirements for the number of hours I must practice per week.	-0.128	-0.131	0.062	0.168	0.136	0.111	0.099	-0.404
I keep a written record of my practice goals.	0.007	-0.146	0.138	-0.037	0.100	0.116	0.153	-0.387
My teacher gives me practice assignments.	0.084	0.025	0.158	-0.067	0.226	0.017	-0.193	-0.348

Upon further examination of these 8 factors, three were determined to be of no conceptual value. This reduced the number of factors to 5. Factor 8 was eliminated due to the low number of items that highly loaded onto it and the low reliability of the subscale ($\alpha = .51$). Factor 5 was also eliminated due to the low reliability of the subscale measure for that factor ($\alpha = .48$). The items comprising factor 2 were eliminated due to poor distributions, high standard errors, and inadequate KMO values on the diagonal of the anti-image correlations matrix. According to Field (2013) and Tabachnick & Fidell (2013) removal of these items should be considered, as they are not good indicators for use in the factor analysis. The items that met these standards were removed from further analysis.

The exploratory factor analysis (EFA) yielding these five factors was conducted with an oblique rotation (direct oblimin). The rotation was used to more clearly discriminate between factors. The resulting pattern matrix is presented in Table 5. These five factors account for 58.59% of the variance (Table 6).

Table 5
Rotated Pattern Matrix Of Five Factor Solution

	Factor				
	Orientation to Practice	Parent Involvement	Motivation	Related to Self	Practice Commitment
I spend time in each practice session reviewing the music.	0.668	0.111	0.083	0.028	-0.138
I think the music I practice is useful for me to learn.	0.552	-0.059	0.094	0.020	0.246
When I have a problem or there is something I do not understand, I ask for help.	0.507	0.132	-0.020	0.041	0.044
I enjoy practicing interesting music even if it means giving	0.462	-0.070	0.021	0.201	0.248

	Factor				
	Orientation to Practice	Parent Involvement	Motivation	Related to Self	Practice Commitment
extra effort.					
When I am successful at learning or performing a piece of music, I feel it is because of my effort.	0.430	-0.033	-0.024	0.166	0.225
My parents expect me to do my best in music.	-0.086	0.671	0.039	0.023	-0.087
My parents are supportive if I am having problems.	0.279	0.664	-0.047	-0.192	0.064
My parents overall attitude toward music is positive.	-0.022	0.612	-0.058	0.078	-0.070
My parents ensure that I do sufficient practice at home.	0.119	0.548	0.046	0.029	0.131
I practice because I want my teacher to think that I am a good musician.	0.115	-0.021	0.701	-0.128	-0.025
I practice because I want to play better than other players.	-0.153	0.095	0.657	0.216	0.149
An important reason I practice my music is so that I don't embarrass myself.	0.087	-0.087	0.530	-0.087	-0.164
I'm confident I can do an excellent job in my practicing.	0.061	0.066	0.025	0.662	0.079
It is easy for me to remain focused on my music when practicing alone.	-0.093	0.223	-0.002	0.475	0.236
I feel I am aware of my own strengths and weaknesses as a musician.	0.123	-0.050	-0.029	0.451	-0.145
I listen critically and evaluate my performance to make sure I understand the material and am performing it correctly.	0.254	0.005	0.077	0.351	0.305
Keeping practice time is the most important thing in my	0.110	0.072	-0.024	-0.230	0.789

	Factor				
	Orientation to Practice	Parent Involvement	Motivation	Related to Self	Practice Commitment
schedule.					
I plan my practice time into my weekly schedule.	0.088	-0.007	0.110	0.100	0.623
Often, I record my playing to identify good and bad aspects.	0.016	-0.052	-0.116	0.084	0.567

Table 6
Eigenvalues and Total Variance Explained Five Factor Model

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
Orientation to Practice	4.574	24.075	24.075
Parent Involvement	2.038	10.729	34.804
Motivation	1.858	9.779	44.583
Related to Self	1.418	7.462	52.045
Practice Commitment	1.244	6.548	58.592

The items that cluster on the same components suggest that component 1 represents “orientation to practicing”, component 2 “motivation”, component 3 “parent involvement”, component 4 “related to self”, and component 5 “practice commitment.”

Table 7 presents the correlation matrix for the factor scores derived after rotation.

Table 7
Factor Correlation Matrix

Factor	Orientation to Practicing	Parental Involvement	Motivation	Related to Self	Practice Commitment
Orientation to Practicing	1	0.179	0.182	0.259	0.351
Parent Involvement	0.179	1	-0.003	0.138	0.166
Motivation	0.182	-0.003	1	0.041	-0.006
Related to Self	0.259	0.138	0.041	1	0.280
Practice Commitment	0.351	0.166	-0.006	0.280	1

The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, $KMO = 0.79$, and all KMO values for individual items were greater than 0.5 (Field, 2009). Bartlett's test of sphericity $\chi^2(171)=952.17, p < .001$, indicated that correlations between items were sufficiently large for exploratory factor analysis.

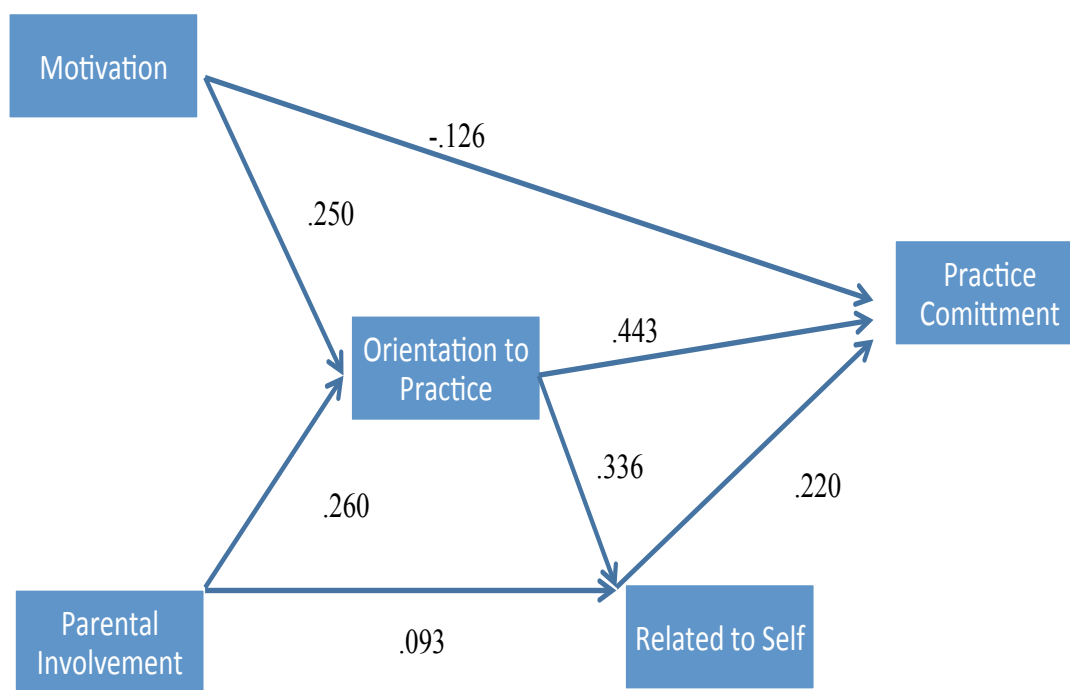
The reliability of the items in the 5 factor solution was .78. In addition, the reliability for each of the subscales was calculated using Cronbach's alpha. The reliability of the subscales are: (1) "orientations to practicing" ($\alpha = .77$), (2) "motivation" ($\alpha = .72$), (3) "parent involvement" ($\alpha = .70$), (4) "related to self" ($\alpha = .70$), and (7) "practice commitment" ($\alpha = .72$). In addition to the EFA, a factor analysis using maximum likelihood was conducted which yielded a chi-square value that indicated the resulting factors in the model fit the observed data ($\chi^2(86, N = 191) = 106.45, p < 0.67$).

Path Analysis

The EFA grouped items to produce a set of variables that combine to form a single indicator or factor to measure a latent construct. Kline (2011) states that path analysis is a part of the structural equation modeling family and is used when there is just a single observed variable of each construct. Therefore, path analysis was chosen for use in analyzing the newly specified model.

Based on the results of the exploratory factor analysis, the model was respecified as an observed variable path analysis. Figure 2 displays the new model. The new model is related to the previous model and is also rooted in the literature on the variables as presented in the Literature Review of Chapter 2. The model's specification was based on time precedence, results of previous research, and the researcher's domain knowledge and experience.

Figure 3. Five Factor Model



An observed variable path analysis was conducted on this newly specified model. Maximum likelihood estimation was employed to estimate the model. The rectangles represent measured variables. A line connecting variables implies a hypothesized direct effect. The hypothesized model examines the predictors of practice commitment.

There is evidence the hypothesized model fit the observed data. The chi-square exact fit test was not significant providing evidence that the differences between the observed data and the predicted model can be attributed to sampling variation (χ^2 , $N = 3$) = 1.32, $p < .725$). The comparative fit index, CFI = 1.00, and the Tucker-Lewis index, TLI = 1.044, indicate that the model exhibited good fit to the data. The root mean square error of approximation (RMSEA) and the 90% confidence intervals indicate that the resulting model exhibited a close fit to the data (RMSEA = .000, (.000 - .088), $p < .841$). The lack of statistical significance, $p < .841$, indicates that the fit of the model is also close. The standardized root mean square residual, SRMR = .015, indicates a good fit of the predicted model to the observed data. Overall, there is evidence that the predicted model fits the observed data in this observed variable path analysis.

Direct Effects

The direct effects on the variable “orientation to practicing” was significant for “parent involvement” (standardized coefficient = 0.25, $p < .001$) and “motivation” (standardized coefficient = 0.26, $p < .001$). The direct effect of “orientation to practice” on “related self” was significant (standardized coefficient = 0.22, $p < .001$), but not “parent involvement” (standardized coefficient = 0.09, $p < .181$). “Commitment” was predicted by an increase in “related to self” (standardized coefficient = 0.22, $p < .001$) and “orientation to practice” (standardized coefficient = 0.44, $p < .001$). There was a

significant negative relationship between “motivation” and “commitment” (standardized coefficient = -0.13, $p < .043$). All of these direct effects are presented in Table 8.

Table 8
Direct Effects

Variable	Estimate	S.E.	Est./S.E.	P-Value
Orientation Predicted by				
Motivation	0.250	0.066	3.817	0.000
Parent Involvement	0.260	0.065	3.980	0.000
Self Predicted by				
Orientation	0.336	0.066	5.101	0.000
Parent Involvement	0.093	0.069	1.336	0.181
Commitment Predicted by				
Self	0.220	0.064	3.435	0.001
Orientation	0.443	0.062	7.171	0.000
Motivation	-0.126	0.062	-2.021	0.043

Indirect Effects

The indirect effects of the variables on “practice commitment” were calculated (Table 9). Each of the indirect effects was significant with the exception of “parent involvement” to “orientation to practice” to “commitment” (standardized coefficient = 0.02, $p < .214$).

The R-squared values (Table 10) indicate the variance accounted for by each variable in the overall model. “Orientation to practice” accounted for 13% of the variance, “related to self” was significant and accounted for 14% of the variance ($p < .003$), and “commitment” accounted for 30% of the variance ($p < .001$).

Table 9
R-squared Values

Observed Variable	Estimate	S.E.	Est./S.E.	P-Value
Orientation to Practice	0.130	0.045	2.913	0.004
Related to Self	0.138	0.046	2.975	0.003
Practice Commitment	0.297	0.055	5.370	0.000

Table 10
Five Factor Model Indirect Effects

Variable	Estimate	S.E.	Est./S.E.	P-Value
Effects of Parent Involvement to Commitment				
Total	0.155	0.040	3.857	0.000
Total Indirect	0.155	0.040	3.857	0.000
Specific Indirect				
Parent Involvement to Orientation to Practice to Practice Commitment	0.115	0.034	3.426	0.001
Parent Involvement to Related to Self to Practice Commitment	0.020	0.016	1.242	0.214
Parent Involvement to Orientation to Practice to Related to Self to Practice Commitment	0.019	0.008	2.294	0.022
Effects of Motivation to Commitment				

Variable	Estimate	S.E.	Est./S.E.	P-Value
Total	0.003	0.070	0.044	0.965
Total Indirect	0.129	0.038	3.412	0.001
Specific Indirect				
Motivation to				
Orientation to Practice to				
Practice Commitment	0.111	0.034	3.270	0.001
Motivation to				
Orientation to Practice to				
Related to Self to				
Practice Commitment	0.018	0.008	2.245	0.025
Effects of Parent Involvement to Self				
Total	0.180	0.070	2.580	0.010
Total Indirect	0.087	0.028	3.098	0.002
Specific Indirect				
Parent Involvement to				
Orientation to Practice to				
Related to Self	0.087	0.028	3.098	0.002
Effects of Motivation to Self				
Total	0.084	0.028	3.002	0.003
Total Indirect	0.084	0.028	3.002	0.003
Specific Indirect				
Motivation to				
Orientation to Practice to				
Related to Self	0.084	0.028	3.002	0.003

Summary

Data screening indicated that the data was appropriate for the factor analysis and SEM procedures planned for them. The data was checked for accuracy, missing data, multivariate normality, univariate normality, outliers, linearity, and multicollinearity and singularity. All indices indicated that there was a close fit of the observed data to the hypothesized model. A model development procedure was implemented using exploratory factor analysis that resulted in five factors being retained. A 5 factor model was respecified and then tested using path analysis. The results indicated that the model fit the data well. Total, direct, and indirect effects were presented. The final chapter will discuss the implications of this research and present ideas for future research in the area of deliberate practice.

CHAPTER 5

Discussion

Getting students to practice, and practice effectively can be challenging. At the same time, practicing is essential to their continued success as musicians. Quality, deliberate practice has been shown to directly influence musical achievement. A commitment to practice is essential for student success. Understanding the variables that influence practice commitment can provide the means for developing practical strategies to improve that commitment.

The purpose of this study is to create a theoretical model of deliberate practice. When placed into the context of previous research on deliberate practice, the findings from this study help to explore how the variables “orientation to practice,” “parent involvement,” “motivation,” and “related to self” interact to influence “practice commitment.”

An important consequence of this study is the development of a reliable and valid instrument that can be used to measure the extracted constructs influencing deliberate practice. The measure constructed for use in this research was designed to quantify the observed variables used to measure the eight latent variables in the proposed model of musical practice. An exploratory factor analysis was performed on those items in which eight factors were extracted. That number was further reduced to five. The items used to measure these five constructs can be used in future research to further refine the creation of this instrument used to study deliberate practice.

Exploratory Factor Analysis

The first research question asks: “Do the items in the measure load highly onto separate factors? If so, how, and what is their relationship to the constructs as specified in the a priori model?”

An exploratory factor analysis (EFA) was conducted using an oblique (direct oblimin) rotation. The 66 items loaded onto five factors. Many items loaded differently onto the factors derived from the EFA than was predicted in the original latent variable model. The eight latent variables specified in the original model are “student characteristics”, “physical environment”, “social influences”, “psychological factors”, “planning/goal-setting”, “practice strategies”, “metacognition/self-reflection”, and “practice commitment.” The newly extracted five factors, although different from those in the original latent variable model, do relate to previous theory as outlined in Chapter 2. These newly defined factors were labeled: “orientation to practice,” “parent involvement,” “motivation,” “related to self,” and “practice commitment.”

The first factor, “orientation to practice”, was measured by the items: (1) I spend time in each practice session reviewing the music, (2) I think the music I practice is useful for me to learn, (3) When I have a problem or there is something I do not understand, I ask for help, (4) I enjoy practicing interesting music even if it means giving extra effort, and (5) When I am successful at learning or performing a piece of music, I feel it is because of my effort. This factor contains an element of self-reflection. It involves the ability to monitor and observe one’s own behavior and thought processes, assess their efficacy, and redirect learning to maintain effective and efficient practice. Once learning has occurred, self-reflection influences that learner's reactions and

subsequent responses to the learning experience. Feedback obtained from prior performances helps the learner to adjust performance and future efforts. Self-reflections may lead back to forethought and the establishment of new goals.

Attribution theory also is incorporated in this factor. Attribution theory is based on what a person retrospectively attributes to the cause of a success or failure (Weiner, 1974). All five items loading onto this factor demonstrate an attitude that the students' attribution of success is credited to their hard work and perseverance. This is in accord to the research on attribution theory of Bandura (1997) and Weiner (1974, 1986) summarized in Chapter 2.

In addition to attribution theory, expectancy value theory also applies to this factor. 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). A task's value may be related to students' perception of their capabilities to achieve in present activities or it may be related to skills and activities that the student believes to be useful and important for future expectations (Stipek, 1998). It assumes that the more valued an expected outcome is to a person, the more motivated that person will be to take action. These characteristics of expectancy value theory are demonstrated in items (2), (4), and (5) respectively.

It is important that students have resources and people available to ask for help and to give guidance. Again quoting Ericsson, a key component to deliberate practice is a "well-informed coach not only to guide you through deliberate practice but also to help you learn how to coach yourself." (Ericsson, 2007, p. 1) "Teacher characteristics" was a variable originally included under the latent variable "social influences."

The second factor, “parent involvement,” had four items that highly loaded onto it. These items are: (1) My parents expect me to do my best in music, (2) My parents are supportive if I am having problems, (3) My parents overall attitude toward music is positive, and (4) My parents ensure that I do sufficient practice at home. These items were originally placed under the latent variable, “social influences,” along with teacher and peer influences. As a result of the EFA, these items loaded separately onto their own factor. This factor is supported by research on parental involvement in school homework and music practicing as described in Chapter 2.

The third factor created by the EFA was labeled “motivation.” This factor is labeled the same as one of the observed variables in the original latent variable model, but differs slightly in the items that comprise it. The items that loaded onto this factor include: (1) I practice because I want my teacher to think I am a good musician, (2) I practice because I want to play better than other players, and (3) An important reason I practice my music is so that I don’t embarrass myself. The motivation needed to maintain interest in any activity includes aspects that are both intrinsic and extrinsic (Sansone and Smith 2000). The items attached to this factor primarily reflect an extrinsic motivation. The goal for many music educators is to develop intrinsically motivated students that have the capability to independently practice effectively. Whether intrinsic motivation or extrinsic motivation is present may depend on the situation and the individual and both may be necessary to initiate and persist in a task.

The fourth factor produced by the EFA is labeled “related to self.” This factor is operationalized by the items: (1) I’m confident I can do an excellent job in my practicing, (2) It is easy for me to remain focused on my music when practicing alone, (3) I feel I am

aware of my own strengths and weaknesses as a musician, and (4) I listen critically and evaluate my performance to make sure I understand the material and am performing it correctly. The research outlined in Chapter 2 clearly supports the importance for successful musicians developing deliberative practice skills to have “considerable metacognitive skills in order to be able to recognize the nature and requirements of a particular task” (Hallam, 2001b, p. 28; Hallam 2001; Lehmann 1997; McPherson & Renwick 2001) that includes an awareness of an extensive repertoire of strategies, demands of the task, and personal strengths and weaknesses (Barry & Hallam 2002, Hallam 1995, Nielsen 1999). Items (3) and (4) above that load on this factor reflect this metacognitive awareness.

Self-efficacy is another contributor of importance to this factor. Self-efficacy represents an individual’s perceived assessment of having the relevant technical or musical skills to organize and apply to a given task (Maehr et al., 2002; Conroy et al., 2007; Ormrod, 2008). Schunk (1983) observes that students who have the capability to detect subtle progress in their learning will increase their levels of self-satisfaction and their beliefs in their personal efficacy to perform at a high level of skill. Items (1) and (2) above that load on this factor reflect this measure of self-efficacy.

Three items loaded highly onto the fifth factor “practice commitment.” These are: (1) Keeping my practice time is the most important thing in my schedule, (2) I plan my practice time into my weekly schedule, and (3) Often, I record my playing to identify good and bad aspects. A commitment to practice is important to the success of musicians. The time spent engaged in quality deliberate practice has been shown to positively influence and enhance the musical skills and concepts necessary for musical success.

The frequency with which one practices is one measure of practice commitment. Each of the items identified above reflect this measure of “practice commitment.”

Path Analysis

The second research question states, “Is there evidence that the data collected fits the a priori model developed for this study?” To answer this research question an observed variable path analysis was conducted using the newly specified model based on the factors extracted from the EFA. This revised model was supported by the observed data. The remaining research questions ask about the indirect and direct effects of the variables in the model. There were significant direct and indirect effects in this analysis.

There was a direct and significant effect of the variable “parental involvement” on “orientation to practicing.” Research cited in Chapter 2 clearly supports the contention that parent expectations and attitude towards music have a profound effect on students. When parents’ attitude toward music is positive and they value student participation in musical activities, students will be more successful and more likely to continue their musical engagement. Parents’ perceptions of music education and musical ability influence the role they play in their children’s practicing. That path analysis performed on the current study’s data directly support these findings and demonstrate them to be significant. This path analysis is described in Chapter 4.

The direct effect of the factor “motivation” was significant on the variable “orientation to practicing.” Researchers have found data supporting a positive relationship between motivation and the practice strategies used by musicians. When investigating the various facets of deliberate practice in music, music education has stressed the importance of motivation and incentives (Hallam, 1997a; Harnishmacher,

1997). Practice is a skill that does not come naturally to exposure to music, but instead effective practice strategies and developing motivation need to be taught by music teachers (Leon-Guerrero, 2008; Lisboa, 2008; McPherson and Renwick, 2001; McPherson, 2005; Miksza, 2007; Pitts, Davidson and McPherson, 2000). The path analysis performed on the current data support the findings of this body of research.

The direct effect of “orientation to practicing” on “related to self” was significant. Self-efficacy judgments concerning academic tasks are developed by one’s evaluating their personal “capabilities, skills, and knowledge to master school-related tasks” (Maehr et al., 2002, p. 357). Bandura (1982) believed that the individual developed self-efficacy from these sources: personal experiences, observation of others, and external influences. The items loading onto the “orientation to practicing” and “related to self” factors in the current study all support previous research and would predict the significant relationship between these factors as found in this path analysis.

There was no direct effect of “parent involvement” to “orientation to practicing.” This at first seems surprising. The majority of studies indicate a positive correlation of parent involvement and children’s performance (Hoover-Dempsey, Battiato, Walker, Reed, DeJong, & Jones, 2001). Students rely upon parents for reminders and checks to perform homework and to practice (McPherson & Davidson, 2006). The role of parental involvement is developmental. As the beginning student matures and develops musical ability it becomes critical for parents to begin withdrawing their active participation and to allow the student to develop self-regulation (Creech, 2010, Sloboda & Davidson, 1996, Zdzinski, 1996). Since the current study used high school students as the subjects,

their developmental maturity may be reflecting parents beginning to withdraw their active participation, and consequently accounts for the lack of direct effect.

There was a significant negative relationship between “motivation” and “practice commitment.” According to the results of this present study, when goals orient around ego, student focus is shifted from full engagement with the task to thoughts about social importance. This focus tends to be associated with negative affect when failure occurs such as anxiety and surface learning.

“Practice commitment” was predicted by an increase in “related to self” and “orientation to practice.” Deliberate practice emphasizes not just behavior but the role of cognition. Engaging in deliberate practice is a cognitive process. “It is not just the doing of a task but musicians need to also think deliberately about their thoughts and behaviors” (Ericsson, 2009; Ericsson, Prietula & Cokely, 2007). Deliberate practice underscores that improvement in performance is not correlated with automation resulting from pure repetition. By increasing the challenge of training, individuals can remain in the cognitive phase and keep engaging in deliberate practice to acquire and refine complex cognitive mechanisms that mediate how the brain and nervous system control performance (Ericsson 2009). The items loading onto the factors “practice commitment”, “related to self” and “orientation to practice” all support the relationship between deliberate practice which is goal oriented, requires effort, and involves self-monitoring; a learner’s commitment to practice that is critical in developing musical achievement; and the time spent engaged in quality practice that has been shown to positively influence and enhance the musical skills and concepts necessary for musical success.

The purpose of this study was to create a model to test the impact of “orientation to practicing,” “parent involvement,” “motivation,” and “related to self” on students’ “commitment to practice.” The largest predictors of “practice commitment” are “orientation to practice” and “related to self.”

For every 1 standard deviation (SD) increase in “orientation to practice,” “practice commitment” increases by 0.44 SD. The factor “orientation to practice” contains items pertaining to task usefulness/difficulty, the ability to get help and have resources available to aid in practicing, and a view that achievement is related to effort in contrast to ability or natural talent. As supported by previous research cited in Chapter 2 and confirmed in the current study, a musician’s ability to review and reflect on their learning is also important. Appropriate strategies and constantly reviewing one’s progress increases the effectiveness of practice, which in turn, increases “practice commitment”.

“Related to self” is also a strong predictor of “practice commitment.” For every 1 SD unit increase in “related to self,” “practice commitment” increases by 0.22 SD. Items related to self-efficacy and self-reflection/metacognition measure “related to self.” The ability to listen critically and evaluate performance, being able to hear the sound of the music in one’s head, and the ability to monitor one’s thoughts and behaviors to regulate practice are critical to effective practice. Providing music that is attainable but challenging may also play a role in students developing and using their metacognitive skills.

Limitations

This study created an instrument that sought to reliably measure the factors impacting deliberate practice. It then attempted to specify and test a theoretical model to

investigate the relationship of these factors to practice commitment. However, there are several limitations.

First, the measure that was created for this study initially had a low reliability due to the significant impact by those questions not using the Likert type scaling. In addition, a number of the items in the survey were removed due to low correlations with other items. Many items from the original survey also loaded unexpectedly on the wrong theoretically derived factors. This raises the question of whether each item was truly measuring the construct that it was intended to measure. These concerns warrant further testing of the model to determine its validity.

The initial sample ($N = 191$) that was used in the development of the measure and the re-specification of the model was also used to test the new theoretical model. The ability to generalize is a limitation since the same sample was used throughout. The size of the sample is also a limitation, although the KMO value of sampling adequacy in the rotated EFA was 0.79 indicating the sample was appropriate for use in factor analysis. Factor analysis and observed variable path analysis are generally large sample techniques and so replicating the study with a larger sample would be appropriate.

Although the model data fit indices indicated that there was a good fit of the predicted model to the observed data, the model was re-specified during the study as a result of the exploratory factor analysis. The testing of the model needs to be replicated with a new sample. The ability to generalize results is also limited for populations different than that used for this study. High school woodwind, brass, and percussion students were used. Therefore, the results are limited to that group and what may be developmental features appropriate to this age of students.

