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DESIGN AND DEVELOPMENT OF THE SELF-EFFICACY
FOR MUSICAL STUDIES SCALE

by
Kathryn R. Pearson

A project submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of
Master of Science

Department of Instructional Psychology and Technology
Brigham Young University
December 2003

BRIGHAM YOUNG UNIVERSITY

GRADUATE COMMITTEE APPROVAL

of a masters project submitted by

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This project has been read by each member of the following graduate committee and by majority vote has been found to be satisfactory.

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ABSTRACT

DESIGN AND DEVELOPMENT OF THE SELF-EFFICACY FOR MUSICAL STUDIES SCALE

Kathryn R. Pearson

Department of Instructional Psychology and Technology

Master of Science

Scale development in psychological studies is an area of intense growth (Clark & Watson, 1995). This report builds upon academic interest in the value of producing viable measurement tools. The purpose of this research project was to evaluate a self-efficacy measurement scale intended to determine individual music students' perceptions of capability. The areas of interest were four self-regulatory skill domains: strategy use, planning, monitoring, and evaluating in two music environments: independent practicing and performance.

This report describes the development and analysis of the Self-efficacy for Musical Studies (SEMS) scale. The report includes statistical analysis of the response data from formative evaluation, field testing, and content evidence of validity. The discussion section examines the strengths and weaknesses of the scale and its development decisions. Finally, recommendations for the future development of self-

efficacy scales for self-regulatory skills and instruction in the area of music education are suggested.

In providing both a preliminary instrument and a measurement evaluation of this instrument, we hope to further academic interest in the usefulness of scale production to enhance music instruction and the value of the relatively untouched connection between the social cognitive concept of self-efficacy, self-regulatory skills, and the study of music.

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The project could not have gone as far as it did without the wonderful sacrifice of time and effort on the part of Valerie Dopp, who went the extra mile and produced wonderful results. I am forever grateful for her help which as come happily on more than one occasion.

I dedicate this project to my husband, Tom, as tangible thanks for his endless kindnesses and sweet support. I could not have done this without his help and encouragement. He truly is a great example of Christ-like love and true friendship. I am filled with gratitude for him and for all the days we have been blessed with together.

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CHAPTER 1: INTRODUCTION

Scale development in psychological studies is an area of intense growth (Clark & Watson, 1995). Interest in the value of producing viable measurement tools has been attributed to the ever-developing world of social science theories as well as to the need to test those theories objectively (Netemeyer, Bearden, & Sharma, 2003). The design and development of new self-efficacy scales, such as the Self-efficacy for Musical Studies (SEMS) questionnaire, opens doors to both theoretical insight and practical improvements in identifying core competencies and measuring associated efficacy beliefs of music students.

Currently, there are no materials related to measuring student efficacy towards key self-regulatory skills on the functional levels of practicing and performing on musical instruments. As McCormick and McPherson (2003) conclude from their recent self-efficacy investigations, “relatively little of [self-efficacy] research has been validated in the domain of music” (p. 37). This is a surprising observation. Progress in music studies is not based solely on ability or natural talent as many believe; it depends greatly on the continuous conscious use of self-regulatory activities and a healthy positive sense of self-efficacy for those activities. Though commonly described as an extracurricular area, music is an academic endeavor to those who have made the commitment to study privately, and as such, is impacted by many of the same factors that affect academics. Also important to note is the constant pressure for musicians to perform consistently, compete with peers, and make steady improvements to their current state of performance (McCormick & McPherson, 2003). These demands logically call for the knowledge and use of self-regulatory skills.

A strong sense of competence in the selected self-regulatory actions facilitates two crucial goals of music instructors: enhancing cognitive awareness (metacognition) and enhancing musical performance. Efficacious outlooks on specific task-oriented activities, such as those that will be outlined within the SEMS questionnaire, contribute to these goals. A lasting sense of accomplishment, motivation, and self-control is a pertinent area of interest in academic as well as artistic pursuits.

Rationale for a Constructing a New Scale

There is a significant gap in assessments related to affective characteristics and the successful music student. Producing scales that focus on the construct of self-efficacy in musical studies in general terms is a newer area of interest (McCormick & McPherson, 2003). Complete scales related to the use of self-regulatory skills and student musicians are still missing from the area of self-efficacy (Hallam, 2001; McCormick & McPherson, 1999). Ideally, researchers of psychology and educational theory would quickly apply instructional theory to the musical arena, but rather than a river of research it seems to be a slow streamlet. Music education is certainly a ripe field with room for growth, especially in developing approaches that investigate skill sets, such as self-regulation.

In this project, I aim to develop and field test an initial version of a self-administered scale for assessing music students' self-efficacy and to provide information about the psychometric properties of this scale, including (a) internal consistency reliability, (b) subscale structure, and (c) content validity evidence as a way to improve upon the initial scale. Developing and critiquing this scale is just one step towards obtaining a better self-reported measure of musicians' efficacious characteristics.

Ultimately, the information gathered with the SEMS questionnaire should help instructors identify where students' perceived abilities lie. The instructor can then make

decisions to adjust instruction to increase frequency of supportive actions that encourage the development of positive self-perception of capabilities in musical self-regulatory skills.

Bandura observed that efficacious beliefs influence more than just the specific area of inquiry:

The belief in one's capability to exercise control over one's own functioning and other events that affect their lives is instrumental in life choices, level of motivation, quality of functioning, resilience to adversity, and vulnerability to stress and depression (1994, p. 14).

This deeper feeling of situational competence is precisely what many teachers desire to instill in their music students because the capability of coping with everyday motivational obstacles not only affects their outlook on their musical experiences, but other aspects of life as well. Music students are subject to the same impact of their self-efficacy beliefs as students in other academic subjects. They require sufficient internal controls in the form of regulatory skills to successfully practice and perform. The belief that they can do these tasks helps them persevere in the face of many daily obstacles and distractions. Identifying specific areas where self-perception of regulatory capabilities plays a role is a constructive activity for those who desire more insight into producing beneficial instructional events and environments that support self-efficacious behavior. Presenting a self-evaluation questionnaire that puts self-reflection into action and requires the student to identify their own perception of desired regulatory skills is a valuable step in encouraging instructional focus on these skills.

A measurement instrument such as the SEMS questionnaire is needed to help further efforts in identifying music students' perceptions of their capability to perform

basic, but crucial, regulatory activities in practice and performance. Self-efficacy, so tightly related to self-regulation and motivation, is an obvious but often neglected concern for music instructors. This neglect is the reason this project focused on components of an instrument with which future instructors can obtain information to enhance their understanding of students' perceived self-efficacy. Overall, we aimed to develop and improve a new scale. The future goal is to produce a usable tool to help music instructors enhance the desired trait of self-efficacy towards key self-regulatory skills.

Statement of Purpose

The purpose of this project was to systematically design and evaluate a new measurement scale intended to measure private music students' self-efficacy beliefs (self-perception of capability) towards specific self-regulatory activities in the context of their music studies. The formative evaluation included (a) item analysis, (b) reliability estimation, (c) principal component analysis, and (d) collection of content validity evidence to determine the appropriateness of the hypothesized construct structure.

Intending to further academic interest in the usefulness of scale production for music instruction, this scale was designed to be an instrument through which the latent construct, self-efficacy, could be investigated. The relatively untouched connection between the social cognitive concept of self-efficacy, self-regulatory skills, and the study of music, only stands to be enhanced by this research.

Target Population

This measurement scale was designed to be used by music instructors of any musical instrument, including voice, to make valid inferences about their students' self-

efficacy for specific self-regulatory activities as well as to guide the focus of their instructional sessions. This scale can be used during individual lessons or in group settings. The instructor should use the scale with select high-school aged students who have sufficient musical experience, maturity, and ability to be held accountable for cultivating self-regulatory traits.

The target age range for student users is fourteen to eighteen. Students in this age range are often better able to implement self-regulatory feedback and exhibit adequate self-control when participating in new activities. The students should have at least two full years of experience in formal music instruction, which would allow them to think beyond the physical demands of playing music or the basic technical aspects of their instrument.

Research Questions

The study focused on six questions:

1. Which items, if any, should be revised or deleted, and which ones should be retained?
2. What is the internal consistency reliability for each subscale of the SEMS questionnaire?
3. To what extent does the empirical structure of the response data match the subscale structure hypothesized by the researcher?
4. To what degree do each of the subscales possess evidence of content validity?
5. How feasible is the SEMS questionnaire for use by private music teachers and their students?
6. What is the potential usefulness of the SEMS questionnaire for improving private music instruction?

CHAPTER 2: LITERATURE REVIEW

Much of our early psychological theorizing builds on the principles of behaviorism (Bandura, 1989). One particularly interesting theory branching from these behavioristic roots, the Social Learning Theory (SLT), has held a strong place in the field of educational psychology. While behaviorism supports the idea that the observable behavior of humans can be almost mechanically described through stimulus-and-response paths, SLT asserts that this behavior is not simply reactional. Rather, human behavior is influenced by drives, goals, relationships with others, and the environment we create. Albert Bandura, one of the greatest contributors to SLT, took the idea of humans as conscious agents into the cognitive realm, creating his own theoretical branch, called Social Cognitive Theory (SCT), which focuses more on the role of self-referent phenomena and agency and supports the existence of a strong link between forethought and action. For Bandura, “a theory that denies that thoughts can regulate actions does not lend itself readily to the explanation of complex human behavior” (1986, p. 15). From this solid foundation that explores self-referent thought came a continual stream of educational and health-related studies exploring the role of cognitive patterns and self-evaluation in motivation and action.

Theoretical Background

Beliefs that people hold about their own capabilities, whether positive or negative, are better predictors of how they will behave than what they are actually capable of doing (Pajares, 2002). This assertion is particularly interesting to the realm of music because many participants view natural ability or talent as the only predictors of success, rather than attributing it to preparation and control.

Both SLT and SCT assert that humans have considerable control over their own behavior. In this light, it would seem most beneficial to focus on what inner controls successful students use to help themselves facilitate their own learning. Specifically, gaining knowledge of and using simple but effective self-regulatory activities could significantly improve music students' practice and performance as well as their perception of themselves as musicians. Because of the varying natural abilities between students, we believe teachers should focus on those skills that can be improved through a student's conscious decisions.

It is interesting to consider the role self-perceived capability plays and how we can improve those perceptions in music students by training them in self-regulatory skills. If we find that they lack a perceived capability in a key skill area, shouldn't our instruction be designed to combat negative perceptions through positive mastery experiences? Because what a student believes they are capable of doing bears great significance on what they will actually be able to do, shouldn't we give more instructional attention to what they believe about their capabilities and how to change these beliefs? The implications of developing self-regulatory skills run deeper than just "doing well enough" at weekly lessons. "Students' belief in their capabilities to master [musical] activities affects their aspirations, their level of interest in [musical] activities, and their [musical] accomplishments" (Bandura, 1994). Tapping into these facilitating or debilitating self perceptions can be of great value to musical educators who are trying to design their instruction to increase the competence and confidence of individual students.

Self-Efficacy

Self-efficacy, or a conviction that one can successfully execute the behavior required to produce desired outcomes, rests on a foundation of research on self-referent

thought, or our ability to analyze and alter our own actions. The theoretical underpinnings of the SEMS scale include the assumption of the existence of human agency, and the importance of self-regulation and self-reflection in all areas of activity. Researchers have repeatedly asserted the influence of self-efficacy upon different processes of human behavior and activity, including cognitive processes, motivation, affect [emotions], and selection of environment (Bandura, 1994; Schwarzer, 1992). Because self-efficacy beliefs can influence the choice of interest pursuits and environments, they can affect a student's lifelong "developmental path" (Bandura, 1989). This choice of pursuits is particularly pertinent to the choice all students make for their continuation or ending of their music studies.

