An Observation Tool for Self-Regulatory Events in Music Teaching (T-SREM): Development and Testing of a Video Coding Tool for Music Lessons

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Abstract

An observation tool for self-regulatory events in music teaching (T-SREM): Development and testing of a video coding tool for music lessons

Elizabeth Warwick

Many young people embark on music lessons during childhood, but few pursue such instruction beyond a few years' time, thus missing out on the life-long pleasure of making music for oneself. Problems with children's self-regulation of learning, particularly the three-phase cycle of forethought, performance, and reflection proposed by Zimmerman (2000, 2006, 2008, 2011), may influence the abandonment of formal music lessons, as suggested by the research of McPherson and his colleagues (McPherson et al., 2012; McPherson & Renwick, 2011; McPherson, Nielsen, & Renwick, 2013; McPherson & Zimmerman, 2011). As part of a larger project examining self-regulation and music learning in the digital age, an observation tool for coding self-regulatory events in music lessons was developed.

The tool uses categories from Zimmerman's self-regulatory cycle of learning to code verbal and nonverbal interactions and behaviours of teachers and students in videotaped music lessons. The iterative process of the tool's development is presented and discussed, including an analysis of issues around using videotaped material. Results from a pilot test, in which researchers coded 12.9 hours of videotaped lessons from four music teachers in the Greater Toronto Area, are given. Patterns in self-regulated learning that emerged during the pilot test are explored, suggestions for triangulating the results with other project data are presented, and suggestions for further research are given.

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Dedication

To my parents Donald Warwick (d. 1997) and Ellen Warwick

Your love, intelligence, curiosity, and commitment to helping others have been, and always will be, an inspiration.

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Chapter 1: Self-Regulated Learning in Music Lessons

Across centuries and cultures, humans of all ages have exhibited a drive to make and listen to music, or what Levitin (2006) refers to as music's "ubiquity and its antiquity." Even in 21st-century North America, where people have access to myriad entertainment opportunities, enjoying music through listening or playing persists, especially among young people (McPherson, Davidson, & Faulkner, 2012). In 2009, American youth ages 8 to 18 reported spending an average of 2 hours and 19 minutes per day listening to music (Rideout, Foehr, & Roberts, 2010). As well, more than 79% reported owning some form of portable audio system, such as an iPod (Rideout et al., 2010).

Data for examining youth creation of music through, for example, piano or violin lessons, are limited and in need of further elaboration (Hill, 2011). However, data from the 2001 Canadian National Longitudinal Survey of Children and Youth show that 25% of children ages 6 to 9 took part in weekly lessons or instruction in music, art, or other non-sport activities, with that percentage rising to 47% for youth ages 10 to 13 and then falling to 38% for teens ages 14 to 17 (Guèvremont, Findlay, & Kohen, 2008). (The survey questions did not ask specifically about music instruction only.) Those who do participate in formal music training appear to reap numerous benefits, ranging from improved reasoning skills to higher levels of cognitive-emotional awareness (McPherson et al., 2012).

Yet, while the numbers suggest that many young people begin formal music lessons at some time in childhood, research also shows that few pursue their music studies long enough to achieve a level of proficiency permitting them to make music independently and for their own pleasure throughout the life span (McPherson et al., 2012; Upitis & Abrami, 2013). Research has been carried out to examine the underlying reasons for the highly variable outcomes in music lessons, focusing on a host of factors, including hours devoted to practice (Ericsson, Krampe, & Tesch-Romer, 1993; Macnamara, Hambrick, & Oswald, 2014); style of music studied (de Bézenac & Swindells, 2009); parental involvement (McPherson et al., 2012; McPherson, 2009); life changes, such as starting a new school (McPherson et al., 2012); expectancy value (McPherson & O'Neill, 2010); strategy use (Nielsen, 2001); and self-efficacy beliefs (Nielsen, 2004). However, of particular relevance to this thesis is the growing body of research, spearheaded by Gary E. McPherson and his colleagues starting in the 1990s, which explores the role of self-regulation in both the acquisition of musical skills and young people's long-term

engagement with music learning and enjoyment (McPherson et al., 2012; McPherson & Renwick, 2011; McPherson, Nielsen, & Renwick, 2013; McPherson & Zimmerman, 2011; Upitis & Abrami, 2013; Upitis, Brook, & Abrami, 2014; Varela, Abrami, & Upitis, 2014).

McPherson's research suggests that a contributing factor to students' abandonment of music lessons may be problems in the self-regulation of their learning (McPherson et al., 2012; McPherson & Renwick, 2011; McPherson & Zimmerman, 2011; Upitis, Abrami, Brook, Troop, & Varela, 2012; Varela et al., 2014). As McPherson and Zimmerman (2011) point out, learning to play an instrument places high demands on students' self-regulatory abilities, as they must organize and carry out daily practice sessions without expert guidance from a teacher who may only see the student once a week. It is also incumbent upon the teacher to support, encourage, and develop the student's ability to practice independently to ensure the acquisition and progression of musical skills. In the past two decades, music education researchers have examined issues of teaching, learning, and practice, but generally with subjects who already demonstrate high levels of expertise and self-regulation (Duke & Simmons, 2006; McPherson & Renwick, 2011). Less is known about learning and teaching in contexts where students of varying abilities and levels are likely to take lessons, such as in independent music studios (McPherson et al., 2012; McPherson & Zimmerman, 2011; Upitis & Abrami, 2013).

To address that gap in the knowledge, Concordia University's Centre for the Study of Learning and Performance (CSLP), Queen's University, and the Royal Conservatory of Music are collaborating on an SSHRC-funded project, "Transforming Music Education with Digital Tools." The project explores how teaching and learning take place in music studios, with a particular focus on how self-regulated learning may be enhanced and encouraged through the use of technology and enhanced teacher support. Data from the project include teacher and student interviews; surveys of students, parents, and teachers; and trace data from the use of an electronic portfolio (iSCORE). As part of the project, a systematic literature review has also been performed to examine the relationships among music students' self-regulatory learning skills, various music learning variables (musical attainment, amount of practice, persistence, practice content, practice efficiency), general music instruction, and self-regulation instruction (Varela et al., 2014).

In addition, six music teachers have been asked to videotape a month's worth of their music lessons, giving researchers a view behind the closed doors of a studio where a student and teacher work together on a weekly lesson. To analyze these video records, the project team has

begun to develop an observation tool called the T-SREM, a "tool for self-regulatory events in music teaching," based on Zimmerman's three-phase model of self-regulation (Zimmerman, 2000, 2006, 2008, 2011). The T-SREM will enable the team to further examine how teachers and students exhibit, model, and support self-regulatory behaviours during music lessons.

This thesis documents the development and initial testing of the T-SREM observation tool, examining the theoretical, methodological, and practical issues involved in creating and testing the tool. The thesis is divided into five chapters. This remaining part of this first chapter identifies the research problem, describes the purpose for the project, and details the project's main objectives. The research questions are then enumerated and consideration is given to the contribution this research may make to the field. Finally, a concise list of definitions of key terms and constructs is presented.

Chapter 2 presents a review of the current literature on self-regulation, focusing on Zimmerman's three-phase model and then examining self-regulation in the context of music learning. Tools currently available for assessing self-regulation, particularly by observations in authentic environments such as classrooms, will be discussed. Finally, because the instrument has been used with videotaped lessons, the key methodological issues involved when using videotaped data will be examined, including the processes carried out for selecting and analyzing specific parts of the taped lessons.

Chapter 3 addresses the methodologies explored, and ultimately selected, for the development and testing of the tool. This chapter includes details of the iterative process used to create the coding system. As well, the data collection process is presented, detailing how the teacher sample was selected and how teachers were instructed to videotape their lessons. An analysis of the ethical issues and concerns, as well as how they have been addressed in this project, is also included.

Chapter 4 presents the results of an initial testing of the observation tool, including analysis of the self-regulatory patterns that emerged during the coding process.

The final section, Chapter 5, elaborates and discusses the findings from both the development of the observation tool and its initial testing. Consideration is given to the strengths and weaknesses of the approach taken, as well as possible alternatives to the use of an observation tool for capturing self-regulatory behaviours in music lessons. In addition, the issue of how to validate the T-SREM or triangulate the findings with other data collected as part of the wider

research project will be discussed.

Research Problem

As interest in self-regulation has grown, there has been a concomitant rise in the development of tools designed to observe and measure SRL constructs (Azevedo, 2009; Boekaerts & Corno, 2005; Winne & Perry, 2005). Distinctions have been made between protocols that assess SRL as an aptitude, meaning an enduring attribute aggregated from multiple self-regulatory events, and tools measuring self-regulation as an event, meaning self-regulated behaviours carried out over a specific time period (Winne & Perry, 2005). Protocols for measuring SRL as an aptitude include self-report questionnaires, structured interviews, and teacher ratings, while tools for measuring SRL as an event include think-aloud measures, error detection tests, trace methodologies (for example, examining what students write in a portfolio), and observations of performance (Winne & Perry, 2005). Of particular relevance to this thesis is the development of protocols for observing performance; however, it should be noted that the "Transforming Music Education with Digital Tools" project also includes questionnaires and surveys for teachers, students, and parents, as well as analyses of student use of portfolios to permit, in the later phases of the project, triangulation of data from these different sources.

Over the past two decades, researchers have developed various protocols for measuring self-regulation as an event carried out in real time and in authentic environments such as classrooms (Dignath-van Ewijk, Dickhauser, & Buttner, 2013; Paris & Paris, 2001; Perry & Rahim, 2011). Perry and Rahim (2011) identify Whitebread's work in preschools (Whitebread et al., 2009) and Perry's work studying literacy instruction in elementary schools (Perry & Vandekamp, 2000; Perry, Vandekamp, Mercer, & Nordby, 2002; Perry, 1998) as key contributors to the field. In addition, the members of Centre for the Study of Learning and Performance (CSLP) at Concordia University developed a protocol for identifying and capturing self-regulation in elementary school classrooms where literacy software or electronic portfolios were being implemented into the curriculum. As well, a recent study carried out in junior high school math classes (Dignath-van Ewijk et al., 2013) has advanced the work being done in observing self-regulation. Below is an overview of these three tools, including an examination of both their strengths and the weaknesses that led to the decision to create a new tool for observing music lessons.

SRL observations in preschools. Much of the self-regulation research has focused on children ages 8 and up, with researchers arguing that very young children do not exhibit self-regulatory behaviours (Whitebread et al., 2009). However, Whitebread and his colleagues have observed and documented self-regulatory behaviour in children ages 3 to 5 (Whitebread et al., 2005, 2009), in part through videotaped sessions of children at play alone, with peers, or with support from a teacher. To code the videos, they developed a tool, the Cambridgeshire Independent Learning (C.Ind.Le) Coding Framework, to identify "verbal and non-verbal indicators of metacognition and self-regulation in the 3-5 age group" (Whitebread et al., 2009, p. 69).

Development of the tool included working with the preschool teachers to help them create activities that children would find meaningful and that were likely to encourage metacognitive and self-regulatory behaviours. The researchers then visited classes multiple times, eventually taping a total of 96 hours of children playing. After each taping session, the classroom teacher watched the tape and identified for the researcher sequences that seemed to demonstrate self-regulatory behaviours. The teacher and the researcher then engaged in a dialogue about why that sequence stood out. (The research team also independently identified other self-regulatory events). Eventually, 592 events lasting from several seconds to several minutes were identified in the 96 hours of video; from those events, 60 were finally retained for a detailed coding (Whitebread et al., 2009).

Whitebread et al. (2009)'s coding scheme comprised three sections:

1. Category name, which included Metacognitive knowledge (knowledge of persons, tasks, and strategies), Metacognitive regulation (planning, monitoring, control, evaluation), and Emotional and Motivational control (emotional/motivational monitoring, emotional/motivational control);
2. Description of behaviour: a more detailed description of particular categories;
3. Examples: specific behaviours seen in the tapes are noted.

Whitebread et al. (2009) explicitly set out to capture not only verbal but also nonverbal indicators of self-regulation, the latter category being a valuable indicator when examining contexts such as music lessons, where physical gestures and sound production might reveal something about self-regulation. The three-section coding framework used by Whitebread et al.

(2009) also provides clear definitions for the broad conceptual ideas, and then supports both the definitions and high-level concepts with specific examples drawn from the observations.

However, as Perry and Rahim (2011) note, this research focuses on the children, in order to marshal evidence of the youngsters' ability to self-regulate, and does not explicitly examine the interaction between the students and teachers, or how the adults may support, encourage, or possibly even undermine the children's attempts at self-regulation. Thus, Whitebread et al. (2009)'s coding scheme does not address how self-regulation is encouraged or supported in a context, such as a music lesson, where there is ongoing interaction between the student and teacher.

Finally, Whitebread et al. (2009) do not document or examine the cyclical nature of self-regulation. The self-regulatory cycle appears to be important in such areas as sports and music; Zimmerman (2006) suggests the cycle has an impact on performance, noting that athletes who received training in all phases of self-regulation (forethought, performance, self-reflection) outperformed those who received no training or training in only one area of the cycle. Examining the SRL cycle in studio music lessons may offer insights into the relationship between self-regulatory skills and the development of musical expertise.

SRL observations in elementary schools. Since the 1990s, Perry and her colleagues have been studying classroom tasks, authority structures, and evaluation practices that support children's self-regulation during the acquisition of literacy skills, as well as working collaboratively with teachers to design literacy activities that foster self-regulated learning (Perry, 1998; Perry, Phillips, & Dowler, 2004; Perry et al., 2002; Perry & Vandekamp, 2000; Perry & Rahim, 2011). They observe literacy activities in elementary school classrooms, keeping detailed notes of what goes on, including verbatim transcripts of teacher and student talk (Perry & Rahim, 2011). To capture the classroom activity and speech, they have developed an observation protocol composed of three sections (Perry & Vandekamp, 2000):

1. Identification information, including the date, name of the teacher and classroom, and what literacy activities are taking place;

2. A running record, which is a space for the researcher to keep notes and verbatim transcripts;

3. A list of categories, drawn from the self-regulation research, that distinguish between high and low SRL classrooms; these categories include:

    a. types of tasks—examining whether activities focused on development of a wide range of skills or tasks promoted the acquisition of a narrow set of teacher-defined skills;
    b. types of choice—observing whether students were offered a variety of choices in terms of how, when, and with whom they could work;
    c. opportunities to control challenges—noting whether students had the opportunity and chance to work at a level they found challenging, but not overwhelming or dull;
    d. opportunities for self-evaluation—examining whether students were encouraged to reflect on and evaluate their own work;
    e. support from the teacher—noting whether the teacher provided both domain-specific knowledge and strategies to ensure students could begin to work independently or whether the teachers focused more on the procedures for completing a task;
    f. support from peers—looking to see whether students were encouraged to work together to share and evaluate ideas as well as offering assistance to peers as necessary;
    g. evaluation practices—examining whether teacher evaluations focused on a student's individual mastery, learning, and progress, or the evaluations were punitive or encouraged a performance mentality (high grades, for example).

After observing in classrooms—a process that could last up to two hours—the researchers would read through the second section, adding in as many details as they could recall. Then, based on what they had seen and heard, they would assign a number rating to each of the categories: 0 if they had seen no evidence of a teacher engaging in that behaviour,1 for some evidence, and 2 for a high level (Perry & Vandekamp, 2000).

Perry's observation protocol provides rich, qualitative descriptions of what takes place in classrooms (i.e. the actions and interactions of teachers and students) through the detailed notes in the second section. Moreover, the coding categories in the third section generate a quantitative

assessment of the occurrence of self-regulatory activities. However, several of the broad self-regulatory categories require high levels of inference to code; for example, determining whether an activity is at an appropriate level of challenge for either an individual student or a classroom as a whole demands knowledge of age-appropriate literacy skills and abilities. As well, the category of "support from peers" is far less relevant in studio music lessons that are carried out between one student and one teacher. Finally, Perry's broad coding concepts do not address the cyclical nature of self-regulation, which, as noted above may be of particular concern in the study of musical skill acquisition.

A more global assessment of self-regulation in classroom setting was undertaken through the development and use of an Implementation Fidelity Measure ("Implementation Fidelity Measure – ABRACADABRA/ePEARL Comprehension Focus," 2010), designed by members of Concordia University's Centre for the Study of Learning and Performance for use in schools that were implementing a literacy software (ABRACADABRA) and an electronic portfolio (ePEARL), both created at the CSLP. The protocol asked two general questions about self-regulation, namely if the observer saw students engaging in self-regulatory processes (the examples given are goal-setting and strategy use) and if so, during which activities. A second question ascertained if students were engaged in self-assessment (the examples given are assessing their own work, selecting pieces for inclusion in a portfolio, and justifying their choices) and if so, during which activities. Another section of the protocol used a 5-point Likert scale to rate the classroom environment and structure on items such as being student-centred and offering young people the chance to discuss and question the work being done. As the protocol is not focused exclusively on self-regulation—rather there are many questions related to the use of the software programs in the classroom—it nonetheless attempts to capture through observations and descriptions of student activities instances of self-regulation. However, the questions regarding SRL are very broad and appear to assume knowledge of the processes and sub-processes involved as those processes are not enumerated or assigned a particular code. The protocol uses open-ended questions for eliciting observations of self-regulation learning. Therefore, the information obtained through the protocol is likely to be descriptive and broad, without a specific way to capture frequency counts of self-regulatory behaviours. As with Perry's protocol, this one also does not address specifically the cyclical nature of self-regulated learning.

SRL observations in junior high schools. Recently, Dignath-van Ewijk et al. (2013)

assessed teacher support for self-regulation in mathematics classrooms. Their study examined how teachers instructed students ages 11 to 15 in self-regulatory strategies, as well as the classroom characteristics that fostered self-regulation. To address the methodological shortcomings of data derived solely from individual ratings such as self-reports, they employed a variety of measures, including teacher and student ratings and an observation protocol. To develop the latter, they drew on Boekaerts' (1999) three-layered model of self-regulation as encompassing (a) students' choice of cognitive strategies, (b) their use of metacognitive skills and knowledge, and (c) their choice of goals; Dignath-van Ewijk et al. (2013) labelled these three categories cognition, metacognition, and motivation. The researchers developed a coding system for both explicit and implicit (modelling) teacher instruction of self-regulatory strategies, then applied it by viewing 34 videotaped lessons (each lesson being about 45 minutes long). Coders, who had received 30 hours of training, examined the tapes in 1-minute increments, stopping after each minute to indicate whether a strategy had been employed (coded as 1) or not (coded as 2).

The study by Dignath-van Ewijk et al. (2013) examines and explicitly attempts to overcome the pitfalls inherent in using one tool to measure self-regulation; these same methodological shortcomings in measuring SRL will eventually be addressed by Dignath-van Ewijk et al. (2013) through a similar process of data triangulation from surveys and interviews. However, the observation protocol designed by Dignath-van Ewijk et al. (2013) builds on a model in which self-regulatory concepts such as goal-setting, strategy use, and self-efficacy are organized in layers, such that the learner moves from the inside toward the outer layers; Boekaerts (1999) labelled these respectively (a) regulation of processing modes, (b) regulation of the learning processes, and (c) regulation of the self. This conception differs from Zimmerman's three-phase model, and as with previous studies, the protocol does not capture the cyclical nature of self-regulation proposed by Zimmerman (e.g. Schunk & Usher, 2013; Zimmerman, 2006). Yet the study's attempt to capture both explicit (utterance) and implicit (modelling) support for self-regulation mirrors Whitebread and his colleagues' coding for both verbal and nonverbal elements (Whitebread et al., 2009). This coding of both what is said and what is done was retained in the observation protocol developed for music lessons.

Rationale for a New Tool

Despite the advances that have been made in creating and validating observation tools for use in classrooms, there does not appear to be any tool developed for observing music lessons that:

(a) is based on Zimmerman's three-phase cycle;

(b) codes both verbal and nonverbal elements;

(c) captures the interaction between teacher and student, not just one or the other.

While the possibility exists to adapt any of the three observation protocols above, the lack of a common underlying theory and research questions is problematic, potentially leading to what Schunk (2008) describes as "definitional quandaries [that] thwart progress" (p. 465). In other words, unless the research is supported by clearly defined theories, it becomes difficult to compare and contrast results with other work done in the field, or even to persuasively identify possible changes to educational pedagogy or policy (Schunk, 2008). Thus, in developing a new coding protocol, we have heeded the advice of Bakeman and Quera (2011) who stipulate, "borrow, or more typically adapt, coding schemes from others only when you share theories, underlying theoretical orientations, and common research goals" (p. 13).

While McPherson and his colleagues have observed students practicing, they did not then turn the cameras into the music studios (McPherson et al., 2012). Therefore, little is known about the interactions between teachers and students during the weekly music lesson, specifically how teachers and students demonstrate and receive support for self-regulatory learning behaviours. The tool developed as part of the iSCORE project addresses this gap in the knowledge.