Further Research

The results of this study lay a foundation for further research into the theory of deliberate practice and the variables that impact it. The following recommendations are presented. The measurement instrument used for this study needs to be further tested and, if necessary, modified to establish reliability and validity. It is crucial for further work in deliberate practice to have a reliable measure to quantify these related constructs. The measure needs to be administered again to a different sample to confirm its ability to do this.

The testing of the newly specified model also needs to be replicated. The measurement instrument needs to be re-administered to a different sample and the data used to confirm the results of the theoretical model. The theory can then be modified if necessary. A larger sample for use with these statistical procedures would also be appropriate as they are generally large sample techniques. In addition, each variable can also be examined in isolation or parts of the model can be extracted and tested to further develop parts of the theory.

Many researchers have shown that the commitment of students to practice their instrument is positively correlated with performance achievement (Ericsson et al., 1993, Sloboda et al., 1996). The impact of these variables and of the model needs to be established on a measure of performance achievement. The aim of increasing the effectiveness of deliberate practice is to improve performance; therefore, this should be an important goal of further research using this model.

Further research should be done with other musical ensembles and different age groups to see if the results replicate and implications need to be drawn. There is evidence

to suggest that the development of practice strategies and effective deliberate practice is impacted by age and developmental stage. Studies researching the growth of effective practicing (Barry & Hallam, 2002; Gruson, 1988; Hallam 1997a, 2001a) attribute its development to increased musical “knowledge” and “expertise.” There is less evidence regarding specific differences between different instruments or with singers.

Research also needs to be done into practical suggestions and strategies that can be used to implement the results of this developing theory. Teachers, students, and parents need to be given the tools to create an environment that fosters deliberate practice and encourages students to persevere through distractions and other constraints.

Conclusion

The purpose of this study was to investigate the variables influential to deliberate practice, create a measure to quantify those variables, specify and test a model, and discuss the implications for the music education profession. There is a strong positive relationship between a musician’s commitment to practice and music achievement (Sloboda et al., 1996). Identifying the variables and their relationship to practice commitment and using that as a basis for developing practical strategies is essential.

In today’s society, students are pulled in many different directions and have a variety of pressures placed upon them. In addition, there are so many different types of activities in which they can be involved, finding time to practice can be difficult. It is important that an environment be established that supports deliberate practice, which effective practice strategies are taught and used, and that students work to create metacognitive and self-reflective behaviors that allow them to develop greater autonomy over their own learning.

Not only should best practices in the classroom be investigated and identified, it is essential to examine what students are doing on their own outside the classroom.

Students need to have the tools to carry out and monitor their practice and performance to regulate their own learning. Teachers and parents need to create an environment that will foster this deliberate practice in addition to providing direct instruction in how to practice effectively. The results of this study are a step towards achieving that goal.

REFERENCES

- Asmus, E. P. (1994). Motivation in music teaching and learning. *Quarterly Journal of Music Teaching and Learning*, 5(4), 5-32.
- 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.
- Atkinson, J.W. (1964). *An introduction to motivation*. Princeton, NJ: Van Nostrand.
- Austin, J. R. & Berg, M. H. (2006). Exploring music practice among 6th-grade band and orchestra students. *Psychology of Music*, 34(4), 535-558.
- Austin, J. & Visopel, W. (1998). How American adolescents interpret success and failure in classroom music: Relationships among attributional beliefs, self concept and achievement. *Psychology of Music*, 26(1), 26-45.
- Austin, J., Renwick, J., & McPherson, G. (2006). Developing motivation. In G. E. McPherson (ed.), *The child as musician: A handbook of musical development*. Oxford: Oxford University Press, 213 - 238.
- Baltes, P.B. & Kliegl, R. (1992). Further testing of limits of cognitive plasticity: Negative age differences in a mnemonic skill are robust. *Developmental Psychology*, 28, 121-125.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122-147.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1995). *Self-efficacy in changing societies*. New York: Cambridge University Press.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A. & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology*, 45, 1017-1028.

- Bandura, A., & Cervone, D. (1986). Differential engagement of self-reactive influences in cognitive motivation. *Organizational Behavior and Human Decision Processes*, 38, 92-113.
- Bandura, A. and E. A. Locke (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology*, 88(1), 87-99.
- Bandura, A. & Schunk, (1981). Cultivating confidence, self-efficacy and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology*, 41(3), 586-598.
- Barry, N. H. (2007). A qualitative study of applied music lessons and subsequent student practice sessions. *Contributions to Music Education*, 34, 51.
- Barry, N.H. & McArthur, V. (1994). Teaching practice strategies in the music studio: A survey of applied music teachers. *Psychology of Music*, 22, 44-55.
- Barry, N. H. & Hallam S. (2002). Practice. In Parncutt, R., & McPherson G. E. (Eds.). *The science and psychology of music performance-creative strategies for teaching and learning* (pp. 151-165). New York: Oxford University Press.
- Barry, N. H. & McArthur, V. H. (1994). Teaching practice strategies in the music studio: A survey of applied music teachers. *Psychology of Music*, 22, 44-55.
- Bauer, W.I. (2008). Metacognition and middle school band students. *Journal of Band Research*, 43(2), 50-63.
- Becker, L.J. (1978). Joint effect of feedback and goal setting on performance: A field study of residential energy conservation. *Journal of Applied Psychology*, 63, 428-433.
- Beck, M. (2008, April 29). If at first you don't succeed you're in excellent company. *The Wall Street Journal*, p. D1.
- Berg, M. H. & Austin J. R. (2006). Exploring music practice among sixth-grade band and orchestra students. *Psychology of Music*, 34 (4), 535-558.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: John Wiley & Sons.
- Bower, G.H., & Hilgard, E.R. (1981). *Theories of learning* (5th ed.). Englewood Cliffs, NJ: Prentice Hall.
- Bryan, J.F. & Locke, E.A. (1967). Goal-setting as a means of increasing motivation. *Journal of Applied Psychology*, 51, 274-277.

- Byo, J. L. & Cassidy, J. W. (2008). An exploratory study of time use in the practice of music majors: Self-report and observation analysis. *Update - Applications of Research in Music Education*, 27(1), 33-40.
- Chaffin, R. (2007). Learning *Clair de Lune*: Retrieval practice and expert memorization. *Music Perception*, 24, 377–393.
- Chaffin, R., & Imreh, G. (2001). A comparison of practice and self-report as sources of information about the goals of expert practice. *Psychology of Music*, 29, 39-69.
- Chaffin, R. & Lemieux, A. F. (2004). General perspectives on achieving musical excellence. In A. Williamon (Ed.), *Musical excellence: Strategies and techniques to enhance performance* (pp. 19-39). Oxford: Oxford University Press.
- Chaffin, R., Lisboa, T., Logan, T., & Begosh, K. T. (2010). Preparing for memorized cello performance: The role of performance cues. *Psychology of Music*, 38(1), 3-30.
- Chappuis, S., & Stiggins, R. J. (2002). Classroom assessment for learning. *Educational Leadership*, 60(1), 40-43.
- Chase, W.G., & Ericsson, K.A. (1982). Skilled memory. In J.R. Anderson (Ed.), *Cognitive skills and their acquisition* (pp. 141-189). Hillsdale, NJ: Erlbaum.
- Chase, W. G., & Simon, H. A. (1973). Perception in chess. *Cognitive Psychology*, 4, 55–81.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd Ed.). Hillsdale, NJ: Erlbaum.
- Conroy, D.E., Elliot, A.J., & Coatsworth, J.D. (2007). Competence motivation in sport and exercise; The hierarchical model of achievement motivation and self-determination theory. In Hagger, M.S., & Chatzisarantis, N.L.D. *Intrinsic motivation and self-determination in exercise and sport* (pp.181-192). Champaign, Illinois: Human Kinetics.
- Corno, L. (1986). The metacognitive control components of self-regulated learning. *Contemporary Educational Psychology*, 11(4), 333 – 346.
- Costa-Giomi, E. (2003). *What differentiates high and low achievement piano students? Teacher and student behaviors during three years of lessons*. Paper presented at the International Symposium for Research in Music Behavior, Chicago, IL.
- Creech, A. (2010). Learning a musical instrument: the case for parental support. *Music Education Research*, 12(1), 13 – 32.
- Csikszentmihalyi, M, Rathunde, K., & Whalen, S. (1993). *Talented teenagers: The roots of success and failure*. Cambridge: Cambridge University Press.

- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: HarperCollins Publishers.
- Csikszentmihalyi, M. (2004). *Mihaly Csikszentmihalyi on flow*. TED Talks. http://www.ted.com/talks/mihaly_csikszentmihalyi_on_flow.html
- Darity, E. (2008). Social psychology. *International Encyclopedia of Social Sciences*, 7(2), 608-611.
- Davidson, J. W., Sloboda, J. A., & Howe, M. J. A. (1994). The role of parents and teachers in the success and failure of instrumental teachers. *Bulletin of the Council for Research in Music Education*, Special Issue, The International Society for Music Education, July 9-15, Univ. of Miami, FL.
- Davidson, J. W., Sloboda, J. A., & Howe, M. J. A. (1995). The role of parents and teachers in the success and failure of instrumental learners. *Bulletin of the Council for Research in Music Education*, 127, 40-44.
- Davidson, J. W., Sloboda, J. A., & Howe, M. J. A. (1996). The role of parents and teachers in the success and failure of instrumental learners. *Bulletin of the Council for Research in Music Education* 127, 40-44.
- Deci, E.L., Eghrari, H., Patrick, B.C., & Leone, D.R. (1994). Facilitating internalization: The self-determination perspective. *Journal of Personality*, 62, 119-142.
- Driscoll, J. (2009). 'If I play my sax my parents are nice to me': opportunity and motivation in musical instrument and singing tuition. *Music Education Research*, 11(1), 37-55.
- Duke, R. A., & Davis, C. M. (2006). Procedural memory consolidation in the performance of brief keyboard sequences. *Journal of Research in Music Education*, 54(2), 111-123.
- Duke, R. A., & Chapman, D. (2010). Changing learners: The nature of expertise in music teaching. In P. M. Ward-Steinman (Ed.), *Advances in social-psychology and music education research* (pp. 29-38). Farnam, UK: Ashgate.
- Duke, R. A., Simmons, A. L., & Cash, C. D. (2009). It's not how much; it's how. *Journal of Research in Music Education*, 56(4), 310-321.
- Ericsson, K. A. (1996). The acquisition of expert performance: An introduction to some of the issues. In K. A. Ericsson (Ed.), *The road to excellence: The acquisition of expert performance in the arts and sciences, sports, and games* (pp. 1-50). Mahwah, NJ: Erlbaum.
- Ericsson, K.A. (2007). Deliberate practice and the modifiability of body and mind: Toward a science of the structure and acquisition of expert and elite performance. *International Journal of Sport Psychology*, 38, 4-34.

- Ericsson, K. A., Krampe, R. T., & Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100(3), 363-406.
- Ericsson, K.A., Prietula, M.J. and Cokely, E.T. (2007). The Making of an Expert. *Harvard Business Review* – Online Version. July –August.
- Ericsson, K.A. & Charness, N. (1994). Expert performance its structure and acquisition. *American Psychologist*, 49, 725-747.
- Ericsson, K. A. & Lehmann, A. C. (1996). Expert and exceptional performance: Evidence of maximal adaptation to task constraints. *Annual Review of Psychology*, 47(1), 273-305.
- Ericsson, K. A. & Lehmann, A. C. (1997). Research on expert performance and deliberate practice: Implications for the education of amateur musicians and music students. *Psychomusicology* 16, 40-58.
- Faulkner, R., Davidson, J., McPherson, G.E. (2010). The value of data mining in music education research and some findings from its application to a study of instrumental learning during childhood. *International Journal of Music Education*. 28(3), 212 – 230.
- Field, A. (2013). (4th Ed.) *Discovering statistics using IBM SPSS Statistics*. Thousand Oaks, CA: Sage Publications Ltd.
- Fitts, P. M., & Posner, M. I. (1967). *Human performance*. Monterey, CA: Brooks/Cole.
- Foley, L. A. (2003). Theory. In *New Catholic encyclopedia*. (2^{ed} Ed ,Vol. 13, p. 934). Detroit: Gale.
- Gagne, F. (1999). Nature or nurture? A re-examination of Slaboda and Howe's (1991) interview study on talent development in music. *Psychology of Music*, 27, 38-51.
- Gagne, R.M. (1970). *The conditions of learning* (2nd ed.). New York: Holt, Rinehart & Winston.
- Garcia, T., & Pintrich, P.R. (1994). Regulating motivation and cognition in the classroom: The role of self-schemas and self-regulatory strategies. In D.H.
- Schunk & B.J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp.127-153). Hillsdale, NJ: Erlbaum.
- Geiersbach, F. J. (2000). Musical thinking in instrumental practice: An investigation of practice strategies used by experienced musicians. Unpublished Doctoral Dissertation, Columbia University Teachers College. UMI #9976723.

- Geringer, J.M. & Kostka, M. J. (1984). An analysis of practice room behavior of college music students. *Contributions to Music Education*, 11, 24-27.
- Gruson, L. M. (1988). Rehearsal skill and musical competence: does practice make perfect? In Sloboda (Ed.), *Generative Processes in Music*, 91-112.
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate data analysis*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Hallam, S. (1995b). Professional musicians' orientations to practice: Implications for teaching. *British Journal of Music Education*, 12(1), 3.
- Hallam, S. (1997a). Approaches to the instrumental music practice of experts and novices: Implications for education. In H. Jorgensen and A.C. Lehman (Eds), *Does practice make perfect? Current theory and research on instrumental music practice*. Oslo: Norges Musikkhogskole.
- Hallam, S. (1997b). What do we know about practicing? Towards a model synthesizing the research literature. In H. Jorgensen and A.C. Lehman (Eds), *Does practice make perfect? Current theory and research on instrumental music practice*. Oslo: Norges Musikkhogskole.
- Hallam, S. (1998). *Instrumental Teaching: A practical guide to better teaching and learning*. Oxford: Heinemann.
- Hallam, S. (2001). The development of metacognition in musicians: Implications for education. *British Journal of Music Education*, 18(1), 27-39.
- Hallam, S. (2001a). The development of expertise in young musicians: Strategy use, knowledge acquisition and individual diversity. *Music Education Research*, 3(1), 7-23.
- Hallam, S. (2001b). The development of metacognition in musicians: Implications for education. *British Journal of Music Education*, 18, 27-39.
- Hallam, S. (2002). Musical motivation: Towards a model synthesizing the research. *Music Education Research*, 4(2), 231-244.
- Hallam, S., & Barry, N. H. (2002). Practice. In R. Parncutt & G. E. McPherson (Eds.), *The science & psychology of music performance* (pp. 151-165). New York, NY: Oxford University Press.
- 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 music performance* (pp. 71-88). Oslo, Norway: Norwegian State Academy of Music.

- Hewitt, M. P. (2001). The effects of self-evaluation, self-listening, and modeling on junior high instrumentalists' music performance and practice attitude. *Journal of Research in Music Education*, 49(4), 307-322.
- Hoover-Dempsey, K., Battiato, A., Walker, J., Reed, R., DeJong, J. & Jones, K. (2001). Parental involvement in homework. *Educational Psychologist*, 36:3, 195-209.
- 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)
- Hyllegard, R., & Bories, T. L. (2008). Deliberate practice theory: relevance, effort, and inherent enjoyment of music practice. *Perceptual and Motor Skills*, 107(2), 439-48.
- Hyllegard, R., & Bories, T. L. (2009). Deliberate practice theory: perceived relevance, effort, and inherent enjoyment of music practice: study II. *Perceptual and Motor Skills*, 109(2), 431-40.
- Jardaneh, N. (2007). *Exploring young piano students' perceptions of effective practice strategies*. Unpublished master's thesis, University of Ottawa, Ottawa, Ontario, Canada.
- Jorgensen, H. (1995). Teaching and learning strategies in instrumental practice: A report on research in progress, In J.A. Taylor (Ed.), *Transatlantic roads of music education: World views*, (pp. 47-51) N.Y.: Oxford University Press, Inc.
- Jorgensen, H. (2002). Instrumental performance expertise and amount of practice among instrumental students in a conservatoire. *Music Education Research*, 4, 105-119.
- Jorgensen, H. (2003). Instrumental practice and developing musicianship. In Kopiez, A. C. Lehmann, I. Wolther & C. Wolf (Eds.) *Proceedings Of The 5th Triennial ESCOM Conference*, p. 195- 199.
- Jorgensen, H. (2004). Strategies for individual practice. In Williamon, A. (Ed.), *Musical Excellence: Strategies and Techniques to Enhance Performance*. (pp. 85-103). N.Y.: Oxford University Press, Inc.
- Jorgensen, H. (2007). Strategies for individual practice. In Williamon, A. (Ed.), *Musical Excellence*, New York: Oxford University Press.
- Kleigl, R., Smith, J., & Baltes, P.B. (1989). Testing-the-limits and the study of adult age differences in cognitive plasticity of a mnemonic skill. *Developmental Psychology*, 25, 247-256.

- Kleigl, R., Smith, J., & Baltes, P.B. (1990). On the locus and process of magnification of age differences during mnemonic training. *Developmental Psychology*, 26, 894-904.
- Kline, R.B. (2011). (3rd ed.) *Principles and practice of structural equation modeling*. New York: Guilford Press.
- Kostka, M. J. (2002). Practice expectations and attitudes: A survey of college-level music teachers and students. *Journal of Research in Music Education*, 50(4), 145-154.
- Krampe, R. Th., & Ericsson, K.A. (1995). Deliberate practice and elite musical performance. In J. Rink (Ed.), *The practice of performance: Studies in musical interpretation* (pp.84-102). Cambridge: Cambridge University Press.
- Lammers, M. & Kruger, M. (2006). Brass and woodwind student practice habits in Norway, Japan and the United States. *NACWPI Journal*, 54, 4-13.
- 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. (2003). Self-reported performance goals predict actual practice behaviour among adult piano beginners. In Kopiez, R., A. C. Lehmann, I. Wolther, & C. Wolf (Eds.), *Proceedings of the 5th Triennial ESCOM Conference*, pp. 389-392.
- Lehmann, A.C. & Davidson, J.W. (2002). Scientific approach to practice: Deliberate (formal) practice. In R. Colwell, & C. Richardson (Eds.), *The new handbook of research on music teaching and learning* (pp. 542-552). New York: Oxford University 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.
- Leon-Guererro, A. J. (2004). An examination of the self-regulation strategies used by adolescent instrumental musicians while practicing. (Unpublished Doctoral Dissertation, Northwestern University, 2004). UMI No. 3132561.
- Leon-Guerrero, A. (2008). Self-regulation strategies used by student musicians during music practice. *Music Education Research*, 10(1), 91-106.

- Lim, S. & Lippman, L. G. (1991). Mental practice and memorization of piano music. *Journal of General Psychology*, 118(1), 21-30.
- Lisboa, T. (2008). Action and thought in cello playing: An investigation of children's practice and performance. *International Journal of Music Education*, 26(3), 243-267.
- Little, R. J. A., & Rubin, D. R. (1987). *Statistical analysis with missing data*. New York: John Wiley & Sons.
- 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(1), 77-88.
- Madsen, C. K., & Geringer, J.M. (1981). The effect 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 isolation of dependent and independent variables. In C. K. Madsen, C.H. Madsen & R. D. Greer (Eds.), *Research in music behavior: Modifying music behavior in the classroom* (pp. 226- 243). New York: Teachers College Press.
- Maehr, M.L., Pintrich, P.R. & Linnenbrink, E.A. (2002). Motivation and achievement. In R. Colwell, & C. Richardson (Eds.), *The new handbook of research on music teaching and learning* (pp. 348-372). New York: Oxford University Press.
- McCormick, J. & McPherson, G. (2003). The role of self-efficacy in a musical performance examination: An exploratory structural equation analysis. *Psychology of Music*, 31(1), 37-51.
- McMillan, J. H. (2000). *Educational research: Fundamentals for the consumer*. New York: Addison Wesley Longman.
- McPherson, G. E. (1995). The assessment of musical performance: Development and validation of five new measures. *Psychology of Music*, 23(2), 142-161.
- McPherson, G. (2005). From child to musician: skill development during the beginning stages of learning an instrument. *Psychology of Music*, 33(1), 5-35.
- McPherson, G. (2009). Playing together in ways that cater for and fulfill student musicians' psychological needs. In Aaron Williamon, Sharman Pretty, and Ralph Buck (eds.) *Proceedings of the international symposium on performance science 2009*. (pp. 475-480). Utrecht, The Netherlands: European Association of Conservatoires (AEC).
- McPherson, G., Davidson, J. W. & Pitts, S. (2000). Developing effective practice strategies: Case studies of three young instrumentalists. *Music Education Research*, 2(1), 45-56.

- McPherson, G.E. & Davidson, J.W. (2006). Playing an instrument. In G.E. McPherson (Ed.) *The child as musician: A handbook of musical development* (pp.331–354). Oxford: Oxford University Press.
- McPherson, G. E. & McCormick, J. (2006). Self-efficacy and music performance. *Psychology of Music*, 34, 322-336.
- McPherson, G. E. & Renwick, J. M. (2001). A longitudinal study of self-regulation in children's musical practice. *Music Education Research*, 3(2), 169-186.
- McPherson, G. & Zimmerman, B. J. (2002). Self-regulation of musical learning: A social cognitive perspective. In R. Colwell & C. Richardson (Eds.), *The New Handbook Of Research On Music Teaching And Learning* (pp. 327-347). New York: Oxford University Press.
- Miksza, P. (2006b). Relationships among impulsiveness, locus of control, sex, and music practice. *Journal of Research in Music Education*, 54(4), 308-323.
- Miksza, P. (2007a). Effective practice: An investigation of observed practice behaviors, self-reported practice habits, and the performance achievement of high school wind players. *Journal of Research in Music Education*, 55(4), 359-375.
- Miksza, P. (2007b). Relationships among impulsivity, achievement goal motivation, practice behavior, and the performance achievement of high school wind players. (Doctoral Dissertation, Indiana University, 2007). UMI No. 3274248
- Miksza, P. (2012). A review of research on practicing: Summary and synthesis of the extant research with implications for a new theoretical orientation. *Bulletin of the Council for Research in Music Education*, 190, 51-92.
- Nielsen, S. G. (1997). Self-regulation of learning strategies during practice: A case study of a church organ student preparing a musical work for performance. In H. Jorgensen and A.C. Lehman (Eds), *Does practice make perfect? Current theory and research on instrumental music practice* (109-122). Oslo: Norges Musikkhogskole.
- Nielsen, S. G. (1999a). Learning strategies in instrumental music practice. *British Journal of Music Education*, 16(3), 275-291.
- Nielsen, S. G. (1999b). Regulation of learning strategies during practice: A case study of a single church organ student preparing a particular work for a concert performance. *Psychology of Music*, 27(2), 218-229.
- Nielsen, S. W. (2001). Self-regulating learning strategies in instrumental music practice. *Music Education Research*, 3(2), 155-167.

- Nielsen, S. G. (2004). Strategies and self-efficacy beliefs in instrumental and vocal individual practice: A study of students in higher music education. *Psychology of Music*, 32(4), 418-431.
- Oare, S.T. (2006). Goals and self-assessment in the middle school learner: a study of music practice habits. *Dissertation, Michigan State University, United States – Michigan*.
- O'Neill, S. (1997). The role of practice in children's early performance achievement. In H. Jorgensen & A.C. Lehmann (Eds.), *Does practice make perfect: Current theory and research on instrumental music practice*. (pp. 52 – 70). Oslo, Norway: Norges musikkhøgskole.
- O'Neill, S. A. & McPherson, G. E. (2002). Motivation. In R. Parncutt & G.E. McPherson (Eds.) *The science and psychology of music performance* (pp. 31-46). New York: Oxford University Press.
- Ormrod, J.E. (2008). *Human learning* (5th ed.). New Jersey: Pearson Prentice Hall.
- Pask, G. (1976). Styles and strategies of learning. *British Journal of Educational Psychology*, 46, 128–148.
- Perry, W. G. (1970). *Intellectual and ethical development in the college years: A scheme*. New York, NY: Holt, Rinehart, & Wilson.
- Pintrich, Paul R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International Journal of Educational Research*. 31(6), 459 - 470.
- Pintrich, P. R. & DeGroot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82(1), 33–40.
- Pitts, S., Davidson, A., & McPherson, G. (2000a). 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.
- Pitts, S. E., Davidson, J. W., & McPherson, G. E. (2000b). 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.
- Rohwer, D. (2002). Understanding practice: An investigation and applications. *International Journal of Music Education*, 40(1), 15-25.
- Rohwer D. & Polk, J. (2006). Practice behaviours of eighth grade instrumental musicians. *Journal of Research in Music Education*, 54(4), 350 - 362.