In his 1986 work, Bandura defined self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391). As a description of students' judgments of capability, self-efficacy research and scales continue to be focused on self-efficacy as a predictor of academic performance (Pintrich & DeGroot, 1990; Pintrich & Schrauben, 1992) and consequently, may also be a predictor of success in musical studies. Efficacious outlooks on specific regulatory activities, such as planning specific practice activities, setting and tracking goals, and accurately evaluating a performance, lead to personal achievement. A lasting sense of accomplishment, motivation, and control are desirable goals in demanding pursuits such as music. Self-efficacy not only affects this sense of motivation independent of actual ability levels (i.e., experimentally induced self-beliefs led to subsequent behavioral changes), but it also influences performance through its strong effects on personal motivation through goal setting and proficient analytic thinking (Bandura, 1986; 1989). According to SCT, people develop perceptions about their own

abilities and characteristics that subsequently guide their behavior by determining what they will try to achieve and how much effort they will put into their performance (Bandura, 1977). Bandura's work showed that the thought-to-action pattern of self-efficacy affects performance.

To summarize, self-efficacy's impact is felt in more than just performance. A person's level self-efficacy affects the goals they set for themselves, the course of action they choose to pursue to obtain these goals, the amount of effort they are willing to expend to accomplish a task or goal, and their willingness to persevere in the face of difficulties. Though the specific characteristic is defined as a latent construct, or one that is naturally changeable over time and with experience, self-efficacy can be reliably measured by well-designed scales (Bandura, 2001).

Scale Components: Self-Regulatory Skills

Self-regulation is one component of successful preparation and performance involved in changing learning behaviors. The development and possession of self-regulation appears to be especially crucial for musical students. Self-regulatory activities have been broken down into many subcomponents by researchers studying academic skills and their relation to academic successes. Schraw (1998) outlined four particularly pertinent skill areas needed for performance improvement: strategy use, planning, monitoring, and evaluating. These skills were judged to be critical factors in enhancing students' feelings of capability in pursuing demanding activities.

Metacognitive strategies are strategies that are employed to monitor one's own learning, such as self-checking, goal setting and planning, reviewing and organizing information after learning, summarizing during learning, and seeking assistance from others. "Metacognition refers to cognitive appraisal and control of one's cognitive

activity; that is, thinking about the adequacy of one's own thinking" (Bandura, 1997, p. 230). The use of metacognitive strategies have been shown in academic subjects such as mathematics and science to result in higher levels of "cognitive engagement," which lead to higher levels of achievement (Pintrich & DeGroot, 1990).

Self-regulation is a companion of metacognitive strategies; a student does not use strategies without making a decision to do so. "Self-regulation is employed when students decide to manage their own learning and performance by blocking out distractions or making a conscious effort to practice" (McPherson & McCormick, 2003, p. 39). Facets of self-regulation cited by McPherson and McCormick's study include the ability to structure environments conducive to learning, plan and organize learning activities, obtain information and get teachers and peers to help them when needed, motivate themselves to do their practice and complete assignments within deadlines, and pursue music activities when there are competing interests.

Self-regulation is extremely important to the idea of personal cognitive agency because it allows the gradual substitution of internal controls for external controls of behavior. In his discussion about self-regulation and motivation, Bandura cites considerable research that shows that both children and adults accomplish much more with the exercise of self-regulative influence than without it (Bandura, 1986; 1989). Adhering to these self-regulatory skills is the key to accomplishing more, even when it is difficult to do so. "An unwavering sense of efficacy is needed to overrule such subverters of self-regulative efforts" (Bandura, 1997, p. 231). This "unwavering sense" is invaluable when approaching obstacles of any kind, whether cognitive, emotional, physical, or psychological, that cause frustration or discontinuance of a beneficial activity. The first step in helping a student to succeed in the area of self-regulation is to

find out if they need instructional aid in developing specific areas of self-regulatory skills. Finding this information can be accomplished by asking how the student perceives him or herself as a functioning agent in a particular environment to find how they perceive their ability to perform the specific required activities of their chosen musical instrument. Such questions serve as a means to assess what students see themselves being capable of in required tasks of this specific musical domain. Student responses to such questions should ignite instructors to foment scaffolding necessary to help students develop those self-regulatory skills.

The studies of McPherson and McCormick (1999) suggest that developing self-efficacy in the area of regulation and self-evaluation might reach beyond traditional academia to apply in music learning. Particularly striking is Hallam's (2001) observation that musicians require considerable metacognitive skills to learn and perform music. She focused on the musician's need to excel in the following self-regulatory areas: recognizing the nature and requirements of a particular task, identifying difficulties, possessing a range of strategies they can use on various tasks, knowing which strategy to use on each task, monitoring progress towards a goal, revising actions as necessary, evaluating performance outcomes, fixing known problems in practice, managing time, regulating concentration, motivating the self, and making their own preparations. Her observations of professional and student musicians support research in the academic realm that suggests that knowing what a strategy's definition or what it does is not enough to achieve in a given area; students must motivate themselves to use those strategies while regulating their learning and effort levels (Pintrich & DeGroot, 1990).

The goal of instructors is to support the skills that enable students to get the most results out of their efforts and motivate them to persevere despite competing interests.

Put simply, skills in self-regulation and metacognition foster a belief of self-control and competence in this competitive area of study. Each music student should be provided the opportunity to acquire skills needed to concentrate, understand their own cognition, and adopt appropriate improvement strategies for what they are learning (Hallam, 1998). Instructing students in desired areas of self-regulation after acquiring information on where they stand will ultimately lead to an increased capability to control their own learning. This increased capability in a cognitive skill set should increase the students' sense of self-efficacy, which encourages setting increasingly challenging goals, and exhibiting effective analytical thinking (Bandura & Wood, 1989).

CHAPTER 3: METHOD

This chapter describes in detail the formative evaluation of the SEMS questionnaire. The formative evaluation constitutes a major effort that resulted in an excellent opportunity to obtain firsthand knowledge of the nature of scale design.

When producing a scale, the designer is inundated with many voices advocating one format or another, one design or another. Several issues were of particular importance during the development of the SEMS questionnaire:

1. Clearly defining the target construct and the content domain;
2. Creating an item pool which includes comprehensive ideas of the core construct as well as those that are potentially relevant to the construct;
3. Writing items that are clearly worded, unambiguous, and ensure variability in responses;
4. Selecting an appropriate number of items;
5. Selecting an appropriate scale format with response options and accompanying descriptive labels;
6. Choosing methods to assess reliability, structure, and validity (Clark & Watson, 1995; Comrey, 1988; Netemeyer, Bearden, & Sharma, 2003).

The formative evaluation helped clarify these issues. The purpose of the formative evaluation was to identify weaknesses in each version of the scale, guide further design work, and suggest revisions to improve development of the end product. Persuasive arguments exist for every aspect of format decisions and data analyses of scale production, particularly those decisions that affect establishing evidence of reliability, structure, and content validity. The following methods aided the determination of development procedures used in this project.

Formative Evaluation

I chose to use Tessmer's series (1993) as a model for the formative evaluations of SEMS questionnaire. Scale and item improvements followed each of the four formative phases: expert review, one-on-one, small group, and field test (Tessmer, 1993, p. 15). In this section I will discuss the methodology, results, and revisions for each phase.

Expert Reviews

Two private music instructors served as subject-matter experts in this phase. Dr. Richard Sudweeks of the Instructional Psychology and Technology Department at Brigham Young University also participated in the initial content review. No script was used in the inquiries, as their function was to get immediate feedback and to know if the path of development I was following was logical. This phase consisted of review, discussion and approval of selected domains, definitions of constructs, the theoretical structure of the domain map and the initial item pool.

Using an expert panel with such diverse capabilities and backgrounds enhanced the problem solving nature of this preliminary work. In person-to-person dialogue, we discussed ways to make the instrument more effective, efficient, interesting, usable, and acceptable to students and instructors. I found that, like any problem solving team, the heterogeneity of their backgrounds was a strength. Also beneficial was the fact that neither instructor came from the same musical school of thought or perception of instructional goals. With them, the focus remained on the content and on the aspects of studying music that could be affected by self-regulatory abilities. Dr. Sudweeks acted as a mentor in scale development issues as well as a knowledgeable advisor on the measurement and statistical details of this project's domain. Preparing drafts of my

developing theoretical constructs paved the path for preliminary item pool and domain map generation.

After the important act of selecting domains and devising construct definitions, the drafts were approved through the expert review panel. From these I drafted a working domain map which contained the specific task areas (self-regulatory actions: strategies, planning, monitoring, evaluating) and environments (practice, lessons, performance) that were perceived to be key skills common across all music instruments. Once approved, this domain map was the basis for the initial item generation.

Following the guidance given by Netemeyer et al. (2003), I constructed an item pool of 74 items questioning the student about how they perceived their ability to do or approach a variety of regulatory tasks as related to the three musical environments. These items were written to tap the target domain as outlined in the preliminary domain map and as reflected in cited self-regulation literature. The expert reviewers then gave input as to whether they believed the items “belonged” in the pool. In other words, they were giving their observations of each item’s face validity.

In support of the item pool size, it was purposefully three times larger than our target questionnaire size, which was originally stated to be 25 items. Though there are no clear-cut numbers to follow as to the size of a preliminary item pool, it is generally accepted that with a multifaceted construct such as the one in this project, a larger number is preferred. Netemeyer et al. (2003) assert that it is better to be overinclusive than to be underinclusive when generating new items to cover a domain. From an initially large pool, a developer can then narrow down the selection according to feedback on word choice, format, redundancy, clarity and so forth. Generating an item pool was a major step towards achieving the goal that these items would eventually lead

to “a final scale measure” that consists of “items from this domain with desirable psychometric properties” (Netemeyer et al., 2003, p. 95).

Results and revisions. The results of this phase of the project were threefold. First, the process helped to more clearly define the various constructs and skills, which was important for me as I tried to apply academic regulatory research to musical practice. Second, the process helped me gain a clearer view of the boundaries of the construct to be assessed, in the form of a domain map. Third, it allowed me to vocalize ideas with those who either knew appropriate scale development procedures or knew what would work for my intended audience. It was an opportunity to have insightful discussions of why certain items should be included or excluded from the item pool. Some items were left in the pool to be tried in the next phases of formative evaluation because I wanted to see how they behaved in further reviews and application.

My initial project focus was on the theory of self-efficacy and self-regulation rather than process of scale development. Because of this, the initial project proposal did not include a plan to obtain content evidence of validity. After further reading, this aspect of scale development became an area of profound interest, though it was not evaluated in the forefront of the project. In retrospect, all future revisions and scale development projects should dwell on establishing methods to obtain this evidence before continuing on to the next phase of formative evaluation. The content evidence of validity obtained later in the production phases will be discussed in its own section in this chapter.

One-on-One Evaluation

In accordance with the accepted guideline to have developing scales judged by members of the “relevant population”, I used one-on-one interview-style evaluations

(Tessmer, 1993). A high school music teacher and two representative subjects, both accomplished senior musicians in high school, participated in this phase of the evaluation.

We used the following format for all one-on-one evaluations: The participants reviewed the drafted scale visual format and response format using a read-aloud/think-aloud technique. They then read through the entire item pool with the researcher, again using a read-aloud/think-aloud technique. The purpose of this process was to identify problems with the scale directions and format as well as the items, in terms of wording, vocabulary, sentence structure, and clarity.

For each item in the item pool, the participants were prompted to comment on that item by answering the following questions about individual items:

1. Is the meaning of this question clear to you?
2. Do you feel that this question applies to your experiences as a student/teacher of music?
3. What would you suggest we change to make this item easier to understand?

Corrective notes were taken during all interviews. I carefully reviewed these notes and implemented suggestions that were shared by the participants. The types of comments I used included grammatical corrections, visual aesthetics, and item exclusions and inclusions. Subjects who were chosen to participate in the one-on-one evaluation phase were offered two movie tickets upon completion of the review experience.