Purpose of the Project

The purpose of this thesis is to report on the development and initial testing of an observation tool for assessing teacher and student self-regulatory behaviours in one-on-one music lessons. The thesis will document the theoretical and methodological issues involved in developing the tool, which is based on Zimmerman's three-phase model of self-regulation (McPherson & Zimmerman, 2011; Zimmerman, 2000, 2002, 2008; Zimmerman & Kitsantas, 2005). Azevedo (2009) suggests that studies of SRL should clearly state the theoretical model or framework that forms the backdrop for the research and is used to generate hypotheses. The thesis will report on the initial testing of the tool, including attempts to achieve inter-rater reliability during coding. Finally, the work will provide a set of descriptive examples of self-regulatory

behaviours found during the teaching and learning of music in individual lessons. As the coding tool is part of a larger project examining the impact of integrating digital technology into music lessons, data obtained from use of the observation tool will be triangulated with other iSCORE project data in a future phase of the project.

Objectives of the Project

The objectives of this project are to:

1. Document the development of the observation tool, including the self-regulation constructs to be coded as well as the methodological and practical issues involved in creating an observation tool for one-on-one music lessons;
2. Report on the initial testing process, carried out primarily by two graduate student research assistants with regular and detailed feedback from the principal researchers and other team members, with the goal of establishing inter-rater reliability (Cohen's kappa) of 0.8;
3. Provide descriptive examples for the tool's coding categories drawn from the teaching and learning observed in the lessons.

Research Questions

The thesis will address the following questions:

1. In what ways may the constructs from Zimmerman's three-phase self-regulation theory be operationalized into coding items on an observation tool for music lessons?
2. Is it possible to achieve inter-rater reliability of k 0.8 when using the coding tool? How much time would be needed to train raters to achieve this level of agreement?
3. How might the SRL tool be validated or triangulated in future research?
4. Are there patterns of self-regulatory behaviours that begin to emerge during this testing phase, which provide rich and meaningful examples for the tool's coding categories?
5. What are the key methodological, practical, and substantive issues to be considered when creating an observation tool for use in one-on-one music lessons?

6. What are the strengths and weaknesses of this coding system? How might both the sample selection and the coding be improved in another phase of the project?

7. What are the possible next steps in the development of this SRL observation tool?

Definitions

Below are definitions and elaborations of the key terms and constructs used in this thesis: Zimmerman's three-phase model of self-regulation, the terms retained for use in the coding tool, and a description of what constitutes studio music teaching.

Zimmerman's model of self-regulation. The observation tool, as well as the electronic portfolio that is an essential component of the overall project, is built on Zimmerman's three-phase model of self-regulation involving forethought, performance, and self-reflection (McPherson & Zimmerman, 2011; Zimmerman, 2011, 2000, 2002, 1989).

Figure 1 below visually illustrates Zimmerman's model:

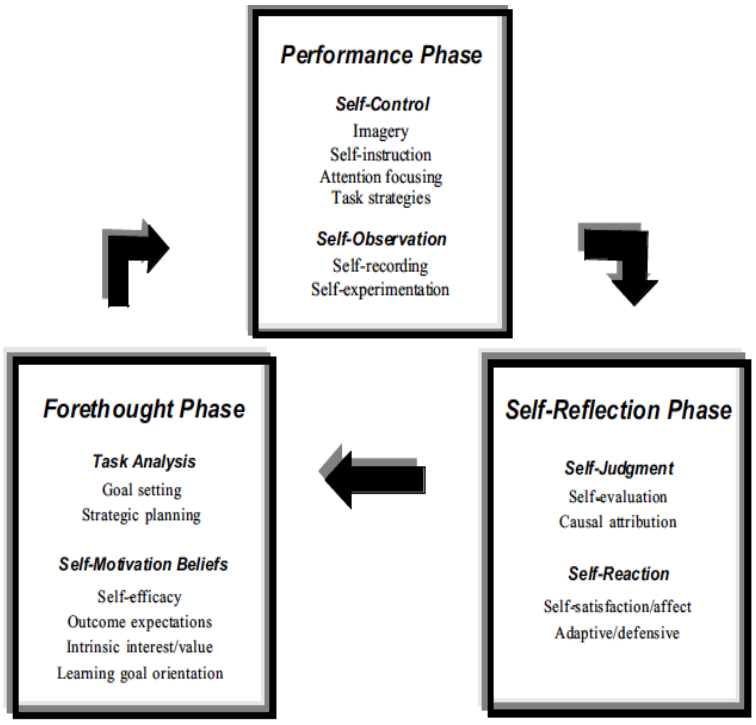


Figure 1: The Self-Regulatory Model as Proposed by Zimmerman (Zimmerman, 2000, 2006, 2008, 2011)

As the coding tool is on observed behaviours, meaning physical actions and verbal utterances, the iSCORE team decided to exclude constructs primarily based on thought processes

and beliefs, namely self-motivation beliefs (Forethought phase), metacognitive monitoring and imagery (Performance phase), and casual attribution, self-satisfaction/affect, and adaptivity (Self-Reflection phase) due to the high degree of inference required from coders in order to assign ratings to such categories.

SRL coding terms. The following constructs were retained and defined for coding:

Forethought phase

- *Goal-setting*: The setting of hierarchical goals that show evidence of progress and foster intrinsic interest (Zimmerman, 2000)
- *Strategic planning:* Identifying the strategies that are appropriate for the task (Zimmerman, 2000)

Performance phase

- *Instruction:* Overt or covert description of how to perform the task as one executes the task (Zimmerman, 2000)
- *Attention focusing*: Using strategies to concentrate (Zimmerman, 2000)
- *Task strategies*: Reducing a task to its essential parts and reorganizing the parts meaningfully (Zimmerman, 2000)
- *Recording*: Keeping records to monitor one's progress (Zimmerman, 2000)
- *Experimentation*: Trying new alternative approaches (strategies) when the selected approach has not been successful (Zimmerman, 2000)

Self-Reflection phase

- *Evaluation*: Comparing self-monitored results with a standard or goal (Zimmerman, 2000)

Studio music teaching. Studio music teaching is one-on-one instrument lessons, usually conducted once a week for anywhere from 30 minutes to an hour (Upitis, Abrami, Brook, Troop, & Catalano, 2010). The relationship between teacher and student has often been characterized as that of master and apprentice, with the novice gaining expertise only after much time and effort (Upitis et al., 2013). As Upitis et al. (2010) note, studio music teachers usually teach between 15 and 20 students a week; many have completed teaching and performance certifications through the Royal Conservatory of Music (RCM). However, there are no specific requirements for becoming a studio music teacher, and practitioners bring many different learning theories and teaching philosophies into their studios (Upitis et al., 2013).

This chapter has explored the research problem, identified the research questions, and provided definitions of key constructs underlying the work presented in this thesis. The following chapter will focus on the research literature that examines self-regulated learning, especially in the context of music instruction, to provide a context for the research and coding work done for the thesis.

Chapter 2: Literature Review

This review of the current literature on self-regulation examines the three-phase model of forethought, performance, and self-reflection proposed by Zimmerman (e.g. Zimmerman, 1989, 2000, 2002, 2008) and then explores how this cyclical model has been applied in music learning. The current tools available for assessing self-regulation are analyzed, and because the tool is being applied to videotaped lessons, the key methodological issues involved when using videotaped data are examined.

For well over 25 years, substantive research has been carried out on self-regulated learning (SRL), which refers to the processes by which a person creates or self-generates the necessary emotions, thoughts, and actions to attain a personally meaningful goal (e.g. Azevedo, 2009; Schunk & Usher, 2013; Svinicki, 2010; Winne & Perry, 2005; Zimmerman, 1989, 2008). Self-regulated learning has emerged in the research as a critical element in higher levels of achievement, with self-regulated students better able to manage their time, use a greater number of learning strategies, and persist in the face of challenges in order to achieve their goals (e.g. Hadwin & Wozney, 2005; Paris & Paris, 2001; Perry et al., 2004; Zimmerman, 2000, 2008). A meta-analysis examining the impact of self-regulation training on achievement levels of primary school students found significant positive effects (Dignath, Buettner, & Langfeldt, 2008). In the music context, a recent systematic review by Varela et al. (2014) examining self-regulation and musical learning variables (musical attainment, amount of practice, persistence, practice content, and efficiency), general music instruction, and self-regulation instruction found an overall positive, albeit weak, relationship between self-regulation and the variables studied. As well, in an effort to encourage and support self-regulation in students, technological tools focusing on SRL have been developed, including electronic portfolios whose use resulted in improved literacy in school-age children (Abrami, Venkatesh, Meyer, & Wade, 2013) and led to an increase in time spent practicing a musical instrument (Upitis et al., 2012).

Considering the important role and impact of self-regulatory skills on learning, researchers have sought, and continue to seek, valid and reliable means for measuring the component constructs involved in SRL (Winne & Perry, 2005; Zimmerman, 2008). To provide a context for the development and initial testing of a new observation tool (T-SREM) to be used in music lessons, the following issues will be addressed:

a. the key constructs and processes involved in Zimmerman's theory of self-regulation, focusing on how those are defined, understood, examined, and applied specifically in musical contexts;

b. the strengths and limitations of the tools developed for assessing SRL, including observation protocols;

c. the methodological issues that must be considered when capturing and analyzing video data in an "event-rich" environment, such as a music lesson that includes talk, music-making, gestures, and facial expressions.

Zimmerman's Triadic Form of Self-Regulation in Musical Contexts

At the simplest level, self-regulation is a person's ability to generate thoughts, feelings, and actions to achieve a particular goal (Zimmerman, 2000). For people studying music, this self-regulatory process might entail learning to establish daily practice sessions, preparing for recitals or music exams, managing performance anxiety when performing in front of others, recovering and moving forward when setbacks occur (a poor performance or grade on an exam, for example), and establishing and working towards new goals as one's proficiency increases. However, Zimmerman draws on Bandura's social cognitive theories (Schunk & Usher, 2013) to propose a triadic interaction between the person, his or her behaviour, and the environment (Schunk & Usher, 2013; B. J. Zimmerman, 2000; Barry J. Zimmerman, 1989, 2006) as shown below in Figure 2:

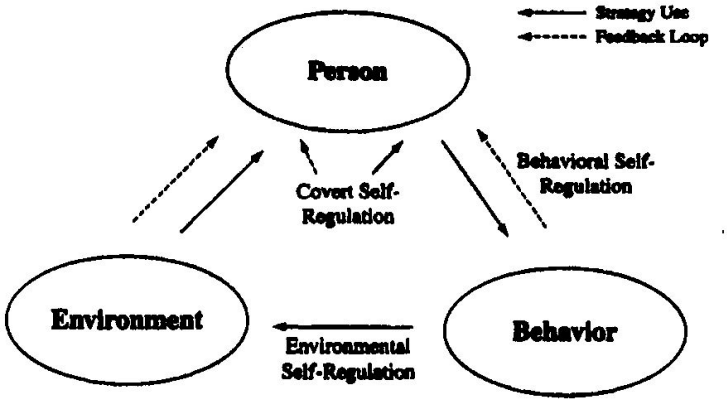


Figure 2: Zimmerman's Triadic Form of Self-Regulation

From: B.J. Zimmerman (1989), *Journal of Educational Psychology, 81*, p. 330.

Thus, in this broad overview of self-regulation, a music student might regulate behaviour by observing and adjusting performance strategies or learning approaches (for example, adopting the strategy of practicing in two shorter sessions per day rather than one long session), while environmental self-regulation requires monitoring the environment and making adjustments or changes (McPherson & Zimmerman, 2011) by, for example, shutting off one's cell phone prior to practice. The student will also engage in covert self-regulation through monitoring cognitive and affective states and making changes when necessary (McPherson & Zimmerman, 2011); this might entail focusing on the overall sound of one's music rather than any errors when one is performing for an audience.

Six Dimensions of Self-Regulation in Musical Contexts

This broad overview illuminates how self-regulation may be viewed not as a trait but as an evolving set of processes that vary as students engage in different learning situations (Paris & Paris, 2001; Schunk & Usher, 2013; Varela et al., 2014; Zimmerman, 2000). As Schunk and Usher (2013) note, one of Zimmerman's great contributions to the self-regulation research is his identification of six dimensions, meaning different types of self-regulatory processes incorporated into the overall cycle. These dimensions are motive, method, time, behaviour, physical environment, and social environment (Schunk & Usher, 2013; Zimmerman & Risemberg, 1997; Zimmerman, 1998). McPherson and Zimmerman (2011) have incorporated these six dimensions into a framework to guide research into the development of musical self-regulation, as shown below in Table 1 (labelled Table 4.1 in the original):

Table 4.1 Dimensions of Musical Self-Regulation

Scientific Question	Psychological Dimensions	Socialization Processes		Self-Regulation Processes
Why?	Motive	Vicarious or direct reinforcement by others	→	Self-set goals, self-reinforcement and self-efficacy
How?	Method	Task strategies are modeled or guided socially	→	Self-initiated covert images and verbal strategies
When?	Time	Time use is socially planned and managed	→	Time use is self-planned and managed
What?	Behavior	Performance is socially monitored and evaluated	→	Performance is self-monitored and evaluated
Where?	Physical environment	Environments are structured by others	→	Environments are structured by self
With whom?	Social	Help is provided by others	→	Help is sought personally

Table 1: Six Dimensions of Musical Self-Regulation. From McPherson, G. E. Zimmerman, B. J. (2011). Self-regulation of musical learning: A social cognitive perspective on developing performance skills. In R. Colwell & P. Webster (Eds.), *MENC Handbook of Research on Music Learning, Volume 1: Strategies*. New York: Oxford University Press.

The one-word questions become the driving force for not only identifying the six specific psychological dimensions, but also highlighting the socializing processes that facilitate (or not) a student's self-regulation (McPherson et al., 2013; McPherson & Zimmerman, 2011; Schunk & Usher, 2013). As McPherson and Zimmerman (2011) note, the framework may also support the development of strategies to improve music teaching. In the next section, the six dimensions will be further elaborated, focusing specifically on their role in teacher-student interactions.

Dimension 1: Motive. McPherson and Zimmerman (2011) outline the considerable challenges to a music student's motives, with young people having to sustain interest and organize practice time despite competing activities and possibly distracting environments, continuing for many years, in order to achieve proficiency. Parental support has been identified as key to long-term musical learning (McPherson et al., 2012; McPherson, 2009; McPherson & Zimmerman, 2011), and while the role of parents falls outside the purview of this thesis, it should be noted that information about parents is being collected as part of the overall iSCORE project, thus opening up future possibilities for triangulation of the data. McPherson and Zimmerman (2011) point out that music students begin lessons with clear expectations about how hard and in

some cases for how long (such as trying a musical instrument for a year) they are willing to work. These researchers suggest that teachers should seek to better understand students' motivations, perhaps by asking questions directly, in order to support young people in their musical journey. As well, teachers are encouraged to give students greater choice over their curricular materials (McPherson et al., 2013) as research. An oft-cited case study by Renwick and McPherson (2002) involving a young clarinettist improving her practice when tackling a self-selected jazzy version of a song suggests that students practice longer and with more engagement when working on materials that they, not a teacher, have chosen. Finally, teachers should consider discussing with students why activities many young people find boring, such as scales, ultimately help musicians to achieve something interesting (for example, using the scale to improvise a new piece of music) (McPherson et al., 2013). In other words, teachers should provide a clear, thoughtful rationale for the musical activities they ask of their students.

Dimension 2: Method. The "method" dimension refers to how students, when practicing and performing, draw on a range of knowledge, skills, and task-oriented strategies and adapt those based on what they hope to accomplish (McPherson & Zimmerman, 2011). McPherson et al. (2013) suggest that it is not enough for teachers (and parents) to exhort students to practice as, particularly with beginners, that approach too often results in children playing through a piece regardless of errors made and with little attention to improvement. Instead, early in their music careers, students may need explicit instruction and guidance to think and reflect on their music-making in order to truly hear what they are doing (McPherson et al., 2013). McPherson and Zimmerman (2011) encourage teachers to implement a practice diary for their students, noting that children who keep records of what they practiced and for how long are better able to perform their pieces in the long run. As well, McPherson and Zimmerman (2011) suggest that teachers may well be better served by focusing somewhat less on the total time students practice (without in any way suggesting improvement occurs without such work) and more on inquiring into and helping students develop, implement, and evaluate strategies used during those practice sessions.

Dimension 3: Time. Managing one's time, meaning setting aside periods for practice and playing an instrument, is vital for acquiring musical skills. However, McPherson et al. (2013) suggest that a common technique used by teachers, suggesting or strongly demanding a certain number of minutes of practice per day or week, may not then lead to a student's self-regulating his or her time management to meet that request. Rather, the researchers suggest students might

be better served if teachers encourage reflection on what mastery (or at least proficiency) of a musical piece sounds like and how much practice time it takes to reach this level (McPherson et al., 2013). These techniques may be particularly useful for beginning students with little aural memory and knowledge to draw on when deciding if a musical piece has been practiced "enough." As McPherson et al. (2013) suggest, students may benefit from support and guidance in discovering the relationship between time spent practicing, the strategies used, and the results as evidenced by a performance of the piece; in other words, they need help with making deeper connections between what they do in the short term (daily practice) and their longer-term goals (McPherson et al., 2013). As well, teachers should encourage students to strive for a balance in daily practice between working to improve and playing for one's own pleasure, as it appears that students who engage in both formal (studies, scales, pieces) and informal (improvising, playing by ear) practice may achieve greater levels of performance ability and exhibit higher satisfaction with their own learning (McPherson et al., 2013).

Dimension 4: Behaviour. Self-regulated learners pay attention to their performance, gauging whether it satisfies a goal they might have and then (if necessary) adjusting their subsequent actions to achieve the desired outcome (McPherson et al., 2013; McPherson & Zimmerman, 2011; Schunk & Usher, 2013). Students achieve this monitoring and controlling function through (a) recognizing, evaluating, and using thoughts about what they know and don't know (metacognition); (b) responding effectively to feedback (the notes played, comments from another person); and (c) taking a mastery-oriented approach to learning, in which setting and reaching one's own goals and persisting in the face of challenges are embraced (McPherson et al., 2013; McPherson & Zimmerman, 2011). Teachers have the opportunity to play a role in the development of these metacognitive, evaluative, and learning-orientation processes (McPherson et al., 2013; McPherson & Zimmerman, 2011). McPherson et al. (2013) encourage teachers and students to engage in a dialogue about what the students are thinking and how the young musicians can better monitor and control their thoughts to achieve the musical sound they desire. As well, teachers should share responsibility for evaluation with the students, meaning to help young musicians actively listen to the sound they are making and figure out what works and what doesn't, rather than having the students wait for the teacher's evaluation (McPherson & Zimmerman, 2011).

Dimension 5: Physical environment. Through videotaped practice sessions with young musicians, McPherson et al. (2012) demonstrated distinct differences in both the physical environments and the proper positioning of instruments in young musicians. Some players had a regular practice spot free from distractions, while others moved from room to room. Some players paid attention to positioning or posture, while others did not. As McPherson & Zimmerman (2011) point out, research into the relationship between physical environment and performance is limited, but teachers should certainly discuss with students where they practice and how that environment may be structured in ways to make it more conducive to productive work. In their videotapes of young students practicing, McPherson and his colleagues noted wide variations in student posture and correct positioning of the instrument during practice (McPherson et al., 2012); therefore, McPherson suggests that young students may benefit when teachers model and discuss proper posture and positioning during lessons, with encouragement to pay attention to these matters in home practice sessions (McPherson et al., 2013).

Dimension 6: Social. When facing a challenging and difficult endeavour, such as learning to play an instrument, self-regulated learners seek help from knowledgeable others, weighing and selecting the assistance that best helps them to achieve self-set goals (McPherson & Zimmerman, 2011). However, there is a subtle distinction between help provided by others (teachers and parents) and help sought out by the student (McPherson et al., 2013; McPherson & Zimmerman, 2011), a distinction that teachers must be aware of and manage. Music teachers, especially the first teacher, can have a critical impact on young students, with research suggesting that students show higher levels of motivation to learn when a teacher is able to pass on a love of music in a warm, nurturing environment (McPherson et al., 2012). Music teachers also need to be aware of the broader social context in which their students make music, particularly the role of parents, who bring their own goals, parenting styles, and parenting practices into the musical triad of teacher-student-parent (McPherson et al., 2013).

Identifying and then striving to develop these six dimensions, either as a music student or as a teacher supporting students, is a valuable and important goal. However, possessing the self-regulatory skills (such as cognitive monitoring, self-evaluation, seeking help, etc.) found in these six dimensions is only the start—these skills need to be applied, often in situations that are complex, changing, and challenging (Schunk & Usher, 2013). Therefore, the next section will examine the three-phase process of forethought, performance, and reflection by which

Zimmerman (2000) suggests self-regulation takes place. Then, the three-phase cycle will be explored in a music context, including findings from a recent systematic review examining correlations between musical development and several of the sub-processes of the cycle.