- Rosenthal, R. (1984). The relative effects of guided model, model only, guide only, and practice only treatments on the accuracy of advanced instrumentalists' musical performance. *Journal of Research in Music Education*, 32(4), 265-273.
- Ross, S. L. (1985). The effectiveness of mental practice in improving the performance of college trombonists. *Journal of Research in Music Education*, 33(4), 221-230.
- Ross, M. E., Green, S. B., Salisbury-Glennon, J. D., & Tollefson, N. (2006). College students' study strategies as a function of testing: An investigation into metacognitive self-regulation. *Innovative Higher Education*, 30(5), 361-367.
- 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.
- Schatt, M. D. (2011). High school instrumental music students' attitudes and beliefs regarding practice: an application of attribution theory. *Update: Applications of Research in Music Education*, 29(2), 29-40.
- Schraw, G. (1998). Promoting general metacognitive awareness. *Instructional Science*, 26, 113-125.
- Schunk, D. H., & Zimmerman, B. J. (Eds.). (1994). *Self-regulation learning and performance: Issues and educational applications*. Hillsdale, NJ: Erlbaum.
- Schunk, D.H., & Zimmerman, B.J. (Eds.) (1998). *Self-regulated learning from teaching to self-reflective practice*. New York: Guilford Press
- Schunk, D. H. (1993). *Enhancing strategy use: Influences of strategy value and goal orientation*. North Carolina. (ERIC Document Reproduction Service No. ED359217).
- Schunk, D. H. (1994). Goal and self-evaluative influences during children's mathematical skill acquisition. Washington, DC: Purdue University, Lafayette, IN.: Dept. of Education: American Educational Research Association. (ERIC Document Reproduction Service No. ED372932).
- Schunk, D. H. (1995). Self-efficacy and education and instruction. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment: Theory, research and application* (pp. 281-303). New York: Plenum.
- Schunk, D. H. (2001). Social cognitive theory and self-regulated learning. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: Theoretical perspectives* (2nd ed., pp. 125-151). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

- 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. (1996). The acquisition of musical performance expertise: Deconstructing the "talent" account of individual differences in musical expressivity. In K. A. Ericsson (Ed.), *The road to excellence: the acquisition of expert performance in the arts and sciences, sports, and games*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Sloboda, J. & Davidson, J. (1996). The young performing musician. In: I. Deliege & J. Sloboda (Eds.) *Musical beginnings: Origins and development of musical competence*. New York, NY: Oxford University Press.
- Sloboda, J. A., Davidson, J. W., Howe, M. J. A., & Moore, D. G. (1996). The role of practice in the development of performing musicians. *British Journal of Psychology*, 87(2), 287-309.
- Smith, B. (2002). The role of selected motivational beliefs in the process of collegiate instrumental music practice. Dissertation Abstracts International, (UMI No. 3042170).
- Smith, B. P. (2005). Goal orientation, implicit theory of ability, and collegiate instrumental music practice. *Psychology of Music*, 33(1), 36-57.
- Stiggins, R. (2001). *Student-involved classroom assessment*, 3rd ed. Upper Saddle River, NJ: Prentice-Hall.
- Stipek, D. (1998). *Motivation to learn: From theory to practice* (3rd Ed.). Boston: Allyn and Bacon.
- Tabachnick, B. G., & Fidell, L. S. (2013). (6th ed.) *Using multivariate statistics*. Upper Saddle River, NJ: Pearson Education, Inc.
- Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. Washington, DC: American Psychological Association.
- Walker, M. P. (2005). A refined model of sleep and the time course of memory formation. *Behavioral and Brain Sciences*, 28(1), 51-104.
- Walker, S. O., & Plomin, R. (2005). The nature-nurture question: Teachers' perceptions of how genes and the environment influence educational relevant behaviour. *Educational Psychology*, 25(5), 509-16.
- 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.

- Wang, M.C., Haertel, G.D., & Walberg, H.J. (1993). What helps students learn? *Educational Leadership*, 51(4), 74 - 84.
- Warton, P. M. (1997). Learning about responsibility: Lessons from homework. *British Journal of Educational Psychology*, 67, 213-221.
- 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., & Valentine, E. (2000). Quantity and quality of music practice as predictors of performance quality. *British Journal of Psychology*, 91, 353-76.
- Woody, R.H. (2001). Learning from the experts: Applying research in expert performance to music education. *Update: the Applications of Research in Music Education*, 19(2), 9-14.
- Zdzinski, S. F. (1996). Parental involvement, selected student attributes, and learning outcomes in instrumental music. *Journal of Research in Music Education*, 44(1), 34-48.
- Zimmerman, B. J. (1986). Becoming a self-regulated learner: Which are the key subprocesses? *Contemporary Educational Psychology* 11(4), 307-13.
- Zimmerman, B.J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, 81, 329-339.
- Zimmerman, B. J. (1998). Developing self-fulfilling cycles of academic regulation: An analysis of exemplary instructional models. In: D. H. Schunk & B. J. Zimmerman (Eds.), *Self regulated learning: From teaching to self-reflective practice* (pp. 1-19). New York: Guilford Press.
- Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P.R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation*. San Diego: Academic Press.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice* 41, 64-70
- Zimmerman, B.J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal* 45(1), 166-183.
- Zimmerman, B. J., Bonner, B. J., & Kovach, R. (Eds.). (1996). *Developing self-regulated learners: Beyond achievement to self-efficacy*. Washington, DC: American Psychological Association.

- Zimmerman, B. J. & Schunk, D. H., Eds. (1989). *Self-regulated learning and academic achievement: Theory, research, and practice*. New York: Springer-Verlag.
- Zurcher, W. (1975). The effect of model-supportive practice on beginning brass instrumentalists. In C. K. Madsen, R. D. Greer & C.H. Madsen (Eds.), *Research in music behavior* (pp. 125-130). New York: Teachers College Press.

APPENDIX A

Survey Items and Their Sources

Survey Items	Study Items Obtained From	Observed Variable	Latent Variable
Your gender.	Mikzsa, 2007	Gender	Student Characteristics
Your age.	Mikzsa, 2007	Age	Student Characteristics
What is your primary instrument?	Mikzsa, 2007	Prior Experience	Student Characteristics
Typical number of days per week on which you practice.	Mikzsa, 2007	Practice Frequency	Practice Commitment
Length of your average practice session in minutes.	Mikzsa, 2007	Practice Frequency	Practice Commitment
Typical number of your practice sessions per day.	Mikzsa, 2007	Practice Frequency	Practice Commitment
Typical amount of your individual practice per day in minutes.	Mikzsa, 2007	Practice Frequency	Practice Commitment
How many years have you played your primary instrument?	Mikzsa, 2007	Prior Experience	Student Characteristics
How many years have you played in a school music ensemble?	Mikzsa, 2007	Prior Experience	Student Characteristics
How many years have you taken private lessons?	Mikzsa, 2007	Prior Experience	Student Characteristics
My parents play an instrument or sing in a musical group.	Zdzinski (In Press)	Parent Involvement	Social Influences
I usually practice in the same location.	Ali, 2010	Environmental Characteristics	Physical Environment
I am in control of my practice environment and make sure I am away from distractions.	Picone, 2012	Environmental Characteristics	Physical Environment

Survey Items	Study Items Obtained From	Observed Variable	Latent Variable
I set up the practice room and my materials a certain way before I begin practice sessions	Ali, 2010	Environmental Characteristics	Physical Environment
Did either parent or other family member ever play a musical instrument or sing?	Zdzinski (In Press)	Parent Involvement	Social Influences
My parents ensure that I do sufficient practice at home.	Zdzinski (In Press)	Parent Involvement	Social Influences
My parents observe me when I practice at home.	Zdzinski (In Press)	Parent Involvement	Social Influences
My parents expect me to do my best in music.	Zdzinski (In Press)	Parent Involvement	Social Influences
My parents overall attitude toward music is positive.	Zdzinski (In Press)	Parent Involvement	Social Influences
My parents are supportive if I am having problems.	Strage, 1998	Parent Involvement	Social Influences
When practicing, I often try to perform for a classmate or friend.	Bone, 2011	Peer	Social Influences
I listen carefully to my teachers practice advice.	Austin & Berg, 2006	Teacher	Social Influences
When I have a problem or there is something I do not understand, I ask for help.	Picone, 2012	Teacher	Social Influences
Lessons with my current teacher include instruction on how to practice effectively.	Carter, 2010	Teacher	Social Influences
An important reason I practice my music is so that I don't embarrass myself.	Smith, 2005; Mikzsa, 2007	Motivation	Psychological Characteristics
I practice because I want my teacher to think that I am a good musician.	Mikzsa, 2007	Motivation	Psychological Characteristics

Survey Items	Study Items Obtained From	Observed Variable	Latent Variable
I feel most successful when I do something I could not do before.	Mikzsa, 2007	Motivation	Psychological Characteristics
I practice because I want to play better than other players.	Smith, 2005	Motivation	Psychological Characteristics
I feel motivated to practice.	Picone, 2012	Motivation	Psychological Characteristics
Whether or not I succeed in music has little to do with my practicing.	Mikzsa, 2006	Motivation	Psychological Characteristics
When I am successful at learning or performing a piece of music, I feel it is because of my effort.	Picone, 2012	Motivation	Psychological Characteristics
I'm confident I can do an excellent job in my practicing.	Bone, 2011	Self-Efficacy	Psychological Characteristics
When I get a piece of music, I am confident that I will learn to play it.	Picone, 2012	Self-Efficacy	Psychological Characteristics
I believe I have musical ability.	Picone, 2012	Self-Efficacy	Psychological Characteristics
I have expectations of achievement and growth from my practice sessions.	Beverly, 2010	Self-Efficacy	Psychological Characteristics
I enjoy practicing interesting music even if it means giving extra effort.	Miksza, 2006	Task Difficulty	Planning/Goal-Setting
I prefer practicing music that is challenging so I can learn new things.	Miksza, 2006	Task Difficulty	Planning/Goal-Setting
I think the music I practice is useful for me to learn.	Bone, 2011	Task Difficulty	Planning/Goal-Setting
I will work hard at learning a piece of music even if I don't really like it.	Picone, 2012	Task Difficulty	Planning/Goal-Setting

Survey Items	Study Items Obtained From	Observed Variable	Latent Variable
It is important for me to choose the music I learn.	Picone, 2012	Task Difficulty	Planning/Goal-Setting
I get bored if the music is too easy.	Miksza, 2006	Task Difficulty	Planning/Goal-Setting
I look over the music before practicing.	Miksza, 2012	Planning	Planning/Goal-Setting
I usually have a plan of what I need to practice most before I begin my practice session.	Miksza, 2006	Planning	Planning/Goal-Setting
I keep a written record of my practice goals.	Smith, 2005	Planning	Planning/Goal-Setting
My practice time is often spent playing simply for fun with no specific musical or technical goal in mind.	Miksza, 2006	Planning	Planning/Goal-Setting
My teacher gives me practice assignments.	Carter, 2010	Planning	Planning/Goal-Setting
My teacher sets specific time requirements for the number of hours I must practice per week.	Carter, 2010	Planning	Planning/Goal-Setting
When practicing, I try to relate the material to what I already know.	Bone, 2011	Practice Strategy Use	Practice Strategies
When practicing, I try to determine which concepts I don't understand well.	Bone, 2011	Practice Strategy Use	Practice Strategies
I feel I am aware of my own strengths and weaknesses as a musician.	Picone, 2012	Self-Reflection	Metacognition/Self-Reflection
When I am practicing, I often stop playing and think about how the music should sound.	Chung, 2006	Practice Strategy Use	Practice Strategies

Survey Items	Study Items Obtained From	Observed Variable	Latent Variable
I practice the hardest passages first and then work on others.	Smith, 2005	Practice Strategy Use	Practice Strategies
I use a Whole/Part/Whole practice strategy where I isolate a phrase or unit, break it down into smaller parts, and then recombine it.	Miksza, 2012	Practice Strategy Use	Practice Strategies
I play a piece through from the beginning and, even if there are errors, move on.	Picone, 2012	Practice Strategy Use	Practice Strategies
I mark my music regularly as a part of practicing.	Miksza, 2006	Practice Strategy Use	Practice Strategies
It is easy for me to remain focused on my music when practicing alone.	Miksza, 2006	Concentration	Practice Strategies
I sometimes forget what I had originally planned to work on when practicing.	Miksza, 2006	Concentration	Practice Strategies
Even when the music is dull or uninteresting, I keep practicing until I get it.	Miksza, 2006	Concentration	Practice Strategies
I often feel so lazy or bored when I practice that I quit before I finish what I planned to do.	Bone, 2011	Concentration	Practice Strategies
I spend time in each practice session reviewing the music.	Miksza, 2012	Self-Reflection	Metacognition/Self-Reflection
I listen critically and evaluate my performance to make sure I understand the material and am performing it correctly.	Bone, 2011	Self-Reflection	Metacognition/Self-Reflection
Often, I record my playing to identify good and bad aspects.	Chung, 2006	Self-Reflection	Metacognition/Self-Reflection

Survey Items	Study Items Obtained From	Observed Variable	Latent Variable
I plan my practice time into my weekly schedule.	Carter, 2010	Commitment	Practice Commitment
Keeping practice time is the most important thing in my schedule.	Chung, 2006	Commitment	Practice Commitment
I find it hard to stick to a practice schedule.	Bone, 2011	Commitment	Practice Commitment
I use two or more shorter practice sessions rather than one longer one.	Smith, 2005	Commitment	Practice Commitment

APPENDIX B

HIPS Survey

Research ID # _____

Instrumental Music Practice Survey

Directions: Fill in the oval or write in the answer that most accurately describes your situation.

- 1.
- Your gender.**

☐

Male

☐

Female

- 2.
- Your age.**

☐

13

☐

14

☐

15

☐

16

☐

17

☐

18

- 3.
- What is your primary instrument?**

- 4.
- Typical number of days per week on which you practice.**

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

- 5.
- Length of your average practice session in minutes.**

- 6.
- Typical number of your practice sessions per day.**

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

8

☐

9

☐

10

- 7.
- Typical amount of your individual practice per day in minutes.**

- 8.
- How many years have you played your primary instrument?**

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

8

☐

9

☐

10

☐

11

☐

12

- 9.
- How many years have you played in a school music ensemble?**

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

8

☐

9

☐

10

☐

11

☐

12

- 10.
- How many years have you taken private lessons?**

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

8

☐

9

☐

10

☐

11

☐

12

Research ID # _____

11. **Did either parent or other family member ever play a musical instrument or sing?**
☐ Yes ☐ No
12. **I find it hard to stick to a practice schedule.**
 Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree ☐
13. **An important reason I practice my music is so that I don't embarrass myself.**
 Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree ☐
14. **My practice time is often spent playing simply for fun with no specific musical or technical goal in mind.**
 Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree ☐
15. **Often, I record my playing to identify good and bad aspects.**
 Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree ☐
16. **I'm confident I can do an excellent job in my practicing.**
 Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree ☐
17. **I feel I am aware of my own strengths and weaknesses as a musician.**
 Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree ☐
18. **I get bored if the music is too easy.**
 Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree ☐
19. **I keep a written record of my practice goals.**
 Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree ☐

Research ID # _____

20. **It is easy for me to remain focused on my music when practicing alone.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
- ☐ ☐ ☐ ☐ ☐
21. **I usually practice in the same location.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
- ☐ ☐ ☐ ☐ ☐
22. **I listen critically and evaluate my performance to make sure I understand the material and am performing it correctly.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
- ☐ ☐ ☐ ☐ ☐
23. **My parents ensure that I do sufficient practice at home.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
- ☐ ☐ ☐ ☐ ☐
24. **I prefer practicing music that is challenging so I can learn new things.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
- ☐ ☐ ☐ ☐ ☐
25. **It is important for me to choose the music I learn.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
- ☐ ☐ ☐ ☐ ☐
26. **I enjoy practicing interesting music even if it means giving extra effort.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
- ☐ ☐ ☐ ☐ ☐
27. **My parents are supportive if I am having problems.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
- ☐ ☐ ☐ ☐ ☐

Research ID # _____

28. **When I get a piece of music, I am confident that I will learn to play it.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
29. **Even when the music is dull or uninteresting, I keep practicing until I get it.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
30. **When I have a problem or there is something I do not understand, I ask for help.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
31. **I often feel so lazy or bored when I practice that I quit before I finish what I planned to do.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
32. **Keeping practice time is the most important thing in my schedule.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
33. **My parents observe me when I practice at home.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
34. **My teacher gives me practice assignments.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
35. **I spend time in each practice session reviewing the music.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree

Research ID # _____

36. **I usually have a plan of what I need to practice most before I begin my practice session.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

37. **Whether or not I succeed in music has little to do with my practicing.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

38. **When I am successful at learning or performing a piece of music, I feel it is because of my effort.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

39. **I think the music I practice is useful for me to learn.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

40. **I play a piece through from the beginning and, even if there are errors, move on.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

41. **My parents play an instrument or sing in a musical group.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

42. **When practicing, I often try to perform for a classmate or friend.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

43. **I set up the practice room and my materials a certain way before I begin practice sessions**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

Research ID # _____

44. **I mark my music regularly as a part of practicing.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

45. **When I am practicing, I often stop playing and think about how the music should sound.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

46. **I sometimes forget what I had originally planned to work on when practicing.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

47. **I look over the music before practicing.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

48. **I have expectations of achievement and growth from my practice sessions.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

49. **I feel most successful when I do something I could not do before.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

50. **I practice because I want my teacher to think that I am a good musician.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

51. **I will work hard at learning a piece of music even if I don't really like it.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

Research ID # _____

52. **I use two or more shorter practice sessions rather than one longer one.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
53. **When practicing, I try to relate the material to what I already know.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
54. **When practicing, I try to determine which concepts I don't understand well.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
55. **I plan my practice time into my weekly schedule.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
56. **I believe I have musical ability.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
57. **I listen carefully to my teachers practice advice.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
58. **Lessons with my current teacher include instruction on how to practice effectively.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree
59. **My parents overall attitude toward music is positive.**
- Strongly Disagree Disagree Neutral Agree Strongly Agree

Research ID # _____

60. **My teacher sets specific time requirements for the number of hours I must practice per week.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

61. **I practice the hardest passages first and then work on others.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

62. **I use a WholePartWhole practice strategy where I isolate a phrase or unit, break it down into smaller parts, and then recombine it.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

63. **I practice because I want to play better than other players.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

64. **My parents expect me to do my best in music.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

65. **I am in control of my practice environment and make sure I am away from distractions.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

66. **I feel motivated to practice.**

Strongly Disagree Disagree Neutral Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

APPENDIX C

IRB Approvals

Page 1 of 2

UNIVERSITY
OF MIAMI



University of Miami
Human Subjects Research Office (M809)
PO Box 016960, Miami, Florida 33101
1500 NW 12 Avenue, Suite 1002, Miami, Florida 33136

Ph: 305-243-3195
Fax: 305-243-3328
www.hsro.miami.edu

EXPEDITED – APPROVAL

December 12, 2013

Edward Asmus, Ph.D.
University of Miami
Department of Music Education and Music Therapy
Coral Gables Campus, Locator Code: 7460
Gusman Hall, Room 110-B
Coral Gables, FL 33124

HSRO STUDY NUMBER:	20130832
STUDY TITLE:	Deliberate Practice of High School Instrumentalists: A Theoretical Model
IRB ACTION DATE:	12/11/2013
STUDY APPROVAL EXPIRES:	12/10/2014
SOURCE(S) OF FUNDING/SUPPORT:	There are no items to display
FWA:	FWA00002247

On 12/11/2013, an IRB Chair approved the following items under the expedited review process. This study has been approved for the inclusion of minors pursuant to 45 CFR 46.404.

APPROVAL INCLUDES:

New Research Protocol
Research Materials (English Versions Only)

- Parental Informed Consent Form
- Child Assent Form
- Student Letter
- Teacher Contact Letter
- Teacher Directions
- Survey

NOTE: Translations of IRB approved study documents, including informed consent documents, into languages other than English must be submitted to HSRO for approval prior to use.

A request to continue this study must be submitted to the HSRO at least **45 days** before IRB approval expires. If this study does not receive continuing IRB approval prior to expiration, all research activities must cease, and it may be officially suspended or terminated.

Sincerely,

*[This is a representation of an electronic record
that was signed electronically and this page is
the manifestation of the electronic signature]*

Amanda Coltes-Rojas, MPH, CIP
Director
Regulatory Affairs & Educational Initiatives

/vc

cc: IRB File

Peter Hamlin
Edward Asmus



Miami-Dade County Public Schools

giving our students the world

Superintendent of Schools
Alberto M. Carvalho

Assessment, Research, and Data Analysis

Miami-Dade County School Board

Perla Tabares Hantman, Chair
Dr. Lawrence S. Feldman, Vice Chair
Dr. Dorothy Bendross-Mindingall
Susie V. Castillo
Carlos L. Curbelo
Dr. Wilbert "Tee" Holloway
Dr. Martin Karp
Dr. Marta Pérez
Raquel A. Regalado

December 18, 2013

Mr. Peter Hamlin
6248 S.W. 57th Drive
Miami, Florida 33143

Dear Mr. Hamlin:

I am pleased to inform you that the Research Review Committee (RRC) of the Miami-Dade County Public Schools (M-DCPS) has granted you approval for your request to conduct the study: "Deliberate Practice of High School Instrumentalists: A Theoretical Model" in order to fulfill the requirement of your dissertation at the University of Miami.

A copy of this approval letter must be presented/and or shared with the principal of each targeted high school.

1. **Participation of the schools targeted in this study is at the sole discretion of each principal.**

NOTE: Even with the approval of the RRC, it is still the responsibility of the Principal as the gatekeeper of the school to decide whether to participate or not. As stated in the Board rule, "... the principal of the individual school has the privilege of deciding if RRC-approved research will be conducted within his/her school."

A copy of this approval letter must be presented/and or shared with the principal of each targeted high school.

2. This research project is conducted to fulfill the requirements of a doctoral dissertation. The study will involve asking the **completely voluntary** participation and collaboration of selected music teachers at selected M-DCPS high schools. Specifically, the study targets woodwind and brass players at these schools.
3. The participation of all subjects is **voluntary**. The anonymity and/or confidentiality of all subjects must be assured.
4. Consent forms from the teachers must be obtained and secured prior before they can engage in the study.
5. Assent forms from students must be obtained and secured prior before they can engage in the study.
6. Disruption of the school's routine by the data collection activities of the study must be kept at a minimum. Data collection activities must not interfere with the district's testing schedule.

Assessment, Research, and Data Analysis • 1450 N.E. 2nd Ave. • Suite 222 • Miami, FL 33132
305-995-7512 • 305-995-2691 (FAX) • www.dadeschools.net

7. All research and data collection activities must be done with the knowledge and approval of the principal of each targeted school site.

It should be emphasized that the approval of the Research Review Committee does not constitute an endorsement of the study. It is simply a permission to request the voluntary cooperation in the study of individuals associated with M-DCPS.

It is your responsibility to ensure that appropriate procedures are followed in requesting an individual's cooperation, and that all aspects of the study are conducted in a professional manner. With regard to the latter, make certain that all documents and instruments distributed within M-DCPS as a part of the study are carefully edited.

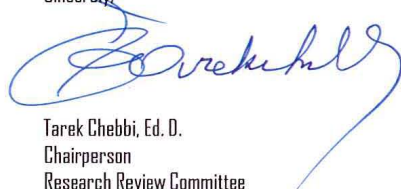
The approval number for your study is **1941**. This number should be used in all communications to clearly identify the study as approved by the Research Review Committee. The approval expires on **06/30/2014**. During the approval period, the study must adhere to the design, procedures and instruments which were submitted to the Research Review Committee.

Finally, as indicated in your application, please submit to the RRC an abstract of the research findings by **July, 2014**.

If there are any changes in the study as it relates to M-DCPS, the RRC must be notified in writing. Substantial changes may necessitate resubmission of the request. Failure to notify me of such a change may result in the cancellation of the approval.

If you have any questions, please call me at 305-995-7512. On behalf of the Research Review Committee, I want to wish you every success with your study.

Sincerely,



Tarek Chebbi, Ed. D.
Chairperson
Research Review Committee

TC:bf

APPROVAL NUMBER: **1941**

APPROVAL EXPIRES: **06/30/2014**

Note: The researcher named in this letter of approval will be solely responsible and strictly accountable for any deviation from or failure to follow the research study as approved by the RRC. M-DCPS will NOT be held responsible for any claim and/or damage resulting from conducting this study.

APPENDIX D

Correspondence and Assent/Consent Forms



August 19, 2013

Dear,

I am a PhD candidate at the University of Miami studying Music Education. I am currently conducting a research study on the practice habits of high school students.

I am writing you to enlist your help so I may conduct this study in your school. The data collected will be potentially useful in developing an understanding of effective practice strategies. The study has been approved by the Institutional Review Board at the University of Miami, and approved by the School District of Miami-Dade County for implementation in individual schools selected for the study.

The research project will consist of a paper survey, and the recording of a short musical excerpt. The entire demand on a student participant takes about 30 minutes on average to complete.

We are hoping to enlist all your high school woodwind and brass instrument players. I would like very much to have your school's participation. I am asking for your help. If you allow your students to participate in this study, as band director your participation would include:

- pass out a letter of invitation to each of your students which provides them information about the purpose of the study;
- distribute and collect a Letter of Consent from each student willing to participate;
- hand out the written survey to participating students, and collect the completed surveys;

Attached you will find a copy of the survey questions and letters of invitation and consent to be passed out to your students.

If you are willing to participate, please let me know by contacting me either by email or phone. I can at that discuss further details and arrangements for the study.

Participation in this survey is completely voluntary. It is up to each school and student to make the decision regarding their participation. In addition, no identifiable information such as school or student name will be collected. Responses will be submitted anonymously. Informed consent will be given before any student can participate.

I appreciate your considering participation in this study. At the completion of the project I will provide you with a summary of the findings. Please don't hesitate to ask any questions you may have regarding the study itself or your participation.

Thank you!

Peter J. Hamlin
PhD Student and Graduate Teaching Assistant
Department of Music Education and Music Therapy

Frost School of Music
University of Miami
Email: p.hamlin@umiami.edu
Phone: 407-301-5004



University of Miami

Deliberate Practice of High School Instrumentalists

A Research Study Invitation

All woodwind and brass students in high schools throughout the District are being invited to participate in a study that will examine your practice habits. The purpose of the study is to learn more about how you practice.

Your participation in this study is completely voluntary. All answers given and data collected will remain anonymous. Your participation will in no way affect your academic grades or standing within the school or the music program.

As a participant in the study you will complete a survey of questions about how you practice. The survey will take about 30 minutes on average to complete. The administration of the survey will take place at your school and at a time agreed to by your band director.

If you are willing to participate, your band director will give you a Consent form describing the study and asking both you and your parent or guardian to sign. Only after receiving consent will you become a participant in this study and times arranged for your survey.

Your participation is greatly appreciated! If you have any questions about this study or your participation, please contact me at p.hamlin@umiami.edu.

Thank you!

Peter Hamlin
PhD Student and Graduate Teaching Assistant
Department of Music Education and Music Therapy
Frost School of Music
University of Miami

Minor Assent Document

Project Title: Deliberate Practice of High School Instrumentalists:

A Theoretical Model

Investigator: Peter Hamlin

We are doing a research study about how musicians practice. A research study is a way to learn more about people. If you decide you want to be part of this study, you will be asked to take a survey. It will take 30 minutes on average to complete.

Not everyone who takes part in this study will benefit. A benefit means that something good happens to you. The study is expected to benefit the music education profession by gaining a better understanding and being able to more effectively guide the practicing habits and strategies used by high school students.

When we are finished with this study we will write a report about what was learned. This report will not include your name or that you were in the study.

You do not have to be in this study if you do not want to be. If you decide to stop after we begin, that's okay too. No one will be mad at you if you decide not to participate. You may ask questions about the study at any time.

Peter Hamlin (305-284-6252; p.hamlin@umiami.edu) will gladly answer any questions you may have concerning the purpose, procedures, and outcome of this project. If you have questions about your rights as a research subject you may contact Human Subjects Research Office at the University of Miami (305-243-3195).

If you decide you want to be in this study, please sign your name.