Results and revisions. Significant structural changes to the scale came resulted from the one-on-one evaluation phase. Changes included reformulating the domain map and reformatting the questionnaire scale length, presentation, and revising individual items in the item pool.

Originally, the domain map outlined the three main environments of private music study: practicing, lessons, and performance. Discussing the prototype questionnaire with our one-on-one reviewers revealed that the items that combine self-regulatory traits and lessons were not covering what actually happens in a “normal”, teacher-driven instructional sequence. Deleting the context of *Lessons* from the domain map was deemed appropriate for the following reasons:

1. At this stage, high-school-age music students commonly do not control the Lessons portion of their music studies. They can prepare for lessons, which logically falls within the area of practice preparation as well as self-evaluation. However, their own perception of the lesson is often overshadowed by the teacher’s immediate feedback. The lesson, in other words, usually functions as a type of performance or even a method of practicing. There are relationships and feelings involved in lesson experiences that would be interesting to investigate, but which do not fall within the area of this scale.

2. Any items asking about the role of social communication and the student’s perception of their music instructor inquires after the student’s outward perceptions rather into perceptions of their own capabilities.

3. Eliminating items that seemed to evaluate the teacher’s role and things only the teacher could truly control was a key concern in developing this questionnaire. Items that were interpreted by reviewers to be inquiring into teaching style, communication style, or teaching environment did not fit our purpose and were avoided.

One of the most serendipitous benefits of the decision to remove the lesson component of the domain map was its facilitation of “scaling back” the item pool. Perhaps a scale designed for teachers to see how they are perceived by students will be

used in the future, whereas, the perception of students of their practicing and performance regulation were to remain the main foci in this scale's items.

A common thread that stemmed from the reviewer's experience of reading aloud and answering each of the 74 items in the item pool came in the form of editorial and item phraseology suggestions. The reviewers were excellent at focusing on the wording and clarity of items and had many ideas for revisions when asked about items that seemed to cause hesitation in their responses. After these one-on-one review sessions, I made changes to the discussed items. These changes were implemented to prepare a clearer questionnaire with fewer, more representative items. At this point, 52 items were to be used in the next phase: small-group evaluation.

Small-Group Evaluation

The revised version of the questionnaire was administered to five representative students and an adult musician in a small-group setting. The purpose of this phase was to improve the instrument as a whole by making a decision on the clearest word choice, response options, and scale length, checking the clarity of the directions, and to judge each remaining item's general face validity and representativeness.

At this stage, the SEMS Questionnaire contained 52 items with about 13 items for each planned subscale. All participants met simultaneously in the same room around a large table, to cultivate an atmosphere of collaboration and problem-solving. Each participant was given the questionnaire packet, which was comprised of a cover sheet, consent form, and the SEMS Questionnaire (the questionnaire packet may be found in Appendix B). The small group evaluation participants first answered each of the 52 items in the drafted questionnaire format. Upon completion of the packet, I gave a brief introduction to the project purpose and distributed the construct definitions. The

participants then responded to the issues addressed in the Small Group Questionnaire, found in Appendix C, which was used to prompt clear responses about the appearance, usability, administration, clarity and to give basic representativeness ratings for each item. We then opened up the evaluation for discussion of any other ideas, questions, or suggestions.

Students rated their belief in their capability using a five-point rating scale with the following response categories:

1. Not at all sure I can,
2. Only slightly sure I can,
3. Somewhat sure I can,
4. Quite sure I can,
5. Extremely sure I can.

Also, the modifiers chosen; extremely, quite, somewhat, slightly, and not at all, have been shown to act as functional discriminate categories for describing varying amounts of a trait or activity in personality scales (Bass, Cascio & O'Connor, 1974). The SEMS questionnaire used in the field test evaluation appears in Appendix B.

In the development of the SEMS questionnaire, the construct consisted of self-regulatory activities and the content domain was practicing and performing. The instrument contained a total of 24 items and covered two conceptual domains and four self-regulatory subscales. The SEMS scale construct is represented by the domain map shown in Figure 1.

		Practicing	Performing
Self-Regulation	Knowledge of Cognition	Strategy Use	Strategy Use
	Regulation of Cognition	Planning Monitoring Evaluating	Planning Monitoring Evaluating

Figure 1. Domain map used to define the construct.

The instrument was composed of four subscales based on Schraw's academic self-regulatory skill categories (Schraw, 1998): Strategy Use, Planning, Monitoring, and Evaluating. It was necessary to define the domain categories as understood in the practicing and performance context. The following definitions were used to guide construction of the SEMS questionnaire items:

1. Strategy Use: Refers to the conscious, intentional use by a learner of one or more learning strategies to accomplish a specific goal or purpose.
2. Planning: The process of developing a proposed course of action. The process includes organizing and arranging elements or key parts and producing a plan or outline. Planning includes the production of goals, practice outlines, time usage, schedules, and mental outlines.
3. Monitoring: Includes the process of observing one's own actions and procedures. Monitoring may result in self-admonishment, cautioning or reminding, especially regarding conduct. Includes checking content of actions, and self-testing as a basis for supervising oneself.

4. **Evaluating:** Judging or appraising the effectiveness of one's actions. Includes observing the result(s) of the procedures used and deciding to what extent the relevant criteria for success are met.

Those participating in the small group evaluations were given monetary remuneration of five dollars for their time. The questionnaire format and items were revised according to the results of this small-group evaluation.

Results and revisions. The first questions on the small-group questionnaire addressed the wording and presentation of directions. The participants were asked "Are the directions clear to you?" and "Would you add anything else?" The participants answered unanimously that the directions were clear to them in their current format. The next question addressed perceived usability. The students were asked, "Does the questionnaire seem usable?" The answers were affirmative, but only given that the final product would be a more approachable length, which was completely understandable given the 52-item length. It was explained that the results of the day's discussion would help reduce the questionnaire's length by choosing the questions that were applicable to the domain map and were clearly important to student musicians. The content of the questionnaire was reported as being provocative and interesting, to adult and student alike, which was an encouraging observation.

The third set of questions addressed format issues. It began by asking the subjective question, "Is the questionnaire format attractive to you?" All the participants answered that the questionnaire packet looked clean and official. The font and spacing seemed attractive to all the participants. Participants suggested a minor change to both sections of the cover page (the Questions and Demographics sections) to have identical formatting. No changes were necessary on the consent page as approved by the

Institutional Review Board. The participants noted that they appreciated the decision to capitalize the key phrases in the consent form so they knew the important parts.

Furthermore, after discussion of other possible improvements, we agreed to remove the numbers 1 through 24 from the left side of the items. The reason behind removing the numbers was to help reduce feelings of being tested, which can be a source of unease or stress for some students.

An important question answered during this phase of the investigation was which response format would be preferred by the target audience. Given the arguments for and against a 100-point (which is often shown as a ten-point) scale and a traditional five-point scale (Bandura, 1997; Bandura, 2001; Clark & Watson, 1995; Pajares, Hartley & Valiante, 2001), it was desirable to see our audience's perception of the issue when offered both formats. The two formats were presented as Format A and Format B on the Small Group Questionnaire (see Appendix C). The participants were asked to first answer an item that used Format A, then, after commenting on their thought process in that experience, they were asked to answer a similar item which used Format B. After this exercise, they were asked, "Which format is clearer to you?" They answered unanimously that Format B was clearer to them. Their reason for this was that the ten-point scale had too-fine distinctions and too many numerical options. Like the students observed, Clark and Watson articulated that not only does having more response alternatives not build reliability or validity, but it "actually may reduce validity if respondents are unable to make the more subtle distinctions that are required" (p. 313), which seems to be the case with this younger audience. One participant observed that as a student, he would probably never answer 0 or 1 "because it was too low for me to admit

to. It would be like giving yourself an F,” but rating yourself at 1 or 2 out of 5 seemed more acceptable to admit.

After this, the participants were asked, “Which format do you prefer?” and were told to privately circle their answer on their questionnaire. All participants preferred to answer the items using Format B. The next question, “Do the number of scale points make a difference to you?” They all answered that, yes, the lesser numbers seemed more approachable to them and it took less time to decide which category they fit into. Format B was reported to be easier to use and easier to look at, whereas Format A was reported to be intimidating to use. One student commented that Format B was more likely to get honest answers from students like him. These observations further support Clark and Watson’s perception of this issue.

The last question addressing scale format was, “Would you change any of the words used on the scale? Which words would you change?” Because Format B was the preferred format, the participants focused on the wording of that scale. They discussed the difference between “only slightly” and “somewhat” used for points 2 and 3 on the scale. After some discussion, they decided point labels 2 and 3 should remain in their current form. The participants asserted that they felt they could answer accurately using those response choices. In a future version of this questionnaire, a more in-depth investigation into finding the most discriminating response choices for the negative (1-2) and positive (4-5) responses, paying special attention to the middle number’s statement, may be beneficial.

The final activity of the small-group evaluation was rating the degree to which each of the 52 items in the questionnaire seemed to represent the constructs as defined and diagrammed in the domain map. The participants were given instructions to give each

item a 1 to 3 rating which were defined as: 1 = Not representative, 2 = Somewhat representative, and 3 = Clearly representative. Those items that were unanimously “not representative” were deleted. Those items that were “somewhat representative” were investigated for their potential to become “clearly representative.” Those items that were unanimously voted as being “clearly representative” were retained. The purpose of this exercise was to investigate how each item performed when representativeness was judged by both adult musician and students. The results of the participants’ judgments of representativeness were used to help make discriminatory judgments for which items would be used in the field test questionnaire. This activity brought the scale closer to a usable length by narrowing the item pool and retaining generally representative items.

After these formative revisions were completed for both one-on-one and small group evaluations, I retained 24 items (with six items in each hypothesized subscale). The scale was revised according to the formatting and item suggestions and was prepared for distribution in the field test phase of the evaluation which would be used to present a clearer picture of our hypothesized constructs.

Subjects

The field test study subjects were young musicians currently enrolled in high school who participated in regular private instruction on a musical instrument, were between the ages of 14 and 18, and were native speakers of English. Exactly 150 students completed the questionnaire. Of the 150 students represented in the field study, 65% were female and 35% were male. Their demographics are represented in Table 1. These students were contacted through their music teachers, performing groups, and high school music programs in California, Arizona, Illinois, and Wisconsin. The teachers had been contacted previously and arrangements had been made for them to help with the

field test. Students were given the option to participate after their lesson or rehearsal as to not interrupt the natural flow of the teachers' plans and time constraints.

Students who participate in public school music programs, but do not have private lessons, are a possible future audience for this instrument, but were not included in the present study.

Field Test

This phase drew on the cooperation of 150 students and their instructors. The revised questionnaire packets were distributed to music instructors who administered the 24-item questionnaire to students who were willing to participate in the project. The instructors gave the questionnaire only to students who fit our subject description. These same instructors collected the questionnaire when the students were finished. Data from this phase of evaluation was used to conduct the preliminary data analysis of the pilot SEMS questionnaire.

In the field test, subjects were given the SEMS questionnaire after their lesson or rehearsal by a teacher/director who had previously agreed to participate. Arrangements with the instructors were made via phone and e-mail a few weeks before distribution. Before committing to the study, instructors were briefly coached on the purpose of the project, the necessity of frank responses, and the non-graded, private nature of the data collected. This alleviated concerns that the teachers themselves were being evaluated or their students were being compared. Subjects were told they would be given approximately 30 minutes in which to complete the questionnaire. We collected information on each individual only one time. The completed questionnaires were collected from the teacher/director in person or through the mail, depending on instructor preference. The field test participants were not offered any tangible reward for

completing the questionnaire, though they may have found some level of satisfaction in participating in a study. In return for cooperation in this project, participating teachers and music directors were promised access to the study's conclusions.