Three Phases of Self-Regulated Learning

Zimmerman (2000) details three phases in the self-regulation cycle: forethought, performance (volitional control), and self-reflection. The forethought phase, which occurs before embarking on a course of action, involves two inter-related processes, namely task analysis (which includes goal-setting and strategic planning) and the initiation of effective self-motivational beliefs, including self-efficacy, goal orientation, intrinsic interest/value, and outcome expectations (Zimmerman, 2000). Then, a self-regulated learner takes action, moving into the performance phase, which requires both self-control (task strategies, attention focusing, imagery, and self-instruction) as well as self-observation (self-recording and self-experimentation) (Zimmerman, 2000). Finally, having completed a course of action, the learner then reflects, using self-judgment (self-evaluation, causal attribution) and self-reaction (self-satisfaction/affect, adaptive/defensive inferences); these reflections may then influence any further actions, meaning the learner returns to the forethought phase to plan what to do next (Zimmerman, 2000).

Three Phases of Self-Regulation in Musical Contexts

The work done by McPherson and his colleagues (e.g. McPherson & Renwick, 2011; McPherson et al., 2013; McPherson & Zimmerman, 2011) has greatly elucidated how these three phases are enacted by both beginners and more advanced students, with the research suggesting that players who exhibit more self-regulatory abilities achieve greater levels of mastery and persist longer in their musical learning (McPherson & Renwick, 2011; McPherson & Zimmerman, 2011). A recent systematic review (Varela et al., 2014) has also provided a nuanced, albeit preliminary, examination of the interplay of different self-regulatory processes (e.g. use of task strategies, self-efficacy) on aspects of musical development including performance levels, persistence, and time spent practicing. Also of interest is the detailed list, drawn from 25 studies, of examples of self-regulatory behaviours classified according to phases of forethought, performance, and self-reflection (Varela et al., 2014). The latter has provided a useful and

important framework when observing music lessons, providing some guidance on how observed actions and interactions may be grouped together to create a valid and consistent classification of musical self-regulatory behaviours. Examples provided by Varela et al. (2014) include:

Forethought

- *Goal-setting*: establishing short- and long-term goals, which might include being able to play the notes in a piece, play with musical expression, perform a piece in front of other people, or participate in a music exam.
- *Strategic planning*: organizing and even writing out what one will do during practice, deciding to use a specific strategy such as slow practice for a particular piece or passage, examining a piece before playing it to identify difficult sections that need more work.

Performance

- *Instruction*: telling oneself to correct a mistake; coaching oneself to play a section using particular strategies, reminding oneself to focus on one aspect of the music (for example, interpretation).
- *Attention focusing*: choosing an appropriate environment in which to practice or making the practice space more conducive to practice by turning off cell phone, television or radio; managing one's attention by stopping when a mistake is made, noticing when one's mind is wandering, stopping to assess why a problem has occurred; using slow practice to stay focused on a particular passage.
- *Task strategies*: practicing in small regular chunks rather than one or two long sessions; starting with technically difficult passages and then playing for fun and pleasure toward the end; dividing a piece into sections and tackling those one by one.
- *Recording*: keeping a record (written, audio, video) of practice or performance, marking the score to indicate difficult passages or highlighting a note that is often played incorrectly.

1. *Experimentation*: using trial and error to acquire a skill not previously taught to you; changing the rhythm, dynamics, or phrasing of a piece.

Self-reflection

- *Evaluation*: taking time to reflect on the quality of the practice (Did you accomplish what you set out to do? Why or why not?).

In their systematic review, Varela et al. (2014) note that there is a positive, although weak, relationship ($\mu = 0.27$) between students' overall self-regulation and levels of expertise (beginner, intermediate, advanced); this score is particularly interesting as it is derived from measurements over all 25 studies. (Note: in their review, Varela et al. (2014) use μ for overall scores for a complete set of studies addressing a specific research question; they use M for the average score for studies examining specific levels of expertise, namely beginner, intermediate, or expert.) This finding lends weight to the accumulating evidence that self-regulation is instrumental to overall musical development. Also of interest is the relationship between use of task strategies and musical expertise ($\mu = 0.64$), which suggests that helping students devise and apply task strategies in their practice and performance may yield positive results in musical attainment.

Of particular note in this review is the relationship between self-regulation instruction and self-regulatory behaviours; some of the highest positive relationship scores ($\mu = 1.00$) were found when examining the effects of SRL instruction on goal-setting, strategic planning, imagery, self-evaluation, and adaptive behaviour. While Varela et al. (2014) note that these findings draw on studies with small participant samples, nonetheless the positive relationships suggest that instruction in self-regulation, as has been done in elementary schools (Dignath et al., 2008), may equally be of interest in the realm of music teaching. Indeed, these authors write, "While music educators are unlikely to challenge the need for self-regulation, what is required is a discussion of how self-regulation instruction can be respectfully integrated into teaching practices. Given the limited evidence, teachers' contributions in future research are crucial" (Varela et al., 2014).

Skill Acquisition in the Self-Regulatory Framework

In addition to this three-phase model, Zimmerman (2000) has posited that skill acquisition emerges in a series of four socio-cognitive levels of regulation: observation, emulation, self-control, and self-regulation. Zimmerman and Kitsantas (2002) note that observation and emulation levels focus on social learning that prepares a person to become competent at the self-controlled and self-regulated level, or on their own. The work done by Zimmerman and Kitsantas (1999, 2002) on students' acquisition of writing skills suggests that modelling and social feedback during emulative practice (the observation and emulation levels), as well as the setting of process and then outcome goals (representing self-control and then self-related levels), produce not only higher levels of achievement but also greater self-regulatory skills.

However, as Zimmerman (2000) notes, achieving the highest level of self-regulation does not mean there is no need for a learner to have or seek out social support, such as that provided by a teacher. Motivational or contextual factors may lead an accomplished learner to consult a knowledgeable other, as may be seen in music lessons when even a student who has achieved very high levels of expertise (evidenced by admission to a conservatory program, for example) continues to work with a teacher.

Having elaborated the different aspects of self-regulation and related them to music learning, attention will now be turned to the tools available for measuring self-regulation, enumerating the strengths and weaknesses of different methods, and then the methodological issues to be considered with using videotapes, which contain vast amounts of data ranging from verbal utterances to physical gestures to facial expressions. Thus, emphasis will be placed on how segments may be selected for coding, as well as the means available for analyzing those sections.

Tools for Assessing SRL

Tools used to assess SRL have evolved and changed according to the shifting theories and conceptualizations of self-regulation (Boekaerts & Corno, 2005; Winne & Perry, 2005). When assessing SRL as an aptitude (a single, aggregated measure reflective of multiple SRL events), researchers have often turned to self-reports (questionnaires, structured interviews, teacher ratings) to capture SRL components such as cognitive and meta-cognitive strategies and knowledge (Winne & Perry, 2005). As theorists developed models of SRL as a dynamic process shaped by social and emotional factors in specific contexts, they turned to assessment tools such as think-aloud protocols, trace methodologies, error detection tests, and observations of performance (Boekaerts & Corno, 2005; Winne & Perry, 2005). While enumerating the contributions and limitations of each of these methods is beyond the scope of this paper, there is general agreement that assessment tools ideally should be used in conjunction with one another, triangulating and comparing data across the methods used (Azevedo, 2009; Veenman, Hout-Wolters, & Afflerbach, 2006; Whitebread et al., 2009).

However, observing SRL in real contexts (classrooms, lessons) and across time has increasingly been suggested as an important means of capturing the social and contextual factors that influence learners' self-regulation (Azevedo, 2009; Boekaerts & Corno, 2005; Butler, 2002;

Perry & Rahim, 2011; Whitebread et al., 2009; Winne & Perry, 2005). Both Azevedo (2009) and Whitebread et al. (2009) have outlined five key advantages of observational methods, which:

1. capture what learners do rather than what learners think they did or recall having done;
2. allow researchers to explore links between behaviours and social contexts;
3. do not require high-level verbal abilities, which may be important when studying younger children;
4. capture both verbal and nonverbal behaviour;
5. allow for recording of social processes involved in the development of self-regulatory behaviour.

Yet observation methods present distinct challenges in both their development and use. In creating observation tools or protocols, researchers are confronted with the issue of what level of granularity (how detailed the analysis of behaviours, actions, facial expressions, speech) best captures the SRL process (Azevedo, 2009). Issues of time sampling also arise, as researchers try to examine both individual actions and social interactions that may occur at varying times rather than at set moments (Azevedo, 2009). As well, because observation methods record what people do, the role and impact of learners' and teachers' beliefs, perceptions, motivations, and intentions are, of course, not tracked, despite their influence on SRL (Perry & Rahim, 2011); this problem again highlights the importance of data triangulation (Perry & Rahim, 2011).

Drawing on the work of Barbara Rogoff, Perry and Rahim (2011) also suggest that when analyzing data observed in social contexts such as classrooms, researchers should consider three different planes or spheres, namely the personal, interpersonal, and community. The personal plane encompasses how individuals participate in a given activity (actions taken, responses given). The interpersonal plane then explores interactions between and among participants. And finally, the community plane seeks to consider how broader social and cultural values influence the particular events being studied. Perry and Rahim (2011) note the difficulty, if not impossibility, of attending to all three planes at once, but rather suggest focusing on one plane without completely ignoring the others.

Rogoff's spheres find an echo in the work done by McPherson et al. (2012) examining the role music plays in people's lives across the life span. Through a variety of methods, including

surveys, structured interviews, and recordings of practice and performance, McPherson and his colleagues present a complex and richly textured examination of the role music and musical experiences play in the lives of young people. The researchers have examined many facets of both musical skill acquisition and the support given by teachers and parents to young people at different ages and stages of life. McPherson et al. (2012) use the term "syzygies" to describe these facets, or what he calls "transactions—across social, biological, psychological, and environmental spheres—that create promotive conditions for significant musical growth" (p. 183). While observations, whether of music lessons or music practice sessions, may provide valuable insights into how participants do or do not self-regulate, the findings ideally will be situated in the wider context of the intersecting influences and roles of parents, siblings, teachers, and community in which the young person is making music.

As noted and explored in Chapter 1, despite the challenges associated with observation methods, a number of observation tools have been developed, notably by Nancy Perry and her colleagues, who have examined SRL and the teaching of literacy skills in elementary schools (Perry & Vandekamp, 2000; Perry, Vandekamp, Mercer, & Nordby, 2002; Perry, 1998); the Centre for the Study of Learning and Performance at Concordia University through their Implementation Fidelity Measure ((("Implementation Fidelity Measure – ABRACADABRA/ePEARL Comprehension Focus," 2010); David Whitebread and his colleagues, who examine the development of SRL in preschool-age children (Whitebread et al., 2009); and Charlotte Dignath-van Ewijk's recent work exploring self-regulation in math classes for junior high school students (Dignath-van Ewijk et al., 2013). However, as pointed out in Chapter 1, none of these tools examined self-regulation in the cyclical phases of forethought, performance, and reflection as they occur in music lessons (e.g. McPherson & Zimmerman, 2011; Zimmerman, 1989, 2008). Capturing this cycle may advance our understanding of how expertise develops and is sustained over time, as research suggests that training in using all three phases results in improved performance (Zimmerman, 2006). Although some observations have been done in music lessons, including work by Duke and Simmons (2006) studying three expert teachers and McPherson and colleagues taping and viewing of students' practice sessions (McPherson et al., 2012), there does not appear to be any existing tool developed for observing music lessons specifically through the three-phase self-regulatory framework, thus providing the impetus for the development of the T-SREM tool.

Methodological Considerations in Video Research

The T-SREM tool is being tested on videotaped data, a process that raises specific methodological as well as practical issues. Barron (2009) states that the methods used in video research have their roots in the scientific practice of "disciplined observation" (p. 160), in which social scientists, before the advent of film, developed ways to document, analyze, and present findings on human behaviours. However, as recording tools were developed, including today's compact and easy-to-operate digital cameras, researchers then had means to collect data of extraordinary richness, in which gesture, conversations, movements, etc., were all captured at a level of detail impossible for a human being with a paper and pen to do (Barron, 2009). Yet it is that vast amount of recorded information that presents significant challenges in terms of collection (where, when, and by whom something should be taped), transcription (in whole or just parts), and analysis (at what level of granularity and guided by what theories) (Erikson, 2006; Goldman & McDermott, 2009).

To assist researchers navigating the complexities of video research, Derry et al. (2010) have suggested four key issues that must be considered and addressed:

1. Selection: What part of the environment to be studied will be placed in the camera's view (in other words, what is selected to be recorded)? Once the recording is done, how do researchers decide what segments to examine in more detail?

2. Analysis: What valid and reliable theoretical frameworks exist to guide the analysis of the selected sections?

3. Technology: What tools and methods exist for recording, archiving, sharing, and disseminating video research?

4. Ethics: What protocols exist or should be created that protect the rights of human subjects while still allowing for the sharing and re-use of valuable videotaped data?

(Of particular interest for this project are the first and second questions, with issues of how and with what the taping was done and ethical considerations explored more fully in the Methodology section.)

Selection. Erickson (2006) suggests that videotaping the environment of interest be done in such a way as to produce a document that is as "phenomenologically neutral" (p. 177) as possible, meaning footage with a minimum of editing or movement and a comprehensive coverage of the social interactions taking place. Once the video record has been created, researchers then face important decisions about what sections to examine in greater detail. Derry et al. (2010) propose two selection systems: data analysis, meaning to identify and track some occurring pattern, or narrative power, meaning for the purposes of telling an important story. In both cases, researchers have the option of working inductively, when analysis proceeds with broad questions but without strong theoretical orientations, or deductively, in which the analysis is guided by a specific theory and more detailed research questions (Derry et al., 2010).

Analysis. As Derry et al. (2010) note, any in-depth analysis of video records is likely to be both based on and constrained by the researcher's theoretical orientation and research questions, a project's long-term goals (will clips be shown to a wide audience or used for teaching purposes, for example), as well as time and money issues. However, they propose three practical suggestions for approaching the analysis phase:

1. Use guiding questions that are drawn from the research literature to avoid getting too lost in all the information contained in the videos;

2. While being guided by theory, remain open to unexpected findings, especially as videos are watched repeatedly over time and by different researchers;

3. Encourage viewing by more than one researcher, as the very richness of the detail means each viewer is likely to perceive the segment in slightly different ways (Derry et al., 2010).

As noted in the beginning of this chapter, substantive research has examined both the theoretical and applied aspects of self-regulation across different contexts. However, the research into self-regulation and its impact on musical performance and practice is far less developed, although significant work is now being carried out to understand the facets and influences that lead people to pursue the making of music across the life span. Recording and then coding music lessons, examining them for evidence of self-regulation, contributes to this research. However, there are, as evidenced from the review above, significant theoretical and practical issues to be considered when using videotaped data. A further examination of how those issues have been

addressed will be described in the next chapter, Methodology. That chapter will also outline both the development and the iterative testing that led to the T-SREM, as well as its pilot testing with several hours of taped data.

Chapter 3: Methodology

This chapter traces the development of the T-SREM, exploring the processes and decisions made during the creation of this new observation tool based specifically on self-regulatory behaviours in music lessons. The tool is presented in the format used during the pilot test and criteria for evaluating it are also given. Then, the steps taken to recruit teachers and students for the taping are described, including the ethical considerations and permissions sought. Finally, the process used by the two graduate student researchers to code the lessons is provided.

The development of the T-SREM began in the summer of 2013, with several iterative database searches carried out to identify previously created and validated classroom or teaching observation protocols that might be adapted for the music context. Searches for scholarly journals were conducted in Academic Search Complete, CBCA Education, Education Full Text, Education Source, ERIC, PsycINFO, Psychology and Behavioral Sciences Collection, RILM Abstracts of Music Literature, Social Sciences Abstracts, and SocINDEX. Search terms included self-regulated learning, self-regulated, self-regulatory, self regulat*, self culture, observation, observation methods, observation protocols, observation tools, teaching, teachers, education.

During this time frame, the relevant literature on self-regulation was being reviewed in preparation for the writing of this thesis literature review, so references found to observation tools were checked as well. In addition, studies focusing on music practice and musical self-regulation literature from the systematic review carried out by Varela et al. (2014) were shared by the study's first author.

The development process, including searches and initial protocols, was discussed with the iSCORE team at eight different meetings held between August 2013 and May 2014. (The iSCORE team included the two lead investigators, with expertise in both self-regulation and music pedagogy; a postdoctoral fellow; two PhD candidates examining issues of self-regulation; and two MA students, including the thesis author.) The iSCORE team also used videotaped lessons to pilot test the protocols as a group in December 2013, and then through smaller teams of two or three persons in March and April 2014.

The initial two versions of the observation protocol (Appendix A) were based on observations of literacy teaching and self-regulation as found in Ames (1992), Perry (1998), Perry and Vandekamp (2000), and Perry et al. (2002). The second version then incorporated work by

McPherson et al. (2012) on musical self-regulation. However, at testing sessions in December 2014, coders expressed confusion about coding "level of challenge" as it required a degree of knowledge about the student's level that was not available through the recording, as well as "support from teacher," again because a high degree of inference about the teacher's thought process was needed. The coding categories were judged to be too broadly worded, making it difficult to identify and label particular behaviours. As well, consensus emerged that the coding protocol did not reflect the project's theoretical foundation, namely Zimmerman's (2000) three-phase cycle of forethought, performance, and self-reflection.

This need for theoretical coherence, notably emphasized in the research literature by Schunk (2008), Bakeman and Gottman (1997), and Bakeman and Quera (2011), as well for more clearly defined coding categories, led to a re-working of the protocol drawing explicitly on the definitions and descriptions found in Zimmerman's extensive body of work (e.g. Zimmerman, 1998, 2000, 2002, 2008). However, the team decided that not all of the sub-processes found in the triadic model could be accurately assessed and coded through observation of behaviour because several processes focused on thoughts and feelings and would thus require a high degree of inference for coding from behaviours. The following sub-processes were thus excluded:

- **Forethought phase**: self-efficacy, goal orientation, intrinsic interest/value, outcome expectations;
- **Performance phase**: imagery;
- **Reflection phase**: causal attribution, self-satisfaction/affect, adaptive/defensive inferences.

While it is possible that some of these sub-processes could be identified and coded accurately through verbal exchanges, they were not included in the revised protocol but could be included in future versions.

The revised protocol also included a system for noting whether the self-regulatory process was initiated by the student or teacher (in other words, was the teacher eliciting, encouraging, or in some way trying to support a student's self-regulation, or was the student exhibiting a self-regulatory behaviour to which the teacher might or might not respond), as well as examples of self-regulatory behaviour drawn from the literature.

The team also analyzed the work of Whitebread and his colleagues, who had developed a detailed coding scheme to identify indicators of young children's self-regulation and metacognition (Whitebread et al., 2009). Their tool allowed for coding of both verbal and nonverbal indicators of self-regulation, which the team deemed to be of interest when examining music lessons in which gestures and sound production might reveal something of a self-regulatory process. As well, the three-section organization of the tool, which included category names (broad conceptual ideas), description of behaviour (more detailed descriptions of particular categories), and examples (specific behaviours seen in the tapes) (Whitebread et al., 2009), was judged to be a clear and concise way of organizing an observation tool and was adapted for use by the iSCORE team. Whitebread et al. (2009)'s decision to apply a very fine-grained analysis to the videotapes also informed the development of the T-SREM; however, the methodological issues arising from those discussions about identifying units for coding will be addressed in the next section.

Identification of Coding Units

Bakeman and Quera (2011) have identified two broad ways researchers may apply codes to a particular set of behaviours (in the case of iSCORE, one individual, recorded lesson):

(a) event recording: a code is assigned to a particular event;

(b) interval recording: a code is assigned for a particular time interval (e.g. for each one-minute time period).

They then refine this classification by accounting for time, meaning that the duration of events may be either recorded (timed event) or unrecorded (untimed event), while a time interval may be contiguous (interval) or intermittent (selected interval) (Bakeman & Quera, 2011), as seen in Figure 3 below:

Figure 3: Recording Strategies for Observational Data

Elements Coded	Specific Attributes		Recording Strategy
Behavioral event	Duration recorded?	No	Untimed-event
		Yes	Timed-event
Time interval	Intervals contiguous	Yes	Interval
		No	Selected-interval

From Bakeman, R., & Quera, V. (2011). *Sequential analysis and observational methods for the behavioral sciences*. New York, NY: Cambridge University Press

During the T-SREM development process, the team discussed using interval recording (suggested intervals were between 1 and 5 minutes). However, it was decided that given the unpredictable nature of a music lesson (which might include long periods of playing interspersed with shorter discussions, or vice versa) and a working hypothesis that several self-regulatory processes might follow in quick succession (i.e. a student might set a goal and then immediately discuss possible strategies for achieving that goal), interval recording was unlikely to accurately capture self-regulation. This decision is in line with the conclusions of Bakeman and Gottman (1997), who suggest that there is almost never a theoretical reason to use interval coding and it should be considered only for the practical reason that such a system is simple and inexpensive to use.