I agree _____ I do not agree _____ to participate in this study which I have read or which has been explained to me by _____

(Sign your name here)

(Date)

(Signature of Person Obtaining Assent)

(Date)



University of Miami
CONSENT TO PARTICIPATE IN A RESEARCH STUDY
Deliberate Practice of High School Instrumentalists

The following information describes the research study in which you are being asked to participate. Please read the information carefully. At the end, if you agree to participate, you will be asked to give your consent.

PURPOSE OF STUDY:

You are being asked to participate in a research study. The purpose of this study is to describe how you practice your musical instrument.

PROCEDURES:

After providing the appropriate consent you will be scheduled by your band director to complete a paper survey. Your scheduled time will be at your school. On average, the survey is expected to take about 30 minutes.

RISKS AND/OR DISCOMFORTS:

We do not anticipate you will experience any personal risk or discomfort from taking part in this study.

- Questionnaires/ Interviews: You may skip any question you do not wish to answer.

BENEFITS:

No benefit can be promised to you from your participation in this study. The study is expected to benefit the music education profession by gaining a better understanding and being able to more effectively guide the practicing habits, strategies, and self-regulation of high school students.

CONFIDENTIALITY:

No identifiable information will be collected through participation in this study. All responses will be submitted anonymously. By signing this consent, you authorize the Investigators to access your answers as may be necessary for purposes of this study.

RIGHT TO DECLINE OR WITHDRAW:

Your participation in this study is voluntary. You are free to refuse to participate in the study or withdraw your consent at any time during the study.

CONTACT INFORMATION:

Peter Hamlin (305-284-6252) will gladly answer any questions you may have concerning the purpose, procedures, and outcome of this project. If you have questions about your rights as a research subject you may contact Human Subjects Research Office at the University of Miami (305-243-3195).

(continue on opposite side for signatures)

University of Miami
CONSENT TO PARTICIPATE IN A RESEARCH STUDY
Deliberate Practice of High School Instrumentalists

PARTICIPANT AGREEMENT:

I have read the information in this consent form and agree to participate in this study. I

have had the chance to ask any questions I have about this study, and they have been

answered for me. I am entitled to a copy of this form after it has been read and signed.

Each form must be signed by both the student participant and a parent or legal guardian.

Signature of Parent (Guardian)

Date

Signature of Person Obtaining

Consent Date

Welcome and thank you for participating in this research study investigating how you practice your musical instrument.

Please listen to the following directions:

1. There does need to be complete silence in the room while those participating complete the survey. When you have finished your survey, please check to be sure you have answered all questions you intend to, and then bring the survey up to me. Please return to your desk and remain quiet until the other people in the room have completed their survey.
2. You are to answer each of the survey questions honestly and to the best of your ability. If you don't know for sure, estimate which answer most closely reflects your feeling or thought. In no way will any answer you give be held for or against you. In fact, all of your answers are entirely anonymous and confidential. Even the Survey Administrator does not know who has what assigned Research Participant Number.
3. Once you have decided upon your answer, please write your answer or fill in completely the appropriate bubble under your answer, as appropriate.
4. Does each person have a pen or a pencil?
5. After you write your answer or fill in a bubble, should you want to change your answer, please erase completely if you are using pencil and then give your correct answer. If you are using pen, please cross out with an X your incorrect answer and write or fill in the bubble of your corrected answer.
6. The survey is not timed, but please take your time to consider each question carefully and provide the truest answer to it you are able. The survey should not take more or much more than 30 minutes to complete.
7. Are there any questions on what I've said so far?

The first step is to write your assigned Research Participant Number on the front of the survey. Please do NOT write your name on the survey or make any other identifying marks on it.

There are 66 questions on this survey. Please read each question carefully and choose the most appropriate answer. Please then fill in the circle which corresponds to your most appropriate answer.

This is not a timed questionnaire. When you are finished, please follow the directions I've given you and bring your survey to the front of the room and then return and remain quiet until all others have finished.

Are there any questions?

You may begin.

APPENDIX E

Descriptive Statistics

Item	Mean	Std. Deviation	N
Often, I record my playing to identify good and bad aspects.	2.638	1.187	188
I feel I am aware of my own strengths and weaknesses as a musician.	4.037	0.791	191
I listen critically and evaluate my performance to make sure I understand the material and am performing it correctly.	3.653	1.037	190
I spend time in each practice session reviewing the music.	3.492	0.951	191
I usually practice in the same location.	3.576	0.925	191
I set up the practice room and my materials a certain way before I begin practice sessions	3.068	1.147	191
I am in control of my practice environment and make sure I am away from distractions.	3.508	1.080	191
My practice time is often spent playing simply for fun with no specific musical or technical goal in mind.	3.419	1.130	191
I keep a written record of my practice goals.	1.764	0.783	191
My teacher gives me practice assignments.	3.305	1.165	190
I usually have a plan of what I need to practice most before I begin my practice session.	3.463	1.101	190
I look over the music before practicing.	3.754	0.922	191
My teacher sets specific time requirements for the number of hours I must practice per week.	2.466	1.104	191

Item	Mean	Std. Deviation	N
Typical number of days per week on which you practice.	3.168	1.721	191
Length of your average practice session in minutes.	55.162	44.638	191
Typical number of your practice sessions per day.	1.487	1.222	191
Typical amount of your individual practice per day in minutes.	40.717	39.385	191
I find it hard to stick to a practice schedule.	2.806	1.100	191
I get bored if the music is too easy.	3.508	1.178	191
I prefer practicing music that is challenging so I can learn new things.	3.859	0.971	191
It is important for me to choose the music I learn.	3.126	0.937	191
I enjoy practicing interesting music even if it means giving extra effort.	4.073	0.915	191
Keeping practice time is the most important thing in my schedule.	2.534	1.009	191
I think the music I practice is useful for me to learn.	3.822	0.795	191
I will work hard at learning a piece of music even if I don't really like it.	3.607	1.050	191
I use two or more shorter practice sessions rather than one longer one.	2.984	1.036	190
I plan my practice time into my weekly schedule.	2.812	1.141	191
It is easy for me to remain focused on my music when practicing alone.	3.298	1.201	191
Even when the music is dull or uninteresting, I keep practicing until I get it.	3.424	0.975	191
I often feel so lazy or bored when I practice that I quit before I finish what I planned to do.	3.079	1.209	191

Item	Mean	Std. Deviation	N
I play a piece through from the beginning and, even if there are errors, move on.	2.984	1.131	191
I mark my music regularly as a part of practicing.	3.147	1.095	191
When I am practicing, I often stop playing and think about how the music should sound.	3.749	0.957	191
I sometimes forget what I had originally planned to work on when practicing.	3.194	1.051	191
When practicing, I try to relate the material to what I already know.	3.571	0.914	191
When practicing, I try to determine which concepts I don't understand well.	3.759	0.897	191
I practice the hardest passages first and then work on others.	3.414	1.062	191
I use a WholePartWhole practice strategy where I isolate a phrase or unit, break it down into smaller parts, and then recombine it.	3.393	1.160	191
An important reason I practice my music is so that I don't embarrass myself.	3.237	1.244	190
I'm confident I can do an excellent job in my practicing.	3.537	0.924	190
When I get a piece of music, I am confident that I will learn to play it.	3.927	0.897	191
Whether or not I succeed in music has little to do with my practicing.	2.728	1.085	191
When I am successful at learning or performing a piece of music, I feel it is because of my effort.	4.042	0.845	191
I have expectations of achievement and growth from my practice sessions.	3.806	0.945	191

Item	Mean	Std. Deviation	N
I feel most successful when I do something I could not do before.	4.435	0.722	191
I practice because I want my teacher to think that I am a good musician.	3.346	1.203	191
I believe I have musical ability.	4.084	0.857	190
I practice because I want to play better than other players.	3.418	1.198	189
I feel motivated to practice.	3.251	1.188	191
Your age.	15.895	1.841	191
How many years have you played your primary instrument?	4.711	2.301	187
How many years have you played in a school music ensemble?	4.804	2.283	189
How many years have you taken private lessons?	0.775	1.672	191
Did either parent or other family member ever play a musical instrument or sing?	0.393	0.490	191
My parents ensure that I do sufficient practice at home.	2.157	1.127	191
My parents are supportive if I am having problems.	3.513	1.146	191
When I have a problem or there is something I do not understand, I ask for help.	3.801	0.996	191
My parents observe me when I practice at home.	1.869	0.951	191
My parents play an instrument or sing in a musical group.	1.869	1.235	191
When practicing, I often try to perform for a classmate or friend.	2.232	1.038	190
I listen carefully to my teachers practice advice.	4.031	0.858	191

Item	Mean	Std. Deviation	N
Lessons with my current teacher include instruction on how to practice effectively.	3.663	0.994	187
My parents overall attitude toward music is positive.	4.031	0.978	191
My parents expect me to do my best in music.	3.634	1.011	191

APPENDIX F
Correlation Matrix

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10
Item 1	1.000	0.077	.312**	0.093	-0.060	.176*	.271**	-0.082	.293**	0.048
Item 2	0.077	1.000	0.125	0.109	-0.022	0.113	0.089	-0.053	0.082	-0.001
Item 3	.312**	0.125	1.000	.341**	0.021	.307**	.440**	-0.107	.224**	0.017
Item 4	0.093	0.109	.341**	1.000	0.053	.167*	0.124	0.012	0.135	.170*
Item 5	-0.060	-0.022	0.021	0.053	1.000	0.112	-0.052	0.136	-0.044	0.095
Item 6	.176*	0.113	.307**	.167*	0.112	1.000	.307**	-0.120	.217**	.148*
Item 7	.271**	0.089	.440**	0.124	-0.052	.307**	1.000	-0.027	.254**	-0.049
Item 8	-0.082	-0.053	-0.107	0.012	0.136	-0.120	-0.027	1.000	-0.112	-0.132
Item 9	.293**	0.082	.224**	0.135	-0.044	.217**	.254**	-0.112	1.000	0.113
Item 10	0.048	-0.001	0.017	.170*	0.095	.148*	-0.049	-0.132	0.113	1.000
Item 11	.207**	0.132	.419**	.345**	0.118	.466**	.353**	-.169*	.152*	.240**
Item 12	.224**	0.020	.313**	.229**	-0.055	.255**	.237**	-0.019	.226**	-0.013
Item 13	.192**	-0.098	.160*	0.101	-0.017	.208**	.184*	-0.045	.329**	.222**
Item 14	.147*	0.050	.173*	0.139	0.068	0.066	.260**	-0.050	.174*	0.077
Item 15	0.093	-0.042	.155*	0.094	-0.004	0.041	0.096	-0.040	.188**	-0.061
Item 16	.204**	-0.089	.289**	0.069	-0.003	0.108	.226**	0.034	0.011	-0.042
Item 17	.303**	0.077	.303**	0.074	0.047	0.080	.271**	-0.068	0.052	-0.046
Item 18	-	-	-	-	-	-	-	-	-	-
Item 19	.339**	0.004	.272**	-0.132	-0.068	.272**	.313**	.151*	.310**	-0.100
Item 20	-.157*	0.070	-0.063	0.025	0.054	-.146*	-0.055	.149*	-.149*	-0.046
Item 21	.268**	0.130	.423**	.275**	-0.061	0.084	.350**	-0.045	0.122	-0.138
Item 22	.145*	-0.042	0.072	0.084	0.062	0.134	0.129	.209**	0.033	0.016
Item 23	.256**	0.120	.522**	.394**	0.080	.221**	.436**	-0.031	0.142	-0.051
Item 24	.446**	-0.110	.350**	.174*	-0.021	.246**	.276**	-0.061	.347**	0.113
Item 25	.238**	0.128	.402**	.388**	0.040	.204**	.265**	-0.001	.228**	0.065

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10
Item 25	.209**	0.043	.373**	.427**	0.012	.306**	.344**	-0.113	.265**	.146*
Item 26	.275**	0.078	.340**	.213**	0.098	.241**	.295**	-0.037	0.100	-0.008
Item 27	.435**	0.130	.426**	.246**	-0.001	.332**	.373**	0.028	.369**	0.019
Item 28	.226**	.182*	.354**	0.110	0.025	.211**	.365**	-0.063	.221**	0.037
Item 29	.202**	0.103	.419**	.375**	0.125	.374**	.364**	-0.101	.256**	0.114
Item 30	-	-	-	-	-	-	-	-	-	-
Item 30	.287**	-0.080	.366**	.223**	-0.096	.258**	.356**	0.111	.237**	-0.100
Item 31	0.042	0.070	0.066	-0.022	0.016	-0.017	0.118	.256**	-0.008	0.038
Item 32	-0.030	-0.006	.151*	.229**	-0.099	.222**	0.141	.222**	0.139	0.136
Item 33	.155*	.186**	.385**	.385**	0.051	.289**	.313**	-0.015	0.019	-0.035
Item 34	-0.120	-0.131	-.153*	-0.078	0.115	.233**	.256**	.237**	-.165*	0.000
Item 35	.197**	0.000	.398**	.335**	-0.011	.259**	.286**	0.054	.167*	-0.015
Item 36	.312**	0.042	.466**	.337**	0.003	.302**	.409**	0.061	.159*	0.010
Item 37	.157*	0.076	.341**	.214**	0.019	0.007	.238**	-0.026	.143*	-0.040
Item 38	.188**	0.070	.289**	0.134	-0.011	.312**	.289**	.187**	0.131	0.101
Item 39	-0.134	0.061	0.034	0.124	0.076	0.012	0.031	0.043	-0.128	-0.136
Item 40	.241**	.339**	.377**	.193**	0.031	.150*	.349**	-0.097	.261**	0.053
Item 41	.210**	.286**	.392**	.289**	0.070	.189**	.310**	0.001	0.050	-0.005
Item 42	-0.042	-0.086	-0.019	-0.043	-0.068	-0.023	-0.079	0.040	-0.014	0.133
Item 43	.273**	0.100	.475**	.348**	0.063	.154*	.288**	-0.103	0.095	0.094
Item 44	.371**	0.059	.572**	.405**	0.092	.366**	.421**	-0.096	.244**	.155*
Item 45	.204**	0.138	.406**	.362**	0.096	.206**	.215**	0.057	0.098	0.029
Item 46	-0.124	-0.074	0.063	.223**	.161*	0.017	.152*	0.103	0.115	0.060
Item 47	0.137	.168*	.272**	0.105	-0.128	.177*	.268**	0.042	0.038	-0.116
Item 48	0.038	0.056	.240**	0.126	0.000	.160*	.206**	.172*	-0.018	-0.072
Item 49	.451**	0.097	.479**	.351**	0.026	.401**	.487**	-0.023	.330**	0.070
Item 50	-0.017	-.146*	.189**	-0.005	0.010	-0.035	-0.026	0.053	-0.028	0.097
Item 51	-0.070	.155*	-0.003	-0.016	-0.039	0.061	0.040	0.037	-0.105	-0.082

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10
Item 52	0.102	0.012	0.010	-0.028	0.051	0.045	0.023	-0.139	0.088	-0.118
Item 53	.240**	0.082	-0.140	-0.080	0.098	-0.093	-0.089	-0.032	-.152*	0.046
Item 54	-.157*	0.025	-.180*	-0.078	-0.031	-0.102	-0.112	-0.095	.213**	0.067
Item 55	-0.057	0.110	0.128	-0.026	0.030	0.077	0.081	-0.003	0.012	0.016
Item 56	0.010	-0.078	0.053	-0.033	0.021	0.008	0.099	-0.044	-0.018	-0.036
Item 57	.148*	0.064	.204**	.271**	0.064	.216**	.224**	-0.027	.376**	.172*
Item 58	0.124	-0.009	0.127	.260**	0.042	.181*	.222**	-0.057	.159*	.210**
Item 59	0.129	0.130	.272**	.437**	-0.029	.201**	.226**	-.159*	.277**	0.121
Item 60	.280**	0.027	0.134	.176*	-0.010	.172*	.219**	0.017	.262**	.194**
Item 61	0.083	0.037	0.085	0.055	-0.063	0.055	-0.005	-0.058	.218**	0.092
Item 62	.260**	0.105	.221**	0.136	0.059	.283**	.182*	0.029	.250**	.143*
Item 63	.223**	0.060	.408**	.246**	-0.043	.238**	.375**	-0.046	.199**	0.017
Item 64	.202**	0.064	.387**	.278**	-0.054	.241**	.351**	0.063	.192**	.235**
Item 65	-0.047	0.053	0.119	0.046	0.032	0.012	0.129	0.031	0.017	.143*
Item 66	-0.019	-0.056	0.114	0.134	-0.077	.158*	0.109	0.040	0.057	0.139

	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18	Item 19	Item 20
Item 1	.207**	.224**	.192**	.147*	0.093	.204**	.303**	.339**	-.157*	.268**
Item 2	0.132	0.020	-0.098	0.050	-0.042	-0.089	0.077	0.004	0.070	0.130
Item 3	.419**	.313**	.160*	.173*	.155*	.289**	.303**	.272**	-0.063	.423**
Item 4	.345**	.229**	0.101	0.139	0.094	0.069	0.074	-0.132	0.025	.275**
Item 5	0.118	-0.055	-0.017	0.068	-0.004	-0.003	0.047	-0.068	0.054	-0.061
Item 6	.466**	.255**	.208**	0.066	0.041	0.108	0.080	.272**	-.146*	0.084
Item 7	.353**	.237**	.184*	.260**	0.096	.226**	.271**	.313**	-0.055	.350**
Item 8	-.169*	-0.019	-0.045	-0.050	-0.040	0.034	-0.068	.151*	.149*	-0.045
Item 9	.152*	.226**	.329**	.174*	.188**	0.011	0.052	.310**	-.149*	0.122
Item 10	.240**	-0.013	.222**	0.077	-0.061	-0.042	-0.046	-0.100	-0.046	-0.138
Item 11	1.000	.280**	.190**	0.027	0.068	0.110	.158*	.240**	0.056	.297**
Item 12	.280**	1.000	0.139	0.033	0.090	.158*	0.108	-.178*	-0.064	.214**
Item 13	.190**	0.139	1.000	0.067	0.111	0.116	0.062	-.157*	-.175*	0.076
Item 14	0.027	0.033	0.067	1.000	.241**	.229**	.300**	.347**	0.041	.213**
Item 15	0.068	0.090	0.111	.241**	1.000	0.124	.378**	.219**	-0.042	.190**
Item 16	0.110	.158*	0.116	.229**	0.124	1.000	.242**	-.172*	-0.056	.218**
Item 17	.158*	0.108	0.062	.300**	.378**	.242**	1.000	.211**	.190**	.220**
Item 18	.240**	-.178*	-.157*	.347**	.219**	-.172*	.211**	1.000	.143*	-.177*
Item 19	0.056	-0.064	-.175*	0.041	-0.042	-0.056	.190**	.143*	1.000	0.072
Item 20	.297**	.214**	0.076	.213**	.190**	.218**	.220**	-.177*	0.072	1.000
Item 21	-0.008	0.060	0.014	0.062	-0.008	.158*	0.057	0.064	-0.039	.170*
Item 22	.333**	.277**	0.060	.340**	.236**	.246**	.228**	.280**	-0.005	.557**
Item 23	.196**	.283**	.196**	.203**	.229**	.253**	.299**	.339**	.225**	.303**
Item 24	.210**	.299**	0.053	.234**	0.046	.176*	.173*	.263**	-0.072	.356**
Item 25	.421**	.427**	.154*	.182*	0.115	.187**	0.106	.233**	-0.051	.307**
Item 26	.275**	.294**	0.117	.197**	0.068	.315**	.242**	-0.136	-0.041	.229**

	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18	Item 19	Item 20
Item 27	.304**	.321**	.212**	.274**	.221**	.195**	.328**	.349**	-.144*	.413**
Item 28	.255**	.157*	0.109	.172*	0.004	0.108	0.139	.392**	-0.119	.235**
Item 29	.420**	.322**	.192**	.284**	.225**	.184*	.252**	.303**	.225**	.292**
Item 30	-.286**	-0.126	-0.024	.368**	.231**	-.145*	.329**	.481**	.202**	.220**
Item 31	0.070	.165*	-0.128	0.004	-0.033	.154*	-0.035	0.006	-0.026	0.079
Item 32	0.136	.166*	.170*	0.099	0.024	-0.058	0.015	0.021	-0.046	0.015
Item 33	.280**	.288**	0.007	0.099	0.060	0.051	0.117	-0.066	-0.022	.335**
Item 34	-.285**	-0.126	0.019	-.162*	-0.071	0.041	.196**	.267**	0.122	-0.073
Item 35	.307**	.549**	0.079	0.079	.174*	.249**	.166*	-.157*	-0.104	.240**
Item 36	.381**	.501**	.151*	0.132	.197**	.165*	.143*	.216**	-0.113	.378**
Item 37	.153*	.217**	0.131	0.123	0.137	.189**	.207**	-0.083	-0.038	.333**
Item 38	.325**	.189**	0.107	0.070	0.093	0.117	.275**	.209**	-0.074	.199**
Item 39	0.036	0.091	-0.031	-0.134	-0.009	0.035	0.124	.179*	.244**	0.035
Item 40	.179*	0.099	0.139	.216**	0.085	0.019	.153*	.286**	-0.122	.226**
Item 41	.238**	.169*	0.061	.294**	-0.057	.172*	0.091	.263**	0.025	.369**
Item 42	0.011	-0.025	.190**	-0.040	-0.012	-0.134	-0.081	0.016	-0.039	-0.067
Item 43	.348**	.277**	0.109	.274**	0.116	.215**	.233**	.240**	-0.138	.360**
Item 44	.482**	.398**	.274**	.240**	.209**	.242**	.277**	.309**	-0.086	.440**
Item 45	.260**	.304**	0.121	0.140	.177*	0.081	0.125	.193**	0.042	.389**
Item 46	.165*	.153*	.223**	-0.031	0.018	0.078	0.096	0.043	0.054	0.078
Item 47	.200**	0.093	0.036	0.063	0.101	0.102	0.051	-0.106	.161*	.357**
Item 48	.201**	0.128	0.079	-0.040	-0.011	0.073	0.049	-0.004	.246**	.210**
Item 49	.318**	.278**	.159*	.350**	0.107	.263**	.313**	.502**	-.159*	.423**
Item 50	-0.075	-0.015	0.053	-0.022	-0.004	-0.118	0.019	0.015	0.060	-0.140
Item 51	0.019	-0.021	-0.025	0.017	-0.010	0.006	0.032	-0.081	0.063	0.039
Item 52	0.116	-0.021	-0.065	0.017	0.064	0.050	-0.002	-0.071	-0.051	-0.083

	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18	Item 19	Item 20
Item 53	-0.058	.246**	.199**	.154*	-0.055	-0.060	-0.027	0.053	.268**	-0.094
Item 54	-0.100	.192**	.229**	0.092	-0.057	-0.028	-0.033	0.069	.221**	-0.072
Item 55	-0.039	-0.057	-0.003	0.077	-0.019	0.121	-0.025	0.034	0.090	0.068
Item 56	0.046	0.052	-0.029	-0.060	-0.062	0.110	0.064	-0.056	-0.056	0.084
Item 57	.147*	.210**	.254**	0.127	0.025	0.082	0.057	-.159*	-0.136	.150*
Item 58	0.107	.170*	0.089	.156*	-0.008	0.072	0.006	-0.083	-0.089	.193**
Item 59	.229**	.210**	0.133	.161*	.211**	0.037	0.070	-.163*	0.001	.281**
Item 60	0.104	.281**	.164*	0.075	-0.087	0.010	0.016	-0.098	-0.114	0.117
Item 61	0.014	0.115	0.064	0.070	0.130	0.063	-0.040	-0.067	0.031	0.024
Item 62	0.112	.181*	.227**	0.078	-0.038	.160*	0.011	-.164*	-0.083	0.111
Item 63	.336**	.296**	.157*	.160*	0.081	.161*	.231**	.262**	-0.115	.321**
Item 64	.309**	.308**	.323**	0.134	0.045	.234**	.169*	.310**	-0.063	.281**
Item 65	0.003	0.055	-0.062	.156*	-0.078	0.009	.215**	-0.074	0.091	0.116
Item 66	0.131	0.129	0.121	0.038	-0.018	0.056	-0.106	-0.100	0.086	0.060

	Item 21	Item 22	Item 23	Item 24	Item 25	Item 26	Item 27	Item 28	Item 29	Item 30
Item 1	.145*	.256**	.446**	.238**	.209**	.275**	.435**	.226**	.202**	.287**
Item 2	-0.042	0.120	-0.110	0.128	0.043	0.078	0.130	.182*	0.103	-0.080
Item 3	0.072	.522**	.350**	.402**	.373**	.340**	.426**	.354**	.419**	.366**
Item 4	0.084	.394**	.174*	.388**	.427**	.213**	.246**	0.110	.375**	.223**
Item 5	0.062	0.080	-0.021	0.040	0.012	0.098	-0.001	0.025	0.125	-0.096
Item 6	0.134	.221**	.246**	.204**	.306**	.241**	.332**	.211**	.374**	.258**
Item 7	0.129	.436**	.276**	.265**	.344**	.295**	.373**	.365**	.364**	.356**
Item 8	.209**	-0.031	-0.061	-0.001	-0.113	-0.037	0.028	-0.063	-0.101	0.111
Item 9	0.033	0.142	.347**	.228**	.265**	0.100	.369**	.221**	.256**	.237**
Item 10	0.016	-0.051	0.113	0.065	.146*	-0.008	0.019	0.037	0.114	-0.100
Item 11	-0.008	.333**	.196**	.210**	.421**	.275**	.304**	.255**	.420**	.286**
Item 12	0.060	.277**	.283**	.299**	.427**	.294**	.321**	.157*	.322**	-0.126
Item 13	0.014	0.060	.196**	0.053	.154*	0.117	.212**	0.109	.192**	-0.024
Item 14	0.062	.340**	.203**	.234**	.182*	.197**	.274**	.172*	.284**	.368**
Item 15	-0.008	.236**	.229**	0.046	0.115	0.068	.221**	0.004	.225**	.231**
Item 16	.158*	.246**	.253**	.176*	.187**	.315**	.195**	0.108	.184*	-.145*
Item 17	0.057	.228**	.299**	.173*	0.106	.242**	.328**	0.139	.252**	.329**
Item 18	0.064	.280**	.339**	.263**	.233**	-0.136	.349**	.392**	.303**	.481**
Item 19	-0.039	-0.005	.225**	-0.072	-0.051	-0.041	-.144*	-0.119	.225**	.202**
Item 20	.170*	.557**	.303**	.356**	.307**	.229**	.413**	.235**	.292**	.220**
Item 21	1.000	.167*	.207**	0.066	-0.062	0.106	.190**	0.027	0.045	0.046
Item 22	.167*	1.000	.362**	.460**	.463**	.241**	.387**	.296**	.496**	.356**
Item 23	.207**	.362**	1.000	.388**	.318**	.286**	.531**	.228**	.325**	.336**
Item 24	0.066	.460**	.388**	1.000	.477**	.208**	.387**	.216**	.444**	.360**
Item 25	-0.062	.463**	.318**	.477**	1.000	.266**	.355**	.239**	.605**	.265**
Item 26	0.106	.241**	.286**	.208**	.266**	1.000	.234**	.225**	.299**	.191**
Item 27	.190**	.387**	.531**	.387**	.355**	.234**	1.000	.314**	.413**	.392**