Those students who agreed to spend the time necessary to complete the questionnaire signed a consent form that described the study's purpose, their role, the risks and benefits, and the confidentiality of the information, all of which is shown in Appendix B. After completion, the questionnaires were collected. Names of students were removed and were replaced by a number in the database to maintain confidentiality.

In the field test, music students rated the strength of their belief in their capability to *do* and *approach* various necessary tasks related to practicing and performing. In other words, they made judgments of their self-efficacy towards specific self-regulatory activities in these areas.

Data Analysis

Detailed statistical results and interpretations for the field test evaluation data will be outlined in Chapter 4. Here, I will describe the student demographics and end with summaries of the analytical methods used on the data collected.

This high percentage of female participants was not surprising, particularly in seeking out high school aged musicians. It was not uncommon for a private music teacher to say, for example, that all of her high school aged students were female. Many of the boys who responded were contacted through instructors who would be teaching at music camps. Because the data came from diverse places, it would not be useful to hypothesize on the particular dispersion of sex or age among the participants though it is interesting to note the gradual decline in participation numbers as the age of the student progresses. The most common explanation for quitting musical studies is the increase in

activities and “being busy” in school and other extracurricular activities. See Table 1 for a complete table of student ages as compared to their sex.

Table 1.

Number of Students in the Field Study by Age and Gender

Age	Gender		Total
	Males	Females	
14	25	39	64
15	17	25	42
16	9	19	28
17	2	9	11
18	0	5	5
Total	53	97	150

A diverse group of musical instruments and student experiences were represented in the field test data. Students from eighteen musical instruments were represented in the field test. The greatest number of instrumentalists who participated were studying violin, cello and piano. Given the teacher contacts who followed through best, this also was not a surprise. Violin teachers also often are in contact with great amounts of violin students at any given time (i.e., orchestras, chamber groups). Students who play less common instruments (such as the bass) were reached through instructors with orchestral contacts. Comparing the self-efficacy for self-regulation of different musical instrumentalists may be an interesting topic of inquiry, though when asked of musicians, the subject may be brushed off as simply an issue of instrument personalities. The dispersion of musical instruments among field test participants is shown in Table 2.

Table 2.

Number and Percentage of Students by Instrument Played

Instrument	Number of Students	Percentage of Total
Bass	1	0.7%
Bass Guitar	2	1.3%
Bassoon	1	0.7%
Cello	18	12.0%
Clarinet	6	4.0%
Drums	3	2.0%
Flute	10	7.0%
French Horn	1	0.7%
Guitar	2	1.3%
Oboe	1	0.7%
Piano	28	19.0%
Saxophone	4	2.6%
Trombone	6	4.0%
Trumpet	3	2.0%
Tuba	2	1.3%
Viola	3	2.0%
Violin	57	38.0%
Voice	2	1.3%

The results of the field test are shown in Chapter 4 and the implications discussed in Chapter 5. The chosen methods of data analysis of the field test questionnaire were

chosen because they would help determine whether the theoretical structure was upheld by the trial data. The analysis consisted of the following techniques:

1. **Internal Consistency Reliability:** Calculate the internal consistency reliability of each subscale to find the indicated correlations between responses.
2. **Principal Components Analysis:** Conduct a Principal Components Analysis (PCA) to determine whether the hypothesized structure was supported.
3. **Content Evidence of Validity:** Obtain subject-matter experts' (experienced music instructors) ratings of item-domain congruence (classifications) and relevance.

Internal Consistency Reliability

Cronbach's coefficient alpha is commonly used to describe the internal consistency of a scale. Alpha is a function of the number of items in a scale and the degree to which they are intercorrelated. In deciding on scale length, I considered the content domain and hypothesized subcategories of the domain as well as the fact that longer scales are more subject to respondent fatigue and/or noncooperation. The item pool was purposefully three times the length of our expected final number of items, but was gradually cut down to 24 items deemed to be representative of the domain.

As far as establishing a target level for the size of the alpha coefficient, Clark and Watson (1995) suggest using an alpha level of at least .80 for a new scale. We used Cronbach's alpha coefficient to measure alpha level of the hypothesized subscales and composite scale.

Principal Components Analysis. A principal components analysis was conducted to confirm or disconfirm the hypothesized subscale structure (Bryant & Yarnold, 2000; Floyd & Widaman, 1995). The analysis was conducted using the principal components

extraction procedure in SPSS without specifying the number of components to be extracted. The extracted components were then rotated using the Promax procedure.

Content Validity Evidence

Content validity, a category of construct validity, “refers to the degree to which a test measures the content domain it purports to measure” (Sireci, 1998, p. 299).

Collecting evidence of content validity is important because in order for the scores from this assessment to be both useful and defensible, some level of content-validity evidence must be established. Content-validity evidence was measured using traditional analysis which includes producing a supportable domain map, evaluating item-objective congruence and analyzing relevance ratings. An inquiry was also made pertaining to the scale’s overall acceptability and feasibility for use as a useful tool of their area of study and teaching. This inquiry was made by interviewing and asking open-ended questions designed to get their view of the questionnaire’s feasibility and usefulness in its represent form.

In this study, the three essential aspects of content validity advocated by Sireci (1998) were examined. The first aspect, domain definition, refers to “the operational definition of the content domain” (p. 300). Content-validity evidence of domain definition was established by beginning with an operational definition of the content domain and constructing a domain map. Following the construction of this domain map, we obtained preliminary feedback regarding the elements and scope of the proposed domain from expert reviews and through the completed item-domain congruency rating activity in Appendix D.

Two traditional approaches to content validity evidence assessment were used to support domain representation and domain relevance. These techniques, which obtain

item-domain congruence ratings and relevance ratings, are appropriate sources of critical external data. Item-domain congruence indices and relevance ratings provided a means of observing the relation of item content to theoretical relationships as judged by subject-matter experts. These measures were deemed important to our investigation because items in any instrument should be representative of the targeted domain (Haynes, Richard & Kubany, 1995; Sireci, 1998).

Item-domain congruence ratings. Sireci's second aspect, domain representation, was obtained through item-domain congruence ratings. The goal of obtaining item-domain congruence data was to see how well the questionnaire represented our target domains. Item-domain congruence indices were derived from the classifications of each item given by six music educators (comprised of a professor and five music instructors of varying instruments, all of whom had a Bachelor's degree or higher). The proportion of the experts who placed an item to its hypothesized category on the domain map gave us the index number. For example, if an item were placed in a particular category by four out of six judges, the index for that item would be approximately .65. We used a criterion index of .65 or greater for considering an item to be congruent with its objective. See Appendix D for item-domain congruence instrument.

Relevance ratings. The third aspect, domain relevance, was established through having this same panel of content experts judge the relevance of each item to the content domain. Each expert rated the relevance of each item. Using a four-point rating scale, each expert was asked to rate the relevance of the items to each subscale. Data was collected from the relevance ratings of each item. Each expert, therefore, gave 96 ratings for the scale's items. The mean relevance rating across all items in a subscale was used as an index of content area representation.

Relevance ratings were analyzed using Aiken's validity index (*V* Index), a proposed statistic for quantitatively summarizing judgments collected from a series of raters about the content validity of items (Aiken, 1980; Aiken, 1996; Crocker, Miller & Franks, 1989). One of the benefits of using Aiken's *V* Index is using its feature that allows for the calculating the probability of obtaining a particular outcome, or distribution of ratings, by chance (the range is 0–1). With this analysis, we can assess the statistical significance of the relevance ratings given by the subject-matter experts.

Though originally determined to be an action beyond the initial aims of the project, obtaining basic evidence of content validity was later judged to be both feasible and appropriate. The rationale for using item-objective indices and relevance ratings to appraise content validity was that if an item was measuring what it was intended to measure, it would be placed with the objective it was originally planned and its relevance rating would be high in that area and lower in others. These judgments gave us more insight into the four-factor structural hypothesis.

CHAPTER 4: RESULTS

This chapter reports results of the item analysis, principal components analysis, and content validity studies. The end of the chapter reports feasibility and potential usability issues as collected through interviews with music educators.

Item Analysis Results

Table 3 shows the distribution of responses to each of the 24 SEMS items by the 150 students plus the mean, standard deviation, and discrimination index (the adjusted item-to-total correlation coefficient) for each item. Inspection of the distribution of responses in Table 3 indicates that the distribution for most items was negatively skewed. Response options 3, 4, and 5 were used much more than options 1 and 2 on most of the items. Option 1, “Not at all sure,” was used very infrequently. This option was used somewhat more for the items on the Planning scale, but even there it was used relatively infrequently. The one exception to this conclusion is Item 10. This item is distinctive because more students chose option 1 than option 5 on this scale, and more of them chose option 2 than option 4. Consequently, this item is positively skewed and has a larger standard deviation than any of the other items.

The adjusted-item-to-total score correlation coefficient was computed as an index of the discriminating power of each item (see Table 3). Items with low correlation coefficients lack the power to discriminate between students with high self-efficacy scores and students with low self-efficacy scores. Hence, these items likely need to be revised or deleted. This process should increase the homogeneity within the set of items retained for inclusion in the final scale. It should also increase the observed score variance and the reliability of each subscale.

Table 3.

Distribution of Responses and Descriptive Statistics for the 24 Items in the SEMS Questionnaire.

Subscale/ Item	Statement	Distribution of Responses					Mean	SD	Item-to- total correlation
		1	2	3	4	5			
Strategy Use									
1	Regularly use several different practice strategies to help me learn difficult sections faster and more accurately.	0	5	25	54	16	3.81	0.77	.39
2	Choose the best strategy for practicing a particularly difficult part.	0	3	26	53	18	3.85	0.75	.40
3	Systematically memorize my pieces.	2	15	22	24	37	3.80	1.15	.16
4	Use strategies that help prepare mentally for performances.	5	12	25	32	27	3.64	1.14	.40
5	Remember and use a new way to practice my teacher has shown me.	1	4	15	36	43	4.16	0.92	.48
6	Obtain help from others when I haven't been able to figure something out on my own.	1	5	12	31	50	4.23	0.95	.26
Planning									
7	After going home from a lesson, accurately outline what my teacher expects from me at my next lesson.	6	12	32	31	19	3.44	1.11	.47
8	Plan all the details for an upcoming performance ahead of time instead of waiting to "see how it goes".	3	5	24	37	31	3.87	1.01	.54
9	Find a consistent location for practicing, where people and noises do not distract me.	3	5	12	25	55	4.22	1.07	.34
10	Stick to a scheduled practice time.	16	27	23	23	11	2.84	1.25	.48
11	Take time to review all my lesson notes and music before my lesson.	9	11	31	27	22	3.43	1.19	.58
12	Stop and think what I want to accomplish in a rehearsal, before playing.	7	11	28	35	19	3.48	1.12	.50

(Table continues)

Table 3. (Continued)

Subscale/ Item	Statement	Distribution of Responses					Mean	SD	Item-to- total correlation
		1	2	3	4	5			
Monitoring									
13	Work diligently on a particular part, even when it is difficult or boring.	0	5	20	37	38	4.09	0.87	.41
14	Stay focused on my musical goals and not allow anything to distract me from my plan of action.	0	9	25	42	24	3.81	0.90	.57
15	Concentrate on practicing one section for a long time, if necessary.	2	3	21	41	33	4.00	0.91	.49
16	Re-focus on the piece quickly if I am distracted from it for a moment.	1	4	28	41	27	3.88	0.87	.43
17	Control my thoughts from wandering while I perform.	5	8	19	35	33	3.85	1.12	.51
18	Effectively monitor myself while practicing, especially if no one else is there to tell me to repeat something or stop.	2	6	23	39	31	3.90	0.97	.55
Evaluating									
19	Carefully keep track of how I am progressing towards my goals in music.	2	10	31	36	21	3.63	0.99	.43
20	Tell specifically what I need to improve after playing a piece.	1	4	19	38	37	4.06	0.92	.41
21	Accurately evaluate how I did at a performance without anyone else's feedback.	1	7	17	40	35	4.03	0.93	.37
22	Accurately tell how things are going as I practice.	1	3	23	44	28	3.94	0.88	.47
23	Accurately evaluate how I am living up to what my teacher expects of me.	2	2	29	40	27	3.89	0.90	.57
24	Accurately evaluate how I am living up to what I expect of myself.	1	2	17	30	49	4.24	0.90	.53

The discrimination coefficients for items 3, 6, and 9 are relatively low and indicate that these items may not have functioned as intended. These three items apparently measure something different than the other items within their subscale. These particular items addressed the issues of memorization, getting help from others, and finding a consistent place to practice. After talking with music educators in content reviews, the following three issues emerged:

1. Though highly valued to some, memorization is not a skill that all teachers emphasize, particularly in the non-solo instruments. Oftentimes, students whose music training focuses on reading and group performances do not use those skills often enough and therefore may not rank themselves highly in that area. Other students, such as those trained under the Suzuki method, have teachers who place heavy emphasis on memorization strategies and performing pieces from memory on a regular basis and may see themselves having high capabilities in that skill.