Therefore, event coding was selected as an appropriate method. In April 2013, another test of the protocol was carried out by two teams, each composed of a graduate student researcher and the thesis author. The team members viewed and coded their video separately, then the results were collated by the thesis author. Results from those initial tests are found in Appendix B.

As can be seen, there was significant variation in the level of granularity for identifying self-regulatory behaviours, with one set of coders identifying 117 versus 91 events for a lesson, while a second set of coders identified 171 versus 40 for another lesson. Coders also did not agree

on the coding categories of the identified behaviours. For example, in one lesson, a coder identified 6.7% of behaviours as being related to "Instruction" while the second coder identified 15.4% of behaviours in that category. As well, in the same lesson, the coders respectively coded 47% versus 21.8% of behaviours as being "Attention Focusing." (Full results of this testing can be found in Appendix B.) The team discussed the results and two key problems were identified:

1. The need for clear guidelines on how to select coding events. The problem of how to define and select events for coding is both crucial and often vexing to researchers using observational methods, whether in ethnography (Angelillo, Rogoff, & Chavajay, 2009), family and communities (Barron, 2009), science learning in informal contexts (Ash et al., 2007), or generally in the social sciences (Bakeman & Gottman, 1997).

2. The need to clarify the examples given for all the sub-codes (Zimmerman's sub-processes), with a particular focus on strategic planning, instruction, and attention focusing.

To address the first problem, the team drew on the work of Ash and her colleagues, who study informal science learning by families at museums (Ash, 2003, 2004, 2009; Ash et al., 2007). Ash (2009) uses a three-level protocol for coding recorded conversations with families:

1. Flow chart: an overview, holistic and large-grained, of a visit by a family to a museum. The flow chart identifies by time markers and conversational themes sections that may potentially be coded in more detail.

2. Significant events: specific events are isolated based on having a defined beginning and end, being sustained over time, and using different sources of knowledge and inquiry strategies.

3. Dialogic analyses: a fine-grained analysis of a significant event, focusing on very small segments of conversation and gestures.

In an earlier phase of the project, the team had developed a tool, informally called the Geography Coding ,which mapped out--through time stamps and code categories--what was happening in the lesson (e.g. teacher talking, student talking, student playing music, teacher demonstrating by playing music, etc. The Geography Coding served a purpose similar to that of Ash's (2009) flow chart, namely to provide a general overview of what was taking place in the

lesson (working on a scale, discussion about repertoire, playing a particular piece). However, after applying the Geography Coding to a number of lessons, the team decided that it did not identify segments of the videos in a way that made it easier to examine them from a self-regulatory framework. Therefore, the idea of an initial flow chart was abandoned, and instead the team focused on defining the equivalent of Ash's (2009) significant events, or what the team called "episodes." The team developed a two-part system for coding the videos:

1. Episode coding: Each lesson would be coded for episodes, defined by the iSCORE research team as:

> *A sustained monologue or a dialogue (verbal or nonverbal) with a recognizable beginning and end and that focuses on a teaching or learning event in which teachers implicitly or explicitly address issues of practicing between lessons.*

The team hypothesized that there would be 3-6 episodes per 30-minute lesson.

2. SRL Coding: The two graduate student researchers would select three episodes from each lesson for a more fine-grained analysis using the a priori coding categories. They would chose episodes for fine-grain coding based on the richness of the interactions and with the hope of illustrating trends in the use of SRL strategies.

Therefore, the coding protocol used during this pilot testing is seen below in Table 2:

Table 2: Verbal and Non-Verbal Indicators of SRL and Teacher-Initiated or Student-Teacher Negotiated Events

1. FORETHOUGHT*

*Prior to playing a piece or a major section of a piece

Code	*Sub-code*	*Locus of control*	*Example*
Task Analysis			
	Goal-setting		*The setting of hierarchical goals that show evidence of progress and foster intrinsic interest (Zimmerman, 2000*)
		Student-initiated	• Student states, reviews, or asks about a goal (e.g. "I want to play the Bach prelude.") • Student sets a goal nonverbally (e.g. decides which piece or section of piece to play for teacher and begins playing)
		Teacher-initiated	• Teacher decides what piece or section of piece student will play • Teacher states, reviews, or asks about a goal (e.g. "We're going to focus on technique during today's lesson.") • Teacher selects technically or musically important and achievable goals
		Student-teacher negotiated	• Teacher and student together select or decide on goals and/or tasks
	Strategic planning		*Identifying the strategies that are appropriate for the task (Zimmerman, 2000)*

	Student-initiated	• Student prepares music • Student identifies strategies needed to accomplish the task 1. Student asks about or discusses a strategy before beginning to play • Student prepares physically to play (hand position, seating on bench, tuning, etc.)
	Teacher-initiated	• Teacher requests/identifies/suggests student use a specific strategy • Teacher requests student/identifies/suggests using a specific strategy with explanation to student • Teacher directs student in physical preparation for playing (tunes instrument, adjusts bench)
	Student-teacher negotiated (co-regulation)	• Teacher and student discuss strategies available to meet demands of task • Teacher and student decide on a strategy or strategies to be used for upcoming task • Teacher and student work together to physically prepare student to play (hand position, seating on bench, tuning, etc.) • Teacher gives choice for instructional support (e.g. use of dictation book)

2. PERFORMANCE*

*While playing a piece or a major section of a piece

Code	*Sub-code*	*Locus of control*	*Example*
Control			
	Instruction		*Overt or covert description of how to perform the task as one executes the task (Zimmerman, 2000)*
		Student-initiated	• Student talks to himself/herself about how to perform a task • Student verbalizes steps to teacher that are needed to accomplish a task
		Teacher-initiated	• Teacher suggests that student use self-talk or self-instruction as a strategy • Teacher models how to use self-talk or self-instruction • Teacher suggests student verbalize steps needed to accomplish a task • Teacher models desired performance outcome (positive or negative)
		Teacher-student negotiated (co-regulation)	• Teacher and student discuss together how to use self-instruction or self-talk • Teacher and student discuss together how to verbalize steps needed to accomplish a task

Attention focusing (monitoring)		*Using strategies to concentrate (Zimmerman, 2000)*
	Student-initiated	• Student synchronizes attention and action (e.g. "I'll start at the first section.") • Student makes notes of critical features on score • Student stops when an error is made • Student corrects error in some way (e.g. re-starting phrase where error occurred) • Student suggests/uses a strategy to avoid errors
	Teacher-initiated	• Teacher synchronizes attention and action (e.g. "Let's start at letter B," or follows score with finger or pencil) • Teacher marks critical features (e.g. F# circled on score, points to score) • Teacher points out an error • Teacher asks student to correct error

	Student-teacher negotiated (co-regulation)	• Teacher and student discuss synchronizing attention and action • Teacher and student notice an error at the same time • Teacher and student acknowledge, verbally or nonverbally, that an error has occurred
Task strategies		*Reducing a task to its essential parts and reorganizing the parts meaningfully (Zimmerman, 2000)*
	Student-initiated	• Student asks teacher to model or demonstrate • Student counts out loud to assist with timing • Student sings to reinforce phrasing • Student keeps time in an observable way (swaying, nodding, tapping) • Student asks to work on a small section of a piece • Student asks to work on hard part • Student indicates she/he will make interpretive choices (tempo, rubato, dynamics)

	Teacher-initiated	• Teacher asks student to count out loud to assist with timing • Teacher asks student to sing to reinforce phrasing • Teacher asks student to work on small section of piece • Teacher asks student to work on difficult section rather than just playing through the piece • Teacher directs the musical interpretation • Teacher manipulates task for difficulty level
	Student-teacher negotiated (co-regulation)	• Teacher suggests that as a strategy for keeping time, student count out loud, and student counts out loud • Teacher suggests that as a strategy for grasping the phrasing, student sing a passage, and student sings • Teacher suggests the strategy of breaking down the piece into small sections, and discussion ensues • Teacher suggests the strategy of working on a difficult part rather than just playing through the piece, and discussion ensues • Teacher prompts student to make interpretive choices (e.g. “How do you think this should sound?”), and discussion ensues

	• Teacher counts or plays simultaneously with student
Observation	
Recording	*Keeping records to monitor one's progress (Zimmerman, 2000)*

	Student-initiated	• Student suggests making a recording right away or in near future • Student (without prompting) writes down something she or he considers important about the music, about practicing, or about performing • Student, without prompting, marks score to record wrong notes or a difficult passage
	Teacher-initiated/negotiated (co-regulation)	• Teacher records student playing • Teacher writes notes for student about her/his progress
	Student-teacher negotiated (co-regulation)	• Teacher suggests or prompts student to record him or herself (right away or in near future) • Teacher suggests or prompts student to write down something important about her/his progress
Experimentation		*Trying new alternative approaches (strategies) when the selected approach has not been successful (Zimmerman, 2000)*
	Student-initiated	• Student, without prompting, tries a new strategy (e.g. changes rhythm phrasing, dynamics, etc.) • Student asks if technique previously learned can be used in a new situation

	Teacher-initiated	• Teacher tells student to use a new strategy or models new strategy
	Student-teacher negotiated (co-regulation)	• Teacher suggests or prompts student to think about using or trying out a new strategy • Teacher suggests or prompts student to think about using a previously learned strategy in a new situation • Teacher suggests or prompts student to leave one strategy and try another

3. REFLECTION*

*After playing a piece or a major section of a piece

Code	*Sub-code*	*Locus of control*	*Example*
Judgment by self and others			
	Evaluation		*Comparing self-monitored results with a standard or goal (Zimmerman, 2000)*

	Student-initiated	• Without prompting from teacher, student reflects on quality of task performed through gestures, facial expressions or verbal comments • Without prompting from teacher, student reflects on strategy or strategies used in performing the task • Student comments on perceived task difficulty
	Teacher-initiated	• Critical feedback (clear, pointed, directed at specific aspects) • Positive feedback (verbal or nonverbal)
	Student-teacher negotiated	• Teacher prompts student to reflect on quality of task just performed (e.g. "How do you think that went?"), and discussion occurs • Teacher prompts student to reflect on the strategy or strategies used in performing the task (e.g. "Did playing that very slowly help you?") and discussion occurs

This coding protocol meets the following criteria:

(a) It has clear definitions, as suggested by Schunk (2008), which are drawn explicitly from the literature and are linked directly to the processes being studied;

(b) It is firmly and directly linked to theory (in fact, it is linked to the theory underlying the iSCORE project), as Schunk (2008) recommends;

(c) It has coding categories that are mutually exclusive and exhaustive (ME&E), so a specific behaviour may be coded in one category only and all processes and sub-processes in the self-regulatory cycle have codes, as described and recommended by Bakeman and Gottman (1997), and Bakeman and Quera (2011).

In this stage of development, two important recommendations made by Schunk (2008) have not been met: the protocol has not been tested for reliability or validity, nor have the outcome measures to be linked to these processes been fully determined (i.e. is teacher support for self-regulation in lessons correlated with improved performance on an exam or end-of-year recital? Is teacher support correlated with longer practice sessions for students?). These methodological limitations will be discussed and addressed more fully in Chapter 5, with a focus on establishing the next steps to be taken for T-SREM.

Data Sampling and Collection

In a form of purposeful sampling, six teachers who are part of the iSCORE project—four from the Greater Toronto Area and two from Montreal—were asked to videotape weekly lessons with students chosen by the teacher (however, all students and parents gave informed consent to participate). This sample of teachers was selected based on their expressed commitment to the iSCORE project and corresponding willingness to engage in the time-consuming videotaping process, which entailed obtaining consent forms for students, training in the use of the video cameras, taping the lessons, and sending the data cards from the cameras back to the research team.

To avoid burdening the teachers any further, a decision was made not to instruct or request teachers to select students based on achievement levels (either number of years spent studying the instrument or teacher-assessed level of play—beginner, intermediate, or advanced) or ability of the students to self-regulate (low, medium, or high). It is very possible they might have chosen their better-performing students (who might already demonstrate significant self-regulatory skills both within the lesson and during private practice) rather than under-performing students who lack these skills.

Teachers were free to tape in their music studios, or in the case of one teacher, in the homes of the students being given a lesson. In the collected videos, piano was the main instrument in half the lessons, with guitar, voice, and violin making up the rest. Students' ages ranged from early elementary school (approximately age 7) to adults, with most of the videos showing students ages approximately 11 to 16. (The teachers were not asked to collect or provide demographic data such as age for their students, hence the age approximations.)

The geographically restricted and limited size of the teacher sample, combined with the teacher-selected sample of students, suggests that the video data collected are not representative of studio lessons across Canada. The inclusion of several lessons with advanced students and adults, who may already possess higher levels of self-regulatory skill, also represents a significant limitation.

The data collection, in the form of teachers videotaping lessons, took place in the fall of 2013. The teachers were provided with digital recording equipment (cameras and tripods) and members of the iSCORE research team visited each teacher individually to demonstrate use of the equipment and answer any questions.

Video recording was selected as an effective method for capturing lesson data (defined as the ongoing interaction between the student and teacher over the lesson period) without the intrusive presence of an outside camera operator or a researcher-observer sitting in and taking notes. However, teacher-controlled recordings meant that not all recorded lessons covered the entire lesson period; for example, one teacher only remembered to turn on the camera five minutes into the lesson, and in several instances, the camera shut off before the end of the lesson. Therefore, the total hours of recorded lesson times per teacher varied between approximately 2 hours and 24 hours.

As noted above, teachers were given minimal guidance on selecting which students to record, and were asked only to record successive weekly lessons over a period of one month. Not all teachers followed this schedule, meaning that some students were recorded only once while others were recorded four times. The recordings were not date-stamped and teachers were not asked to track the actual dates for which recordings were taken. Five teachers conducted lessons in English, while one conducted lessons in Spanish.

After receiving the entire set of video lessons from the six teachers, the iSCORE team decided to focus the initial testing of the observation tool on four teachers from the Greater Toronto Area. The other two teachers were excluded for the following reasons:

1. One teacher had given lessons in Spanish and due to time constraints and resources (namely the need for translation services), the team decided to exclude those tapes;

2. One teacher had selected students who demonstrated exceptionally high levels of expertise (conservatory level); the team decided the teaching and learning were not being done with students typically found in independent music studios.

It should be noted, however, that the video recordings are a permanent record and it is possible that in the future, further coding work will be done on lessons from those two teachers.

Thus, the data set for the testing of T-SREM consisted of 37.1 hours of recorded lessons from four teachers and 11 students.

Ethics

The iSCORE project received ethical clearance from Concordia University and Queen's University, meaning it met all requirements set out in the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans. In 2013, teachers and parents were sent a letter of information outlining the overall purpose of the iSCORE project, with a description of the video collection procedures, the risks and benefits of participating in the project, and the right to withdraw at any time without any consequences. Teachers and parents were then invited to sign a consent form indicating that their participation in the project was free and voluntary, along with that of the parent's child or children. They were also invited to sign a more detailed consent form asking for specific permission to allow the project's principal investigators, as well as their graduate students and research staff, to use the video for any or all of the following purposes: (a) viewing for research purposes only; (b) publication in a journal; (c) demonstration at a conference; and (d) demonstration on a website/DVD. (See Appendix C for copies of the letter of information and consent forms.)

As well, the video coding process discussed in this thesis also received specific ethical clearance from Concordia University in accordance with both the Tri-Council policy and the institution's own policies on graduate student research. To ensure the ethical use of the video

data, including privacy of the teachers and students shown in them, the videos are kept on a secure server at Queen's University. For the video analysis, two graduate students were provided with hard drives containing copies of the videos. The hard drives were kept in a locked and secure area at the students' homes when not being used for the actual analysis process. During the coding process, the graduate student researchers carried out their work in a closed room to ensure confidentiality. The names of students and teachers have been changed in reporting the data in this thesis (and will be changed in any future publications) to ensure their privacy.

Coding Process

In May 2014, two graduate students, including the thesis author, began coding the selected videos. For the initial testing of the T-SREM, two graduate students reviewed all the lessons, then selected lessons for coding, based on the following criteria:

(a) lessons divided as evenly as possible among the four teachers;

(b) inclusion of students of different genders, ages (adult, teen, child), musical instruments, and skill levels.

Efforts were made to include students for whom several recorded lessons had been done over the month, but that was not possible in all cases. No transcriptions of the tapes were made; rather, the coders would watch each video and take notes. First, the two coders would examine the video to determine episodes, as per the agreed-upon definition of "a sustained monologue or a dialogue (verbal or nonverbal) with a recognizable beginning and end and that focuses on a teaching or learning event in which teachers implicitly or explicitly address issues of practicing between lessons." They watched the video together, but took notes separately. Then they would compare how they had selected episodes, including the start and end times, and through discussion, resolve any differences.

Establishing inter-rater reliability proved problematic, largely due the coders focusing on the difficulties of demarcating events. As Bakeman and Quera (2011) note, the classic Cohen's kappa is used for events that are demarcated prior to coding, with coders comparing the agreement across a list of agreed-upon events. The assumption is that the number of decisions is equal to the number of tallies in the kappa table (Bakeman & Quera, 2011). In the case of this episode coding, the researchers were attempting to demarcate the events (episodes) themselves, including identifying an episode plus its start and end time, which could vary depending on the

coder. This latter situation is what Bakeman and Quera (2011) call a problem of alignment. However, as the purpose of the pilot testing was not to divide the lesson into mutually-exclusive episodes for further SRL-coding—indeed, not all episodes identified in the lessons were SRL coded—a decision was made to use the areas of disagreement as a way to refine the definition of an episode itself, in order to improve the coding process in future iterations. An analysis of the areas of disagreement is found in Chapter 4.

Another, arguable more appropriate, approach would have been to divide the coding into steps. The coders would first come to an agreement on the events and event times. Once that task was completed, and events had been agreed upon, the SRL codes would then be applied to these delineated events. Consideration should also be given in future coding to simply coding the entire lesson, thus eliminating the need for events. The coding process would take more time—as there would be videotape to be observed closely and coded, but possible less (or at most the same amount) time than was needed to identify "events" first.

Once the episodes had been identified, the researchers took a sample of those episodes for more detailed SRL coding, selecting episodes that appeared to contain rich and varied interactions between the teacher and student around self-regulatory behaviours. The SRL coding was then carried out in a similar fashion, with the researchers watching the video and taking notes separately, then coming together to compare and discuss their findings. As with the episode coding, determining a classic Cohen's kappa was not possible. Instead, the researcher used the areas of disagreement to further refine the operationalized coding definitions. An analysis of the identified problems and suggestions for changes to the coding definitions are found in Chapter 4.

Data about the episodes (start and end times, brief description of what had occurred) and the SRL codes (start and end time, the actual code, brief description of what had occurred) were collected in Excel spread sheets (see Appendix D for a sample coding document). Excel was selected for its ease of use by all iSCORE team members. The team did consider using the video-annotator HyperResearch, but issues of licensing and sharing files between the two universities precluded its use.

This concludes the examination of the methodology used in the pilot test. The next chapter will present the results obtained from the initial testing as well as an analysis of the results.

Chapter 4: Results and Analysis

This chapter presents both an overview of the data collected via the coding and a more detailed analysis by individual teacher. The issue of how to calculate inter-rater reliability is discussed. Suggestions for refining and clarifying several of the coding categories are then given. Finally, the issue of the time needed to code lessons is examined.

Results from Initial Testing

As seen in the tables presented below, the initial testing of T-SREM allowed for the identification of behaviours in all three phases of the self-regulatory cycle of forethought-performance-self-reflection as identified by Zimmerman (2000, 2006, 2008, 2011). In this early phase of testing, all the SRL behaviours identified were derived from verbal interactions (i.e. the conversation and comments of students and teachers); no nonverbal interactions were identified and coded, which may reflect both the ages and ability levels of participants, who were all able to ask questions and discuss what was taking place. Thus, it remains unknown how well this coding system will accurately categorize nonverbal interactions, which are perhaps more likely to be seen with very young students and may require a high degree of inference about motivation and intentions.

As well, the original coding system attempted to identify behaviours that were deemed to be "co-regulated" between the teacher and the student. However, the initial testing revealed an insufficiently robust definition of the term co-regulation in the coding scheme to permit coders to assess it with confidence. The term co-regulation, as explored in Sameroff (2010) and discussed in teaching and learning contexts by McPherson et al. (2012), Whitebread et al. (2009), and Perry and Rahim (2011), does not have a large body of research linking measures and methods of assessing it to the theoretical construct (Perry & Rahim, 2011). Therefore, the coders faced the task of trying to determine how much of an interaction between teacher and student was needed for it to be coded as co-regulation, from a few seconds to several minutes. As might be expected in a dynamic situation like a lesson, initiating a regulatory behaviour, such as proposing a weekly goal for a student, often resulted in a conversational give-and-take, thus highlighting some of the difficulties of assessing behaviours as being only from the "self" or from an "other." The definitions given in the original coding system did not provide enough theoretical or practical

guidance to allow for accurate and replicable determination of co-regulation. Therefore, as a preliminary step, the coders identified the initiator of the behaviour—teacher or student—or what was called the "locus of control." Additional research is needed to more accurately assess, describe, and code co-regulatory behaviours.