	Item 21	Item 22	Item 23	Item 24	Item 25	Item 26	Item 27	Item 28	Item 29	Item 30
Item 28	0.027	.296**	.228**	.216**	.239**	.225**	.314**	1.000	.255**	.317**
Item 29	0.045	.496**	.325**	.444**	.605**	.299**	.413**	.255**	1.000	.521**
Item 30	0.046	.356**	.336**	.360**	.265**	.191**	.392**	.317**	.521**	1.000
Item 31	.147*	.172*	0.099	0.114	0.138	0.000	0.117	0.121	0.013	0.051
Item 32	-0.105	0.094	0.057	.193**	.233**	0.128	0.123	0.039	.178*	-0.130
Item 33	0.053	.352**	0.129	.287**	.273**	.305**	.270**	.194**	.273**	-.158*
Item 34	.169*	-0.138	-0.095	-0.048	-.179*	-0.008	-0.114	-.167*	.269**	.390**
Item 35	0.088	.434**	.341**	.336**	.432**	.433**	.366**	.170*	.347**	-.154*
Item 36	0.067	.503**	.311**	.390**	.486**	.359**	.418**	.233**	.424**	.304**
Item 37	-0.015	.283**	.259**	.287**	.330**	.236**	.247**	0.105	.343**	-0.077
Item 38	0.061	.265**	.243**	.145*	.404**	.278**	.299**	0.055	.313**	.203**
Item 39	-0.004	0.025	-0.129	0.091	0.103	-0.006	-0.060	-0.134	0.020	0.124
Item 40	0.038	.307**	.146*	.200**	.186*	0.092	.253**	.430**	.330**	.385**
Item 41	0.042	.494**	.200**	.365**	.265**	.231**	.285**	.313**	.355**	.359**
Item 42	0.111	-0.065	-0.006	-.160*	.224**	-0.075	-0.059	-0.111	-0.129	0.112
Item 43	0.040	.452**	.301**	.513**	.434**	.230**	.341**	.257**	.432**	.306**
Item 44	0.099	.540**	.390**	.507**	.437**	.342**	.449**	.371**	.552**	.428**
Item 45	-0.011	.430**	.236**	.411**	.331**	.235**	.292**	.208**	.373**	-.166*
Item 46	0.031	0.072	0.038	.235**	.316**	0.038	0.109	-0.013	.166*	-0.014
Item 47	0.112	.303**	0.060	.154*	.225**	.164*	.179*	.181*	.160*	-.157*
Item 48	.212**	.158*	0.091	.144*	.198**	0.071	.223**	.170*	0.093	0.007
Item 49	.165*	.564**	.542**	.460**	.472**	.256**	.610**	.416**	.498**	.525**
Item 50	0.075	-0.072	0.040	-0.054	0.049	-0.105	-0.107	.204**	-0.088	0.094
Item 51	0.044	0.092	-0.015	0.077	0.003	0.033	-0.024	0.067	0.028	-0.034
Item 52	-.149*	-0.043	-0.058	-0.141	-0.050	0.086	-0.051	0.088	0.043	-0.080
Item 53	-0.109	-0.088	.231**	-0.129	-0.115	-0.037	.240**	-0.001	-0.082	0.000
Item 54	-0.122	-0.128	.199**	-0.080	-0.042	0.000	.202**	-0.088	-0.079	0.054

	Item 21	Item 22	Item 23	Item 24	Item 25	Item 26	Item 27	Item 28	Item 29	Item 30
Item 55	0.099	0.138	-0.003	0.037	-0.015	0.053	-0.039	.217**	-0.012	-0.100
Item 56	0.007	0.029	0.042	0.072	0.086	0.012	0.039	-0.030	0.046	-0.045
Item 57	0.076	0.070	.222**	.178*	.199**	.170*	.248**	.296**	.250**	.234**
Item 58	0.052	.195**	.235**	.216**	.159*	0.034	.163*	.148*	.285**	-.180*
Item 59	0.044	.363**	.310**	.421**	.388**	.222**	.226**	.195**	.358**	.249**
Item 60	0.125	0.035	.293**	.178*	0.127	.153*	.302**	.187**	0.128	-.165*
Item 61	0.105	-0.085	.149*	0.030	0.009	0.015	0.132	0.087	0.055	-0.095
Item 62	.241**	.176*	.310**	.268**	.239**	0.077	.304**	0.114	.232**	-0.108
Item 63	0.002	.279**	.230**	.418**	.440**	.291**	.297**	.221**	.424**	.327**
Item 64	0.029	.360**	.248**	.388**	.384**	.363**	.288**	.272**	.325**	.250**
Item 65	-.165*	0.044	0.063	0.048	0.058	0.110	0.019	.158*	0.102	-0.082
Item 66	-0.034	0.035	0.054	0.004	0.017	0.116	-0.005	.186*	-0.018	-0.024

	Item 31	Item 32	Item 33	Item 34	Item 35	Item 36	Item 37	Item 38	Item 39	Item 40
Item 1	0.042	-0.030	.155*	-0.120	.197**	.312**	.157*	.188**	-0.134	.241**
Item 2	0.070	-0.006	.186**	-0.131	0.000	0.042	0.076	0.070	0.061	.339**
Item 3	0.066	.151*	.385**	-.153*	.398**	.466**	.341**	.289**	0.034	.377**
Item 4	-0.022	.229**	.385**	-0.078	.335**	.337**	.214**	0.134	0.124	.193**
Item 5	0.016	-0.099	0.051	0.115	-0.011	0.003	0.019	-0.011	0.076	0.031
Item 6	-0.017	.222**	.289**	.233**	.259**	.302**	0.007	.312**	0.012	.150*
Item 7	0.118	0.141	.313**	.256**	.286**	.409**	.238**	.289**	0.031	.349**
Item 8	.256**	.222**	-0.015	.237**	0.054	0.061	-0.026	.187**	0.043	-0.097
Item 9	-0.008	0.139	0.019	-.165*	.167*	.159*	.143*	0.131	-0.128	.261**
Item 10	0.038	0.136	-0.035	0.000	-0.015	0.010	-0.040	0.101	-0.136	0.053
Item 11	0.070	0.136	.280**	.285**	.307**	.381**	.153*	.325**	0.036	.179*
Item 12	.165*	.166*	.288**	-0.126	.549**	.501**	.217**	.189**	0.091	0.099
Item 13	-0.128	.170*	0.007	0.019	0.079	.151*	0.131	0.107	-0.031	0.139
Item 14	0.004	0.099	0.099	-.162*	0.079	0.132	0.123	0.070	-0.134	.216**
Item 15	-0.033	0.024	0.060	-0.071	.174*	.197**	0.137	0.093	-0.009	0.085
Item 16	.154*	-0.058	0.051	0.041	.249**	.165*	.189**	0.117	0.035	0.019
Item 17	-0.035	0.015	0.117	.196**	.166*	.143*	.207**	.275**	0.124	.153*
Item 18	0.006	0.021	-0.066	.267**	-.157*	.216**	-0.083	.209**	.179*	.286**
Item 19	-0.026	-0.046	-0.022	0.122	-0.104	-0.113	-0.038	-0.074	.244**	-0.122
Item 20	0.079	0.015	.335**	-0.073	.240**	.378**	.333**	.199**	0.035	.226**
Item 21	.147*	-0.105	0.053	.169*	0.088	0.067	-0.015	0.061	-0.004	0.038
Item 22	.172*	0.094	.352**	-0.138	.434**	.503**	.283**	.265**	0.025	.307**
Item 23	0.099	0.057	0.129	-0.095	.341**	.311**	.259**	.243**	-0.129	.146*
Item 24	0.114	.193**	.287**	-0.048	.336**	.390**	.287**	.145*	0.091	.200**
Item 25	0.138	.233**	.273**	-.179*	.432**	.486**	.330**	.404**	0.103	.186*
Item 26	0.000	0.128	.305**	-0.008	.433**	.359**	.236**	.278**	-0.006	0.092

	Item 31	Item 32	Item 33	Item 34	Item 35	Item 36	Item 37	Item 38	Item 39	Item 40
Item 27	0.117	0.123	.270**	-0.114	.366**	.418**	.247**	.299**	-0.060	.253**
Item 28	0.121	0.039	.194**	-.167*	.170*	.233**	0.105	0.055	-0.134	.430**
Item 29	0.013	.178*	.273**	-	.347**	.424**	.343**	.313**	0.020	.330**
Item 30	0.051	-0.130	-.158*	.390**	-.154*	.304**	-0.077	.203**	0.124	.385**
Item 31	1.000	-.180*	-0.055	0.082	.276**	0.123	0.008	0.003	-0.111	0.035
Item 32	-.180*	1.000	.302**	-0.112	0.126	.224**	0.115	.215**	.145*	0.068
Item 33	-0.055	.302**	1.000	-0.002	.327**	.395**	.186*	0.123	0.138	0.142
Item 34	0.082	-0.112	-0.002	1.000	-0.032	-0.100	0.030	-.179*	0.101	-.226**
Item 35	.276**	0.126	.327**	-0.032	1.000	.592**	.249**	.299**	0.051	0.086
Item 36	0.123	.224**	.395**	-0.100	.592**	1.000	.309**	.354**	0.031	.242**
Item 37	0.008	0.115	.186*	0.030	.249**	.309**	1.000	.290**	.157*	.170*
Item 38	0.003	.215**	0.123	-.179*	.299**	.354**	.290**	1.000	.169*	0.133
Item 39	-0.111	.145*	0.138	0.101	0.051	0.031	.157*	.169*	1.000	-.151*
Item 40	0.035	0.068	0.142	-.226**	0.086	.242**	.170*	0.133	-.151*	1.000
Item 41	0.069	0.022	.254**	-0.110	.218**	.305**	.281**	.195**	-0.003	.416**
Item 42	-0.027	0.007	-0.081	0.064	-0.023	-0.138	-0.066	0.006	-0.065	-0.003
Item 43	0.076	0.062	.345**	-0.032	.282**	.347**	.221**	.241**	0.016	.262**
Item 44	0.042	0.139	.382**	-.149*	.482**	.571**	.306**	.219**	-0.008	.305**
Item 45	-0.002	.165*	.426**	-0.013	.364**	.471**	.348**	.273**	0.132	0.071
Item 46	-0.019	0.137	0.053	0.066	.188**	0.136	.143*	0.091	.393**	0.026
Item 47	0.091	-0.024	.174*	0.018	.256**	.212**	0.113	0.047	-0.039	.268**
Item 48	0.075	0.061	.149*	0.087	0.132	.186*	.247**	0.139	.307**	.214**
Item 49	0.087	.190**	.301**	.222**	.371**	.521**	.251**	.345**	-0.113	.389**
Item 50	-0.078	-0.050	-0.056	0.064	-0.058	-0.093	-0.105	0.022	.203**	-.251**
Item 51	0.011	-0.099	0.030	-0.095	0.036	-0.034	-0.029	-0.099	-0.134	0.004
Item 52	-.158*	0.032	0.045	-0.124	-0.029	-0.026	-0.039	-0.025	-0.115	0.086

	Item 31	Item 32	Item 33	Item 34	Item 35	Item 36	Item 37	Item 38	Item 39	Item 40
Item 53	- .189**					- .192**				
Item 54		0.012	-0.037	-0.047	-.168*		0.066	-0.036	0.038	-0.029
Item 55		0.013	0.008	0.047	-0.120	-.165*	0.128	0.030	0.057	-0.118
Item 56	-0.018	0.018	0.063	-0.028	0.115	0.058	0.076	0.032	0.066	.157*
Item 57	0.027	-0.108	-0.013	-0.056	0.073	0.073	.192**	0.033	0.124	0.044
Item 58	0.052	0.067	.164*	-0.014	.178*	0.121	0.051	0.065	-0.040	.180*
Item 59	0.083	0.124	0.099	-0.061	0.086	.151*	.209**	0.089	-0.049	0.074
Item 60	0.036	.234**	.212**	0.003	.276**	.329**	.292**	.186**	-0.055	.246**
Item 61	0.031	0.104	0.120	-0.004	.195**	.191**	0.127	0.095	-0.032	.150*
Item 62	-0.014	0.080	-0.019	0.009	-0.008	0.000	0.005	0.007	-.177*	0.023
Item 63	0.108	0.050	0.064	0.050	0.139	0.140	.148*	0.096	-.165*	.149*
Item 64	0.005	0.074	.183*	-0.116	.339**	.352**	.194**	.231**	-0.056	.256**
Item 65	.167*	.144*	.196**	0.020	.416**	.384**	.212**	.255**	0.040	.231**
Item 66	0.133	-0.024	0.053	-0.076	0.080	0.141	0.134	0.040	-0.054	0.098
Item 66	0.116	0.073	0.046	-0.003	0.136	0.082	-0.049	0.061	-0.015	0.068

	Item 41	Item 42	Item 43	Item 44	Item 45	Item 46	Item 47	Item 48	Item 49	Item 50
Item 1	.210**	-0.042	.273**	.371**	.204**	-0.124	0.137	0.038	.451**	-0.017
Item 2	.286**	-0.086	0.100	0.059	0.138	-0.074	.168*	0.056	0.097	-.146*
Item 3	.392**	-0.019	.475**	.572**	.406**	0.063	.272**	.240**	.479**	.189**
Item 4	.289**	-0.043	.348**	.405**	.362**	.223**	0.105	0.126	.351**	-0.005
Item 5	0.070	-0.068	0.063	0.092	0.096	.161*	-0.128	0.000	0.026	0.010
Item 6	.189**	-0.023	.154*	.366**	.206**	0.017	.177*	.160*	.401**	-0.035
Item 7	.310**	-0.079	.288**	.421**	.215**	.152*	.268**	.206**	.487**	-0.026
Item 8	0.001	0.040	-0.103	-0.096	0.057	0.103	0.042	.172*	-0.023	0.053
Item 9	0.050	-0.014	0.095	.244**	0.098	0.115	0.038	-0.018	.330**	-0.028
Item 10	-0.005	0.133	0.094	.155*	0.029	0.060	-0.116	-0.072	0.070	0.097
Item 11	.238**	0.011	.348**	.482**	.260**	.165*	.200**	.201**	.318**	-0.075
Item 12	.169*	-0.025	.277**	.398**	.304**	.153*	0.093	0.128	.278**	-0.015
Item 13	0.061	.190**	0.109	.274**	0.121	.223**	0.036	0.079	.159*	0.053
Item 14	.294**	-0.040	.274**	.240**	0.140	-0.031	0.063	-0.040	.350**	-0.022
Item 15	-0.057	-0.012	0.116	.209**	.177*	0.018	0.101	-0.011	0.107	-0.004
Item 16	.172*	-0.134	.215**	.242**	0.081	0.078	0.102	0.073	.263**	-0.118
Item 17	0.091	-0.081	.233**	.277**	0.125	0.096	0.051	0.049	.313**	0.019
Item 18	-.263**	0.016	.240**	.309**	.193**	0.043	-0.106	-0.004	.502**	0.015
Item 19	0.025	-0.039	-0.138	-0.086	0.042	0.054	.161*	.246**	-.159*	0.060
Item 20	.369**	-0.067	.360**	.440**	.389**	0.078	.357**	.210**	.423**	-0.140
Item 21	0.042	0.111	0.040	0.099	-0.011	0.031	0.112	.212**	.165*	0.075
Item 22	.494**	-0.065	.452**	.540**	.430**	0.072	.303**	.158*	.564**	-0.072
Item 23	.200**	-0.006	.301**	.390**	.236**	0.038	0.060	0.091	.542**	0.040
Item 24	.365**	-.160*	.513**	.507**	.411**	.235**	.154*	.144*	.460**	-0.054
Item 25	.265**	.224**	.434**	.437**	.331**	.316**	.225**	.198**	.472**	0.049
Item 26	.231**	-0.075	.230**	.342**	.235**	0.038	.164*	0.071	.256**	-0.105

	Item 41	Item 42	Item 43	Item 44	Item 45	Item 46	Item 47	Item 48	Item 49	Item 50
Item 27	.285**	-0.059	.341**	.449**	.292**	0.109	.179*	.223**	.610**	-0.107
Item 28	.313**	-0.111	.257**	.371**	.208**	-0.013	.181*	.170*	.416**	.204**
Item 29	.355**	-0.129	.432**	.552**	.373**	.166*	.160*	0.093	.498**	-0.088
Item 30	-	0.112	.306**	.428**	-.166*	-0.014	-.157*	0.007	.525**	0.094
Item 31	0.069	-0.027	0.076	0.042	-0.002	-0.019	0.091	0.075	0.087	-0.078
Item 32	0.022	0.007	0.062	0.139	.165*	0.137	-0.024	0.061	.190**	-0.050
Item 33	.254**	-0.081	.345**	.382**	.426**	0.053	.174*	.149*	.301**	-0.056
Item 34	-0.110	0.064	-0.032	-.149*	-0.013	0.066	0.018	0.087	.222**	0.064
Item 35	.218**	-0.023	.282**	.482**	.364**	.188**	.256**	0.132	.371**	-0.058
Item 36	.305**	-0.138	.347**	.571**	.471**	0.136	.212**	.186*	.521**	-0.093
Item 37	.281**	-0.066	.221**	.306**	.348**	.143*	0.113	.247**	.251**	-0.105
Item 38	.195**	0.006	.241**	.219**	.273**	0.091	0.047	0.139	.345**	0.022
Item 39	-0.003	-0.065	0.016	-0.008	0.132	.393**	-0.039	.307**	-0.113	.203**
Item 40	.416**	-0.003	.262**	.305**	0.071	0.026	.268**	.214**	.389**	.251**
Item 41	1.000	-0.037	.337**	.405**	.245**	0.121	.379**	.211**	.437**	-.147*
Item 42	-0.037	1.000	-.154*	-0.134	-.164*	-0.016	-0.072	-0.031	-0.073	0.015
Item 43	.337**	-.154*	1.000	.517**	.505**	0.069	.157*	0.110	.420**	0.015
Item 44	.405**	-0.134	.517**	1.000	.479**	.175*	.242**	.198**	.559**	-0.102
Item 45	.245**	-.164*	.505**	.479**	1.000	0.129	.163*	.173*	.333**	-0.069
Item 46	0.121	-0.016	0.069	.175*	0.129	1.000	0.038	.424**	0.090	0.114
Item 47	.379**	-0.072	.157*	.242**	.163*	0.038	1.000	.265**	.230**	-.163*
Item 48	.211**	-0.031	0.110	.198**	.173*	.424**	.265**	1.000	.197**	-0.061
Item 49	.437**	-0.073	.420**	.559**	.333**	0.090	.230**	.197**	1.000	-.149*
Item 50	-.147*	0.015	0.015	-0.102	-0.069	0.114	-.163*	-0.061	-.149*	1.000
Item 51	.311**	-0.017	-0.031	0.025	-0.077	-0.081	.163*	-0.092	-0.017	-0.011
Item 52	0.049	0.000	-0.064	0.037	-0.037	.198**	0.041	-0.042	0.040	.391**

	Item 41	Item 42	Item 43	Item 44	Item 45	Item 46	Item 47	Item 48	Item 49	Item 50
Item 53	.168*	-0.017	.212**	-0.126	-0.055	-0.086	0.080	-0.064	.197**	-0.008
Item 54	0.119	-0.032	-.150*	-.147*	-0.052	-0.118	0.139	-0.022	-.177*	0.020
Item 55	.171*	-0.040	-0.023	0.046	-0.023	-0.050	.161*	0.086	0.050	-0.011
Item 56	-0.006	0.014	0.049	0.017	0.051	.144*	0.034	0.114	0.056	-0.083
Item 57	0.069	0.070	.159*	.271**	.142*	0.107	0.118	0.074	.254**	0.042
Item 58	.165*	0.041	.200**	.243**	.263**	0.027	-0.012	0.050	.295**	-0.056
Item 59	.337**	-0.036	.279**	.361**	.297**	.145*	.144*	0.098	.394**	-0.104
Item 60	0.081	0.123	0.072	.223**	0.129	0.049	0.033	.163*	.295**	-0.013
Item 61	-0.013	-0.050	-0.015	0.082	0.052	-0.044	0.020	0.018	0.012	-0.045
Item 62	0.126	-0.003	0.097	.207**	0.097	.169*	.144*	.151*	.296**	-0.091
Item 63	.277**	.228**	.448**	.494**	.318**	.285**	.255**	.184*	.416**	-.142*
Item 64	.271**	-0.039	.384**	.473**	.308**	.170*	.198**	0.143	.413**	-0.023
Item 65	.189**	0.023	0.081	0.029	.174*	-0.121	.192**	0.087	0.061	-0.069
Item 66	0.057	0.115	0.024	0.074	0.133	-0.004	.182*	0.100	0.046	0.010

	Item 51	Item 52	Item 53	Item 54	Item 55	Item 56	Item 57	Item 58	Item 59	Item 60
Item 1	-0.070	0.102	.240**	-.157*	-0.057	0.010	.148*	0.124	0.129	.280**
Item 2	.155*	0.012	0.082	0.025	0.110	-0.078	0.064	-0.009	0.130	0.027
Item 3	-0.003	0.010	-0.140	-.180*	0.128	0.053	.204**	0.127	.272**	0.134
Item 4	-0.016	-0.028	-0.080	-0.078	-0.026	-0.033	.271**	.260**	.437**	.176*
Item 5	-0.039	0.051	0.098	-0.031	0.030	0.021	0.064	0.042	-0.029	-0.010
Item 6	0.061	0.045	-0.093	-0.102	0.077	0.008	.216**	.181*	.201**	.172*
Item 7	0.040	0.023	-0.089	-0.112	0.081	0.099	.224**	.222**	.226**	.219**
Item 8	0.037	-0.139	-0.032	-0.095	-0.003	-0.044	-0.027	-0.057	-.159*	0.017
Item 9	-0.105	0.088	-.152*	.213**	0.012	-0.018	.376**	.159*	.277**	.262**
Item 10	-0.082	-0.118	0.046	0.067	0.016	-0.036	.172*	.210**	0.121	.194**
Item 11	0.019	0.116	-0.058	-0.100	-0.039	0.046	.147*	0.107	.229**	0.104
Item 12	-0.021	-0.021	.246**	.192**	-0.057	0.052	.210**	.170*	.210**	.281**
Item 13	-0.025	-0.065	.199**	.229**	-0.003	-0.029	.254**	0.089	0.133	.164*
Item 14	0.017	0.017	.154*	0.092	0.077	-0.060	0.127	.156*	.161*	0.075
Item 15	-0.010	0.064	-0.055	-0.057	-0.019	-0.062	0.025	-0.008	.211**	-0.087
Item 16	0.006	0.050	-0.060	-0.028	0.121	0.110	0.082	0.072	0.037	0.010
Item 17	0.032	-0.002	-0.027	-0.033	-0.025	0.064	0.057	0.006	0.070	0.016
Item 18	-0.081	-0.071	0.053	0.069	0.034	-0.056	-.159*	-0.083	-.163*	-0.098
Item 19	0.063	-0.051	.268**	.221**	0.090	-0.056	-0.136	-0.089	0.001	-0.114
Item 20	0.039	-0.083	-0.094	-0.072	0.068	0.084	.150*	.193**	.281**	0.117
Item 21	0.044	-.149*	-0.109	-0.122	0.099	0.007	0.076	0.052	0.044	0.125
Item 22	0.092	-0.043	-0.088	-0.128	0.138	0.029	0.070	.195**	.363**	0.035
Item 23	-0.015	-0.058	.231**	.199**	-0.003	0.042	.222**	.235**	.310**	.293**
Item 24	0.077	-0.141	-0.129	-0.080	0.037	0.072	.178*	.216**	.421**	.178*
Item 25	0.003	-0.050	-0.115	-0.042	-0.015	0.086	.199**	.159*	.388**	0.127
Item 26	0.033	0.086	-0.037	0.000	0.053	0.012	.170*	0.034	.222**	.153*

	Item 51	Item 52	Item 53	Item 54	Item 55	Item 56	Item 57	Item 58	Item 59	Item 60
Item 27	-0.024	-0.051	.240**	.202**	-0.039	0.039	.248**	.163*	.226**	.302**
Item 28	0.067	0.088	-0.001	-0.088	.217**	-0.030	.296**	.148*	.195**	.187**
Item 29	0.028	0.043	-0.082	-0.079	-0.012	0.046	.250**	.285**	.358**	0.128
Item 30	-0.034	-0.080	0.000	0.054	-0.100	-0.045	.234**	-.180*	.249**	-.165*
Item 31	0.011	-.158*	.189**	.198**	-0.018	0.027	0.052	0.083	0.036	0.031
Item 32	-0.099	0.032	0.012	0.013	0.018	-0.108	0.067	0.124	.234**	0.104
Item 33	0.030	0.045	-0.037	0.008	0.063	-0.013	.164*	0.099	.212**	0.120
Item 34	-0.095	-0.124	-0.047	0.047	-0.028	-0.056	-0.014	-0.061	0.003	-0.004
Item 35	0.036	-0.029	-.168*	-0.120	0.115	0.073	.178*	0.086	.276**	.195**
Item 36	-0.034	-0.026	.192**	-.165*	0.058	0.073	0.121	.151*	.329**	.191**
Item 37	-0.029	-0.039	0.066	0.128	0.076	.192**	0.051	.209**	.292**	0.127
Item 38	-0.099	-0.025	-0.036	0.030	0.032	0.033	0.065	0.089	.186**	0.095
Item 39	-0.134	-0.115	0.038	0.057	0.066	0.124	-0.040	-0.049	-0.055	-0.032
Item 40	0.004	0.086	-0.029	-0.118	.157*	0.044	.180*	0.074	.246**	.150*
Item 41	.311**	0.049	.168*	0.119	.171*	-0.006	0.069	.165*	.337**	0.081
Item 42	-0.017	0.000	-0.017	-0.032	-0.040	0.014	0.070	0.041	-0.036	0.123
Item 43	-0.031	-0.064	.212**	-.150*	-0.023	0.049	.159*	.200**	.279**	0.072
Item 44	0.025	0.037	-0.126	-.147*	0.046	0.017	.271**	.243**	.361**	.223**
Item 45	-0.077	-0.037	-0.055	-0.052	-0.023	0.051	.142*	.263**	.297**	0.129
Item 46	-0.081	.198**	-0.086	-0.118	-0.050	.144*	0.107	0.027	.145*	0.049
Item 47	.163*	0.041	0.080	0.139	.161*	0.034	0.118	-0.012	.144*	0.033
Item 48	-0.092	-0.042	-0.064	-0.022	0.086	0.114	0.074	0.050	0.098	.163*
Item 49	-0.017	0.040	.197**	-.177*	0.050	0.056	.254**	.295**	.394**	.295**
Item 50	-0.011	.391**	-0.008	0.020	-0.011	-0.083	0.042	-0.056	-0.104	-0.013
Item 51	1.000	-0.040	.288**	.313**	0.056	-0.059	.228**	-.144*	0.060	.276**
Item 52	-0.040	1.000	.156*	0.118	0.096	0.057	-0.018	-0.071	0.062	0.044