2. As for getting help from others, many students may have social or environmental issues that prevent them from having access to someone they could freely ask for help. Going to lessons each week is the extent of their help. Others, of course, are more fortunate to have peers, parents, or performing group leaders who can offer insight into problems the student cannot solve on their own. So student responses to this item may have been influenced by extraneous concerns about access (i.e., how easily accessible are people who can help you?) rather than a question of capability.

3. Finally, it was interesting to note that using a consistent place for practice would have such a diverse response. Many students simply do not plan for practice and do it wherever they find themselves in the moments before the lesson. Some students might also read that question and conclude that using more than one place to practice would be the wrong answer and would give themselves a lower score for the item. Another interesting observation is that some teachers encourage their students to practice in noisy or distracting environments to test their ability to focus in less than ideal

surroundings. These items should be removed for revision and review before inclusion on a final scale.

Internal Consistency Reliability

Cronbach's alpha was computed to estimate the reliability of each of the four subscales and the 24-item composite scale. The alpha coefficients for each of the four subscales and the composite 24-item scale are shown in Table 4.

Table 4.

Descriptive Statistics for Each Subscale (n=150)

Subscale	Number of Items	Mean	Standard Deviation	Cronbach's Alpha	Standard Error of Measurement
Strategy Use	6	23.49	3.10	.53	2.13
Planning	6	21.30	4.41	.73	2.29
Monitoring	6	23.53	3.65	.72	1.93
Evaluating	6	23.79	3.57	.73	1.86
Composite	24	92.11	12.02	.88	4.16

The internal consistency of the six items on the Strategy Use scale was .53 which was much lower than desired. This indicates that the six items in this scale are not very highly intercorrelated and may not all measure the same trait. The low item-to-total correlation coefficients for the items in this scale provide additional evidence in support of this conclusion. Table 10 in Appendix E is a 24-by-24 correlation matrix which displays the interitem correlation coefficients for all possible pairs of items in the SEMS

scale. Inspection of this table shows that items 1 and 6 are negatively correlated with each other, and that item 3 is negatively correlated with both item 5 and item 6.

The other subscales performed better with the alpha coefficients for Planning, Monitoring, and Evaluating recorded at .73, .72, and .73 respectively. Even with the lack of correlation among the items on the Strategy Use subscale, the alpha for the 24-item composite scale was .88.

Principal Components Analysis

The purpose for conducting the principal components analysis was to collect evidence to confirm or refute the hypothesized four-factor structure by determining to what extent the theoretical structure matches the structure shown in the empirical data.

Five components were extracted and then rotated using the Promax procedure. The first component accounted for 27% of the variance. The second, third, and fourth principal components accounted for 7%, 6%, 6%, and 5% respectively. Together, the four principal components accounted for 51% of the variance.

The rotated loadings are displayed in Table 5. For the most part the loadings exhibit simple structure. That is, most of the items have a relatively high loading ($\geq .40$) on one component and much lower loadings ($< .40$) on the other components. Item 8 is a clear exception to this conclusion. It does not clearly load on any of the five components and should probably be deleted from the 24-item scale. The loadings for items 1 and 6 are also somewhat worrisome. Item 1 loads on both components 2 and 3. Item 6 loads on both components 3 and 5. Considering item 6, it is important to remember that the correlation coefficients reported in Table 3 indicate that this item had low discriminating power.

Table 5.

Rotated Principal Component Loadings

Item	Principal Component				
	1	2	3	4	5
Item 1	-.12	.34	.46	-.13	.36
Item 2	.24	-.19	.13	.32	.50
Item 3	-.08	.00	.17	.06	.69
Item 4	.17	-.10	.81	-.30	.14
Item 5	-.12	.26	.50	.18	-.21
Item 6	.14	-.20	.39	.16	-.41
Item 7	.38	.44	.01	-.07	-.25
Item 8	.27	.22	.33	.04	-.21
Item 9	-.18	-.11	-.01	.84	.06
Item 10	.33	-.18	-.04	.60	-.04
Item 11	.61	-.06	.09	.19	-.07
Item 12	.59	.01	.11	.03	-.15
Item 13	.03	-.09	.66	-.01	.26
Item 14	.24	.02	.15	.40	.23
Item 15	-.07	.02	.61	.20	.06
Item 17	.25	.17	-.26	.61	.02
Item 18	.59	.09	-.06	.16	.05
Item 19	.73	-.11	.08	-.14	.16
Item 20	.73	.15	-.05	-.25	-.02
Item 21	-.13	.80	-.07	.01	.01
Item 22	.13	.72	-.05	-.05	.05
Item 23	.16	.55	.20	-.01	-.07
Item 24	.30	.49	-.14	.06	.39
Eigenvalue	6.46	1.67	1.50	1.39	1.28
Percent of Variance Accounted For	26.91	6.94	6.23	5.81	5.34

Perhaps the most important finding from the principal components analysis is that the empirical structure does not match the hypothesized structure proposed by the researcher. This finding is displayed in Table 6. The reader should note that item 8 has been excluded from Table 6 because this item does not clearly load on any of the principal components. Items 1 and 6 are included in Table 6, but they are listed as having dual loadings. Both of these items should be scrutinized and either revised or deleted. The data in Table 6 lead to the conclusion that the proposed subscale structure for the SEMS needs to be reconsidered and revised.

The items that make up principal component 1 consist of questions asking about self-evaluation of practice, performance and progress. In other words, these items focus on a student's capability to observe and judge the effectiveness of their actions. This self-evaluation may show itself in self-admonishment, cautioning or reminding.

The items that loaded most highly on principal component 2 pose questions that ask about a student's awareness of expectations. These items ask about the student's perceived capability to understand and do what is expected of them in their music studies. This includes having a clear definition of what they should expect of themselves, what their teacher expects them to accomplish each week, what they expect to accomplish in a performance, and what they expect from a practice session.

The items that make up principal component 3 relate to students' capability to use strategies to enhance preparation. These items ask about using specific practice strategies to help improve their practicing as they prepare for lessons and performances. If a student sees him or herself as capable of remembering strategies, using strategies, and concentrating on what will help them get through a difficult section, they may have a better sense of preparation.

Table 6.

Subscale Structure Indicated by the Principal Component Analysis

Item	Principal Component				
	1	2	3	4	5
Item 20	.73				
Item 19	.73				
Item 11	.61				
Item 12	.59				
Item 18	.59				
Item 21		.80			
Item 22		.72			
Item 23		.55			
Item 24		.49			
Item 7		.44			
Item 1		.34	.46		
Item 4			.81		
Item 13			.66		
Item 15			.61		
Item 5			.50		
Item 6			.39		-.41
Item 9				.84	
Item 16				.63	
Item 17				.61	
Item 10				.60	
Item 14				.40	
Item 3					.69
Item 2					.50

Note: Item 8 was omitted from this table. As shown in Table 5, it did not clearly load on any single factor.

The items in principal component 4 items ask questions relating to exercising self-control. This control is made evident by perseverance in the face of difficult music and mental or physical distractions.

Finally, the fifth principal component included only two items: item 2 and item 3. Item 2 may be problematic because it asks students to decide whether they are capable of choosing the “best” strategy before we know if they are consistently *using* strategies in practice. The inclusion of Item 3 should be questioned because though systematic memorization is a useful skill to develop, some teachers and even genres of music study do not emphasize memorization in lessons. Further insight was achieved through expert review in the form of subjective classifications and relevance ratings, which showed how music professionals themselves would essentially load each item.

Evidence of Content Validity

Six experienced music teachers were asked to assess how well the 24 SEMS items were congruent with the subscales they were intended to measure and to what degree they were relevant to the intended domain. These same teachers communicated their perception of feasibility and usability issues by answering questions about these issues.

Item-Domain Congruence Ratings. The item-domain congruence ratings for the 24-item SEMS questionnaire showed that though several strong items are present in the scale, there were some that were difficult to clearly classify. These ambiguous items were most prevalent in the Monitoring subscale. See Table 7 for the complete list of item congruence ratings (out of 6 judges) and their percentages. If an item percentage was 100, that means six of the six raters classified that item as belonging to the subscale hypothesized by the researcher.

Table 7.

Number and Percent of Judges who Classified Each Item on the Intended Subscale

Number and Percent of Judges who Classified Each Item on the Intended Subscale		
Subscale/Item	Number	Percent
Strategy Use		
1	6	100
2	4	67
3	6	100
4	6	100
5	5	83
6	5	83
Planning		
7	3	50
8	6	100
9	5	93
10	5	93
11	4	67
12	6	100

(Table continues)

Table 7. (Continued)

Number and Percent of Judges who Classified Each Item on the Intended Subscale

Number and Percent of Judges who Classified Each Item on the Intended Subscale		
Subscale/Item	Number	Percent
Monitoring		
13	3	50
14	3	50
15	4	67
16	4	67
17	5	83
18	6	100
Evaluating		
19	1	17
20	6	100
21	6	100
22	3	50
23	6	100
24	6	100

The Monitoring and Evaluating subscales contained the items with the most confusion over classification. For item 13, music educators categorized the question in Planning just as often as they did in Monitoring. The same occurred with item 14. The questions addressed the issue of focusing on a goal or particular piece. Evidently some of the judges believe focus is an element of planning rather than checking actions. Items 19 and 22 fared poorly in the Evaluating subscale. They addressed evaluating progress on goals and evaluating practice. The music educators placed the activity of tracking progress into Planning and Monitoring, and evaluating practice into Monitoring. I believe these are sound judgments and the items could be clearer in their delineation. Though some items showed poor item-domain ratings, the improvements can be made by rephrasing and even reclassifying those items.

Relevance Ratings. For the most part, the SEMS questionnaire items were rated as highly relevant to their hypothesized domain, but the relevancy of some items is questionable. Results of the relevance ratings by subscale are shown in Table 8. Some items, specifically those in the Monitoring subscale, have Aiken's V indices in the .80 range or lower. Of the Monitoring items, five out of the six items scored low. On the other subscales like Planning, lower scores were caused by one or two raters voicing differing opinions on which subscale an item was most relevant. The p-values for each subscale indicate that, with the exception of the Monitoring subscale, the relevance rating evidence enhances this aspect of the SEMS questionnaire's content validity.

From the results of the Aiken's V Index, we have two options to increase consistency in relevance ratings for the future version of the scale. The first option is to go through a more concentrated activity for training the raters on domain definitions to make sure they can make logical distinctions between categories before allowing them to judge item relevance. The second option is to collapse the scale's domains to more

Table 8.