Overview of Teacher/Student Data

As shown in Table 3, four different teachers taped a total of 37.1 hours of lessons. The total recorded lesson time varied considerably from teacher to teacher (times were 1.4 hours, 3.7 hours, 7.5 hours, and 24.5 hours). Two teachers recorded two complete lessons for three of their students. One teacher recorded two complete lessons for seven of his students. One teacher recorded only one complete lesson for a student, and then one complete and one incomplete lesson for a second student. The average lesson time varied as well, lasting 32 minutes for Teacher 1, 34 minutes for Teachers 2 and 4, and 49 minutes for Teacher 3. Lessons were given on piano, guitar, keyboard, and voice. After listening to the recordings of the 11 students, the researchers classified one student as being at the beginner level, six students as being at the intermediate level, and four as being at the advanced level.

For this pilot test of the coding protocol, the total recorded lesson time examined by the researchers for events was 12.9 hours, including 3.2 hours from Teacher 1, 3.4 hours from Teacher 2, 4.9 hours from Teacher 3, and 1.4 hours from Teacher 4. The total time needed by the graduate student researchers to view the more than 12 hours of lesson time, identify events, and then code those events for self-regulatory behaviours was 100 hours each, or a total of 200 research hours. This amounted to almost eight hours of coding for every hour of video for each coder or almost sixteen hours per hour of video per pair of coders.

However, the coding ratio may not be reflective of pure coding time, as the researchers also spent time discussing areas of disagreement and refinements to the coding system. Therefore, it would be expected that the time needed to code an hour of video would be less as the coding system evolves, the coding categories are refined and any given set of researchers is trained to use it. In discussions with the iSCORE team during the development of the coding protocol, an initial estimate was made that four hours of coding time would be needed for each hour of video. Having completed this pilot testing, the researchers suggest that this estimate is still valid, given

that the conditions outlined above are met, because by the end of the coding exercise, they had come close to achieving that ratio.

In those 12.9 hours of lesson time, the researchers identified 98 different episodes that focused on teaching and learning and addressed practice during the week. From those identified episodes, the researchers selected 69 for further examination and coding for self-regulatory behaviours. As this was a pilot test and there were constraints about how much coding time would be appropriate for this initial use of the protocol, the coders sorted the 98 episodes into those of high, medium and lower interest based on the richness of the interactions around self-regulation seen in the videos. They then worked through the list, eventually coding 69 of the 98 identified episodes. This procedure resulted in the coding of significantly more episodes from Teacher 1 (29) than for Teachers 2 and 3 (18). (Note: because of the limited recordings available for Teacher 4, it would have been impossible to keep his number of episodes even close to being the same as the other teachers).

A more systematic and careful selection of episodes to be coded for SRL could have been employed. It would be essential for researchers using this tool to (a) either code the entire lesson (meaning discarding the event identification step) or (b) code ALL event found within a lesson before moving on. Either choice would address the problem seen below: namely the lack of appropriate frequency comparisons as well as measures of central tendency and variability because not all events in a lesson were coded, leading to under-reporting of SRL coding data for individual lessons as well as the overview. While the coders tried to be systematic in selecting which events to code (leaving out 29 for the reasons noted above), the end result was lessons in which some events were coded and others not, making comparisons across teachers must more tentative.

Table 3: Overview of Teacher/Student Data

	Teacher 1	**Teacher 2**	**Teacher 3**	**Teacher 4**

Total lesson time recorded by teacher	3.7 hrs	7.5 hrs	24.5 hrs	1.4 hrs
Total number of students recorded	3	3	7	2
Number of lessons/students selected for coding	Student 1.1 - 2 lessons Student 1.2 - 2 lessons Student 1.3 - 2 lessons Total: 3 students/6 lessons	Student 2.1 - 2 lessons Student 2.2 - 2 lessons Student 2.3 - 2 lessons Total: 3 students/6 lessons	Student 3.1 - 2 lessons Student 3.2 - 2 lessons Student 3.3 - 2 lessons Total: 3 students/6 lessons	Student 4.1 - 2 lessons (1 incomplete, 1 complete) Student 4.2 - 1 lesson Total: 2 students/2.5 lessons
Student age/level/instrument	Student 1.1 child, beginner, piano Student 1.2 early teen, intermediate, piano Student 1.3 teen, intermediate, piano	Student 2.1 adult, advanced, guitar Student 2.2 adult, intermediate, guitar Student 2.3 adult, intermediate, guitar	Student 3.1 teen, advanced, piano Student 3.2 teen, advanced, piano Student 3.3 teen, advanced, piano	Student 4.1 teen, intermediate, voice + keyboard Student 4.2, teen, intermediate, guitar
Average lesson time	32 min	34 min	49 min	34 min
Total lesson time reviewed for events	3.2 hrs	3.4 hrs	4.9 hrs	1.4 hrs

Total number of events identified	46	20	25	7
Total number of events selected for SRL coded	29	18	18	4
Total number of SRL interactions coded	126	114	139	17

The total recorded lesson time for each teacher was not the same; thus, direct comparisons of frequency counts must be carried out with caution, as higher counts may simply reflect the longer recorded time and not a sustained emphasis on supporting self-regulation. In future, this problem could be addressed by dividing these frequencies by the length of the video. However, this has not been done for this thesis because, as noted above, not all events in a lesson were coded, meaning it is possible that frequency counts for the teachers will ultimately be higher than those that appear in Table 4 below. Again, due to the 29 uncoded events across the lessons, measures of central tendency and variability were not calculated for the frequencies shows below.

However, a broad overview of the frequency of SRL categories found in the teaching does provide some preliminary, albeit provisional, findings as seen below in Table 4. The majority of the examples found were in the following categories: goal-setting (77 out of 396 examples), strategic planning (77), task strategies (104), evaluation (99). Considerably lower counts were found for the categories of instruction (1), attention focusing (21), recording (12), and experimentation (5).

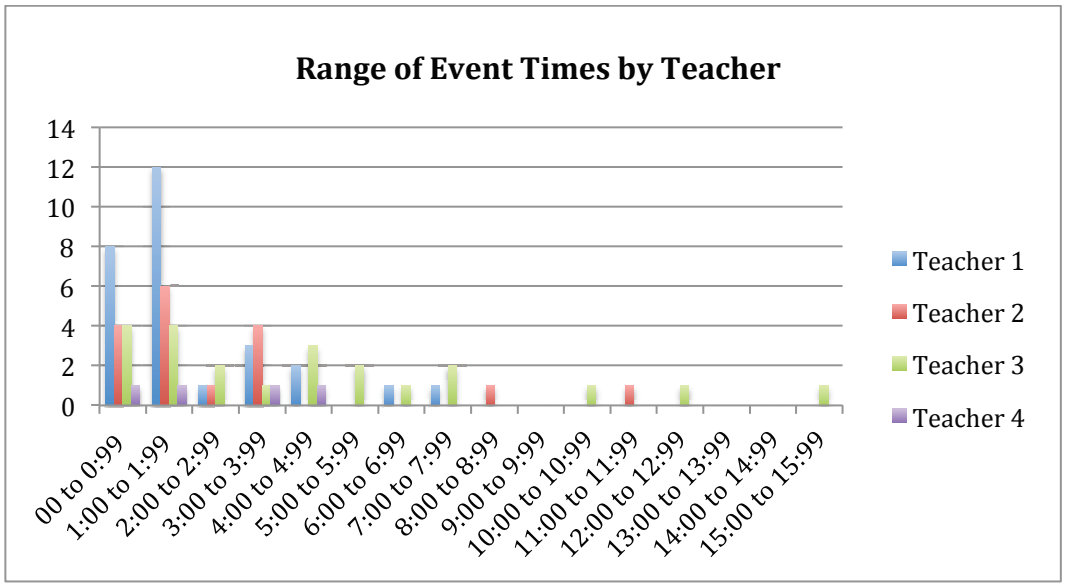
Table 4: Frequency of SRL Categories by Teacher

SRL Categories	Teacher 1	Teacher 2	Teacher 3	Teacher 4	Category Total

Goal-setting	45	6	26	0	77
Strategic Planning	32	12	32	1	77
Instruction	0	0	0	1	1
Attention Focusing	3	4	11	3	21
Task Strategies	12	58	27	7	104
Recording	0	0	12	0	12
Experimentation	1	2	2	0	5
Evaluation	33	32	29	5	99
Total Categories Identified	126	114	139	17	396
Teacher-initiated	115	89	115	9	328
Student-initiated	11	25	24	8	68
Explicit for practice	76	33	32	1	142

As shown in Figure 4 below, there was great variation in the actual time for identified events, with some lasting fewer than 60 seconds, and a few extending over a period of 15 minutes. However, most of the SRL coded events lasted between one and four minutes.

Figure 4: Range of Event Times by Teacher



When examining these variations in length, it is important to note that there was a wide range of student ages and levels of experience in the sample, and these variations may have had a direct influence on both the lesson pace and the length of any SRL event. Teacher 1, who had younger, less experienced students, tended to have very short events, which reflected the overall fast pace of her lessons, in which her students played short (beginner to early intermediate level) pieces and did not spent a great deal of time analyzing a piece in-depth. By contrast, Teacher 3 had students who were playing at very advanced levels and tackling repertoire that required much more in-depth analysis; he might spend 20 or even 30 minutes on one piece, and his SRL events tended to be longer. The end result of a longer SRL event is that there is time to be coded, thus leading to higher frequency in the coding categories. In other words, if the identified events themselves are very short, they will have fewer SRL codes, simply because of the time. The longer the event, the more SRL codes researchers will tend to find. Therefore, when making comparisons among the teachers, it will become important to account not just for frequency but also time.

Data for Individual Teachers

Data for each of the four teachers were then analyzed and are presented below.

Teacher 1. This teacher has over 20 years' experience as a piano teacher and works with 30 to 40 students per year. The students selected for taping included a child beginner and two early-teenage intermediate students. The average lesson time was 32 minutes, with lessons being

given at the teacher's home studio. It is evident from conversations during the lessons with the two intermediate students that each had access to and was using, even in a limited way, the iSCORE program.

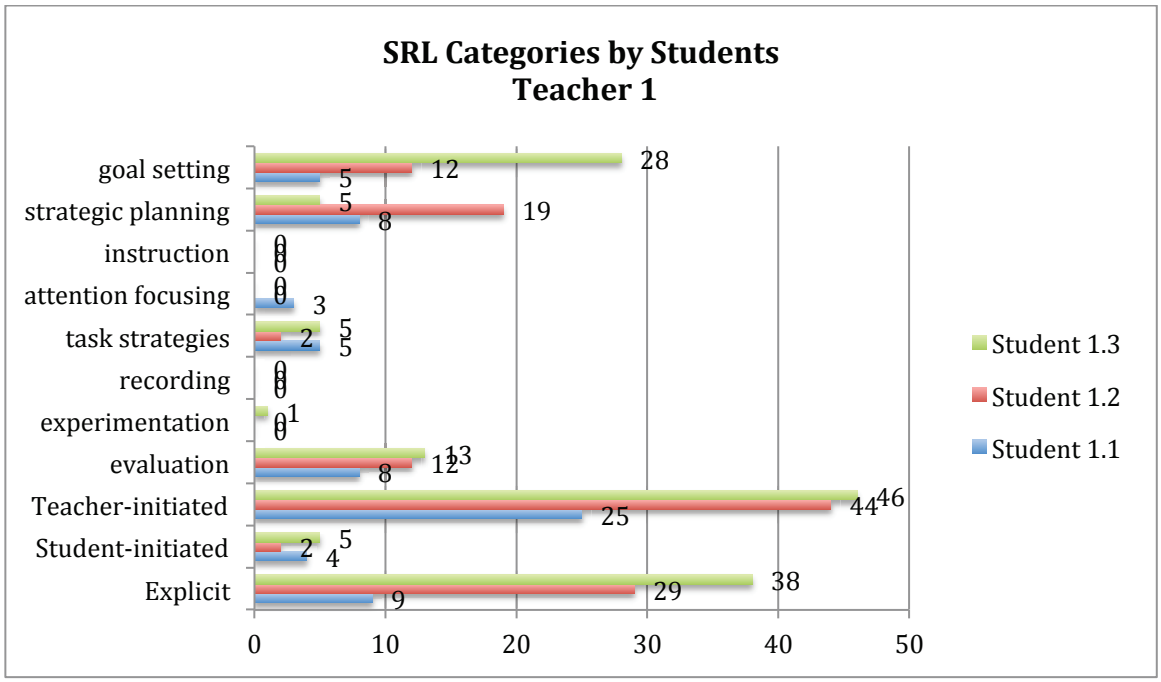
Table 5: Overview of Teacher 1 Data

SRL Categories (Teacher 1)	Total (3 students)	$\bar{x}$	SD
Goal-setting	45	14.67	11.93
Strategic Planning	32	10.67	7.37
Instruction	0	--	--
Attention Focusing	3	1	1.73
Task Strategies	12	4	1.73
Recording	0	--	--
Experimentation	1	0.33	0.58
Evaluation	33	11	2.65
Total SRL interactions coded: 126			
Teacher-initiated	115	38.33	11.59
Student-initiated	11	3.67	1.52
Explicit for practice	76	25.33	14.84

As seen from Table 5 above, Teacher 1 demonstrated a strong emphasis on goal-setting (45 examples out of 126), followed by strategic planning (32), and evaluation (33). Thus, her support for students' self-regulation appeared to focus on the forethought and self-reflection phases of the SRL cycle, with far fewer interactions occurring during the performance phase. It is

possible that this focus on the planning phase may reflect her teaching of younger children, who may need explicit and ongoing guidance for setting goals for practice. In fact, Teacher 1 asked one student, "What's your goal here?" during a lesson when writing down what to do for the week. As well, she may focus on strategic planning in order to support and guide younger students in how to accomplish their practice. While Teacher 1 does use a great deal of evaluation, she (like all the teachers viewed in the selected recordings) does not explicitly use the evaluation to guide the "next steps"; in other words, instead of evaluation leading the student back to the planning phase of the self-regulatory cycle, it becomes the end or stopping point for that particular passage or piece. Thus, there is little sense of a self-regulatory cycle at work, but rather a series of separate events in which elements of self-regulation are suggested or somewhat supported, but the entire cycle is never discussed or made explicit.

Figure 5: SRL Frequency Count/Students of Teacher 1



In addition, as seen in Figure 5 above, there were significant variations in the kinds of interactions around self-regulation, depending on the student. These variations from student to student and from lesson to lesson lend support to the concept of self-regulated learning as a context-specific event. Depending on what a particular student and teacher are working on – from a simple study designed to improve technique to a large piece requiring months of analysis and

interpretation – the teacher may need to support different aspects of self-regulation during a lesson, perhaps moving from goal-setting as a student starts working on a piece to a sustained period where the teacher suggests task strategies that enable a student to break down a complex piece and then reintegrate the pieces into a musical whole.

Teacher 2. This teacher has more than 20 years' experience working as a guitar teacher, but currently teaches part-time and has fewer than 10 students. The lessons recorded consisted entirely of adult students, two of whom were at an intermediate level and one at an advanced level. The average length of the lessons was 34 minutes, with the lessons being given at the teacher's home music studio.

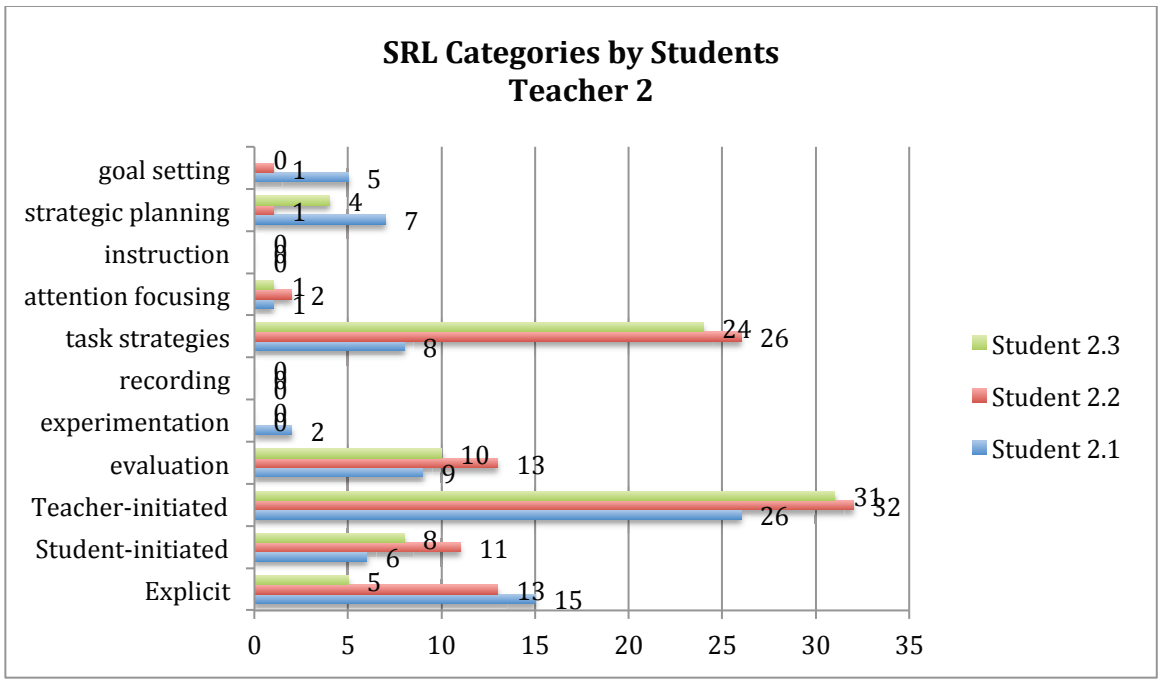
Table 6: Overview of Teacher 2 Data

SRL Categories (Teacher 2)	**Total (3 students)**	**$\bar{x}$**	**SD**
Goal-setting	6	2	2.65
Strategic Planning	12	4	3
Instruction	0	--	--
Attention Focusing	4	1.33	0.58
Task Strategies	58	19.33	9.87
Recording	0	--	--
Experimentation	2	0.67	1.15
Evaluation	32	10.67	2.08
Total SRL interactions coded: 114			

Teacher-initiated	89	29.67	3.21
Student-initiated	25	8.33	2.52
Explicit for practice	33	11	5.29

As shown in Table 6 above, Teacher 2 appeared to focus on task strategies during lessons (58 episodes coded), followed by evaluation (32). The number of coded episodes in the other categories was much smaller: strategic planning (12), goal-setting (6), attention focusing (4), and experimentation (2). In supporting self-regulation, Teacher 2 seemed to emphasize the performance and self-reflection phases in the cycle over the forethought phase. It is possible that these patterns emerged because Teacher 2 is working with adults, who tend to have clear goals about their music learning (i.e. no one is making them take lessons; they have chosen to do so). Teacher 2 may focus more heavily on task strategies (with only a few references to practicing at home) because she is confident they will apply these strategies during at-home practice without her having to say so. She also emphasizes evaluation by encouraging students to listen and judge for themselves, just as they will do at home during their practice.

Figure 6: SRL Frequency Count/Students of Teacher 2



As can be seen in Figure 6 above, there was considerable variation among the students and teacher for task strategies, goal-setting, strategic planning, and evaluation, with somewhat consistent numbers for attention focusing and experimentation. Again, these variations lend support to the concept of self-regulation as context-specific. However, despite the adult-to-adult nature of these lessons, it was the teacher who primarily initiated interactions around self-regulation (89) rather than the students (25). Approximately one-third of the episodes (33) were coded as explicitly mentioning practice.

Teacher 3. This teacher has more than 20 years' experience giving piano instruction and works with more than 40 students per year. The lessons selected for coding all took place in the students' homes rather than in a music studio. All three students whose lessons were coded played at an advanced level. The average lesson time was 49 minutes.