	Item 51	Item 52	Item 53	Item 54	Item 55	Item 56	Item 57	Item 58	Item 59	Item 60
Item 53	.288**	.156*	1.000	.830**	.383**	-0.030	-0.097	0.042	-0.014	-.170*
Item 54	.313**	0.118	.830**	1.000	.211**	-0.021	-.157*	-0.019	0.000	.195**
Item 55	0.056	0.096	.383**	.211**	1.000	-0.001	0.086	0.096	-0.037	0.077
Item 56	-0.059	0.057	-0.030	-0.021	-0.001	1.000	-0.112	-0.051	-0.055	-0.047
Item 57	-	.228**	-0.018	-0.097	-.157*	0.086	-0.112	1.000	.475**	.253**
Item 58	.228**	-0.018	-0.097	-.157*	0.086	-0.112	1.000	.475**	.253**	.599**
Item 59	-.144*	-0.071	0.042	-0.019	0.096	-0.051	.475**	1.000	.297**	.506**
Item 60	0.060	0.062	-0.014	0.000	-0.037	-0.055	.253**	.297**	1.000	.217**
Item 61	-	.276**	0.044	-.170*	.195**	0.077	-0.047	.599**	.506**	.217**
Item 62	.276**	0.044	-.170*	.195**	0.077	-0.047	.599**	.506**	.217**	1.000
Item 63	-0.022	0.038	0.033	0.039	0.001	.367**	.321**	.189**	0.133	.241**
Item 64	0.020	-0.084	.199**	-.182*	-0.077	0.103	.177*	.144*	.234**	.239**
Item 65	0.032	0.031	-0.083	-0.068	-0.032	0.108	0.126	0.091	.322**	0.089
Item 66	0.082	-0.112	-.165*	-.166*	0.125	0.069	.190**	0.094	.280**	0.135
Item 67	-0.080	0.010	.173*	.169*	.172*	-0.048	.253**	.455**	0.055	.231**
Item 68	-0.139	-0.004	.144*	0.115	0.100	-.176*	.365**	.363**	0.100	.306**

	Item 61	Item 62	Item 63	Item 64	Item 65	Item 66
Item 1	0.083	.260**	.223**	.202**	-0.047	-0.019
Item 2	0.037	0.105	0.060	0.064	0.053	-0.056
Item 3	0.085	.221**	.408**	.387**	0.119	0.114
Item 4	0.055	0.136	.246**	.278**	0.046	0.134
Item 5	-0.063	0.059	-0.043	-0.054	0.032	-0.077
Item 6	0.055	.283**	.238**	.241**	0.012	.158*
Item 7	-0.005	.182*	.375**	.351**	0.129	0.109
Item 8	-0.058	0.029	-0.046	0.063	0.031	0.040
Item 9	.218**	.250**	.199**	.192**	0.017	0.057
Item 10	0.092	.143*	0.017	.235**	.143*	0.139
Item 11	0.014	0.112	.336**	.309**	0.003	0.131
Item 12	0.115	.181*	.296**	.308**	0.055	0.129
Item 13	0.064	.227**	.157*	.323**	-0.062	0.121
Item 14	0.070	0.078	.160*	0.134	.156*	0.038
Item 15	0.130	-0.038	0.081	0.045	-0.078	-0.018
Item 16	0.063	.160*	.161*	.234**	0.009	0.056
Item 17	-0.040	0.011	.231**	.169*	.215**	-0.106
Item 18	-0.067	-.164*	.262**	.310**	-0.074	-0.100
Item 19	0.031	-0.083	-0.115	-0.063	0.091	0.086
Item 20	0.024	0.111	.321**	.281**	0.116	0.060
Item 21	0.105	.241**	0.002	0.029	-.165*	-0.034
Item 22	-0.085	.176*	.279**	.360**	0.044	0.035
Item 23	.149*	.310**	.230**	.248**	0.063	0.054
Item 24	0.030	.268**	.418**	.388**	0.048	0.004
Item 25	0.009	.239**	.440**	.384**	0.058	0.017
Item 26	0.015	0.077	.291**	.363**	0.110	0.116

	Item 61	Item 62	Item 63	Item 64	Item 65	Item 66
Item 27	0.132	.304**	.297**	.288**	0.019	-0.005
Item 28	0.087	0.114	.221**	.272**	.158*	.186*
Item 29	0.055	.232**	.424**	.325**	0.102	-0.018
Item 30	-0.095	-0.108	.327**	.250**	-0.082	-0.024
Item 31	-0.014	0.108	0.005	.167*	0.133	0.116
Item 32	0.080	0.050	0.074	.144*	-0.024	0.073
Item 33	-0.019	0.064	.183*	.196**	0.053	0.046
Item 34	0.009	0.050	-0.116	0.020	-0.076	-0.003
Item 35	-0.008	0.139	.339**	.416**	0.080	0.136
Item 36	0.000	0.140	.352**	.384**	0.141	0.082
Item 37	0.005	.148*	.194**	.212**	0.134	-0.049
Item 38	0.007	0.096	.231**	.255**	0.040	0.061
Item 39	-.177*	-.165*	-0.056	0.040	-0.054	-0.015
Item 40	0.023	.149*	.256**	.231**	0.098	0.068
Item 41	-0.013	0.126	.277**	.271**	.189**	0.057
Item 42	-0.050	-0.003	.228**	-0.039	0.023	0.115
Item 43	-0.015	0.097	.448**	.384**	0.081	0.024
Item 44	0.082	.207**	.494**	.473**	0.029	0.074
Item 45	0.052	0.097	.318**	.308**	.174*	0.133
Item 46	-0.044	.169*	.285**	.170*	-0.121	-0.004
Item 47	0.020	.144*	.255**	.198**	.192**	.182*
Item 48	0.018	.151*	.184*	0.143	0.087	0.100
Item 49	0.012	.296**	.416**	.413**	0.061	0.046
Item 50	-0.045	-0.091	-.142*	-0.023	-0.069	0.010
Item 51	-0.022	0.020	0.032	0.082	-0.080	-0.139
Item 52	0.038	-0.084	0.031	-0.112	0.010	-0.004

	Item 61	Item 62	Item 63	Item 64	Item 65	Item 66
Item 53	0.033	.199**	-0.083	-.165*	.173*	.144*
Item 54	0.039	-.182*	-0.068	-.166*	.169*	0.115
Item 55	0.001	-0.077	-0.032	0.125	.172*	0.100
Item 56	-	0.103	0.108	0.069	-0.048	-.176*
Item 57	.367**	.177*	0.126	.190**	.253**	.365**
Item 58	.189**	.144*	0.091	0.094	.455**	.363**
Item 59	0.133	.234**	.322**	.280**	0.055	0.100
Item 60	.241**	.239**	0.089	0.135	.231**	.306**
Item 61	1.000	.209**	0.034	-0.013	0.112	.202**
Item 62	.209**	1.000	0.140	.153*	-0.111	-0.054
Item 63	0.034	0.140	1.000	.473**	-0.033	-0.102
Item 64	-0.013	.153*	.473**	1.000	0.024	0.038
Item 65	0.112	-0.111	-0.033	0.024	1.000	.453**
Item 66	.202**	-0.054	-0.102	0.038	.453**	1.000

APPENDIX G

Raw Data

Participant	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10
1	1	14	6	2	140	1	20	4	4	1
2	0	15	4	1	20	1	30	3	4	1
3	0	15	3	2	90	1	60	4	4	0
4	0	17	11	2	30	1	30	4	4	0
5	1	15	5	2	30	1	30	2	2	0
6	0	15	5	3	120	2	60	4	4	0
7	0	18	9	6	38	2	60	10	5	4
8	1	15	3	1	90	1	120	3	3	0
9	0	15	3	3	13	1	8	2	2	0
10	0	14	14	3	180	1	60	4	4	0
11	0	17	3	3	38	1	20	2	2	0
12	0	15	9	3	13	2	5	2	2	2
13	0	15	11	2	30	1	30	2	2	0
14	1	14	5	4	35	3	90	4	4	0
15	0	15	11	0	6	0	0	3	1	0
16	0	15	4	3	120	1	0	3	3	1
17	1	16	6	3	100	1	20	2	2	1
18	0	15	11	3	90	1	20	4	4	0
19	1	15	16	2	30	1	30	7	7	0
20	1	15	5	3	30	1	30	1	1	0
21	0	16	11	3	90	1	20	2	3	0
22	0	14	9	5	60	3	5	7	4	3
23	0	14	12	2	45	2	90	4	4	0
24	0	15	5	1	15	1	15	3	2	1
25	0	18	13	7	300	5	60	8	8	4
26	0	18	12	7	100	1	100	7	7	1
27	0	17	13	3	90	3	150	7	7	0
28	1	16	3	3	120	1	20	5	5	0
29	0	15	12	2	38	2	38	5	5	1
30	0	15	9	5	90	1	75	3	5	0
31	0	14	12	5	120	2	30	4	4	1
32	0	16	3	4	120	1	30	2	5	0
33	0	18	7	7	45	5	225	6	6	2
34	0	16	8	7	60	2	60	5	5	0
35	0	18	6	2	30	1	30	6	6	0
36	0	14	13	3	18	2	30	4	4	1
37	0	16	14	3	53	6	20	2	4	0
38	1	16	4	6	150	1	200	5	5	0
39	1	17	7	3	120	1	120	4	2	0

Participant	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10
40	0	18	6	2	30	2	120	4	6	0
41	1	14	9	4	15	3	18	4	4	2
42	0	17	3	3	120	1	0	7	7	0
43	0	15	14	3	120	1	0	3	4	0
44	0	15	5	7	40	3	90	5	5	0
45	0	14	13	2	60	1	60	4	4	2
46	0	4	13	5	120	2	70	4	4	1
47	0	15	12	4	60	2	60	5	5	1
48	0	17	11	5	30	3	115	7	10	1
49	0	15	12	4	30	1	30	5	5	1
50	1	16	12	2	60	1	120	4	4	1
51	1	15	11	2	30	1	30	3	4	0
52	0	17	16	3	53	1	50	10	10	9
53	0	14	13	2	20	1	0	4	4	0
54	0	18	11	1	30	1	30	7	7	1
55	0	15	11	2	25	11	40	4	4	0
56	0	14	12	3	30	1	30	4	4	0
57	1	15	5	3	120	1	120	4	4	0
58	0	18	6	1	25	3	25	3	10	1
59	0	18	3	3	60	2	60	7	7	0
60	1	18	13	3	120	1	0	6	6	0
61	0	15	6	1	30	1	30	4	4	0
62	0	16	13	2	60	2	60	5	7	0
63	1	15	10	5	110	2	60	8	4	7
64	0	17	14	5	90	1	60	2	4	0
65	0	14	14	2	40	1	30	4	4	1
66	0	16	13	1	120	1	0	3	3	1
67	0	17	6	7	60	2	60	3	4	1
68	0	17	14	1	60	1	30	7	7	0
69	0	18	13	1	35	3	30	7	7	1
70	0	15	12	1	30	1	30	5	5	0
71	0	17	12	2	120	1	30	6	6	0
72	0	15	7	7	60	1	120	2	3	0
73	0	15	4	3	60	1	60	5	5	0
74	0	14	9	5	30	2	60	4	4	0
75	0	18	12	1	45	2	45	7	7	0
76	0	16	11	3	60	1	60	6	6	0
77	0	15	12	3	45	2	45	3	3	0
78	1	15	11	4	150	3	45	4	9	0
79	1	14	5	4	180	2	120	4	4	0
80	0	17	2	3	120	1	30	6	6	0
81	0	16	13	5	45	3	30	3	3	1
82	0	14	13	4	45	1	45	4	4	1

Participant	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10
83	0	17	14	2	120	2	30	3	3	1
84	0	18	11	1	60	1	60	5	5	0
85	0	18	3	2	30	2	60	4	4	0
86	0	18	9	3	30	1	30	5	5	0
87	1	18	11	3	120	1	120	7	7	0
88	0	15	3	3	3	5	3	4	4	0
89	0	15	13	3	90	1	90	4	4	2
90	0	14	3	2	60	1	60	3	3	0
91	0	15	5	2	30	1	30	4	4	0
92	1	17	5	2	60	1	60	5	5	0
93	0	17	11	2	120	1	30	6	6	0
94	0	15	9	3	30	1	30	5	5	0
95	0	17	13	2	20	3	20	5	5	0
96	1	18	8	4	45	3	20	3	8	0
97	1	18	4	2	38	2	30	4	5	0
98	0	15	6	7	90	2	30	3	3	1
99	0	16	11	4	60	1	120	5	5	0
100	1	15	5	7	60	5	120	2	5	0
101	0	16	7	7	90	2	180	4	4	1
102	1	14	3	2	20	2	10	2	2	0
103	1	16	11	1	60	2	90	2	3	0
104	1	15	3	4	30	3	20	4	4	1
105	1	14	5	3	20	2	60	4	4	1
106	1	17	3	3	38	1	30	4	4	0
107	0	18	11	2	68	2	68	7	7	0
108	0	15	5	2	20	1	20	3	3	0
109	1	14	11	2	30	1	30	1	1	0
110	0	18	13	4	90	1	90	7	7	1
111	1	16	5	3	60	2	45	6	6	0
112	1	17	5	3	45	2	20	3	5	3
113	1	17	5	2	20	1	20	8	8	0
114	1	14	5	2	20	2	20	6	6	6
115	0	17	11	2	30	1	30	7	7	7
116	0	17	12	5	40	1	30	9	9	0
117	1	15	3	1	15	1	15	6	6	1
118	1	17	5	1	15	1	15	9	9	0
119	0	17	9	5	60	1	6	9	9	0
120	0	18	13	5	40	1	20	9	8	0
121	0	17	11	5	40	1	30	6	5	0
122	0	18	12	1	30	1	30	9	9	5
123	1	17	5	5	0	0	0	9	9	0
124	1	17	11	5	30	1	15	9	9	0
125	1	17	6	5	15	1	15	9	9	1

Participant	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10
126	0	15	14	5	0	0	6	6	0	0
127	0	16	6	5	40	1	30	8	8	0
128	1	15	13	5	40	1	10	6	3	2
129	1	17	3	5	40	1	10	9	9	2
130	1	15	1	5	40	1	20	5	5	0
131	1	16	3	5	40	1	10	7	7	0
132	0	17	9	5	30	N	0	7	7	0
133	1	16	3	1	15	1	15	8	8	8
134	1	16	5	1	15	1	20	8	8	1
135	0	17	9	2	15	1	15	9	9	9
136	0	17	10	7	60	5	60	7	2	7
137	0	17	12	3	45	2	25	2	1	1
138	1	14	5	3	200	2	60	4	4	1
139	1	16	5	4	120	1	120	4	4	1
140	0	17	7	3	180	1	80	3	1	0
141	0	18	13	1	30	1	30	2	1	1
142	0	15	13	4	60	1	60	1	1	1
143	1	17	7	3	90	1	90	5	6	1
144	1	18	9	2	30	1	30	3	1	0
145	0	18	5	1	30	1	30	1	1	0
146	1	18	3	0	0	0	0	1	0	0
147	1	17	9	2	90	1	20	1	1	1
148	1	14	11	3	40	1	20	1	1	0
149	1	17	3	3	20	1	20	1	1	0
150	1	15	5	3	5	3	60	1	1	0
151	0	16	5	4	90	1	20	1	1	1
152	1	15	6	4	35	2	20	1	1	0
153	0	16	13	7	30	2	60	1	1	0
154	0	16	2	2	30	1	30	1	1	0
155	0	14	6	4	60	2	N	3	4	0
156	1	14	11	6	60	1	60	4	4	1
157	1	18	12	2	50	1	N	7	7	0
158	0	16	5	1	0	N	NN	4	2	0
159	0	16	13	3	60	1	60	6	3	0
160	0	17	11	4	30	1	30	3	6	0
161	1	16	3	N	N	N	N	5	5	0
162	0	16		3	30	2	30	N	5	3
163	0	15	9	2	38	2	N	5	7	0
164	0	16		3	30	2	30	N	5	3
165	0	15	9	2	38	2	N	5	7	0
166	0	16	9	2	30	2	N	8	4	6
167	0	16	9	5	60	2	N	5	5	0
168	0	18	3	4	35	1	N	6	6	0

Participant	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10
169	0	14	12	4	30	1	15	4	4	0
170	0	19	9	N	30	1	30	2	3	0
171	1	15	13	2	20	N	30	6	6	1
172	0	18	11	3	30	1	30	5	6	0
173	0	16	11	3	75	N	45	6	6	0
174	0	17	11	4	38	1	38	5	5	0
175	1	17	3	3	30	1	N	2	2	0
176	1	15	3	2	150	2	150	N	4	0
177	0	3	11	N	0	0	0	3	3	0
178	0	14	11	4	30	N	2	3	3	0
179	1	17	5	6	60	1	30	1	2	0
180	1	14	3	2	35	1	35	3	3	0
181	1	16	5	4	N	N	30	5	5	0
182	0	16	14	N	N	N	N	7	7	0
183	1	17	5	5	20	1	20	9	9	6
184	1	16	12	5	40	1	10	8	8	1
185	1	18	11	5	40	N	N	9	9	0
186	0	17	11	5	15	1	15	9	9	1
187	1	16	3	5	40	N	0	8	8	0
188	0	16	13	0	0	0	0	N	8	0
189	0	17	9	3	150	3	N	2	2	0
190	1	16	3	N	N	N	N	5	5	0
191	0	18	9	4	30	3	75	10	6	1

Participant	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18	Item 19	Item 20
1	0	3	5	4	3	2	5	5	1	1
2	1	4	4	2	1	3	3	2	1	4
3	1	4	2	3	2	3	3	3	2	2
4	0	4	4	4	3	4	4	3	3	3
5	1	2	3	4	3	4	3	4	3	4
6	0	3	4	5	2	4	4	5	1	3
7	0	2	2	3	4	5	5	4	1	5
8	0	5	4	3	1	2	3	3	1	3
9	1	4	2	3	1	5	2	1	1	3
10	0	3	4	3	4	3	3	5	3	2
11	0	2	1	3	3	4	4	2	1	2
12	0	4	3	4	2	4	3	4	2	4
13	0	4	5	1	2	2	4	5	1	4
14	0	2	4	3	4	4	5	3	2	4
15	0	4	3	4	2	2	4	5	2	1
16	1	4	5	3	3	4	4	5	2	3
17	1	5	4	2	2	3	4	4	1	1
18	0	2	4	1	4	4	3	3	3	4
19	0	2	1	3	4	5	4	5	3	3
20	0	3	3	2	4	4	4	4	2	4
21	0	3	1	1	4	4	4	3	2	4
22	1	3	2	5	4	3	4	4	2	5
23	1	2	3	2	4	4	4	2	3	5
24	0	3	3	3	2	3	4	4	2	4
25	0	1	1	1	3	4	3	4	3	4
26	0	2	2	2	2	4	4	4	2	3
27	1	2	5	1	4	5	4	3	2	4
28	0	3	3	2	1	3	2	4	1	2
29	1	3	5	2	3	3	4	4	3	4
30	1	3	3	2	2	2	4	1	2	2
31	0	2	3	1	2	4	4	3	2	4
32	1	4	5	2	3	3	5	4	2	2
33	1	2	3	2	3	2	4	4	1	4
34	0	2	2	2	4	5	4	3	2	5
35	1	3	3	2	3	4	4	4	2	3
36	0	3	3	2	3	2	4	3	2	2
37	0	3	3	2	1	3	4	3	1	3
38	0	3	4	2	3	5	5	3	2	4
39	1	2	4	3	4	5	4	4	2	4
40	0	4	4	2	5	3	4	3	2	2
41	0	3	4	3	2	4	4	4	2	4
42	0	5	1	5	1	3	5	4	1	2
43	1	3	4	2	3	3	4	2	3	3

Participant	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18	Item 19	Item 20
44	1	2	5	1	3	4	5	4	3	5
45	0	4	2	2	4	4	5	1	2	5
46	0	5	4	3	3	4	4	3	2	4
47	0	2	1	2	3	4	4	2	2	4
48	0	2	5	3	4	3	4	3	1	5
49	1	3	4	1	2	4	3	2	2	2
50	0	3	4	3	4	3	4	2	2	2
51	1	5	5	2	4	2	4	3	1	1
52	1	4	4	3	2	4	4	4	2	4
53	1	5	1	3	1	2	2	4	2	3
54	0	4	4	4	2	3	4	3	1	3
55	1	4	3	4	4	2	3	4	1	3
56	0	4	4	3	2	3	4	4	2	3
57	1	3	4	3	2	3	4	4	1	2
58	0	3	3	5	4	4	5	5	1	4
59	0	4	4	1	2	4	5	2	1	5
60	0	4	4	4	1	3	4	3	1	3
61	0	4	5	2	2	3	5	2	2	1
62	1	3	3	1	4	5	5	2	3	5
63	0	3	5	1	2	4	5	1	4	5
64	0	3	2	1	3	4	4	3	2	2
65	1	3	4	2	3	3	4	3	2	3
66	0	4	5	3	1	4	5	5	1	5
67	0	2	5	2	5	5	5	5	1	5
68	1	4	4	2	2	4	5	2	2	2
69	1	2	3	4	1	5	5	3	1	4
70	0	5	4	2	3	3	4	4	2	4
71	0	3	1	2	2	3	4	3	2	2
72	0	2	2	5	2	4	4	2	2	5
73	1	1	1	1	5	4	4	2	3	5
74	1	3	2	1	4	4	4	5	2	3
75	1	5	3	2	3	2	5	4	2	2
76	1	5	4	2	2	4	5	4	2	2
77	1	5	5	3	1	4	5	5	1	4
78	1	3	2	2	5	2	1	5	2	3
79	0	4	4	3	2	4	5	3	2	1
80	1	3	5	4	1	3	4	4	1	2
81	0	4	3	2	4	4	3	4	2	3
82	0	2	3	3	3	4	4	4	3	4
83	0	2	1	2	1	4	4	1	1	3
84	1	4	4	2	3	4	4	4	2	2
85	1	4	3	3	3	3	3	3	2	4
86	1	3	2	5	1	3	4	5	1	1

Participant	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18	Item 19	Item 20
87	1	3	5	4	4	3	4	4	2	4
88	0	4	3	4	2	4	4	2	2	3
89	1	2	3	1	3	4	4	5	1	4
90	0	5	4	2	2	3	4	5	1	1
91	0	4	4	3	2	3	3	5	1	2
92	1	3	3	3	4	3	4	3	2	2
93	0	4	3	3	4	4	5	5	1	4
94	1	4	2	4	3	3	2	1	1	4
95	1	1	4	1	3	4	5	5	1	5
96	0	3	4	2	5	3	4	2	2	3
97	1	4	4	2	2	3	4	4	2	2
98	0	1	1	3	4	5	5	4	5	5
99	0	1	1	1	5	5	3	2	2	5
100	1	3	5	5	4	3	2	1	1	1
101	0	4	3	2	5	5	5	1	2	5
102	0	3	4	4	2	3	3	2	1	1
103	0	5	4	3	3	3	5	5	1	3
104	0	3	2	4	3	3	3	4	5	3
105	0	3	4	4	5	4	4	4	2	3
106	1	3	3	3	4	5	5	3	2	4
107	0	4	5	3	3	3	4	5	1	1
108	0	5	5	5	4	2	4	5	1	2
109	1	3	5	2	3	3	4	2	1	2
110	1	1	1	1	5	5	5	2	2	5
111	0	2	5	2	4	4	4	4	2	3
112	1	2	5	3	3	3	3	4	1	4
113	0	2	4	1	4	4	4	5	1	4
114	0	4	3	2	3	4	4	4	2	2
115	1	2	5	2	2	4	4	4	2	4
116	1	3	4	2	1	4	5	5	2	3
117	0	4	4	1	1	4	5	4	1	4
118	0	1	4	2	1	1	3	4	1	4
119	0	2	5	3	1	3	4	5	1	5
120	0	4	4	2	1	4	3	5	1	3
121	0	2	3	1	1	4	5	5	3	4
122	1	4	2	4	1	3	5	4	1	3
123	0	5	1	3	1	1	5	5	1	1
124	0	4	4	3	2	3	3	4	2	3
125	1	2	4	2	2	4	4	3	2	4
126	0	3	2	2	3	5	4	4	2	3
127	1	4	3	4	1	4	3	5	1	2
128	1	3	3	2	2	3	4	3	2	2
129	0	3	3	2	1	3	3	5	1	3