Summary Statistics for Item Relevance Ratings by Subscale

Subscale/Item	Mean Rating	Standard Deviation	Aiken's V	
			Index	<i>p</i>
Strategy Use				
1	4.0	0	1.00	.0026
2	4.0	0	1.00	.0026
3	4.0	0	1.00	.0026
4	4.0	0	1.00	.0026
5	4.0	0	1.00	.0026
6	3.8	.45	.93	.0082
Planning				
7	3.8	.45	.93	.0082
8	4.0	0	1.00	.0026
9	3.2	1.10	.73	.1151
10	3.6	.89	.87	.0228
11	4.0	0	1.00	.0026
12	4.0	0	1.00	.0026
Monitoring				
13	3.2	1.10	.73	.1151
14	2.8	1.64	.60	.3446
15	3.2	1.30	.73	.1151

(Table continues)

Table 8. (Continued)

Summary Statistics for Item Relevance Ratings by Subscale

Subscale/Item	Mean Rating	Standard Deviation	Aiken's <i>V</i>	
			Index	<i>p</i>
Monitoring				
16	3.4	.89	.80	.0548
17	3.4	.89	.80	.0548
18	3.8	.45	.93	.0082
Evaluating				
19	3.8	.45	.93	.0082
20	4.0	0	1.00	.0026
21	4.0	0	1.00	.0026
22	4.0	0	1.00	.0026
23	4.0	0	1.00	.0026
24	4.0	0	1.00	.0026

accurately conform to the raters' pre-existing assumptions of the subscale domains. This may include integrating the Monitoring and Evaluation items into one domain definition.

Feasibility

Instructors who participated in the content evidence of validity evaluation also formally answered the question: How feasible is the SEMS questionnaire for use by private music teachers and their students? In other words, how they perceived this questionnaire being utilized in a realistic teaching environment.

Environment. The response pattern honed in on the practicability of using this questionnaire to help teachers teach each other. From the responses, it became apparent that the key to successfully utilizing this questionnaire and the information it provides is to present it to teachers while they are in an environment for change. Each music educator brought up the subject of introducing the questionnaire at a teacher workshop or presenting it at a conference or a meeting of music teachers. The experts claimed that teachers who attend such meetings are generally seeking for ways to improve, looking for ideas to latch onto, opening their hands for new materials, and are enthusiastic about learning in general. One piano instructor said, "Take this to a piano teacher conference, where we go to learn, or to a pedagogy workshop or master classes specifically for teachers. When they go to conferences and workshops, they tend to be the ones that are more open and would really love this kind of information." Another instructor commented that, "The information presented here seems to be perfect for studying about teaching. It is worth several articles in the American String Teachers Association (ASTA), Music Teachers National Association (MTNA), The National Association for Music Education (MENC), and American Suzuki Journal." In other words, there are many realistic venues where this scale could be readily introduced to and accepted by the instructors. Reaching to instructors in this kind of environment would potentially give

teachers an exciting new slant on what they are doing, or what they could be doing to enhance their students' self-regulation skills.

Time. The questionnaire takes well under thirty minutes to complete, even for slower-reading students. Most of our field test students needed less than fifteen minutes to finish. The amount of time required is an important consideration because teachers often do not have more than thirty minutes with a student during a lesson. The relative quickness for responding may add to the appeal to teachers as well as their students.

Cost. The SEMS questionnaire also has advantage in its chosen medium both in terms of cost and usability. Being a paper-based tool is a great advantage with this audience. Most music teachers do not use forms of electronic media to teach or interact with their students. In addition, many teachers do not have more than a few students who would fit the profile, and so would only need to order a few packets of questionnaires, which would not amount to much of a real cost. The ease of accessibility to the product, as well as low cost, could be large factors in the questionnaire's feasibility as an instructional tool.

Potential Usefulness

What is the potential usefulness of the SEMS questionnaire for improving private music instruction? It was not difficult for music educators to find instances where the SEMS questionnaire could improve current instruction. Through one-on-one interviews conducted over the phone or at the home of each of the music educators, four main areas for potential use were identified: (a) to review student progress, (b) to act as feedback tool for teachers, (c) to be a focal point in the lesson itself, and (d) to direct teachers in forming their instruction.

The thought of enhancing awareness of these specific skills and a teacher's ability to measure students' perceived capabilities struck a common chord of interest and excitement. Comments from music educators included such potential uses as being a

means for teachers to review their students' progress as well as the clarity of their own approach. "[The questionnaire] is a good tool to help teachers become aware of these issues and how their students see themselves doing these things." One teacher commented that this questionnaire made her ask herself, "Am I teaching my students monitoring skills? Am I cluing them in to my type of evaluation and encouraging them to find their own self-evaluation approach?" I think these are valuable questions that would benefit both teacher and student.

Another possibility is to use the questionnaire as a method of feedback for teachers. "From a professional standpoint, the project seems to be perfectly suited for an opportunity to teach teachers how to teach." "The questions outline what the students eventually *should* be able to do on their own and the questionnaire acts as a measuring stick to see how they are doing."

Teachers may also use the questionnaire as a focus point in their lesson and to discuss it with their student. Several music educators commented that discussing the questionnaire with students adds the interesting dimension of student perception; a dimension that is missing from many teaching approaches. One teacher correctly observed, "Even if the teacher believes the child can act upon a particular skill set, it is useful to see where the student rates themselves the lowest." The idea behind this use is that the students will answer the questions and reflect, while the teacher can see where they can help students help themselves.

Before deciding to use the SEMS instrument with a particular student a teacher should consider the student's: (a) age, (b) experience, (c) maturity, and (d) musical ability. For example, a sixteen-year-old who has been studying piano for six months will probably not have the same musical experience, maturity, or ability as a thirteen-year-old who has been studying since he was four. It was suggested that a student have completed

at least three years of music lessons before being held accountable for cultivating these traits. This time is needed so they can start thinking for themselves.

The usefulness of encouraging these kinds of skills in music students has potential beyond the music arena. Two of the teachers noted that improvements in their music students' practice and effort levels transferred and directly benefited their daily schoolwork. Most specifically, the potential usefulness rests on the fact that sometimes simple questions lead to a worthwhile end product. The questionnaire can work as a guide as well as a stimulus to action. As one subject-matter expert noted, the questionnaire outlines "an understanding of what you need to *do*. It's a domino effect. If you don't have a good plan, then you won't have a good result." With self-regulatory skills, most music students do need guidance and specific teaching to help them focus and develop into independent, self-directed learners and musicians.

The music educators who were interviewed thought it very possible and desirable to incorporate the concepts behind self-regulation into the lesson to help students become more independent in their practicing and approach to performances.

The reaction to the project's purpose and product was overwhelmingly positive. Though the scale will likely change over time as improvements are implemented, the goals and format of the questionnaire were well-received. Asking capability belief (self-efficacy) questions to enhance self-regulatory awareness in music students and teachers has great potential for future interest and research.

Once again, the feasibility for use by private music teachers and their students will be possible only if the teacher is actively looking for new ideas, theories, or materials to enhance their teaching. I agree that the best way to properly get the information into the hands of those who will benefit the most is to take it to the places where teacher-learners congregate. Academic and music conventions, journal articles, music teacher

conferences, teacher discussion forums all present an opportunistic environment where sharing new approaches with those who can see the value of teaching self-regulatory skills to music students is possible. This, combined with simple, user-friendly directions for administration and interpretation, will make the SEMS questionnaire more valuable to teachers and student users.

CHAPTER 5: DISCUSSION

This chapter begins with recommendations for future directions in the development of self-efficacy and self-regulation scales in the area of music education. The chapter concludes by examining the strengths and weaknesses of the project.

I approached the issue of self-efficacy by beginning with an inquiry into what actions could improve performance of music students. This question led to an investigation of the role of self-regulation in the realm of academics and musical studies. From the results, it seems that cognitive regulation is a key to opening students' eyes to their own capability to use fundamental skills to support their natural abilities. It is then the teacher's responsibility to help each student cultivate a sense of awareness by (a) becoming educated in basic cognitive theory, (b) using a variety of strategies they can model in the lessons, (c) emphasizing the importance of self-control and what that means, (d) clearly outlining expectations and correcting faulty reasoning and, (e) giving students opportunities to evaluate themselves and others. In short, the teacher should put each area of focus into practice by modeling how it should be done and reinforcing student efforts in these areas.

Recommendations

The structure of the SEMS questionnaire was complex due to the presence of subscales. For future scale development in this area, I would advocate one of two options. First, the developer could potentially produce individual short subscales with few items (i.e., 6 items) for each of the selected subdomains of self-regulatory skills (i.e., Strategy Use, Planning, Evaluating, etc.). Dividing the overall coverage into smaller pieces may be beneficial from a scale development point of view and perhaps to the end user as well. The developer could devote considerable focus to each subset of items, and

the teacher could use separate scales to conduct a series of tests for their students instead of using one larger test. Publishing each subscale as a separate questionnaire might provide a more manageable approach for both parties.

Secondly, in light of the information given in the results, I propose continuing the development process by constructing a new domain map that more accurately encompasses the changes derived from data in the results and content validity evidence feedback. I would recommend deleting items 8 and 23 to improve the clarity and consistency of each observed item cluster. I would also recommend deleting items 13 and 15 as they received low relevance ratings. With these deletions, I would recommend writing more items for the subscales that lost weaker items during the revision in an attempt to increase the alpha coefficient. If the subscales are to be administered and used together, I would suggest keeping the total number of items to at least twenty-four.

I recommend retention of the first four subscales and deletion of the fifth, as identified in the principal components analysis. A new domain map such as the one in Figure 2 should be constructed and questionnaire items included, deleted or added as needed to represent the four components of the construct. The revised subscale structure should then undergo subject-matter expert review and be incorporated into the next version of the questionnaire. The revised questionnaire should be presented to a larger sample of students and examined for evidence of both content and construct validity. I believe the result would be a psychometrically and theoretically stronger questionnaire, one that would be feasible to use as well as useful to the teacher and student as they enhance these skills.

Once the revised questionnaire has been judged to provide reliable scores that lead to valid inferences, I recommend that a user's guide be produced. The reason is that music teachers will be in charge of scoring and interpreting the scores of the questionnaire. The user's guide should provide an example of how an individual

student's score should be tallied and brief instructions for correctly interpreting the student's score for each subscale.

		Practicing
Self-Regulation	Regulation of Cognition	Awareness of Expectations
		Strategy Use to Enhance Preparation
		Exercising Self-Control
		Self-evaluation of Practice, Performance & Progress

Figure 2. Recommended Domain Map

Strengths

Using a domain map to guide the construction of the item pool was immensely helpful. Though the structure of the domain map changed through the various iterations of analysis, it kept the focus of the questionnaire in check and helped with categorization of the items to assure adequate coverage of each domain. Strengths of the project included obtaining a variety of professional perspectives from the subject-matter experts. Discussing the scale development issues with teachers and students from various backgrounds was an excellent technique to uncover and resolve issues efficiently. Not everyone agreed with the opinions the others, and each brought their own teaching and learning experiences into the picture, which also helped me broaden my perspectives of teaching self-regulatory skills in private music lessons.

Having the small group questionnaire prepared before meeting with the group helped lead our discussion into answering questions on scale format and content in a

concise and organized manner. The participants in that phase appreciated the organization of the discussion and the visual aids (small-group questionnaire) because it helped them visually confirm what was being asked of them.

The methods used to collect evidence of content validity were most helpful to me in seeing where those who work in the area of music instruction perceived the items to be categorized. This was most evident in the item-domain congruence rating results. The teachers' responses opened my eyes to potential pitfalls in my own perception of classifications and their explanations as to why they chose one category over another helped me see how intertwined self-regulatory skills are when put into practice. This phase was a key factor in improving my understanding of private music instructors' motivations and personal theories of teaching. The construction and use of content-validity evidence questionnaires also helped me improve skills in developing evaluation instruments and item writing.