Table 7: Overview of Teacher 3 Data

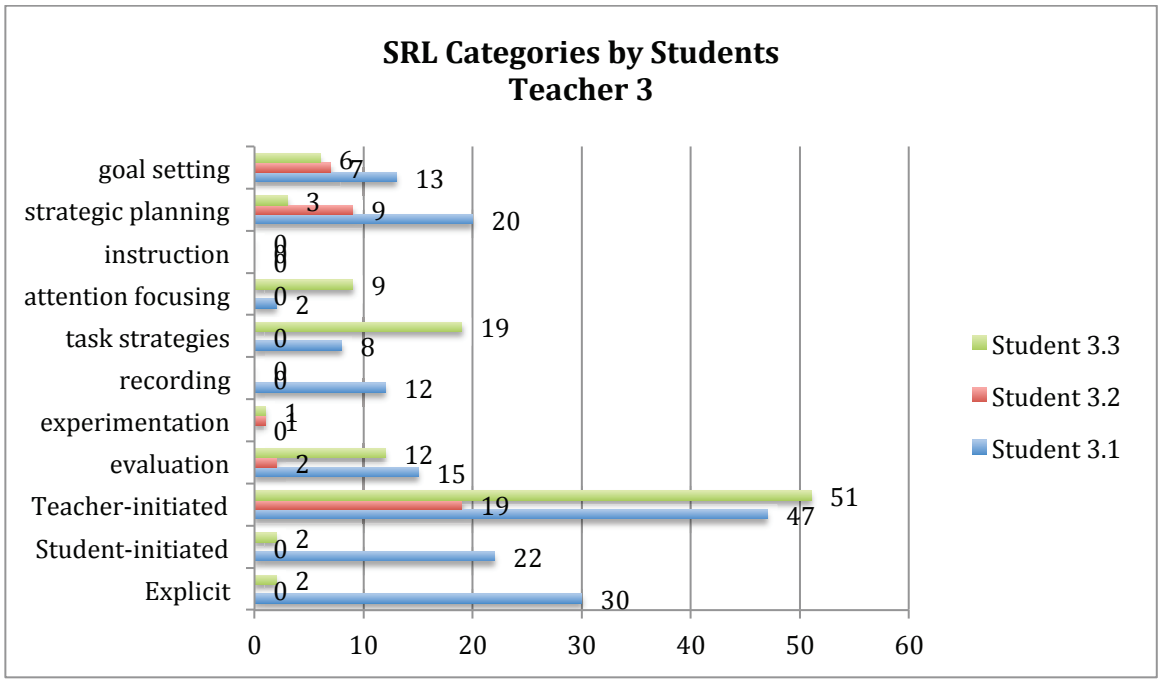
SRL Categories (Teacher 3)	Total (3 students)	$\bar{x}$	SD
Goal-setting	26	8.67	3.79
Strategic Planning	32	10.67	8.62
Instruction	0	-	-
Attention Focusing	11	3.67	4.73
Task Strategies	27	9	9.54
Recording	12	4	6.93
Experimentation	2	0.67	0.58
Evaluation	29	9.67	6.81
Total SRL interactions coded: 139			
Teacher-initiated	115	38.33	16.74
Student-initiated	24	8	12.17
Explicit for practice	32	10.6	16.77

As seen in Table 7 above, Teacher 3 supported self-regulatory behaviours across all but one category (zero examples of instruction), but with a somewhat greater emphasis on strategic planning (32 examples), evaluation (29 examples), task strategies (27 examples), and goal-setting (26 examples). The data from Teacher 3 show support, albeit in limited amount, for all three SRL phases. It is possible that this is related to the expertise of the students. All were at an advanced level and therefore may not have needed the more targeted support (for example, in goal-setting) seen with younger or less experienced students. While these preliminary data do not allow for any conclusions, the question of how students' expertise or levels of experience influence and shape a

teacher's support for different phases of the self-regulatory cycle remains a valuable one to be pursued.

In this teacher's lessons were also found the highest number (12) of examples of self-recording (i.e. a student keeping records to monitor his/her progress). The recording examples all came from two different lessons with the same student, who appeared from the conversation in the lessons to be preparing for a music exam. This student had recorded herself playing scales during her practice and asked the teacher to review them during the lesson. She also recorded the lesson (the inference being for review at home during practice). As well, she had prepared a chart to track the progress of her scales and reviewed this chart with the teacher. These two lessons were a powerful illustration of how a student could use recordings (both of lessons and of previous practice sessions) and a progress chart – along with discussion with the teacher — to define more precisely both what she was trying to achieve (the goal) and how she intended to get here (strategic planning).

Figure 7: SRL Frequency Count/Students of Teacher 3



As seen in Figure 7 above, while Teacher 3 seems to emphasize all aspects of the self-regulatory cycle within lessons, there was a great deal of variability in the codes found in lessons

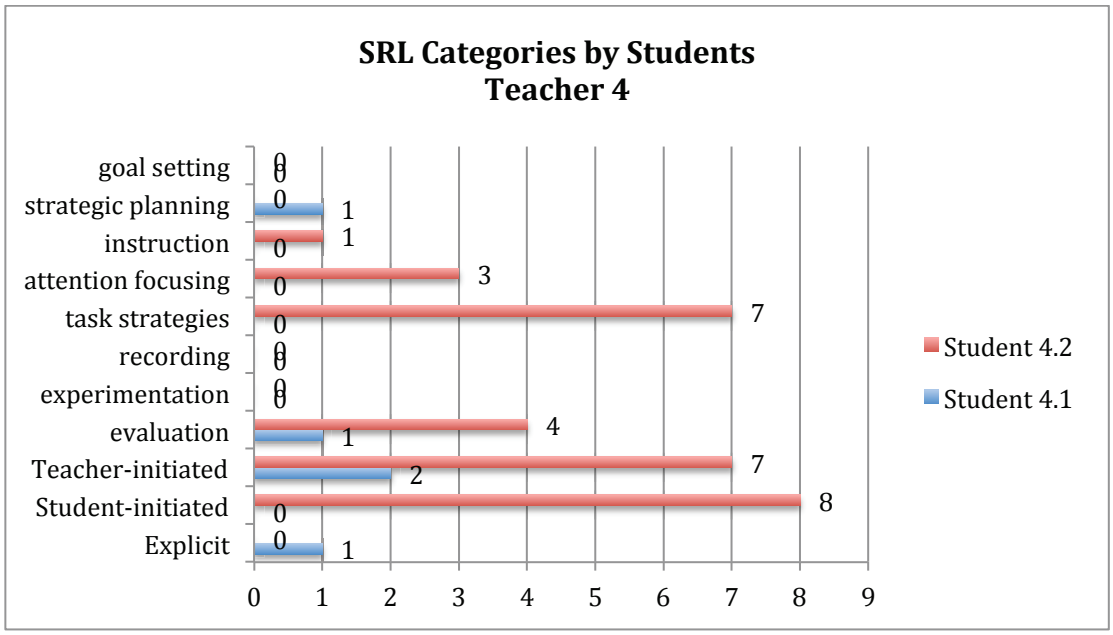
with different students. As noted previously, these variations are in line with the theory of self-regulation as a contextually-driven event.

Teacher 4. This teacher has over 10 years' experience as a music teacher offering instruction in voice, violin, guitar, and keyboard to between 30 and 40 students each year. The lessons were recorded at the teacher's music studio and featured two students, one learning guitar and one learning voice and keyboards. Teacher 4 recorded the lowest amount of lesson time; as well, one lesson for Student 4.1 was incomplete (the camera appeared to shut off). The limited amount of recorded lesson time makes assessment of self-regulation interactions difficult.

Table 8: Overview of Teacher 4 Data

SRL Categories (Teacher 4)	Total (2 students)	$\bar{x}$	SD
Goal-setting	0	--	--
Strategic Planning	1	0.5	0.71
Instruction	1	0.5	0.71
Attention Focusing	3	1.5	2.12
Task Strategies	7	3.5	4.95
Recording	0	--	--
Experimentation	0	--	--
Evaluation	5	2.5	2.12
Total SRL interactions coded: 17			
Teacher-initiated	9	4.5	3.54
Student-initiated	8	4	5.66
Explicit for practice	1	0.5	0.71

Figure 8: SRL Frequency Count/Students of Teacher 4



As seen in Table 8 and Figure 8 above, Teacher 4 seemed to emphasize task strategies (7 out of 17 examples), attention focusing (3 out of 17 examples) and evaluation (5 out of 17 examples), suggesting a focus on the performance and self-reflection phases rather than the forethought phases. The number of teacher-initiated interactions (9) was closer to the number of student-initiated interactions (5) than seen with any other teacher. However, due to the limited amount of recorded lesson time, these results must be treated with caution.

It should be noted that Teacher 4 often played along with his students, a technique the researchers called "modelling." This technique was used by the other teachers, but not to the extent seen with Teacher 4. During the pilot test, the researchers discussed how to code modelling, but did not establish a category for it. However, in future testing, it would be useful to discuss with teachers and students their perceptions of the role modelling plays in a lesson and in self-regulation. It is possible that modelling could be coded as implicit goal-setting; in other words, the teacher is acting out, but not saying, the statement, "I want you to play it like this." Yet it could also be argued that a teacher may be acting out a task strategy, as in, "Here are some ideas for how it could sound" or even strategic planning ("How you go about playing it is like this—watch and listen"). There is even the possibility that a teacher is simply playing to show the student the pure enjoyment of playing, and that certain instances of modelling are not about self-regulation at all. Given the very limited amount of recorded lesson time with Teacher 4, these

questions could not be answered, but in future iterations of the coding protocol, the researchers could begin to address this issue, triangulating their observations with interview data from teachers and students to better categorize the role such modelling may play in the self-regulatory cycle.

Issues of Inter-Rater Reliability

As noted in Chapter 3, the coders struggled with how to best approach and calculate inter-rater reliability, overly focusing on what seemed to be an intractable problem: namely that the lack of pre-demarcated events precluded the use of a classic Cohen's kappa, which depends on coders looking for agreement on a pre-determined set of units (Bakeman & Quera, 2011). In situations in which observers must first segment the data and only then apply codes, Bakeman and Quera (2011) recommend the use of kappas based on the Needleman-Wunsch algorithm for assessing alignment. The use of an alignment algorithm may be considered in the future, or, as suggested earlier, the coding process could be broken down into smaller, sequential steps with events being agreed upon before the application of the coding process. However, for this pilot test, the coders instead used the points of disagreement to further refine the coding protocol. In demarcating events, the coders quickly came to a high level of agreement – an estimate would be 75 to 80%. The major areas of disagreement were as follows:

1. Start and end times: one coder would sometimes identify as one episode a segment that the second coder had divided into two. This raises the issue of the granularity of episodes themselves, or what constitutes a beginning and an end during a lesson containing conversations that are not always linear, meaning the teacher and student may start a topic, think of something related to a previous conversation or lesson, discuss that, and then move forward again. Ash (2007) refers to the inherent problems and tensions of segmenting conversations, noting that there may be more than one valid way to divide them, even when working with a highly-refined set of rules.

   As well, because the iSCORE team had experimented with a preliminary system of "geography coding" the lessons, meaning identifying what was taking place in the lesson (working on scales, selecting a few bars of a piece of music for slow practice), it should be noted that identified episodes did not always begin and end around a specific piece of music or type of work (playing scales, for example). In

lessons with Teacher 1, whose teaching time was the shortest with each student, episodes did tend to take place within or at least be bounded by the different musical tasks carried out in the lesson, usually moving from scales to a musical study to one or more musical works. However, with all four teachers, two or more episodes might be found during the time the teacher and student addressed one specific piece of work.

2. Identification of segments that, as per the definition, "implicitly or explicitly address issues of practicing between lessons." As the coders viewed lessons, determining when a teacher "explicitly" addressed issues of practice came down to verbal cues, with some being quite simple to identify (for example, "How much work [on a particular piece of music] can you do for next week?" (Teacher 3, student 3.3) or even more directly "When do you practice at home" (Teacher 1, student 1.1).

However, the coders also identified more subtle cues with, for example, student 2.2 starting a segment by addressing Teacher 2 with "I'm going to start warming up while you talk," but that opening gambit leading into a discussion about task strategies for how to construct and carry out a warm-up session during home practice sessions. At no point does Teacher 2 say explicitly, "Please do this at home," but the references to possible ways of doing a warm-up make it clear that the exercises being done and discussed at that very moment also apply to practice sessions at home.

The example above with Teacher 2, however, raises the issue of how much of any lesson time should be considered as "implicit for practice." It could be argued that everything a teacher says to a student about playing should be taken as advice, strategies, tips, and encouragement for use during practice. In other words, a lesson may be viewed as "supervised practice," with the teacher in essence providing the structure for the following week's worth of practice sessions. Whether or not all students (and teachers) perceive a lesson in this way remains unknown, but for the purposes of the pilot testing coding, the researchers looked for explicit verbal cues as well as the conversational context to guide them towards a determination if a segment addressed practicing, rather than assuming the entire lesson was implicitly about practice.

Clarifications and Refinements of Coding Categories

As seen from the coding protocol presented in Chapter 3, the coding definitions were taken directly from Zimmerman's work, with the team then extrapolating to provide preliminary examples of behaviours that might be found in a music lesson. Now that actual lessons have been coded using these definitions and examples, certain clarifications and refinements are proposed to assist the researchers in making decisions about assigning codes for any future sessions. These changes are grouped and presented according to the three phases of the model: forethought, performance, self-reflection.

However, while refining and clarifying the written codes is vitally important, it would be useful in the future to develop a multimedia coding book using examples taken directly from the videos to illustrate the codes as well as to explore, again through actual clips, areas where discussion had arisen between coders and how those disagreements were resolved. A multimedia code book would demonstrate visually and verbally why particular behaviours and interactions were coded in a certain way, allowing coders to see, hear, and discuss why certain decisions were made. For the iSCORE project, there are no ethical issues involved in retaining video clips in a multimedia coding book as permission has been granted from participants for the indefinite storage of the project data (for further information on data storage, see Appendix C, which contains the project's information and consent forms).

Below are suggested clarification and refinements to the written coding definitions:

Forethought phase. The forethought phase, in which Zimmerman places goal-setting and strategic planning (Zimmerman, 2000), may best be understood as identifying *what* is to be achieved (i.e. the goal) and then the *how* (i.e. strategies) of attempting to reach that goal. Zimmerman's definition of goal-setting also includes a focus on progress and fostering of intrinsic interest. The difficulty when coding behaviours for goal-setting is that identifying progress and intrinsic interest require insight into people's thoughts to determine whether a goal is being perceived that way. Accounting for progress and intrinsic interest, even if that requires a degree of inference on the part of coders, addresses a second problem around goal-setting: namely, that almost any purposeful behaviour in a lesson (for example, taking out one's music and setting it on the stand, actually showing up for a lesson) may potentially be coded as goal-setting (i.e. the student has perhaps the goal of attending the lesson). In other words, a distinction might usefully be made between setting a goal for something to happen in the lesson, for example a teacher saying, "I would like you to play your G major scale now" and more distal goal-setting,

addressing what is to be achieved over several lessons (for example, a student saying in the fall, "for the spring recital, I would like to play the pieces by Bach and Mozart").

The question of how the setting of goals in and for a specific time-limited lesson does or does not support self-regulation is complex and not answered by the literature to date. However, in keeping with the emphasis on teaching and learning events that focus on practice, the researchers coded as goal-setting only episodes in which more distal goals were identified, presented, or discussed by the teachers and students. The rationale is that such distal or larger goals were more likely to foster progress and intrinsic interest. For example, an exchange between Teacher 3 and Student 3.1 in which the student identifies the studies she would like to learn for an upcoming exam were coded as student-initiated goal-setting. A short time later, Teacher 3 then offers a counter goal, suggesting that Student 3.1 learn several studies well and then together they make the selection for the exam; this was coded as a teacher-initiated goal-setting. In both cases, there was a focus on *what* was to be achieved. There is a level of inference in both of these examples as to the goal fostering progress and encouraging intrinsic motivation; in this example, the student's evident relish about preparing these studies, as seen in both her tone of voice and body language, supported the identification of goals as defined by Zimmerman (2000).

However, there is an inherent limitation in this coding protocol for identifying distal goals set by teachers and students prior to a particular recorded lesson. Decisions around repertoire to be learned during the year, technical requirements to be addressed, making plans to take a music exam, etc., may be made at various times during the year, so the chances of capturing all those goals in a particular lesson are very small. Thus, the coding of individual lessons is unlikely to capture the full range of goal-setting carried out by teachers and students.

As with goal-setting, the difficulties encountered when attempting to code for strategic planning, i.e. identifying strategies that are appropriate for the task (Zimmerman, 2000), lies in what is considered the "task." Strategic planning, in other words, focuses on the *how* or strategies for accomplishing a goal. If that goal is playing a particular piece in a lesson, then the examples given in the initial coding protocol of a student preparing the music or physically adjusting, for example the piano bench, might apply. However, if the focus is on the larger, distal goals as discussed above, then the strategic planning will have a focus on the practice carried out by the student during the week, and not necessarily what is happening right now in the lesson.

Therefore, the coding of strategic planning during this pilot test focused on examples where teachers and students identified or discussed strategies of use during the upcoming practice sessions. For example, about halfway through a lesson with Teacher 2 and Student 2.3, in which the student and teacher have identified and played through several difficult segments in a piece (meaning places where the student has obviously fumbled the notes), Teacher 2 suggests that when practicing, Student 2.3 focus on these difficult spots. This was coded as strategic planning.

However, significant difficulty currently exists in the coding protocol for consistently identifying and coding strategic planning versus task strategies, largely because task strategies identified in a lesson, for example, "Play this slowly with a metronome to make sure you are making the transition between chords correctly and on-time," may all be tapped when a student thinks about how to plan out a practice session. In this pilot test, we coded as strategic planning instances in which a teacher explicitly referred to practice time, or strongly inferred it during the conversation. Task strategies, as will be discussed below, were coded when there was strong evidence of a teacher or student breaking down a task and then re-integrating the parts in meaningful ways, as per the definition by Zimmerman (2000), but no explicit reference was made to its use in practice sessions. Yet there is still much work to be done to clarify, refine, and provide clear, succinct and useful examples that differentiate between the two categories.

Performance phase. The performance phase includes five subcategories: instruction, attention focusing, task strategies, recording, and experimentation. The term "instruction" was used in the coding protocol, but that term should perhaps be revised to Zimmerman's (2000) original term of "self-instruction" to differentiate it from its commonly understood meaning, instruction or teaching. According to Zimmerman's definition, *Overt or covert description of how to perform the task as one executes the task,* self-instruction is a form of self-talk in which a person walks through the necessary steps. As might be inferred from the definition, and as reflected in the lack of any examples from the pilot testing, a coding protocol for observed behaviours is unlikely to capture this process, unless the person speaks aloud. Therefore, it is not surprising or unexpected that no examples were found, but this does not mean that self-instruction did not occur; it would simply require a different form of analysis (a think-aloud protocol, for example) to capture it.

The examples of attention focusing found in this pilot testing consisted of teachers asking students to perform segments slowly, a process called "slow work" and identified in the

systematic review by Varela et al. (2014) as belonging to this category, or a teacher stopping a student to point out incorrect rhythms (Teacher 1 and Student 1). It is not surprising that attention focusing, primarily a cognitive activity carried on internally, is difficult to capture with a coding protocol for behaviours. Therefore, the limited number of attention focusing examples should not be construed as meaning it was absent from the lessons, but rather as a fundamental problem in coding cognitive functions through observed behaviours.

The subcategory of task strategies, as noted above, presented significant issues during the coding process. As can be seen in the examples provided in Varela et al. (2014), task strategies encompass a wide range of activities, from repetition of a section to a specific focus on one aspect of playing, be that rhythm, notes, tempo, or fingering. It was particularly difficult to establish whether a task had, as per the definition given, both (a) been broken down into its parts; and (b) been meaningfully reintegrated afterwards. A clearer definition of reintegration will need to be developed and tested with more coding. For this pilot test, "reintegration" consisted of playing the piece or a segment at tempo and with correct rhythms after having separated out and practiced some aspect of the piece. For example, we coded as task strategy a segment in which Student 2.2 practiced shifting from one position to the other, including while using a metronome, before playing the passage with the shifts in its entirety. It should be noted that task strategies include a focus on tempo, and if the tempo is slowed down, then this begins to resemble the slow work of attention focusing. Again, this is an area of ambiguity in the coding definitions in which the purpose of the action (i.e. playing slowly) is difficult to ascertain: is the slow playing done to focus attention on a particular phrase or is it used as a strategy by which a segment is broken down into smaller, more manageable parts before being brought back into the larger whole? As the coding protocol is used, a decision will need to be made on how to categorize (code) these ambiguous situations, and a list of criteria for evaluating them will need to be developed.

In coding for "recording," the researchers were careful to include only examples that demonstrated an element of monitoring of one's progress, as per Zimmerman's (2000) definition, thus excluding (not coding for) the common practice of teachers writing down what was to be done during the week. According to the given definition, and as seen in the examples provided in Varela et al. (2014), the category might better be labelled "self-recording," as the focus is on tracking one's progress. An example of this was found in a lesson with Teacher 3 and Student 3.1, in which she had prepared a progress chart for the learning of scales to be performed as part

of a future exam. The student had also recorded herself playing the scales to play for the teacher for evaluation. These instances were coded as "recording."