Participant	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18	Item 19	Item 20
130	1	3	4	3	1	4	4	4	2	4
131	0	3	3	2	1	3	4	4	2	2
132	0	5	1	4	3	3	4	4	1	2
133	0	5	4	1	1	3	4	3	1	4
134	0	2	4	4	2	2	3	4	1	3
135	0	4	4	4	2	5	5	5	1	5
136	1	2	1	2	4	5	4	4	1	4
137	1	3	4	3	2	4	3	2	2	4
138	0	2	4	3	1	2	2	4	2	5
139	0	2	4	3	4	5	5	3	3	3
140	0	2	1	4	4	4	4	1	2	5
141	0	2	2	3	2	4	4	1	3	4
142	1	2	4	3	2	4	5	4	2	4
143	0	3	5	5	1	4	4	4	1	2
144	1	3	3	5	4	3	4	2	1	2
145	0	4	1	2	2	3	4	4	1	4
146	0	4	2	3	4	3	4	1	1	5
147	0	4	4	3	2	4	3	5	3	2
148	0	3	2	2	4	3	4	3	2	5
149	1	5	4	5	2	5	5	5	3	5
150	1	4	4	1	1	3	4	3	1	2
151	0	1	1	3	5	5	5	3	4	4
152	1	2	3	3	4	2	4	4	2	3
153	0	2	2	2	4	4	4	4	1	4
154	0	1	4	3	2	4	5	4	2	5
155	0	3	4	1	3	3	5	3	3	2
156	0	3	3	2	4	4	5	3	2	4
157	0	2	4	2	3	1	2	4	2	2
158	0	5	3	4	2	4	5	3	2	5
159	0	4	5	4	1	4	3	4	2	5
160	0	2	1	1	3	4	4	2	3	4
161	0	5	3	1	2	3	3	4	1	3
162	1	4	4	2	2	3	4	4	1	4
163	1	3	3	2	2	5	5	4	1	3
164	1	4	4	2	2	3	4	4	1	4
165	1	3	3	2	3	5	5	4	1	3
166	0	5	3	5	3	5	5	5	3	5
167	1	1	1	2	3	5	4	3	2	5
168	1	3	5	1	2	5	5	5	3	2
169	1	3	2	3	1	4	4	2	2	5
170	0	4	1	1	3	4	5	3	2	4
171	1	2	3	3	4	3	4	4	2	4
172	0	4	2	2	1	3	4	2	1	4

Participant	Item 11	Item 12	Item 13	Item 14	Item 15	Item 16	Item 17	Item 18	Item 19	Item 20
173	0	4	2	3	3	4	5	5	1	4
174	0	2	4	2	3	2	5	5	2	4
175	0	3	4	3	3	2	5	2	3	4
176	1	3	4	1	1	3	4	2	2	3
177	1	4	5	1	3	4	3	3	1	1
178	1	2	3	4	4	4	4	3	1	5
179	0	2	1	2	N	4	4	2	2	4
180	1	2	2	3	3	4	4	4	2	4
181	0	3	4	4	1	4	5	5	1	3
182	1	4	2	2	1	3	4	2	2	3
183	0	5	5	1	2	N	5	5	1	3
184	0	3	3	3	2	3	4	4	2	2
185	0	5	2	2	1	3	4	5	1	2
186	0	5	N	5	1	2	4	5	1	2
187	0	4	2	2	1	1	4	5	1	1
188	0	5	1	1	N	4	4	1	1	1
189	0	2	2	2	N	4	4	2	2	3
190	0	5	3	1	2	3	3	4	1	3
191	0	3	3	3	3	4	5	2	1	4

Participant	Item 21	Item 22	Item 23	Item 24	Item 25	Item 26	Item 27	Item 28	Item 29	Item 30
1	4	3	1	4	2	5	3	4	3	4
2	3	4	2	4	3	4	3	4	3	4
3	4	3	2	4	3	4	3	4	3	4
4	3	4	3	3	2	4	4	4	4	4
5	4	3	5	3	3	4	4	4	4	5
6	4	4	2	5	4	4	4	4	3	2
7	5	5	2	4	1	5	4	5	4	2
8	3	4	2	2	4	3	3	2	4	3
9	4	5	1	4	4	5	5	5	5	5
10	4	4	2	4	3	4	2	3	4	4
11	3	4	2	5	4	5	4	5	3	4
12	4	3	2	4	3	4	4	4	4	4
13	4	4	1	5	4	5	1	3	2	5
14	4	4	5	4	3	5	4	4	4	3
15	4	2	3	3	4	2	3	2	1	2
16	4	4	3	5	3	5	5	4	4	4
17	3	4	2	3	3	5	4	3	3	3
18	4	3	3	4	3	5	4	4	5	4
19	4	4	3	4	3	4	4	4	4	4
20	4	4	2	4	3	4	3	4	3	4
21	3	4	2	3	1	4	4	4	4	5
22	5	5	3	4	5	5	4	3	3	5
23	5	5	3	3	1	4	3	4	4	3
24	4	3	3	4	5	4	5	3	4	4
25	4	4	1	4	3	5	4	4	2	5
26	4	4	2	5	4	5	3	3	4	4
27	4	5	2	4	2	4	4	4	4	4
28	4	3	2	3	3	3	4	3	4	4
29	4	3	3	4	3	4	5	4	4	5
30	1	3	1	4	3	4	3	2	4	4
31	3	5	4	3	2	5	4	4	4	4
32	4	3	2	4	3	4	2	2	3	5
33	5	5	1	5	5	5	5	5	4	3
34	4	4	1	3	4	5	5	4	5	5
35	4	4	2	4	3	4	4	4	3	3
36	3	4	2	3	2	3	3	4	3	4
37	4	3	1	4	2	5	3	5	4	4
38	3	4	2	5	2	5	4	5	4	4
39	4	4	1	5	5	5	1	4	4	5
40	4	5	2	4	2	4	4	4	4	4
41	4	4	4	4	2	4	4	3	4	4
42	4	1	1	3	3	3	4	4	3	4
43	4	3	3	4	4	3	4	3	4	4

Participant	Item 21	Item 22	Item 23	Item 24	Item 25	Item 26	Item 27	Item 28	Item 29	Item 30
44	2	4	4	5	3	5	5	5	4	4
45	5	5	5	5	5	5	5	4	4	5
46	2	4	5	4	3	2	5	2	4	4
47	4	4	2	3	4	4	2	4	4	3
48	4	4	2	5	3	5	5	5	4	4
49	4	4	1	3	3	4	3	4	4	4
50	4	3	2	3	3	4	5	3	4	3
51	5	2	2	3	3	4	4	2	4	1
52	4	4	4	5	4	4	4	5	4	4
53	4	2	3	2	1	4	4	3	3	4
54	4	3	2	3	3	3	4	4	3	3
55	4	4	1	4	5	4	4	4	3	3
56	4	3	3	3	3	4	4	4	3	4
57	4	5	1	4	3	5	3	3	4	3
58	2	3	2	5	4	4	4	4	2	4
59	4	4	4	5	5	5	4	5	5	5
60	4	1	1	1	3	3	4	4	4	4
61	1	4	2	3	4	4	5	5	2	5
62	5	3	3	4	5	5	3	5	5	5
63	5	5	5	5	3	5	4	5	4	5
64	4	5	1	5	4	5	2	4	4	4
65	4	3	2	3	3	3	5	4	5	4
66	3	3	1	4	2	4	1	2	3	1
67	3	5	3	5	3	5	5	5	4	5
68	2	4	1	3	2	4	1	4	4	4
69	2	5	1	5	3	5	3	5	5	4
70	3	4	2	2	2	2	4	4	3	2
71	2	3	3	5	2	5	5	4	4	5
72	5	4	3	3	3	5	3	4	3	3
73	3	5	2	5	3	5	5	4	5	4
74	2	4	1	5	3	5	1	4	3	4
75	3	2	2	4	4	4	4	5	3	4
76	4	3	1	4	2	4	4	4	3	4
77	4	5	2	5	3	4	3	4	3	5
78	2	4	1	5	3	5	3	3	3	5
79	3	4	2	4	2	5	3	5	4	5
80	4	3	1	3	3	3	2	4	5	3
81	3	5	4	5	5	4	4	5	3	5
82	5	4	3	4	3	4	5	4	3	5
83	5	4	3	3	2	3	4	3	4	4
84	2	4	1	4	3	3	3	3	2	4
85	3	4	3	3	3	3	4	3	3	4
86	4	2	1	2	3	3	1	2	1	3

Participant	Item 21	Item 22	Item 23	Item 24	Item 25	Item 26	Item 27	Item 28	Item 29	Item 30
87	3	4	3	4	4	4	3	4	3	4
88	4	4	4	4	3	4	4	3	4	4
89	3	4	1	4	4	3	2	4	2	3
90	3	3	2	4	3	3	4	3	3	3
91	2	4	1	5	2	5	5	4	4	5
92	4	4	3	4	3	4	5	3	4	3
93	3	4	1	5	3	5	3	5	4	4
94	4	3	1	5	3	3	3	4	1	1
95	3	5	1	3	1	4	1	5	1	3
96	2	4	4	4	4	4	4	4	4	4
97	4	4	1	3	4	4	4	4	3	4
98	2	3	3	4	5	5	4	4	5	5
99	2	5	4	5	1	5	5	5	5	5
100	5	4	1	5	4	5	1	5	5	1
101	3	5	3	5	3	5	5	4	5	5
102	4	3	1	2	4	4	1	4	3	1
103	4	4	1	4	2	3	1	4	3	5
104	2	5	4	5	5	4	3	3	3	3
105	4	4	4	5	3	5	5	5	3	4
106	3	4	2	4	4	5	2	5	2	4
107	3	3	1	3	3	3	1	3	2	4
108	4	3	1	5	3	5	4	4	3	5
109	4	3	3	5	4	5	5	4	4	5
110	4	5	1	5	2	5	4	5	5	5
111	2	2	2	4	3	4	4	4	4	5
112	2	5	1	3	4	3	3	5	3	3
113	5	4	4	4	4	3	4	5	2	5
114	4	4	3	3	4	4	4	3	3	3
115	4	4	2	4	2	4	4	4	4	4
116	4	5	2	4	3	5	4	5	4	5
117	3	5	4	5	3	4	5	4	4	5
118	4	1	1	2	2	2	3	1	2	2
119	3	4	3	4	3	4	3	5	5	3
120	4	2	1	4	3	5	3	5	4	4
121	4	4	3	4	2	4	3	4	3	2
122	4	2	1	4	4	3	1	4	3	4
123	3	1	1	4	1	1	3	3	1	2
124	4	4	2	3	4	4	4	4	5	5
125	4	2	2	4	2	4	4	5	4	4
126	3	1	1	1	2	1	1	4	2	4
127	4	3	1	3	3	4	4	3	2	4
128	3	2	3	2	3	3	4	3	3	4
129	4	2	2	4	3	4	4	4	3	4

Participant	Item 21	Item 22	Item 23	Item 24	Item 25	Item 26	Item 27	Item 28	Item 29	Item 30
130	4	4	3	4	3	4	3	4	3	4
131	4	3	2	2	3	3	4	3	2	4
132	5	4	1	3	5	4	3	4	4	2
133	4	4	2	4	3	4	5	4	3	4
134	4	3	1	3	3	4	4	3	3	4
135	3	5	1	1	3	5	3	5	3	3
136	2	4	4	5	4	5	5	5	4	4
137	4	4	2	5	4	4	4	5	4	4
138	3	4	4	5	4	5	4	2	4	3
139	4	4	1	4	4	4	1	4	4	4
140	5	4	3	4	4	4	4	4	3	4
141	4	4	1	4	3	5	2	4	4	5
142	4	4	2	4	3	5	4	4	3	3
143	4	3	2	4	4	4	3	5	3	5
144	4	3	1	4	5	5	3	4	3	2
145	4	5	4	5	3	4	4	4	4	4
146	1	3	1	3	3	2	1	4	1	2
147	3	4	3	4	3	4	4	4	3	4
148	4	4	3	3	3	5	4	4	4	4
149	2	5	4	5	5	5	5	4	5	5
150	4	2	2	2	3	2	1	2	3	1
151	3	5	3	5	3	4	5	5	4	4
152	3	5	2	4	4	4	4	4	4	4
153	4	4	1	4	5	5	4	5	4	4
154	4	5	4	5	3	5	3	5	3	4
155	4	5	3	5	2	5	5	5	4	5
156	4	4	3	4	3	5	4	4	4	4
157	3	4	2	4	3	4	3	4	3	4
158	4	3	1	3	5	4	5	3	2	3
159	5	4	1	5	3	4	3	4	2	4
160	4	4	4	2	4	4	4	5	4	4
161	4	2	1	3	3	4	2	3	2	3
162	2	4	1	5	2	5	3	4	3	2
163	5	5	2	5	3	5	3	5	5	5
164	2	4	1	5	2	5	3	4	3	2
165	5	5	2	5	3	5	3	5	5	5
166	4	5	1	5	4	5	2	5	3	3
167	4	4	2	5	2	4	4	5	4	5
168	5	5	1	5	2	4	3	5	5	3
169	2	2	3	5	2	4	5	4	3	4
170	3	2	3	3	3	2	4	3	3	4
171	4	2	2	3	2	3	3	4	3	2
172	3	4	1	2	2	4	2	3	4	4

Participant	Item 21	Item 22	Item 23	Item 24	Item 25	Item 26	Item 27	Item 28	Item 29	Item 30
173	3	4	1	4	3	5	1	5	4	4
174	4	5	1	5	3	5	3	5	5	5
175	3	3	N	3	2	3	2	3	3	4
176	4	3	3	3	3	3	3	2	3	4
177	4	3	1	2	3	2	4	1	1	2
178	5	2	4	4	3	4	5	4	3	4
179	2	3	2	4	3	5	2	4	4	5
180	4	4	3	4	3	4	4	4	4	4
181	5	2	2	3	3	3	5	5	4	3
182	2	3	2	2	2	3	4	4	2	4
183	3	1	1	4	5	5	4	5	2	3
184	4	N	3	4	3	4	4	4	3	3
185	4	4	1	3	3	4	4	4	2	4
186	5	2	5	2	2	2	3	4	2	4
187	3	2	1	5	3	4	5	4	2	4
188	1	1	1	4	4	1	2	1	1	1
189	3	4	2	4	3	5	5	4	4	4
190	4	2	1	3	3	4	2	3	2	3
191	2	5	3	3	4	4	4	5	4	4

Participant	Item 31	Item 32	Item 33	Item 34	Item 35	Item 36	Item 37	Item 38	Item 39	Item 40
1	3	2	1	1	3	3	3	3	3	4
2	3	2	1	4	4	3	2	4	4	4
3	4	2	2	2	4	2	2	4	4	2
4	3	3	2	2	4	3	4	4	4	2
5	3	3	2	4	4	5	1	5	4	3
6	3	2	2	3	4	4	4	4	2	2
7	1	1	3	4	4	5	3	5	3	5
8	5	3	3	4	3	3	3	3	3	3
9	1	3	1	4	5	4	1	5	5	5
10	2	3	1	5	4	4	3	4	4	2
11	3	3	4	4	5	4	5	4	5	4
12	2	2	2	3	3	3	3	4	4	2
13	4	2	1	2	5	5	1	5	4	2
14	2	4	3	5	4	4	2	4	5	3
15	5	1	2	3	3	4	4	3	2	4
16	5	3	3	4	4	4	4	4	5	4
17	3	3	2	3	3	3	2	4	4	3
18	2	3	1	3	4	4	2	4	4	2
19	3	1	3	1	4	4	1	4	4	4
20	4	3	2	1	4	4	1	4	4	2
21	1	3	1	5	5	3	2	5	4	3
22	2	3	2	4	3	5	3	3	4	5
23	1	2	2	4	4	5	3	4	3	2
24	3	2	2	5	4	3	3	5	4	4
25	2	5	1	3	3	2	2	4	4	2
26	2	4	1	4	4	4	4	5	5	3
27	2	3	2	4	4	4	3	4	4	2
28	4	2	1	2	4	4	5	4	3	2
29	3	3	3	4	4	4	1	4	4	3
30	2	3	1	4	4	2	4	3	4	4
31	2	2	3	3	4	4	4	4	4	2
32	4	2	1	2	5	1	1	5	5	2
33	1	5	1	1	3	4	1	5	5	4
34	2	4	2	1	2	3	1	5	4	5
35	4	3	2	3	4	4	3	4	4	2
36	3	2	2	4	4	4	2	4	4	2
37	4	3	1	3	4	3	1	5	4	4
38	1	3	2	4	4	5	2	5	4	4
39	2	3	1	4	3	4	2	4	4	2
40	4	4	2	4	4	4	3	3	4	4
41	3	4	2	2	4	2	1	4	4	3
42	3	1	2	5	4	4	1	4	4	3
43	2	2	3	3	4	4	2	4	4	2

Participant	Item 31	Item 32	Item 33	Item 34	Item 35	Item 36	Item 37	Item 38	Item 39	Item 40
44	1	3	4	4	4	4	1	5	5	4
45	2	4	5	5	4	4	5	5	5	4
46	3	1	4	3	4	4	2	5	3	3
47	2	2	1	2	3	3	2	4	4	4
48	2	3	2	4	4	5	1	5	5	3
49	3	2	2	5	4	4	4	3	3	2
50	2	3	2	3	4	4	2	5	4	2
51	5	2	1	4	4	5	4	5	4	2
52	2	2	2	3	4	4	2	4	4	2
53	4	2	2	4	2	2	3	2	4	4
54	4	1	2	4	3	4	4	4	3	3
55	4	2	1	4	3	4	2	4	4	4
56	4	2	2	3	4	3	3	3	3	2
57	2	2	2	4	4	4	3	5	4	2
58	5	3	2	4	3	2	4	5	4	3
59	4	1	1	1	4	5	5	5	3	2
60	3	2	1	4	4	3	3	4	3	3
61	4	2	2	2	4	2	4	4	4	4
62	2	3	2	4	4	4	1	4	4	4
63	2	4	3	2	4	2	1	4	5	1
64	2	3	1	4	4	5	4	5	5	3
65	4	3	4	3	4	4	3	4	5	2
66	5	1	1	1	1	4	2	1	1	5
67	2	2	3	3	3	2	3	5	5	3
68	4	2	1	1	4	2	4	3	4	2
69	2	2	1	2	5	5	2	5	5	3
70	3	2	2	4	2	4	4	3	2	2
71	2	3	2	4	4	5	3	4	3	3
72	2	2	1	3	4	2	3	5	4	5
73	2	5	2	4	1	3	4	5	4	5
74	1	3	1	1	1	3	3	5	4	1
75	3	3	2	2	3	2	3	2	3	4
76	2	2	1	2	4	4	3	4	4	3
77	5	3	3	3	4	4	3	5	4	2
78	3	4	2	5	4	5	5	5	3	3
79	3	2	1	4	3	4	3	4	4	2
80	2	4	1	3	1	4	1	5	5	5
81	4	4	4	3	5	5	4	5	4	4
82	4	5	4	5	3	5	4	3	2	4
83	3	1	1	5	2	2	4	5	3	3
84	2	2	2	4	4	4	2	4	4	4
85	2	3	3	3	3	3	3	3	3	2
86	4	1	1	1	1	1	3	1	3	2

Participant	Item 31	Item 32	Item 33	Item 34	Item 35	Item 36	Item 37	Item 38	Item 39	Item 40
87	5	3	2	2	4	4	4	4	4	2
88	2	3	2	4	4	4	3	4	4	4
89	2	2	1	4	2	4	3	3	2	1
90	4	2	2	3	2	4	2	3	4	3
91	4	3	1	1	4	2	3	4	4	2
92	2	3	2	4	3	2	2	4	4	3
93	2	3	1	1	4	4	3	4	4	3
94	4	3	3	1	1	1	1	4	3	4
95	5	1	1	3	3	5	3	5	3	5
96	2	3	4	3	4	3	3	4	4	2
97	5	3	1	3	4	2	3	4	4	4
98	5	4	4	5	5	3	2	3	4	5
99	1	4	3	4	5	5	4	5	5	1
100	1	3	1	1	3	1	3	5	4	2
101	3	2	2	5	4	4	1	5	5	4
102	3	4	1	4	3	4	4	4	3	4
103	3	1	1	1	3	3	1	4	4	5
104	3	4	3	4	3	3	3	4	5	4
105	2	4	3	4	3	4	3	4	5	3
106	3	3	1	4	5	3	3	5	4	3
107	3	1	1	1	3	4	3	3	3	4
108	4	3	3	3	3	3	1	4	4	5
109	3	2	3	4	4	3	4	4	4	4
110	1	4	1	3	2	5	1	5	3	1
111	2	3	2	3	4	3	2	5	5	2
112	4	3	1	4	4	2	2	4	5	2
113	1	3	4	4	4	4	4	3	4	1
114	3	3	2	4	4	4	2	4	3	4
115	2	2	2	4	4	4	2	4	4	2
116	3	2	1	4	4	4	3	4	4	3
117	4	1	3	5	4	4	2	5	4	2
118	4	1	1	5	1	3	2	2	4	2
119	1	2	1	3	4	3	2	3	4	2
120	2	1	1	4	4	3	2	4	3	2
121	2	2	1	5	4	4	3	4	4	2
122	4	1	1	4	3	4	4	2	3	3
123	5	1	1	3	3	1	1	4	3	1
124	3	2	1	3	4	4	2	5	4	2
125	2	1	1	4	4	4	2	4	4	2
126	2	1	1	4	2	1	5	1	3	3
127	4	2	1	4	4	2	3	4	4	5
128	3	2	2	4	3	3	3	4	3	2
129	4	2	2	4	3	3	4	4	4	3

Participant	Item 31	Item 32	Item 33	Item 34	Item 35	Item 36	Item 37	Item 38	Item 39	Item 40
130	2	2	2	4	4	4	3	4	3	3
131	5	2	1	4	3	2	3	4	3	3
132	4	1	1	4	3	3	3	3	3	3
133	2	3	2	4	3	4	3	4	4	4
134	4	2	2	5	4	4	2	3	4	2
135	1	1	2	3	4	2	2	4	4	2
136	2	4	4	4	4	4	4	4	4	3
137	3	4	2	4	3	5	4	4	4	4
138	2	3	1	2	4	3	3	4	3	4
139	1	3	1	4	4	4	3	4	4	2
140	2	4	2	3	3	2	4	4	4	4
141	2	3	3	2	2	4	4	5	5	3
142	3	2	2	1	4	4	4	4	5	4
143	3	3	2	2	4	2	2	3	3	4
144	4	2	1	1	3	3	3	4	3	3
145	3	2	2	3	4	3	1	4	3	3
146	5	3	1	4	1	2	4	4	4	4
147	3	2	2	3	3	3	2	4	4	3
148	1	3	3	4	3	5	1	5	5	4
149	1	4	4	4	5	5	5	5	5	5
150	5	1	1	4	2	2	3	4	1	2
151	2	3	2	4	4	4	3	5	4	5
152	3	3	2	4	4	4	4	5	4	5
153	1	4	2	5	4	5	1	5	4	2
154	2	2	1	3	5	5	2	5	5	5
155	2	4	3	4	5	5	2	4	4	1
156	2	5	2	4	4	5	3	5	4	2
157	4	4	2	2	4	4	2	4	4	2
158	5	1	1	3	4	4	3	3	3	3
159	5	2	1	1	4	2	3	4	4	2
160	2	2	4	4	2	4	4	4	4	2
161	5	2	1	4	3	3	3	3	3	4
162	4	1	1	1	3	4	2	4	4	4
163	3	3	1	5	5	5	2	5	5	5
164	4	1	1	1	3	4	2	4	4	4
165	3	3	1	5	5	5	2	5	5	5
166	4	3	1	3	3	2	3	4	4	2
167	1	3	1	2	4	5	4	4	4	4
168	2	1	1	4	2	5	2	5	5	1
169	3	3	2	2	2	N	4	4	4	3
170	3	4	2	3	3	3	2	4	4	3
171	3	3	2	4	3	4	2	4	3	4
172	2	3	2	N	4	4	3	4	4	1

Participant	Item 31	Item 32	Item 33	Item 34	Item 35	Item 36	Item 37	Item 38	Item 39	Item 40
173	4	3	1	4	4	4	1	5	4	2
174	2	3	1	2	4	5	3	5	5	2
175	4	2	1	4	3	4	2	4	4	4
176	2	4	2	4	3	4	3	4	4	3
177	5	2	3	4	2	1	4	4	3	1
178	1	3	5	3	5	1	2	4	4	3
179	3	3	2	4	4	4	2	5	4	3
180	2	3	2	2	4	4	4	4	4	2
181	2	2	4	4	4	2	4	3	4	2
182	4	2	2	4	2	2	3	4	2	2
183	5	1	1	3	1	1	4	4	3	4
184	2	2	3	4	3	3	3	4	3	4
185	5	1	1	4	3	3	3	4	3	2
186	5	1	2	3	2	2	3	4	4	5
187	4	1	1	5	4	2	5	2	3	2
188	5	1	1	1	1	1	1	1	1	1
189	2	2	2	2	3	2	1	4	4	4
190	5	2	1	4	3	3	3	3	3	4
191	2	4	1	4	4	3	2	4	4	4

Participant	Item 41	Item 42	Item 43	Item 44	Item 45	Item 46	Item 47	Item 48	Item 49	Item 50
1	1	1	3	2	3	3	4	3	5	3
2	1	2	3	4	4	3	3	4	4	4
3	2	2	2	4	4	4	2	3	4	4
4	2	3	2	3	3	3	4	3	4	4
5	1	3	3	3	5	4	4	5	5	5
6	2	2	2	2	4	2	1	3	5	4
7	1	2	2	3	4	1	4	5	5	1
8	1	2	4	3	4	3	4	3	3	3
9	1	3	3	4	4	2	4	3	5	5
10	4	2	5	3	4	2	3	4	5	3
11	1	2	4	2	4	2	5	4	5	1
12	4	2	2	3	4	3	4	4	4	4
13	1	1	4	5	5	4	4	5	5	4
14	4	4	5	4	5	3	4	5	4	4
15	1	1	2	1	3	4	3	2	4	2
16	1	2	3	3	4	5	4	5	5	5
17	1	2	3	3	4	2	3	4	4	3
18	3	3	4	4	4	2	4	4	5	5
19	1	1	2	1	4	3	4	4	4	1
20	2	4	3	4	4	3	4	4	5	4
21	1	2	3	4	4	2	3	4	5	4
22	1	4	5	3	4	5	1	4	5	4
23	1	4	4	3	5	2	3	4	4	4
24	2	3	2	3	3	3	5	4	5	4
25	3	2	2	2	4	4	3	4	4	2
26	1	2	3	4	4	3	3	4	4	2
27	2	2	2	4	2	2	4	4	4	4
28	1	3	4	4	4	4	4	4	5	4
29	3	3	4	1	4	1	4	4	5	4
30	1	2	2	3	4	3	3	4	5	1
31	5	2	4	4	4	3	4	4	5	2
32	1	3	1	4	4	3	5	3	5	3
33	1	1	5	1	3	2	3	5	5	1
34	4	3	4	3	3	2	4	4	4	3
35	2	2	3	3	4	3	4	4	4	3
36	2	2	4	4	4	3	4	4	5	4
37	1	1	1	4	3	4	4	4	5	4
38	1	2	3	4	4	1	5	5	5	5
39	1	4	4	2	3	3	4	4	5	4
40	1	4	5	5	5	2	5	5	5	5
41	2	2	2	3	4	2	3	4	5	4
42	2	1	2	4	4	3	4	3	4	3
43	1	3	3	3	5	3	4	4	5	4