Weaknesses

Overall, I believe the project would have benefited from more iterative reviews. Taking each revision back to two or three subject-matter experts for their opinions on classification and relevance would have been difficult to do logistically, but would have helped the decision-making process. Ideally, I would have had the time and connections to coordinate twenty-plus subject-matter experts for classification and relevance data collection. This would have helped to minimize the incidence of crossloading items by subjecting the proposed items to many reviews to see if the music educators agreed upon their classifications before setting out to test with students. By following the traditional techniques for content-validity evidence collection, it is possible the experts' responses could reflect general predispositions or could be directly influenced by the developer's

conceptualization of the domain (via presented explanation and new knowledge of the desired domain map). One possible analytical technique that could be used in the future is multidimensional scaling, a newer procedure that uses data gathered by a larger group of reviewers (20+) to provides a visual representation of the data structure. Another possible technique would be the paired comparison procedure, a method that can be used to eliminate unwanted sources of bias in ratings, one of our concerns here (Sireci, 1998).

During the course of learning about scale development and analysis techniques, the importance of establishing construct definitions and structure prior to assessing internal consistency became apparent, as did the importance of frequent music educator feedback. The results of these analyses led to a better understanding of what would improve the continuing development process and improve the finalized SEMS questionnaire.

The analysis involved the use of real data from a scale where the factor structure was not known beforehand, and so I did my best with the resources available. In the future, however, these procedures should be done with earlier attention to the areas of content-validity evidence, particularly domain relevance, and repeating reviews.

Summary

The positive response to the scale's theoretical basis, goals, and format were indicative that musicians are becoming more aware of the metacognitive aspects of their profession and of the need to teach these skills to young students. I firmly believe that when self-regulatory skills are openly discussed and developed, the self-efficacy of a student towards these activities will increase. When implemented, this scale could act as the focal point for these discussions and instructional exploration.

With the information taken from this instrument and from future variations of this instrument, instructors may enhance their awareness and their ability to make more sound

instructional judgments when trying to support positive self-perception of self-regulatory skills in their music students.

Discussion of Project Timeline

The first phases of the project began in January 2003 with the estimated completion date reaching to July 2003 (see Figure 3 for complete schedule).

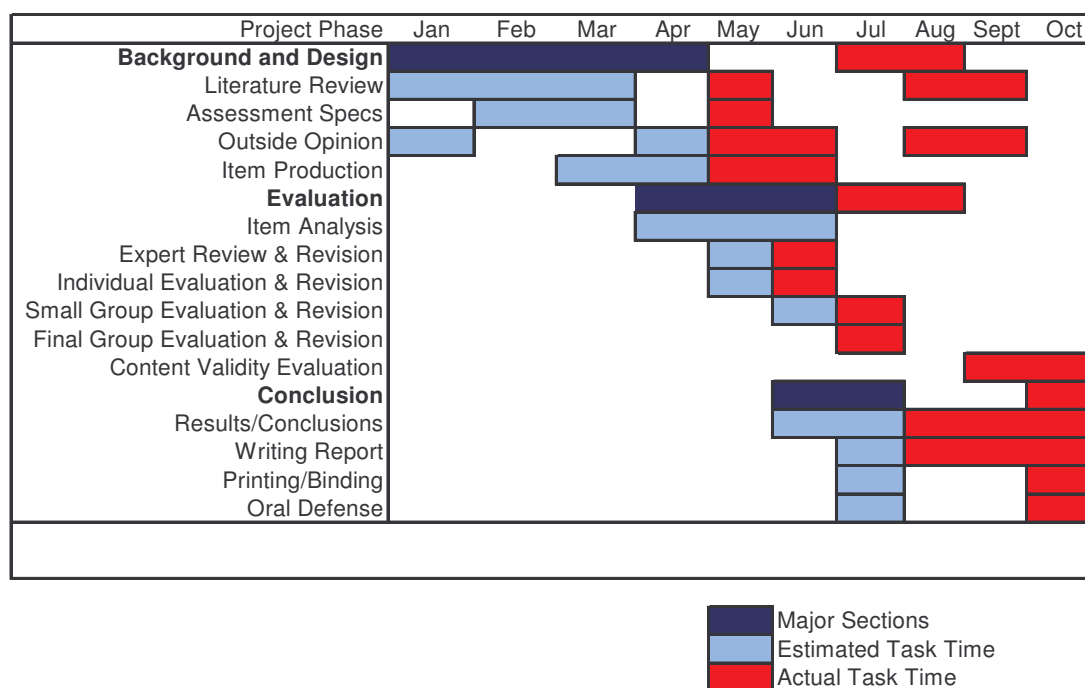


Figure 3. Project Timeline

The initial development plan was to spend ten hours each week on the project, which was then reduced to five to eight hours a week due to increased workplace demands. This difference in hours per week makes a considerable impact on the “real time” necessary for project completion. Considerable effort and hours went into particular phases involving theoretical research, student participants and outside evaluators. These formative evaluations took place during the months of June, July, September, and October.

In the initial project timeline, no time was allotted to collecting content validation evidence because it was not included into the project plan at the time. Gathering data and performing principal components analysis was the second large piece that was initially judged to be out of the scope of the proposal and therefore was not part of the original project plan and timeline. However, careful consideration and further inquiry into development and evaluation issues compelled me to build upon the original project to include more along the lines of evaluation and interpretation through PCA and content validity. The addition of these two aspects of the project were particularly beneficial both to me as a student learning about scale production issues and to the future development of a better questionnaire.

The addition of these major pieces added to the timeline in all areas. Content validity evidence warranted a new space on the project timeline, which accounts for the September/October work in that new area. It was particularly difficult to keep on schedule when finding music experts and scheduling with them around full time work schedules became a key issue. Background and design work had to be completed for the materials used to evaluate content validity evidence and the principal components analysis. More literature was gathered on methods and studies involved with content validity evidence and factor analysis considerations, particularly in the decision of which type of analysis to use (Briggs & Cheek, 1986; Bryant & Yarnold, 2000). Time was allotted for these sections to gather data and perform new item analyses. Finally, the results and conclusion chapters were expanded to include this new information which naturally became major parts of the report. Time taken to restructure the study and evaluation techniques added to the time needed. In light of our additions and to allow adequate time for committee review, the oral defense of the project was completed in October with revisions completed in November 2003.

Discussion of Project Costs

In summarizing the costs associated with this project, the most interesting fact is that the actual cost was close to the original estimate (see Table 9). This can be attributed mainly to two things: first, most of the personnel time was attributed to my own schedule and the project was a smaller operation. Second, the planning for materials and having volunteers for most of the outside work helped reduce out-of-pocket costs.

The designing phase took more hours than estimated because it included all the literature review which grew in several phases. As the project developed and analysis techniques were investigated, more research was needed in later months. This added to the time designated to that phase. The evaluation phase took less time than originally estimated, which I would attribute to the finite schedule needed to get the results and revise both for the formative and the content validity evidence. I estimated too highly on the conclusion phase, which took forty less hours than I originally thought. This phase was helped by previous planning and research which led to making clear conclusions and recommendations given the information that was gathered during the other phases. I counted my discussions with Dr. Sudweeks into the consultant category and added his hours to those of other teachers. We spent larger amounts of time discussing during my visits to Utah than during the regular weekly calls, which attributes to the estimation discrepancy. The editor work cost what was expected because I offered and paid a flat fee.

The small differences in physical material costs can be credited to underestimating the amount of paper used to print drafts and questionnaires for students. Originally I planned to fly to Utah once in the month of May and again in August, but I extended my project through the Fall and defended in October, making a total of three

Table 9.

Itemized Budget of Estimated and Actual Costs

Resource	Number of Hours		Rate	Cost		
	Estimated	Actual		Estimated	Actual	
Personnel						
Design	96	128	\$18/hr	\$1,728	\$2,304	
Evaluation	100	84	\$18/hr	\$1,800	\$1,512	
Conclusion	120	80	\$18/hr	\$2,160	\$1,440	
Consultants	22	42	\$30/hr	\$660	\$1,300	
Editor	24	24	\$250/job	\$250	\$250	
Materials						
Paper Reams	1	2	\$15	\$15	\$30	
Copying	600	800	\$0.05	\$30	\$40	
Report Copies	300	950	\$0.05	\$15	\$48	
Other						
Air Travel	2	3	\$160/trip	\$320	\$450	
Gas (gallons)	10	12	1.76/gal.	\$18	\$21	
FedEx/Mailing	10	17	\$3.85 each	\$39	\$65	
Final Copies	5	7	\$13 each	\$65	\$91	
Project Total	362	328		\$7099	\$7551	

trips. As for gas prices, my frequent trips to south Orange County added a few dollars onto my mileage. Also, more teachers needed to have materials sent through the mail than originally planned, a cost that quickly adds up when sending bundles of information and questionnaires in packages. Last of all, I decided to have two more copies of my project bound, which added another twenty-six dollars to my original estimate.

Overall, I was pleased with the final results of the project costs. With some adjustments for consultant work and travel, which were necessary given my location, the final costs would have been lower than the estimated costs.

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APPENDIX A: Domain Maps

			Practice	Lessons	Performance
Self-Regulation	Metacognition	Knowledge of Cognition	Strategy Use	Strategy Use	Strategy Use
		Regulation of Cognition	Planning	Planning	Planning
			Monitoring	Monitoring	Monitoring
			Evaluating	Evaluating	Evaluating

Figure 4. First version of Domain map

		Practicing	Performing
Self-Regulation Metacognition	Knowledge of Cognition	Strategy Use	Strategy Use
	Regulation of Cognition	Planning	Planning
		Monitoring	Monitoring
		Evaluating	Evaluating

Figure 5. Intermediate version of Domain map used in Field Test Study

APPENDIX B: Field Test SEMS Questionnaire

Consent to be a Research Subject

First, answer the following three questions:

Are you between the ages of 14 and 18 years old? Yes No

Is English your native language? Yes No

Do you take private music lessons? Yes No

If you answered “No” to any of the questions above, please **stop** and do not continue.
If you answered “Yes” to all of the questions above, please continue.

DEMOGRAPHICS

Age: _____

Class Level (check one): Freshman Sophomore Junior Senior

Instrument(s) for which you receive private lessons: _____

Gender: Male Female

Be sure to SIGN and DATE the bottom of the next page before taking the questionnaire.

CONSENT FORM

The purpose of this research study is to analyze the reliability of a new questionnaire. Kathryn Pearson, a graduate student in Instructional Psychology and Technology at Brigham Young University, is conducting this study. You were selected for participation because you fit our desired user group profile.

This questionnaire is part of a study of music instruction and learning in relation to student self-efficacy (capability beliefs) and self-regulatory behaviors. We would like to ask for your participation in the study. As part of the study, you will be asked to fill out a questionnaire related to specific tasks that are common to music students who take private lessons. There are minimal risks or discomforts for participation in this study.

You will fill out the questionnaire during a time deemed convenient for your teacher or director. This will likely be after your individual lesson time or rehearsal. Your teacher or director will collect the questionnaire from you when you are finished. As a research participant, we will require approximately 20 minutes of your time to complete the questionnaire. You will complete the questionnaire on your own, preferably sitting separately from any one else.

There are no known benefits or risks to you for participating in this study. Future students and music instructors may benefit for the knowledge gained regarding the importance of self-efficacy and designing appropriate instructional activities to support this trait in students like you.

YOUR PARTICIPATION IS VOLUNTARY AND NOT RELATED IN ANY WAY TO YOUR GRADE IN THIS CLASS OR YOUR POSITION IN ANY PERFORMING GROUP. You may decide to participate now but you can withdraw from the study at any time with no penalty. All your responses are strictly confidential and only members of the research team will see your individual responses.

THERE ARE NO RIGHT OR WRONG ANSWERS TO THIS QUESTIONNAIRE. THIS IS NOT A TEST. We want you to respond to the questionnaire as accurately as possible, reflecting your own real attitudes and behaviors.

Participation in this research is voluntary. You have the right to refuse to participate and the right to withdraw later without any jeopardy to your grade or any other record. Your answers will not be seen by any one other than the researchers. Strict confidentiality will be maintained. No individual identifying information will be disclosed. All identifying references will be removed and replaced by control numbers. All data collected in this research study will be stored in a secure area and access will only be given to personnel associated with the study. Your answers to this questionnaire will be analyzed by computer, not by your teacher.