For the category of "experimentation," very few examples were found. As well, the examples do not explicitly include the element of dissatisfaction with one strategy leading to the use of another strategy. The clearest example of a strategy being changed because it wasn't working was with Teacher 3 and Student 3.3, in which the teacher asks the student to find a position that will make it easier to play a difficult scale passage at a rapid tempo. The student then tries out, in fairly quick succession, different positions. In a second example, Teacher 3 specifically asks another student (3.2) to try and then decide upon two different interpretations of a particular passage (either playing it softly as an echo or more loudly). In the other three examples, which involve Teachers 1 and 2, the teachers explicitly encourage the students to experiment during practice, actually using the term "experiment." All of these instances were coded as "experimentation." However, in future uses of the coding protocol, clarification may be needed around how much experimentation involves dissatisfaction with a strategy or whether simply trying out new strategies, in more of a spirit of inquiry, should also qualify.

Self-reflection phase. In the coding protocol, this phase included only one category, evaluation, which is defined by Zimmerman (2000) as "*Comparing self-monitored results with a standard or goal."* For the pilot testing, evaluations were coded if they were made either by the student (self-monitored) or the teacher (other-monitored). In either case, the examples had to include the evaluative or reflective component, meaning some verbal indication that the teacher or student was examining the results critically. Therefore, a nod of the head or even a short phrase like "good job" would not be coded. Rather, examples of evaluation included students evaluating their own playing, teachers asking or encouraging students to evaluate their playing, and teachers offering their own evaluations.

This chapter has examined the data gathered from a pilot test of the coding protocol, presenting both an overview and then more detailed information on how individual teachers appear to support and encourage students' self-regulation during practice. The difficulties of calculating inter-rater reliability have been analyzed, and a discussion of how to refine and clarify several of the coding categories has been presented. Consideration has also been given to

calculating the time needed to use the coding protocol with new recordings. The next chapter will explore the implications of this research, examining the strengths and weaknesses of observation methods and this coding protocol specifically, as well as offering suggestions for alternative means and methods for analyzing self-regulation in music lessons.

Chapter 5: Discussion and Conclusions

Having examined the development and testing of the T-SREM, attention will now be given to the overall impact of the research, with a focus on what has been learned through the pilot testing, data patterns that have emerged, and what steps may be taken next in the development process.

Successful Development of the T-SREM

As the data and information contained in the previous chapters demonstrate, the iSCORE team has successfully operationalized several of the self-regulatory constructs from the three-phase model and created a coding protocol that appears to be both conceptually and methodologically sound, as well as useable in practice. However, the tool has not yet been tested for reliability, defined by Creswell (2012) as having scores that are consistent and stable over time. The third research question of this thesis addressed establishing inter-rater reliability, but this issue was not answered by the pilot test, due to the inexperience of the researchers in correctly calculating Cohen's kappa, as well as the significant methodological problems associated with establishing kappas for events in which the duration of the event, in addition to its coding, must be determined. As noted in Chapter 4, the inter-rater reliability might have been more easily calculated had the coders first come to agreements on the length of each event, then coded those events and compared how often each code had been used in that particular segment.

However, the difficulty of establishing inter-rater reliability calls into question the need to identify "events" within the lesson that are then coded for self-regulatory behaviours. The process of including some parts of the lesson (the event) and excluding others (non-events) requires significant time and did not appear to simplify the labour-intensive process of coding. Rather, it added a level of complexity because the researchers first had to agree on events (both what constituted an event and its duration) and then code that event, again seeking agreement for both the coding category and the duration. As well, because the number of events and their duration varied from teacher to teacher, it became impossible to make valid comparisons across lessons. In future use of the protocol, researchers might consider coding a lesson as a whole, looking for examples of the self-regulatory categories across the entire lesson. Total teacher lesson time (and not the total number of lessons) could then be controlled, meaning one teacher's four 30-minute

lessons could be fully coded and compared to another teacher's two one-hour lessons, as the total teaching time (four hours) would be the same. It is possible that after coding the entire lessons, patterns or clusters may emerge that closely resemble the events identified in this pilot testing. However, in directly coding for self-regulation in the entire lesson, establishing inter-rater reliability becomes less onerous; as Bakeman and Quera (2011) suggest, a time-unit kappa with tolerance for slightly differing times for the self-regulated event may then be accurately calculated.

As well, the T-SREM has not been validated, which Creswell (2012) defines as a protocol that actually measures the desired concepts, in this case self-regulatory concepts. Validity, which may include content, criterion-related, and construct validity, could be carried out in several ways, including having experts in self-regulation assess the tool (test content), interviewing students and teachers for their assessment of the behaviours seen in lessons (response processes), or correlating the coding scores with outcome measures, such as exam scores or a performance rating (relationship to other variables). As the iSCORE project has ethical clearance to interview students and teachers, the second option may be a logical step in the process. A think-aloud protocol in which students and teachers would review a recorded lesson as soon as possible after the actual lesson itself might shed light on what the participants were thinking about and trying to achieve and allow the researchers to improve the coding protocol based on feedback from the students and teachers.

In seeking to validate the tool, consideration must also be given to outcome measures that could be used in that process. In many of the studies of self-regulation undertaken in classrooms (e.g. Dignath-van Ewijk et al., 2013; Perry & Vandekamp, 2000; Perry et al., 2002; Perry, 1998), outcome measures are a standardized achievement test given to all the students because they share similar ages, grade levels, and overall curricula. However, in studio music lessons, there is no such standardized achievement test unless a student choses to participate in a formal exam such as those given by the Royal Conservatory of Music. The iSCORE team has begun work on a performance rating scale that would track students' musical progress by evaluating a performance at different points in the year. Such ratings could provide a useful outcome measure to triangulate with the observation scores in order to look for correlations between what teachers do in the lessons and how students ultimately perform musically.

Establishing the reliability and validity of this coding protocol through the processes outlined above would make a significant contribution to the research, particularly in light of the fact that there does not appear to be a tool that codes for Zimmerman (2000)'s self-regulatory cycle in the context of a music lesson. As well, a reliable and valid tool might also advance the music research undertaken to date, notably by Varela et al. (2014), in which the authors explore the relationship between self-regulatory constructs, such as goal-setting or self-recording, and their impact on musical attainment, as well as the work of McPherson and his colleagues, who examine the link between self-regulation and life-long music-making (McPherson et al., 2012). By examining how teachers and students discuss and exhibit self-regulation during a lesson—and then linking that to an outcome measure such as performance or sustained interest in music-making, researchers will better be able to develop evidence-based techniques and strategies that will encourage young people to continue learning music.

Emerging Patterns in Musical Self-Regulation

The pilot testing of the coding protocol yielded some preliminary patterns in musical self-regulation during music lessons (RQ4). A note of caution: as the total lesson time analyzed varied from teacher to teacher, and not all identified events in every lesson were coded, these results must be treated with care. However, of particular interest was the variation in frequency of observed behaviours of the teacher-students dyad in the three phases of the self-regulatory cycle. For example, Teacher 1 seemed to place greater emphasis on the forethought phase when dealing with her younger, more inexperienced students, who may not have had the necessary planning skills to organize daily practice sessions. On the other hand, Teacher 2, who works with adult learners, tended to emphasize the performance phase, particularly task strategies. It is possible that she assumes the adults are capable and experienced enough to take these strategies and organize a practice session without explicit guidance from her. The question of how teachers and advanced students interact around self-regulation also came to the forefront in watching Teacher 3, whose young teenage students had already achieved very high levels of proficiency at the time of the recordings. The coded behaviours for Teacher 3 and his students covered all three phases of the self-regulatory cycle, perhaps because the students were musically experienced enough and mature enough not to require additional help on any particular phase.

From a conceptual point of view, these variations lend support to the theory of self-regulated learning as context-specific, meaning that the behaviours changed and adapted depending on the demands of a particular task (Boekaerts & Corno, 2005; Winne & Perry, 2005). Yet these variations also point to potential areas for further research, specifically examining self-regulation and the teacher-students dyad in terms of expertise (beginner, intermediate, and advanced, for example), number of years of playing, and student ages (school-age, teenage, and adult). The T-SREM pilot test was carried out on a very small sample, in which the teachers themselves had selected the students to be recorded. This resulted in a high number of recordings of advanced students or adult learners, both of whom appeared to have high levels of self-regulation. What is needed now is a sample that includes beginning students or those whom teachers can identify as struggling with self-regulation. The latter could be identified by asking teachers to differentiate between students who appear to "know how to learn and practice" and those who don't. Observing lessons with beginners or those who struggle to self-regulate is vital, as it appears that those early years of musical instruction play a critical role in the decision to continue with lessons (McPherson et al., 2012; McPherson et al., 2013). Through observing, coding, and eventually correlating differences in self-regulatory behaviours across ages and levels of experience, teachers might eventually be able to offer more personalized support to music students, especially in those crucial early years of music instruction when younger students may become discouraged by the demands of practicing coupled with a lack of self-regulation skills, which leads them to simply give up (McPherson et al., 2012). Offering teachers evidence-based tools and techniques for supporting their music students and offering a high degree of differentiated instruction to each learner might go a long way toward preventing the cycle of children abandoning music lessons early on, before they have achieved a level of proficiency that allows them to make and enjoy music on their own.

A major finding from this pilot test was the low levels of student initiation of self-regulatory behaviours around practice found during coding. The recordings reviewed for this pilot test revealed a high degree of teacher control of the lesson. In one case, a young student asked to start the lesson by playing a particular piece he had practiced extensively during the week, but the teacher insisted on starting with the scales first, thus thwarting the student's evident desire to show what he had accomplished over the week's practice. As well, there was significant evidence of teachers asking students questions of a self-regulatory nature, such as "What do you think is

the problem here?" or "How did that sound?," but immediately answering the question themselves. It can be argued that the time constraints of a lesson, in which a teacher sees a student for an hour or less, create pressure on both parties, as within that time frame, the teacher is assessing what the student has done in the previous week's practice and then trying to provide feedback on the performance and suggest techniques for improving the playing. The students also may not be used to taking on the responsibility of directing their own learning, as could be seen in a recording with Teacher 3, who attempted to elicit evaluations from a student about his playing, but the student struggled to answer and then simply lapsed into silence. The impact of a more teacher-controlled versus a student-controlled lesson on both performance and long-term engagement with musical learning remains unexplored in the music literature, but could provide interesting and useful research avenues for linking the music, self-regulatory, and teacher practice literatures together by examining whether higher levels of student choice, control in the lesson, and self-regulatory behaviours correlate with a number of outcomes, including longer practice times, sustained interest in music, and musical proficiency.

Next Steps

Now that an initial testing of the T-SREM observation has been completed, several research pathways have opened up, with the choice of direction to be made depending on the broader research questions to be explored. However, a fundamental question must first be asked: is self-regulation theory, specifically Zimmerman's triadic formulation of forethought, performance, and reflection (Zimmerman 2000, 2006, 2008, 2011), both appropriate and adequate for understanding and analyzing music lessons? As noted in previous chapters, while the theory accounts for the thoughts and emotions of learners, its primary focus is the learner as an individual: what do particular students plan to do? What are their specific, personal feelings of competence? How do they individually monitor their actions? How do they reflect on the learning process and make adjustments their approaches to completing or learning a new task? As music practice is essentially an individual act, it thus makes sense to embrace this theory to explore how students practice individually (i.e. alone or with only intermittent support or interaction from another person such as a parent). However, while it is certainly true that the music lesson itself is no longer an individual act, but an interaction between teacher and student, nonetheless it is of vital importance for understanding good music teaching that we explore how teachers support their students self-regulation in practice, given that students will spend the majority of their music

learning time practicing alone.

However, it is a valid and important issue as to whether or not the music lesson itself is the appropriate arena for sustained attention to self-regulation. Would the research be better served by focusing elsewhere, for example on what students do during their practice, as McPherson and his colleagues have done (McPherson et al., 2012)? It is true that even with beginning students, who might practice only half an hour or an hour a week, the ratio of practice to teaching time may be 2:1 (presuming an hour of practice and a half-hour lesson a week). As students advance, that ratio only increases; students who practice six or seven hours a week and have an hour-long lesson once a week have a 6:1 or 7:1 ratio. Given the predominance of individual practice time in the musical development of a student, there is clearly a need for more research into what happens during practice, particularly focusing on beginning and intermediate students who have not been as extensively studied, to examine what these learners do during sessions, especially from a self-regulatory framework (McPherson et al., 2012; McPherson & Renwick, 2011; McPherson et al, 2013; McPherson & Zimmerman, 2011; Upitis & Abrami, 2013; Varela et al., 2014).

However, the lesson time—as well as the relationship between the teacher and student—plays a critical role in a young person's decision to continue or abandon musical studies (McPherson et al., 2012). Yet to date, what happens behind the closed doors of the music studio has remained largely unexamined, for the obvious reason that having a researcher observing lessons is likely to have a significant impact on the behaviours of both teachers and students. The use of small, unobtrusive digital cameras, as was done for the iSCORE project, minimizes that problem and has resulted in a rich trove of recorded lessons. Because so little is known about the role teachers can play, particularly when it comes to supporting self-regulation in their students, investing in the analysis of these recordings has great value. As Varela et al. (2014) point out, music teachers are unlikely to question the need for student self-regulation, but they may not know how to go about supporting it during their time with students. The data derived from the use of the T-SREM could help teachers develop evidence-based practices that better support students.

However, it is not then axiomatic that the T-SREM must be used in the same way as during the pilot test. As noted earlier, the detailed coding of lessons is labour-intensive (best estimates are four hours of coding time for one hour of video). Outcome measures must be determined and a larger sample sought in order to make meaningful comparisons and

correlations. Another possibility is to focus less on the frequencies of self-regulatory behaviours and more globally on how teachers integrate and discuss self-regulation during the lessons with students. It would be possible to have coders review the recordings and rate the teaching on a 1-5 Likert scale for the different coding categories. This would be very similar to work with classroom teachers carried out by Perry and her colleagues (Perry & Vandekamp, 2000; Perry et al., 2002), in which the researchers examine and rate the overall lesson across eight categories, assigning zero when there is no evidence, a 1 if there is some evidence, and a 2 if there is a great deal of evidence. After adding up the ratings, Perry was able to identify—and more closely examine—what teachers deemed to support a high degree of self-regulation in their classrooms. Such a system could be implemented with the T-SREM, with raters watching a full lesson and then assigning a number for each of the eight Zimmerman processes operationalized in the tool. Consideration would need to be given to total lesson time (i.e. overall lesson time, although not necessarily the number of lessons, would need to be the same for each teacher to allow for comparisons), but this system might offer a faster and less resource-intensive way to examine self-regulation in music lessons. The data could also be used to identify teachers who appear to support a high level of self-regulation, and it might be possible to work with them, as Perry has done, to develop professional development programs focused on self-regulation in music.

Whatever choices are finally made, it will be important, as noted earlier, for observations to be triangulated with other data sources. While observations provide valuable information on what people do rather than what they say they do (Azevedo, 2009; Whitebread et al., 2009), observation tools always involve a level of inference as to what particular behaviours actually mean. As well, observation tools do not capture all the cognitive, meta-cognitive, and emotional constructs involved in self-regulation. Therefore, data collected from the application of T-SREM should be analyzed in light of findings from the project's other data sources, which include surveys of students, parents, and teacher, interviews with teachers, and examination of student portfolios (where they may have kept notes about practice).

Limitations

While the initial pilot test demonstrated that the T-SREM, when used with recorded music lessons, yielded data on how teachers and students both demonstrate and support self-regulatory behaviours focusing on practice, the testing did not establish inter-rater reliability. As well, the

pilot test did not include any validation measures. The T-SREM was tested on a limited student-teacher sample, in which the teachers themselves decided which students to record. Therefore, the sample was not necessarily representative of (a) all of a particular teacher's set of students; and (b) studio music students in general. The teachers came from a geographically restricted area (one province in Canada) and may not be representative of studio music teachers overall. The results from the data analysis of individual teachers cannot be compared, as not all events in any given lesson were coded and the time for lessons varied considerably. In future use and testing of this coding protocol, measures must be put in place to account for time variations inherent in music lessons that may be offered for anywhere from half an hour to over an hour.

While the T-SREM observation protocol assesses behaviours, it does not code for thoughts, emotions, and beliefs, such as self-efficacy, which are part of self-regulation (Zimmerman, 2000). As noted in Chapter 3, the following SRL sub-processes were not examined in the coding protocol:

- **Forethought phase**: self-efficacy, goal orientation, intrinsic interest/value, outcome expectations;
- **Performance phase**: imagery;
- **Reflection phase**: causal attribution, self-satisfaction/affect, adaptive/defensive inferences.

As both behaviours and verbal exchanges were coded, it is possible that some of these sub-process that involve thoughts, emotions, and beliefs might be verbalized during a lesson. Therefore, an expanded coding protocol might include these categories, although coding them might require a high degree of inference based what a student or teacher said. Alternatively, to more fully capture the entire self-regulatory learning cycle, data from this observation protocol could be triangulated with data from methods, such as surveys and interviews, which would specifically address cognitive and emotional aspects of learning, such a student's sense of self-efficacy.

Another limitation of the observation protocol is that it hasn't been used to code non-verbal interactions that we might expect to see with very young students. Therefore, in future testing of this tool, it would be important to include lessons with younger, less verbal students to

evaluate if non-verbal interactions (for example, a teacher placing a student's hands in a particular position on the piano) could, with a high degree of inter-rater agreement, be coded.

Finally, as Dignath-van Ewijk et al. (2013) point out, tools like the T-SREM, which depend on recorded or observed lessons, open the possibility that the act of observing, even if done in as discreet a way as possible, changes the behaviours of the participants. Finally, in keeping with the iterative and long-term development of video coding protocols suggested by Derry et al. (2010), one that involves repeated viewings and refining of the conceptual categories, the T-SREM pilot test carried out by two researchers should be viewed as an initial and preliminary step that requires broadening to a larger set of researchers.

Conclusions

The pleasures-–and challenges-–of making music stretch far back in time, a reminder of the importance and need for humans to create through sound and rhythm. Despite the fast pace of modern life and the ever-increasing availability of recorded music, the desire to slow down and make music remains. Yet too often, that desire never quite comes to fruition, with students abandoning lessons after a few years, convinced that they lack the talent or ability to play a musical instrument. There are, of course, multiple and complex reasons why students fail to pursue music-making at a higher level, but the iSCORE project, and this observation tool, may offer both insights and practical techniques for ensuring that playing music continues to be part of people's lives. By opening up the studio music door and examining what happens in the weekly lesson, we may begin to understand more about how students and teachers develop and support processes that encourage fruitful practice during the week and ultimately independent music-making ability throughout life.

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Appendix A: SRL Teaching Strategies Checklists (Versions 1 &2)

Version 1
August 19, 2013
(Based on Ames (1992); Perry 1998; Perry and VandeKamp (2000) and Perry et al (2002))

Learning Tasks				
Engages students in developing or improving skills or gaining new understanding through tasks that have personal relevance and meaningfulness to that student				
Offers tasks with reasonable level of challenge				
Helps student set short-term, self-referenced goals				
Designs tasks for diversity, variety, novelty, and student interest				
Engages student in several learning processes (listening, analyzing, predicting, remembering)				
Choices				
Gives choices about "what": student prioritizes when to work on tasks with input from teacher				
Gives choices about "when": student prioritizes when to work on tasks with input from teacher				
Note: "where" and "who" (from Perry, 1998) are not included as deemed not relevant for a private, one-on-one lesson				
Control Over Challenge				
Gives student opportunity to set				

the level of challenge, especially via choices as described above				
Also encourages student to take on challenges, but based on knowledge of each student				
Offers support and strategies for meeting those challenges so student can achieve success				
Opportunities for Self-Evaluation				
Encourages student to evaluate demands of a task				
Encourages student to think about strategies available to him/her for meeting demands of that task				
Encourages students to select and use a strategy or strategies				
Encourages students to evaluate effectiveness of chosen strategies once used				
Support from Teacher*				
Offers appropriate scaffold instruction to help student function independently				
Offers both domain-specific and strategy-specific support				
Focuses on helping students generate solutions to their problems rather than just correcting an error or supplying information				
Engages in self-talk (talk out loud) to model thought processes for student				
Uses open-ended questions to encourage students to think more deeply				
* Did not include "Support from Peers" as a category; it did not seem relevant to a private, one-on-one lesson				

Teacher Evaluations				
Focuses on individual improvement, progress, and mastery (i.e. are mastery-oriented and not performance oriented)				
Recognizes students effort				
Provides opportunities for improvement				
Encourages view that mistakes are part of the learning process				

Student _____ Composition _____

Date recorded_____ Date Analyzed_____

Instrument_____

Level of playing (beginning, intermediate, advanced) _____

Researcher_____

Version 2
December 3, 2013
(Based on Ames (1992); Perry 1998; Perry and VandeKamp (2000) and Perry et al (2002), G. E. McPherson, G. E., J. W. Davidson, and R. Faulkner. *Music in our lives: Redefining musical development, ability and identity*. Oxford: Oxford University Press, 2012.)