Participant	Item 41	Item 42	Item 43	Item 44	Item 45	Item 46	Item 47	Item 48	Item 49	Item 50
44	1	3	3	3	5	3	5	5	5	5
45	5	3	3	3	5	4	5	5	5	5
46	5	1	1	5	5	3	4	4	5	3
47	2	4	4	4	4	2	4	4	4	4
48	4	2	3	5	5	1	5	5	5	5
49	1	2	4	4	3	2	2	4	4	4
50	1	2	4	3	3	2	3	4	5	3
51	1	1	4	2	5	2	5	4	5	4
52	1	2	4	3	4	2	4	4	4	3
53	1	2	3	2	2	3	4	4	4	3
54	1	2	3	2	3	3	3	4	4	3
55	1	4	4	2	2	4	4	4	4	4
56	2	2	4	4	4	4	4	4	4	3
57	1	2	3	3	4	2	4	4	5	4
58	4	3	3	2	4	4	4	3	5	1
59	2	2	4	1	4	3	3	4	5	5
60	1	1	4	4	3	3	4	4	4	4
61	1	2	2	4	4	4	4	2	4	4
62	2	3	4	4	4	3	4	4	5	3
63	1	1	5	4	5	1	4	5	5	3
64	1	3	4	5	5	3	4	5	3	4
65	2	4	3	4	4	2	5	4	5	5
66	1	1	5	5	5	1	5	1	5	1
67	1	3	3	4	5	3	4	5	5	3
68	1	1	2	4	4	3	4	3	5	4
69	1	3	4	2	5	2	2	5	5	1
70	1	1	2	3	3	2	4	4	3	3
71	4	3	3	3	5	2	4	5	5	3
72	1	4	3	3	4	2	2	2	4	5
73	1	3	3	3	4	2	5	5	5	1
74	1	3	2	4	3	2	4	5	5	3
75	2	4	4	3	4	2	4	4	4	3
76	1	2	2	2	4	2	3	2	5	4
77	1	3	3	1	4	5	3	4	5	5
78	1	1	3	4	3	3	4	4	5	1
79	1	3	3	3	3	3	4	4	4	5
80	1	3	3	1	1	3	5	3	5	5
81	5	4	4	3	5	3	5	5	5	4
82	3	5	4	3	4	5	4	3	4	2
83	3	1	4	4	3	5	3	4	5	1
84	2	2	4	4	4	2	4	4	4	3
85	2	2	3	4	3	3	4	4	4	3
86	1	3	1	3	4	2	4	2	3	3

Participant	Item 41	Item 42	Item 43	Item 44	Item 45	Item 46	Item 47	Item 48	Item 49	Item 50
87	1	1	1	3	4	3	4	4	5	5
88	2	2	3	3	4	2	4	4	4	3
89	1	1	3	1	2	2	2	4	4	5
90	5	2	4	2	3	3	4	5	4	5
91	1	1	1	4	4	4	3	2	5	5
92	2	2	3	4	4	2	4	3	5	3
93	3	2	3	3	5	3	5	4	4	3
94	1	2	2	3	4	4	4	4	5	4
95	1	1	3	1	4	1	5	4	4	4
96	3	4	4	4	4	4	4	4	4	2
97	1	1	1	3	5	4	4	3	5	3
98	5	4	4	2	1	1	5	5	5	5
99	1	1	5	4	5	1	5	5	5	3
100	1	1	1	1	5	5	5	5	5	5
101	1	3	3	3	4	4	5	5	5	2
102	1	2	3	2	2	3	4	3	3	4
103	3	3	1	2	4	4	4	4	4	5
104	5	5	3	3	2	4	5	3	3	4
105	1	2	3	3	4	3	4	5	5	5
106	1	3	3	3	4	3	3	4	5	4
107	4	1	2	4	3	5	3	3	4	3
108	1	1	1	3	3	4	4	3	5	4
109	1	2	2	3	4	2	4	4	4	3
110	1	1	5	1	5	1	3	5	5	1
111	1	2	4	4	5	3	4	5	5	4
112	1	4	5	5	5	4	4	4	5	5
113	5	3	4	4	4	2	5	3	5	3
114	2	2	3	4	3	4	4	4	4	4
115	2	2	4	4	4	2	4	4	4	4
116	4	3	4	5	5	3	5	4	5	4
117	2	2	4	5	5	3	4	5	5	5
118	1	1	1	1	2	3	2	1	4	5
119	4	1	3	4	4	4	3	4	4	4
120	1	1	1	4	4	2	2	4	4	5
121	4	1	1	4	4	1	3	4	5	4
122	1	1	4	4	4	4	3	3	4	5
123	4	1	1	1	4	4	1	1	5	1
124	2	1	5	4	4	2	4	4	5	3
125	1	1	4	4	2	2	4	4	5	4
126	1	1	1	3	1	1	1	1	1	1
127	1	1	1	3	3	4	3	4	4	3
128	2	2	2	2	1	2	4	3	3	3
129	1	1	3	3	4	2	4	4	4	4

Participant	Item 41	Item 42	Item 43	Item 44	Item 45	Item 46	Item 47	Item 48	Item 49	Item 50
130	1	1	2	3	4	3	4	4	4	4
131	5	5	3	3	3	4	4	3	5	3
132	3	3	3	2	4	2	4	4	5	2
133	4	2	3	3	3	2	3	4	4	4
134	2	3	4	4	4	4	4	4	5	4
135	1	2	3	2	4	2	4	4	5	2
136	2	4	3	4	4	2	4	4	4	4
137	2	2	3	4	5	3	5	4	4	4
138	2	1	2	2	4	4	5	5	5	4
139	4	1	3	3	4	2	4	4	4	4
140	4	3	2	2	2	2	2	5	4	2
141	1	3	4	4	4	2	5	4	5	4
142	1	2	2	3	2	3	4	4	5	5
143	2	1	4	2	4	3	4	3	4	4
144	1	4	4	1	4	3	3	3	4	3
145	4	2	1	2	2	3	4	4	5	1
146	1	1	1	1	3	4	3	3	4	2
147	3	2	3	3	3	3	4	4	4	4
148	5	2	4	4	4	2	3	4	5	2
149	1	3	5	4	4	1	5	5	5	5
150	1	2	4	2	3	3	4	1	2	3
151	4	2	5	4	4	2	5	5	5	3
152	1	3	3	2	4	1	4	4	5	4
153	1	2	4	4	5	2	5	5	5	1
154	1	1	5	1	5	3	5	5	5	2
155	1	2	5	5	4	2	4	4	5	5
156	1	2	4	4	3	2	3	4	5	2
157	4	2	3	4	4	2	4	4	4	2
158	1	2	5	5	5	3	4	4	4	3
159	1	1	1	4	3	3	4	4	5	5
160	2	2	4	3	4	4	4	4	4	2
161	1	2	2	2	2	4	2	3	3	3
162	1	1	3	4	4	2	4	3	4	2
163	1	4	3	2	5	4	4	5	5	4
164	1	1	3	4	4	2	4	3	4	2
165	1	4	3	2	5	4	4	5	5	4
166	2	2	2	2	5	5	4	4	5	3
167	1	2	4	2	3	1	5	3	3	3
168	1	4	5	5	3	2	2	5	5	5
169	2	3	4	3	3	2	4	4	5	3
170	4	4	4	4	4	4	4	3	4	3
171	2	2	2	2	2	4	4	3	4	3
172	3	3	4	4	4	2	4	4	4	3

Participant	Item 41	Item 42	Item 43	Item 44	Item 45	Item 46	Item 47	Item 48	Item 49	Item 50
173	1	3	1	4	4	2	3	5	5	1
174	1	4	5	4	5	2	5	5	5	1
175	1	2	3	4	4	4	3	4	4	4
176	2	2	3	5	4	1	4	3	4	4
177	1	1	3	5	3	4	3	2	5	1
178	1	4	3	1	4	5	4	4	4	3
179	2	2	4	4	5	2	4	4	5	3
180	2	N	3	4	4	2	4	4	4	4
181	2	2	3	4	3	4	2	3	4	4
182	2	2	2	3	2	4	4	2	4	3
183	1	1	1	3	4	5	1	1	3	1
184	1	1	4	4	5	2	4	4	5	3
185	2	1	2	2	4	4	4	3	4	3
186	1	1	4	3	3	4	2	2	4	3
187	2	4	1	4	2	3	3	2	4	3
188	1	1	1	1	1	1	1	1	1	1
189	4	3	4	2	2	2	4	4	4	2
190	1	2	2	2	2	4	2	3	3	3
191	4	2	3	4	4	2	3	4	5	2

Participant	Item 51	Item 52	Item 53	Item 54	Item 55	Item 56	Item 57	Item 58	Item 59	Item 60
1	4	2	4	4	1	4	3	3	4	1
2	4	2	4	4	2	4	4	4	4	1
3	4	2	3	4	3	4	4	4	3	2
4	4	3	3	4	3	3	4	3	4	3
5	4	4	4	5	4	3	4	5	4	5
6	2	4	2	2	3	5	4	4	4	4
7	4	4	5	5	2	4	4	5	5	1
8	3	3	3	3	3	3	3	3	3	2
9	5	3	4	5	3	5	5	5	5	1
10	4	3	2	3	3	4	4	4	3	2
11	3	3	4	5	4	4	4	4	3	2
12	3	2	2	4	2	4	4	4	4	3
13	5	5	4	4	5	4	4	5	1	2
14	4	4	3	4	4	5	4	4	4	3
15	1	3	3	2	1	4	2	3	4	2
16	4	4	4	4	2	4	4	4	5	3
17	3	3	4	4	2	2	3	4	4	3
18	4	3	4	4	3	4	4	4	4	3
19	4	3	3	3	3	5	4	2	5	1
20	3	2	4	4	4	4	4	3	3	4
21	4	3	3	4	2	4	5	5	5	3
22	4	4	4	5	4	5	4	4	4	3
23	4	4	3	4	3	4	3	3	4	3
24	3	3	4	4	2	4	4	5	5	3
25	2	3	4	4	4	3	3	3	5	1
26	4	4	4	4	4	4	4	4	4	3
27	4	4	4	4	4	4	4	4	4	2
28	3	2	4	4	2	4	2	3	4	4
29	4	1	4	4	4	4	4	3	4	1
30	3	2	4	4	4	3	3	3	4	2
31	4	2	5	4	4	5	4	4	5	3
32	4	2	3	3	2	4	5	3	3	2
33	1	5	4	4	5	4	5	5	5	1
34	5	3	3	3	4	5	5	3	5	1
35	4	2	4	4	4	4	4	3	3	4
36	3	3	4	3	3	4	5	2	4	2
37	4	4	5	5	3	3	3	4	4	2
38	4	3	4	4	4	4	5	5	4	2
39	4	2	4	4	3	5	5	5	1	3
40	5	5	5	4	3	5	5	5	5	4
41	4	4	4	3	3	3	3	4	5	2
42	4	3	4	4	3	5	4	4	4	1
43	4	3	3	4	3	4	4	3	4	3

Participant	Item 51	Item 52	Item 53	Item 54	Item 55	Item 56	Item 57	Item 58	Item 59	Item 60
44	5	3	5	5	4	5	5	5	5	5
45	4	3	4	5	5	3	5	5	5	2
46	4	4	4	4	4	4	4	4	5	3
47	4	3	3	4	2	4	4	4	2	2
48	5	4	4	4	4	4	4	4	5	3
49	2	2	4	2	2	4	4	4	4	4
50	4	3	4	4	2	4	4	3	2	2
51	4	2	4	4	2	4	2	2	4	2
52	4	3	4	3	3	5	4	4	5	3
53	4	3	4	4	2	4	4	3	4	3
54	3	2	4	4	1	4	4	4	4	2
55	4	4	3	3	2	4	4	3	4	4
56	4	2	4	3	2	4	4	4	4	3
57	4	2	4	4	4	4	4	3	4	2
58	4	3	4	4	3	5	3	4	5	1
59	4	5	4	4	3	4	4	2	4	4
60	4	2	3	4	2	3	4	4	4	4
61	4	3	4	4	3	5	4	4	5	2
62	5	4	4	4	2	5	4	3	3	2
63	5	5	5	4	2	5	4	5	5	4
64	4	3	4	4	5	4	4	3	2	3
65	5	3	4	4	3	4	5	3	2	3
66	4	3	4	5	4	5	1	1	5	1
67	3	3	2	4	4	5	4	5	5	5
68	4	4	4	4	1	4	4	4	3	4
69	3	2	2	2	2	5	5	5	3	2
70	2	3	4	3	2	4	4	3	4	2
71	4	3	4	5	2	5	5	4	5	4
72	4	3	4	3	4	4	5	3	3	3
73	5	3	4	4	5	3	5	5	4	3
74	3	5	4	4	2	5	5	4	1	2
75	2	1	3	2	5	4	3	2	1	1
76	3	2	3	4	2	5	3	2	5	2
77	4	3	3	4	2	5	4	4	4	3
78	5	5	5	5	3	5	5	5	5	5
79	4	3	3	4	3	4	5	3	3	4
80	5	3	5	3	3	5	5	3	5	1
81	5	5	5	4	4	5	5	4	4	3
82	3	2	3	3	4	4	3	5	5	5
83	1	3	4	2	1	5	5	5	4	5
84	3	3	4	4	3	4	4	3	3	2
85	3	3	4	4	3	4	4	3	4	3
86	1	3	4	4	1	4	3	4	3	2

Participant	Item 51	Item 52	Item 53	Item 54	Item 55	Item 56	Item 57	Item 58	Item 59	Item 60
87	3	4	4	4	2	5	5	4	5	2
88	4	3	4	4	3	4	4	4	4	3
89	2	3	2	3	3	5	4	3	2	4
90	3	2	4	3	2	4	4	3	4	3
91	3	2	4	3	2	4	5	2	4	1
92	4	3	3	4	4	3	4	3	5	3
93	4	3	2	4	4	5	4	3	3	3
94	1	3	3	4	3	4	4	1	5	1
95	4	2	5	4	2	4	5	5	4	1
96	4	4	4	4	4	4	4	4	4	3
97	4	4	4	3	2	2	3	3	3	2
98	5	5	5	5	5	5	5	5	5	5
99	5	3	4	5	5	5	5	5	5	4
100	5	4	5	5	5	5	5	5	3	3
101	5	4	4	5	3	3	5	5	1	3
102	2	2	3	3	3	3	3	3	3	4
103	4	5	4	4	2	4	5	3	4	1
104	5	2	4	4	3	5	4	4	3	3
105	4	3	4	4	4	5	5	5	5	3
106	4	2	4	3	3	5	4	5	3	2
107	1	3	3	4	1	4	5	5	1	1
108	3	3	4	4	3	3	3	5	4	2
109	4	2	4	5	1	3	4	4	5	3
110	5	4	3	5	2	5	5	3	5	1
111	4	4	4	4	3	4	5	5	3	2
112	5	3	4	5	2	5	4	5	3	3
113	2	4	3	4	3	4	3	3	4	3
114	4	2	4	4	2	4	4	4	4	2
115	4	4	4	4	4	4	4	5	4	2
116	4	4	4	4	2	5	4	3	5	2
117	4	2	4	4	3	5	5	3	5	2
118	4	1	1	1	1	1	4	4	3	1
119	4	2	4	4	3	5	4	3	5	1
120	4	2	3	4	1	4	4	2	4	1
121	3	2	1	1	1	4	4	3	4	2
122	3	4	4	4	2	5	5	4	4	2
123	1	1	1	1	1	2	3	1	5	1
124	4	4	3	4	2	3	4	3	5	2
125	4	3	3	4	4	4	5	5	5	4
126	1	1	1	1	1	2	1	1	5	1
127	4	2	3	3	2	5	3	3	5	1
128	3	3	2	3	2	3	4	4	4	3
129	4	3	4	4	1	5	4	3	5	2

Participant	Item 51	Item 52	Item 53	Item 54	Item 55	Item 56	Item 57	Item 58	Item 59	Item 60
130	3	3	3	4	2	4	4	3	4	2
131	3	2	3	3	2	4	4	3	5	3
132	2	4	4	4	2	2	4	3	4	2
133	4	2	3	4	2	3	4	3	4	2
134	4	3	4	4	2	3	4	4	4	3
135	3	2	4	4	1	5	4	3	5	2
136	4	3	4	4	3	5	4	4	5	4
137	4	4	4	4	3	3	5	4	4	4
138	4	2	4	4	3	5	5	4	4	2
139	4	3	4	4	4	3	4	4	3	3
140	2	2	3	4	4	4	2	2	4	2
141	4	3	4	4	3	5	4	4	4	4
142	4	1	4	4	4	4	4	3	4	1
143	3	2	4	5	3	5	3	3	4	1
144	3	1	3	3	4	4	4	3	3	2
145	4	2	2	4	2	4	3	3	5	3
146	1	3	3	3	2	5	2	4	5	4
147	4	3	3	4	3	4	4	4	4	3
148	4	3	4	4	3	5	5	4	5	2
149	5	2	5	4	5	4	5	5	5	1
150	3	4	2	1	1	2	3	4	3	2
151	5	3	5	5	5	4	5	5	5	5
152	4	3	4	4	4	4	5	4	4	3
153	5	4	3	5	2	4	5	4	5	1
154	3	4	4	5	3	5	5	5	5	2
155	5	5	4	5	4	4	5	3	5	3
156	4	4	4	4	4	N	4	4	4	2
157	4	4	4	4	2	4	4	3	4	2
158	1	3	3	4	1	3	3	3	3	3
159	3	1	3	3	2	2	5	N	3	4
160	2	4	4	3	4	4	4	N	4	1
161	4	2	3	2	1	4	3	3	3	3
162	4	4	4	4	2	5	4	5	5	1
163	5	4	5	5	3	5	5	5	5	1
164	4	4	4	4	2	5	4	5	5	1
165	5	4	5	5	3	5	5	5	5	1
166	2	5	5	5	5	5	5	5	5	3
167	5	3	3	3	3	4	5	3	4	3
168	5	1	1	5	5	5	5	5	5	5
169	3	N	3	4	2	3	4	4	5	2
170	4	3	4	3	4	5	5	4	4	3
171	3	2	3	4	3	4	4	3	4	4
172	4	4	4	4	2	2	4	N	3	3

Participant	Item 51	Item 52	Item 53	Item 54	Item 55	Item 56	Item 57	Item 58	Item 59	Item 60
173	4	2	3	4	4	5	4	3	3	3
174	5	5	5	5	5	5	5	N	5	1
175	4	2	3	4	3	3	4	4	3	3
176	3	4	4	3	3	3	4	3	3	3
177	1	1	1	4	1	1	3	1	5	1
178	3	5	4	3	4	4	4	3	5	1
179	5	2	4	5	4	3	5	4	2	3
180	4	3	4	4	3	4	4	4	4	2
181	4	5	2	3	2	4	4	4	5	2
182	3	2	2	2	2	4	3	4	4	2
183	1	1	1	1	1	5	1	1	4	1
184	4	2	4	4	3	4	3	4	5	3
185	3	3	3	3	1	5	4	3	5	1
186	3	2	2	2	1	4	4	3	4	2
187	2	2	2	2	1	4	1	3	5	1
188	1	1	1	2	1	5	5	1	4	1
189	3	2	4	4	2	4	4	4	4	2
190	4	2	3	2	1	4	3	3	3	3
191	4	4	3	4	4	4	4	4	5	2

Participant	Item 61	Item 62	Item 63	Item 64	Item 65	Item 66
1	4	5	3	4	2	3
2	4	3	4	3	3	3
3	4	4	4	3	2	3
4	3	3	3	3	3	4
5	4	3	3	5	5	4
6	4	4	5	5	4	2
7	4	4	2	4	3	4
8	3	3	3	3	2	3
9	5	4	3	3	4	4
10	2	4	5	3	2	3
11	4	3	1	4	3	4
12	3	2	3	3	4	4
13	1	5	5	4	2	4
14	4	4	3	5	4	5
15	1	3	2	4	1	1
16	5	2	4	4	4	3
17	3	3	5	3	3	1
18	3	4	2	4	3	4
19	4	1	4	4	4	4
20	3	3	3	3	4	4
21	2	3	1	4	5	5
22	2	3	5	3	5	5
23	4	4	4	4	4	3
24	3	2	4	4	4	3
25	4	2	3	3	3	3
26	4	4	3	4	4	4
27	4	4	4	4	4	4
28	4	4	3	4	2	2
29	4	4	5	4	5	4
30	3	4	1	1	3	3
31	3	4	1	5	4	4
32	5	1	2	1	1	1
33	3	4	2	4	4	5
34	4	4	5	3	5	5
35	4	4	3	3	4	3
36	3	4	2	3	2	3
37	4	4	3	3	2	3
38	4	5	5	4	4	5
39	3	4	5	1	3	4
40	4	4	4	4	4	4
41	4	4	4	4	4	4
42	1	1	1	4	3	2
43	4	3	3	4	3	3

Participant	Item 61	Item 62	Item 63	Item 64	Item 65	Item 66
44	5	5	5	5	5	5
45	5	5	4	5	4	4
46	4	4	3	5	4	2
47	2	3	3	4	4	4
48	5	4	4	5	4	4
49	4	2	4	3	3	3
50	2	2	2	3	4	4
51	2	2	2	4	1	1
52	4	4	5	5	4	4
53	4	2	2	4	2	2
54	3	4	3	4	3	2
55	4	3	4	4	4	3
56	4	4	4	4	4	3
57	3	4	4	4	4	4
58	4	5	5	5	1	5
59	4	5	5	4	4	3
60	3	4	3	3	4	2
61	3	5	4	3	4	3
62	3	5	2	3	4	4
63	4	4	1	5	5	4
64	4	4	4	2	4	5
65	4	2	5	2	3	3
66	3	4	5	5	5	1
67	3	1	5	5	5	4
68	4	4	3	4	2	2
69	5	3	5	5	5	3
70	4	3	4	3	2	2
71	3	4	5	5	3	5
72	4	5	4	3	5	5
73	5	5	1	3	5	5
74	3	4	3	3	5	4
75	4	3	2	2	3	4
76	4	4	3	4	3	2
77	5	2	5	4	5	3
78	5	5	1	5	5	5
79	3	3	3	3	4	3
80	5	5	5	5	3	2
81	4	4	5	5	4	3
82	3	4	4	5	5	5
83	1	4	1	5	1	1
84	4	4	3	3	4	2
85	3	3	3	4	3	3
86	2	1	2	3	4	2

Participant	Item 61	Item 62	Item 63	Item 64	Item 65	Item 66
87	4	4	5	3	5	2
88	4	2	2	4	3	4
89	3	3	5	3	3	3
90	4	3	4	3	3	2
91	4	3	5	4	4	2
92	3	4	3	4	4	3
93	3	3	4	3	3	4
94	2	2	4	5	3	2
95	1	3	4	4	5	3
96	3	4	3	4	4	4
97	4	4	3	3	3	4
98	5	5	5	5	4	5
99	3	4	4	5	5	5
100	5	3	5	1	5	5
101	5	5	1	3	4	4
102	1	4	3	3	3	3
103	4	4	4	3	4	1
104	2	4	4	5	4	3
105	4	5	5	4	5	4
106	4	3	3	1	3	3
107	4	3	3	3	4	1
108	5	3	4	3	3	4
109	4	5	3	3	5	4
110	5	5	1	3	5	5
111	3	4	4	3	4	4
112	4	4	5	4	4	5
113	4	5	5	4	4	4
114	4	4	4	4	2	3
115	4	4	4	2	4	4
116	4	4	3	4	4	4
117	3	4	4	5	5	3
118	2	4	1	3	2	1
119	2	2	5	5	1	4
120	1	4	1	4	4	4
121	2	1	2	3	4	2
122	4	2	5	3	3	3
123	3	1	1	3	1	1
124	5	5	4	5	4	3
125	3	5	4	5	4	4
126	1	1	1	5	1	1
127	3	4	4	5	4	3
128	3	3	3	4	2	2
129	3	2	4	4	3	3

Participant	Item 61	Item 62	Item 63	Item 64	Item 65	Item 66
130	4	2	3	4	3	3
131	3	2	3	5	2	1
132	2	4	2	2	4	1
133	2	4	3	4	4	2
134	4	4	4	4	4	2
135	4	4	5	4	3	3
136	4	4	3	5	5	5
137	4	4	4	4	4	3
138	4	1	4	4	5	3
139	4	4	4	3	4	3
140	4	3	3	3	4	5
141	3	3	3	3	4	4
142	4	4	5	4	5	5
143	3	4	4	4	3	3
144	2	2	2	3	2	3
145	4	2	3	3	2	2
146	3	1	3	5	3	1
147	3	3	3	3	4	3
148	2	2	4	4	4	4
149	1	3	5	5	5	5
150	2	4	2	1	4	1
151	4	3	4	5	5	5
152	2	4	4	3	3	5
153	2	4	5	2	4	5
154	1	4	2	5	4	4
155	5	5	5	5	4	4
156	4	4	2	4	4	5
157	4	4	2	4	4	2
158	3	1	5	5	5	3
159	5	1	4	2	1	4
160	4	4	4	3	4	4
161	2	3	3	4	2	1
162	4	4	4	3	4	3
163	5	3	5	3	3	4
164	4	4	4	3	4	3
165	5	3	5	3	3	4
166	3	3	3	3	3	3
167	3	3	3	3	3	3
168	5	5	5	1	5	4
169	4	4	4	2	4	3
170	3	4	4	3	3	4
171	3	2	3	3	3	2
172	2	1	2	3	3	3

Participant	Item 61	Item 62	Item 63	Item 64	Item 65	Item 66
173	4	5	4	1	3	3
174	5	5	1	3	5	5
175	4	3	3	2	2	3
176	3	4	3	3	3	3
177	3	5	4	5	1	3
178	2	N	4	4	3	4
179	3	4	N	3	4	5
180	4	4	4	4	4	4
181	4	5	3	3	3	3
182	4	2	3	4	2	2
183	3	1	3	3	3	1
184	4	4	N	4	4	3
185	3	2	3	5	3	1
186	1	1	4	3	2	2
187	3	2	2	5	1	1
188	1	2	2	2	3	2
189	2	2	2	4	4	4
190	2	3	3	4	2	1
191	5	2	3	4	4	4