If you have any questions regarding this research project, you may contact Kathryn Pearson, 503 Verano Place, Irvine, California 92613; (949) 856-3089. If you have questions regarding your rights as a participant in a research project, you may contact Dr. Shane S. Schulthies, Chair of the Institutional Review Board, 120B RB, Brigham Young University, Provo, Utah 84602; phone, (801) 422-5490.

Please sign below if you would like to be involved in this study. Thank you for your cooperation.

I have read, understood, and received a copy of the above consent, and desire of my own free will and volition, to participate in this study.

Your Name: _____ Date: _____

Performing Group or School: _____

DIRECTIONS: Please rate how you feel about your ability to successfully complete each of the following tasks. Please give your frank opinions.

- 1 Not at all sure I can
- 2 Only slightly sure I can
- 3 Somewhat sure I can
- 4 Quite sure I can
- 5 Extremely sure I can

- _____ Regularly use several different practice strategies to help me learn difficult sections faster and more accurately.
- _____ Choose the best strategy for practicing a particularly difficult part.
- _____ Systematically memorize my pieces.
- _____ Use strategies that help prepare mentally for performances.
- _____ Remember and use a new way to practice my teacher has shown me.
- _____ Obtain help from others when I haven't been able to figure something out on my own.
- _____ After going home from a lesson, accurately outline what my teacher expects from me at my next lesson.
- _____ Plan all the details for an upcoming performance ahead of time instead of waiting to "see how it goes".
- _____ Find a consistent location for practicing, where people and noises do not distract me.
- _____ Stick to a scheduled practice time.
- _____ Take time to review all my lesson notes and music before my lesson.
- _____ Stop and think what I want to accomplish in a rehearsal, before playing.
- _____ Work diligently on a particular part, even when it is difficult or boring.

Continued on next page

DIRECTIONS: Please rate how you feel about your ability to successfully complete each of the following tasks. Please give your frank opinions.

- 1 Not at all sure I can
- 2 Only slightly sure I can
- 3 Somewhat sure I can
- 4 Quite sure I can
- 5 Extremely sure I can

- _____ Stay focused on my musical goals and not allow anything to distract me from my plan of action.
- _____ Concentrate on practicing one section for a long time, if necessary.
- _____ Re-focus on the piece quickly if I am distracted from it for a moment.
- _____ Control my thoughts from wandering while I perform.
- _____ Effectively monitor myself while practicing, especially if no one else is there to tell me to repeat something or stop.
- _____ Carefully keep track of how I am progressing towards my goals in music.
- _____ Tell specifically what I need to improve after playing a piece.
- _____ Accurately evaluate how I did at a performance without anyone else's feedback.
- _____ Accurately tell how things are going as I practice.
- _____ Accurately evaluate how I am living up to what my teacher expects of me.
- _____ Accurately evaluate how I am living up to what I expect of myself.
-

APPENDIX C: Small Group Evaluation Questionnaire

Small Group Questionnaire

QUESTIONNAIRE FORMAT

1. Are the directions clear to you? Would you add anything else?
2. Does the questionnaire seem usable?
3. Is its format attractive to you?
4. What would you change about its “looks” if you could?

FORMAT A	0	Not at all sure I can
	1	
	2	Only slightly sure I can
	3	
	4	Somewhat sure I can
	5	
	6	Fairly sure I can
	7	
	8	Quite sure I can
	9	
	10	Extremely sure I can
FORMAT B	1	Not at all sure I can
	2	Only slightly sure I can
	3	Somewhat sure I can
	4	Quite sure I can
	5	Absolutely sure I can

SCALE FORMAT

1. Which format is clearer? A B
2. Which do you prefer? A B
3. Do the number of scale points (1-5 or 1-10) make a difference to you?
4. Would you change any of the words used on the scale?
5. Which words would you change?

REPRESENTATIVE CONTENT

1. We will rate the degree to which the question represents the definitions and areas we want to cover. We will keep those questions that are clearly representative and either discard or re-work those that are somewhat representative.

- 1 not representative
- 2 somewhat representative
- 3 clearly representative

APPENDIX D: Content Evidence of Validity Questionnaires

Content Validity Evidence Questionnaires

Acquaint yourself with the following definitions:

Strategy Use: Refers to the conscious, intentional use by a learner of one or more learning strategies to accomplish a specific goal or purpose.

Planning: The process of developing a proposed course of action. The process includes organizing and arranging elements or key parts and producing a plan or outline. Planning includes the production of goals, practice outlines, time usage, schedules, and mental outlines.

Monitoring: Includes the process of observing one's own actions and procedures. Monitoring may result in self-admonishment, cautioning or reminding, especially regarding conduct. Includes checking content of actions, systematically tracking progress, and self-testing as a basis for supervising oneself.

Evaluating: Judging or appraising the effectiveness of one's actions. Includes observing the resulting product(s) of your chosen procedures and deciding to what extent the relevant criteria for success are met.

DIRECTIONS: Read the statement on each of the accompanying index cards one at a time. Using the Classification table shown on the accompanying sheet, classify each statement in terms of (1) which self regulatory process it best represents, and (2) the context in which the process would most likely occur. Place the card in the row and column of the Classification Table which best indicates your decision.

CLASSIFICATION TABLE

		CONTEXT	
		PRACTICE	PERFORMANCE
SELF-REGULATORY PROCESS	Strategy Use		
	Planning		
	Monitoring		
	Evaluating		

3x5 Cards with
Written Statements
(24 items)

Does not apply

DIRECTIONS: Twenty-four statements are listed below in the left column. Each of these statements describes an action. Rate the relevance of each action to each of the self-regulatory processes (Strategy Use, Planning, Monitoring, Evaluating). Use the 4-point Rating Scale shown in the box as a basis assigning ratings. Rate each statement four times, once for each of the self-regulatory processes. Record your ratings in the blanks on the right side of each statement.

RATING SCALE

1 Not at all relevant	2 Not very relevant	3 Somewhat relevant	4 Highly relevant
--------------------------	------------------------	------------------------	----------------------

ACTION	SELF-REGULATORY PROCESSES			
	Strategy Use	Planning	Monitoring	Evaluating
1. Regularly use several different practice strategies to help me learn difficult sections.	_____	_____	_____	_____
2. Choose the best strategy for practicing a particularly difficult part.	_____	_____	_____	_____
3. Systematically memorize my pieces.	_____	_____	_____	_____
4. Use strategies that help prepare mentally for performances.	_____	_____	_____	_____

RATING SCALE

1 Not at all relevant	2 Not very relevant	3 Somewhat relevant	4 Highly relevant
--------------------------	------------------------	------------------------	----------------------

SELF-REGULATORY PROCESSES

ACTION	Strategy Use	Planning	Monitoring	Evaluating
5. Remember and use a new way to practice my teacher has shown to me.	_____	_____	_____	_____
6. Obtain help from others when I haven't been able to figure something out on my own.	_____	_____	_____	_____
7. After going home from a lesson, accurately outline what my teacher expects from me at my next lesson.	_____	_____	_____	_____
8. Plan all the details for an upcoming performance ahead of time instead of waiting to "see how it goes".	_____	_____	_____	_____
9. Find a consistent location for practicing, where people and noises do not distract me.	_____	_____	_____	_____

RATING SCALE

1 Not at all relevant	2 Not very relevant	3 Somewhat relevant	4 Highly relevant
--------------------------	------------------------	------------------------	----------------------

SELF-REGULATORY PROCESSES

ACTION	Strategy Use	Planning	Monitoring	Evaluating
10. Stick to a scheduled practice time.	_____	_____	_____	_____
11. Take time to review all my lesson notes and music before my lesson.	_____	_____	_____	_____
12. Stop and think what I want to accomplish in a rehearsal before playing.	_____	_____	_____	_____
13. Work diligently on a particular part, even when it is difficult or boring.	_____	_____	_____	_____
14. Stay focused on my musical goals and not allow anything to distract me from my plan of action.	_____	_____	_____	_____

RATING SCALE

1 Not at all relevant	2 Not very relevant	3 Somewhat relevant	4 Highly relevant
--------------------------	------------------------	------------------------	----------------------

SELF-REGULATORY PROCESSES

ACTION	Strategy Use	Planning	Monitoring	Evaluating
15. Concentrate on practicing one section for a long time if necessary.	_____	_____	_____	_____
16. Control my thoughts from wandering when I perform.	_____	_____	_____	_____
17. Re-focus on the piece quickly if I am distracted from it for a moment.	_____	_____	_____	_____
18. Effectively monitor myself while practicing, especially if no one else is there to tell me to repeat something or stop.	_____	_____	_____	_____
19. Carefully keep track of how I am progressing towards my goals in music.	_____	_____	_____	_____

RATING SCALE

1 Not at all relevant	2 Not very relevant	3 Somewhat relevant	4 Highly relevant
--------------------------	------------------------	------------------------	----------------------

SELF-REGULATORY PROCESSES

ACTION	Strategy Use	Planning	Monitoring	Evaluating
20. Tell specifically what I need to improve after playing a piece.	_____	_____	_____	_____
21. Accurately evaluate how I did at a performance without anyone else's feedback.	_____	_____	_____	_____
22. Accurately tell how things are going as I practice.	_____	_____	_____	_____
23. Accurately evaluate how I am living up to what my teacher expects of me.	_____	_____	_____	_____
24. Accurately evaluate how I am living up to what I expect of myself.	_____	_____	_____	_____

APPENDIX E: Interitem Correlation Matrix

Table 10.

Interitem Correlation Matrix

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1		.22	.21	.32	.33	-.02	.14	.25	.04	.22	.19	.07	.18	.27	.17	.21	.15	.14	.15	.10	.22	.30	.33	.31
2			.18	.20	.11	.07	.06	.22	.18	.27	.22	.21	.23	.36	.27	.23	.32	.24	.17	.27	.15	.15	.12	.33
3				.11	-.01	-.14	.07	-.03	.08	.05	.07	.09	.12	.12	.13	.21	.07	.07	.15	-.04	.16	.00	.10	.25
4					.27	.29	.15	.33	.09	.14	.24	.22	.33	.25	.25	.13	.10	.17	.24	.26	.11	.17	.26	.15
5						.4	.32	.30	.17	.32	.30	.18	.23	.30	.42	.33	.23	.22	.20	.17	.21	.24	.35	.16
6							.11	.23	.20	.21	.15	.21	.13	.13	.21	.11	.14	.20	.14	.18	.06	.05	.14	-.02
7								.37	.12	.23	.37	.36	.13	.21	.24	.21	.21	.30	.33	.24	.26	.24	.43	.33
8									.20	.26	.37	.42	.29	.31	.26	.24	.36	.22	.25	.30	.29	.23	.37	.20
9										.38	.23	.06	.20	.36	.23	.29	.29	.13	.14	-.03	.13	.15	.15	.24
10											.47	.31	.10	.36	.23	.23	.34	.33	.23	.22	.07	.15	.21	.22
11												.48	.19	.29	.39	.16	.36	.42	.36	.32	.10	.24	.34	.30
12													.25	.24	.29	.17	.32	.38	.28	.6	.21	.19	.31	.18
13														.23	.41	.21	.18	.27	.23	.10	.12	.16	.26	.26
14															.37	.27	.37	.44	.32	.26	.14	.34	.40	.33
15																.29	.11	.29	.06	.16	.15	.27	.32	.22
16																	.45	.24	.07	.03	.31	.24	.28	.21
17																		.38	.19	.27	.22	.21	.34	.36
18																			.39	.32	.14	.43	.35	.33
19																				.31	.04	.20	.26	.29
20																					.24	.25	.22	.36
21																						.42	.29	.38
22																							.45	.51
23																								.37
24																								