Opportunities for meaningful choices				
Transactions* between teacher and student occur around choices in:				
• repertoire				
• sequencing of tasks in lesson (what piece to start with, for example)				
• strategies to use during tasks				
• interpretation of musical				

piece (expression)				
• solutions to be tried				
• Other:				
Control over challenge				
Transactions between teacher and student occur around challenge:				
• Setting of level of challenge (in any areas mentioned in choice or other)				
• Strategies for meeting challenges				
Opportunities for self-evaluation of learning				
• Transactions between teacher and student support self-evaluation of the learning through:				
• Evaluating demands of a task				
• Thinking about/discussing strategies available for meeting demands of that task				
• Selecting and using strategy or strategies				
• Evaluating effectiveness of chosen strategies once used				
Support from teacher				
• During transactions with				

student, teacher offers:				
○				
• Appropriate instruction to help student perform independently				
• Domain-specific and strategy-specific support leading to independent performance				
• Encouragement for students to generate solutions to their problems (rather than just correcting an error or supplying information)				
• Self-talk (talk out loud) to model thought processes for student				
• Open-ended questions to encourage students to think more deeply				
• Support for view that mistakes are part of the learning process				
• Support for mastery-oriented, rather than performance-oriented, goals				

* "Transaction. . . is not limited to verbal interaction, but includes any kind of behaviour around music experiences whether verbal, gestural, musical, or other non-verbal direct forms of communication." G. E. McPherson, G. E., J. W. Davidson, and R. Faulkner. *Music in our lives: Redefining musical development, ability and identity*. Oxford: Oxford University Press, 2012

Teacher/student _____

Instrument _____

Date recorded_____ Date Analyzed_____

Researcher_____

Appendix B: Results from Test Coding Spring 2014

Lesson 1
James (student) and Jill (teacher)
April 2014

T= Teacher initiated
S= Student initiated
C= Co-regulated

		Coder 1 (117 events coded)	Coder 2 (91 events coded)
Goal setting		5.1%	7.7%
	T	5.1%	7.7%
	S	0.0%	0.0%
	C	0.0%	0.0%
Strategic planning		5.9%	19.8%
	T	2.5%	16.5%
	S	1.7%	2.2%
	C	1.7%	1.0%
Instruction		6.7%	15.4%
	T	5.9%	15.4%
	S	0.8%	0.0%
	C	0.0%	0.0%
Attention focusing		47.0%	21.8%
	T	15.3%	9.8%
	S	20.5%	9.8%
	C	11.2%	2.2%
Task strategies		2.5%	3.3%
	T	1.7%	3.3%
	S	0.8%	0.0%
	C	0.0%	0.0%

Recording		0.8%	0.0%
	T	0.8%	0.0%
	S	0.0%	0.0%
	C	0.0%	0.0%
Experimentation		4.1%	0.0%
	T	2.5%	0.0%
	S	0.8%	0.0%
	C	0.8%	0.0%
Evaluation		26.4%	31.7%
	T	14.5%	16.4%
	S	7.6%	12.0%
	C	4.3%	3.3%
Question (event not coded)		0.8%	0.0%

Lesson 2
Suzy (student) and Samantha (teacher)
April 2014

T= Teacher initiated
S= Student initiated
C= Co-regulated

		Coder 3 (171 events coded)	**Coder 4 (40 events coded)**
Goal setting		2.2%	17.5%
	T	0.5%	17.5%
	S	1.2%	0.0%
	C	0.5%	0.0%
Strategic planning		12.8%	17.5%
	T	6.4%	15.0%

	S	3.5%	0.0%
	C	2.9%	2.5%
Instruction		0.5%	5.0%
	T	0.5%	2.5%
	S	0.0%	0.0%
	C	0.0%	2.5%
Attention focusing		40.3%	17.5%
	T	9.9%	12.5%
	S	26.9%	2.5%
	C	3.5%	2.5%
Task strategies		22.8%	7.5%
	T	8.2%	0.0%
	S	2.3%	2.5%
	C	12.3%	5.0%
Recording		0.0%	0.0%
	T	0.0%	0.0%
	S	0.0%	0.0%
	C	0.0%	0.0%
Experimentation		0.5%	7.5%
	T	0.5%	5.0%
	S	0.0%	0.0%
	C	0.0%	2.5%
Evaluation		12.2%	27.5%
	T	10.5%	22.5%
	S	0.5%	0.0%
	C	1.2%	5.0%
Question (event not coded)		8.2%	0.0%

Appendix C: Letters of Information and Consent Forms

Letter of Information and Consent Form for Parents of Students in Enhanced Case Study

Project title: *Transforming music education with digital tools*

Researchers: Dr. Rena Upitis, Faculty of Education, Queen's University, Kingston, ON
Dr. Philip C. Abrami, Centre for the Study of Learning and Performance, Concordia University, Montreal, QC
Angela Elster, The Royal Conservatory, Toronto, ON

Date: May 13, 2013

Ethical Clearance:
This study has been granted clearance according to the recommended principles of Canadian ethics guidelines and Queen's policies.

Purpose:
We would like to thank you for choosing to take part in the first year of this major Canadian research study that examines music teaching. Our data analyses for Year 1 have shown that research on independent music studios is sorely lacking and we know that teachers such as your child's teacher have enormous effect on Canada's youth. We would like the opportunity to learn more about music teaching and we are inviting your child to participate for one more year (September 2013 - June 2014).

We are interested in investigating contemporary music teaching and in particular how music instruction can be enhanced through the use of interactive digital tools. This research project will allow us to better understand the place of digital tools in the music studio, and investigate the factors that affect teaching and learning in contemporary music studios. We aim to characterize the 21st-century studio from the perspectives of both teachers and students and to determine how best to deliver effective and accessible professional development programs to studio music teachers.

Method:
If you decide to continue in this study, your child will receive the following remuneration: 1) a 50% discount for any Royal Conservatory exams taken over the next one-year period of the study, and 2) a Frederick Harris voucher for $20.

Your child's teacher will give students a questionnaire in to complete in the fall of 2013, which will take about 30 minutes. Students will be asked to fill out another questionnaire in the spring of 2014. Parents will be invited to complete a questionnaire in the fall of 2013 (15 minutes). If your child completes a questionnaire, his or her name will be entered into a draw for a $25 iTunes gift card. Similarly, if you complete the parent survey, your name will also be entered into a draw for a $25 iTunes gift card.

The teacher may video-record up to 8 hours of your child's lessons and may ask to audio- or video-record a performance of the polished piece. Your child may also be asked to video-record part of a practice sessions. These videos will be viewed only for research purposes. Other data sources include examination results as contained in The Royal Conservatory database. As a research partner, The Royal Conservatory has granted access to the database for research purposes. No research results will be reported about individual students.

Privacy:
There are no known risks to participating in this study. Participation is voluntary and students are free to withdraw at any time without consequence. If a participant withdraws he/she may request to have some or all of his/her data removed from the study. Participants (or parents) may contact their studio teacher or the iSCORE Project Manager or any member of the research team to withdraw. Participants may to continue to use iSCORE as part of their lessons if they choose to withdraw from the study but they will no longer be offered reduced exam fees or music vouchers. Your signature(s) below indicates that you understand that your participation and/or the participation of your child is completely voluntary and that you are free to withdraw at any time.

Your child is not obliged to answer any questions that he or she might find objectionable or which make him or her feel uncomfortable, and researchers working with your child will ensure that your child understands that he or she only needs to answer those questions that they would like to answer. The identity of the participants will be protected to the extent possible. Reports of this study will aggregate the data collected and will not identify individuals through their portfolios or interviews. However, since it is possible that the identity of participants will become known through the videotaping, parents may elect to take part in the portfolio aspect of the study and not have video-tapes taken of their child (see attached consent).

The researchers will maintain confidentiality to the extent possible. All of the data will be stored on password-protected computers at Queen's University and Concordia University, and, in accordance with Queen's policies, will be retained for at least five years. After this point, they will continue to be retained indefinitely. Only the researchers, their graduate students, and staff associated with the project will have access to this data. Your signature below indicates that you understand these provisions around confidentiality.

Research results will be presented at conferences and published in academic journals. Examples of student work may appear on the university research websites without identifying information. Any secondary uses of the data will contain no identifying information.

Any questions about study participation may be directed to Dr. Rena Upitis (613 533 6212 or by email at rena.upitis@queensu.ca). Any ethical concerns about the study may be directed to the Chair of the General Research Ethics Board at 613-533-6081 or chair.GREB@queensu.ca

Yours sincerely,

Dr. Rena Upitis
Faculty of Education
Queen's University

Dr. Philip C. Abrami
CSLP
Concordia University

Angela Elster
THE ROYAL CONSERVATORY

Consent

Please sign one copy of this letter and return it to your child's studio teacher or to Rena Upitis, Faculty of Education, Queen's University, Kingston, ON K7L 3N6. Retain the second copy for your records.

Please fill out either Section A or Section B

Section A

I have read the above Letter of Information and all my questions about this project have been answered to my satisfaction. I hereby give consent for me and my child to participate in the study "*Transforming music education with digital tools."*

I agree to allow RENA UPITIS, PHILIP ABRAMI, ANGELA ELSTER and their graduate students and research staff to use the videotape footage of my child for research purposes only.

Signature: _____

Date: _____

I understand that neither my name nor my child's name will be associated with the work, but that my child might be identified though the videotape itself.

Section B

I have read the above Letter of Information and all my questions about this project have been answered to my satisfaction. I hereby give consent for me and my child to participate in the study "*Transforming music education with digital tools".*

I prefer not to have my child videotaped, but I would still like my child to take part in the study.

Signature: _____

Date: _____

Name of Parent: _____

Name of Teacher: _____

Student's Name: _____

If you would like a copy of the results of the study please provide your email or postal address below:

Email address:

_____

Postal address:

_____

Letter of Information and Consent Form for Studio Teachers in Enhanced Case Study

Project title: *Transforming music education with digital tools.*

Researchers: Dr. Rena Upitis, Faculty of Education, Queen's University, Kingston, ON
Dr. Philip C. Abrami, Centre for the Study of Learning and Performance, Concordia University, Montreal, QC
Angela Elster, The Royal Conservatory, Toronto, ON

Date: May 13, 2013

Ethical Clearance:
This study has been granted clearance according to the recommended principles of Canadian ethics guidelines and Queen's policies.

Purpose:
We would like to thank you for choosing to take part in the first year of this major Canadian research study that examines music teaching. Our data analyses for Year 1 have shown that research on independent music teachers is sorely lacking and we know that teachers such as you have enormous effect on Canada's youth and we would like the opportunity to learn more about your pedagogy and tools that you use in your teaching.

We are interested in investigating contemporary music teaching and in particular how music instruction can be enhanced through the use of interactive digital tools. This research project will allow us to better understand the place of digital tools in the music studio, and investigate the factors that affect teaching and learning in contemporary music studios. We aim to characterize the 21st-century studio from the perspectives of both teachers and students and to determine how best to deliver effective and accessible professional development programs to studio music teachers.

Method:
You were originally selected as a potential participant in the one-year pilot study using The Royal Conservatory's database. We appreciate that you have included your studio in the first year of this study and are seeking your permission to continue with the study for one more year.

If you decide to continue with the study, any of your students who take the Royal Conservatory exams over the course of the study will be able to do so at 50% of the normal fee. We will also issue a Frederick Harris voucher for $20 for each student who takes part in the study.

As in the first year, we would like to observe your teaching. We will ask you to videotape a series of studio lessons twice over the course of the study (Fall, 2013 & Spring 2014). These videos will be viewed only for research purposes. If needed, we will provide you with recording equipment. Studio teachers will be asked to complete questionnaires in the Fall of 2013 (30 minutes each). We would also like to conduct an interview with you in the Spring of 2014 to discuss your pedagogical practises. The total time that iSCORE teachers will be expected to spend on the research aspect of the project, over the one-year period, will be approximately 10 hours (30 minutes for questionnaire, 45 minutes for interviews, 8 hours of self-recorded teaching).

Privacy:
There are no known risks to participating in this study. Participation is voluntary and you and your students are free to withdraw at any time without consequence. The Royal Conservatory will not be aware of which students and teachers are taking part in the study, as all portfolio information will be held at Queen's University. If you choose to withdraw, you may contact the iSCORE PG Project manager or any member of the research team and request to have some or all of your data removed from the study. Your studio will no longer be a research site. Your signature below indicates that you understand that your participation is completely voluntary and that you are free to withdraw at any time.
You are not obliged to answer any questions that you find objectionable or which make you feel uncomfortable. The identity of the participants will be protected to the extent possible. Reports of this study will aggregate the data collected and will not identify individuals through their portfolios or interviews. However, since it is possible that the identity of participants will become known through the videotaping, we will inform parents that they may elect to take part in the portfolio aspect of the study and not have videotapes taken of their child.

The researchers will maintain confidentiality to the extent possible. All of the data will be stored on password-protected computers at Queen's University and Concordia University, and, in accordance with Queen's policies, will be retained for at least five years. After this point, they will continue to be retained indefinitely. Only the researchers, their graduate students, and staff associated with the project will have access to this data. Your signature below indicates that you understand these provisions around confidentiality.

Research results will be presented at conferences and published in academic journals. Examples of student work may appear on the university research websites without identifying information. Any secondary uses of the data will contain no identifying information.

Any questions about study participation may be directed to Dr. Rena Upitis (613 533 6212 or by email at rena.upitis@queensu.ca). Any ethical concerns about the study may be directed to the Chair of the General Research Ethics Board at 613-533-6081 or chair.GREB@queensu.ca.

Yours sincerely,

Dr. Rena Upitis
Faculty of Education
Queen's University

Dr. Philip C. Abrami
Centre for the Study of Learning and Performance
Concordia University

Angela Elster
The Royal Conservatory

Consent

Please sign one copy of this letter and return it to Rena Upitis, Faculty of Education, Queen's University, Kingston, ON K7L 3N6. Retain the second copy for your records.

I have read the above Letter of Information and all my questions about this project have been answered to my satisfaction. I hereby give my consent to participate in the study "*Transforming music education with digital tools.*"

Name: _____

Date: _____

If you would like a copy of the results of the study please provide your email or postal address below:
Email address:
_____

Postal address:
_____

Consent Form for Students for the use of videotape of studio teaching and iSCORE use

Project title: *Transforming music education with digital tools*

Researchers:	Dr. Rena Upitis	Faculty of Education, Queen's University, Kingston, ON
	Dr. Philip C. Abrami	Centre for the Study of Learning and Performance, Concordia University, Montreal, QC
	Angela Elster	The Royal Conservatory of Music, Toronto, ON

Please fill out either Section A or Section B

Section A
I agree to allow RENA UPITIS, PHILIP ABRAMI, ANGELA ELSTER and their graduate students and research staff to use the videotape footage of my child for one or more of the following purposes:

1) Viewing for research purposes only *Signature:* _____

2) Publication in a Journal *Signature:* _____

3) Demonstration at a Conference *Signature:* _____

4) Demonstration on a Website/DVD *Signature:* _____

Date: _____

I understand that neither my name nor my child's name will be associated with the work, but that my child might be identified though the videotape itself.

Section B

I prefer not to have my child videotaped, but I would still like my child to take part in the study.

Signature: _____

Date: _____

Please sign one copy of this consent form and return it to your child's studio teacher or to Jane Willms, Faculty of Education, Queen's University, Kingston, ON K7L 3N6 (jane.willms@queensu.ca). Please retain a second copy for your records.

Name of Teacher: _____

Student's Name: _____

Consent Form for Teachers for the use of videotape of studio teaching and iSCORE use

Project title: *Transforming music education with digital tools*

Researchers:	Dr. Rena Upitis	Faculty of Education, Queen's University, Kingston, ON
	Dr. Philip C. Abrami	Centre for the Study of Learning and Performance, Concordia University, Montreal, QC
	Angela Elster	The Royal Conservatory of Music, Toronto, ON

Please fill out either Section A or Section B

Section A
I agree to allow RENA UPITIS, PHILIP ABRAMI, ANGELA ELSTER and their graduate students and research staff to use the videotape footage of me for one or more of the following purposes:

1) Viewing for research purposes only *Signature:* _____

2) Publication in a Journal *Signature:* _____

3) Demonstration at a Conference *Signature:* _____

4) Demonstration on a Website/DVD *Signature:* _____

Date: _____

I understand that my name will not be associated with the work, but that I might be identified though the videotape itself.

Section B

I prefer not to be videotaped, but I would still like to take part in the study.

Signature: _____

Date: _____

Please sign one copy of this consent form and return it to Jane Willms, Faculty of Education, Queen's University, Kingston, ON K7L 3N6 (jane.willms@queensu.ca). Please retain a second copy for your records.

Appendix D: Sample Coding Sheet (Teacher 1 & Teen Girl)

Teen girl 1 (Teacher 1, 2013)
INFO

Teacher	Teacher 1
Student	Teen girl
Age, Level, Genre	Teenager, intermediate, classical
File name 1	***
Duration	27:06
Instrument	Piano
Full, Full-split, Partial	F
Episode coding	x
SRL coding	x

Video summary

In this lesson the teacher and student work on a Hanon exercise and 2 different pieces. The teacher makes use of iSCORE throughout the lesson.

There are 6 episodes of the teacher supporting SRL.

EPISODE(S)

Start	End (mm:ss)	EPISODES	Description	Start ma
00:00	01:13	Y	T starts typing today's date into iSCORE. Asks S if she is using iSCORE and whether she receives her e-mails. T reads out pieces S is working on.	T: Today Novembe
02:11	02:42	Y	T asks about the different ways S might have practiced a Hanon exercise and asks her to evaluate. T tells her to use it as a warm-up	T: Try to warm up
03:26	03:43	Y	T tells S what her goal should be	T: Your g hands as

05:59	06:51	Y	T tells S that once she has learned the pattern she will have memorized the Hanon. T tells S to practice ascending hands together. She asks S if she has somewhere to put the photocopy and mentions that she can win a folder in a prize for best practicer. T starts writing down in iSCORE the goals for Hanon.	T: Try thi homewo
13:42	13:56	N	T tells S she needs to focus on two specific lines. [Asks S to pick up from the next part to see what else they will focus on during the lesson]	T: So, firs want you these tw
15:53	16:37		T asks S what are goals are. Writes elicited answers in iSCORE	T: Work lines
16:43	17:43	Y	T reads from iSCORE notes of the previous (?) lesson. T asks S if she has worked on those goals and evaluate her progress.	T: Celebr Carols. V this…
19:47	23:30	Y	T demonstrates and elicits strategies for improving the piece. T asks S to play various sections and gives feedback.	T: What to do to cleaner?

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SRL

Episode 1			0:00 to 01:13	
Start	**End**	**Initiated**	**Category**	**Notes**
00:00	00:51	**T → TS**	**SRL**	T starts typing today's date into iSC if she is using iSCORE and whether s her e-mails. S says she does.
00:52	01:13	**T → TS**	**goal setting**	T starts to read out the pieces S is w and asks if she is going to sing a part at an upcoming Xmas concert, tellin doesn't have to sing it. T is reading iSCORE.

Episode 2			02:11 to 02:42	
Start	**End**	**Initiated**	**Category**	**Notes**

02:10	02:14	T → TS	task strategies	T tells S to try to use the Hanon as a to go as fast as she can. S appears to does this.
02:15		T → TS	evaluation	T asks 'Is it fun?' S says it is.
02:16	02:23	T → TS	task strategies	T asks S if she practices with straight swinging rhythms… S says 'I do, yeal
02:25	02:26	T → TS	task strategies	T asks if S tried doing this fast. S say
02:27	02:37	S → ST	evaluation	…but explains it's hard because her cold, adding something inaudible (fr this appears to be her evaluation of strategy). T seems to be agreeing w comment/evaluation and says 'but t warms up, right?'
02:38	02:40	T	task strategies	T reiterates that S should use this as up.

Episode 3			03:26 to 03:43	
Start	**End**	**Initiated**	**Category**	**Notes**
03:26	03:43	T	goal setting	T tells S her goal is to learn the exer together ascending and descending score on the music stand.

Episode 4			05:59 to 06:51	
Start	**End**	**Initiated**	**Category**	**Notes**
05:59	06:12	T	goal setting	T tells S what to practice this week, down in dictation book (?) and then
06:16	06:45	T → TS	strategic planning?	T asks if S has somewhere to keep a photocopied music. T tells if she wi practice award she will get a practic
06:46	06:51	T	goal setting	T reiterates goals for the week, writ iSCORE

Episode 5			15:53 to 17:43	
Start	**End**	**Initiated**	**Category**	**Notes**
15:53	16:36	T → TS	goal setting	T tells S to work on 2 lines. T asks S want to accomplish with those two what S's goals are for these two line discuss. T is writing in iSCORE

16:37	17:00	T → TS	EVALUATION FAIL	T looks over in iSCORE what she hac down previously and reads it out. T you do that? How did you feel abou this the last time?' [*double-barreled* doesn't give time for S to answer 1s As a result, S answers 2nd question felt really awkward because she did own sheet.
17:01	17:21			T stretches and tells S she would like opinion on something. T & S have a conversation about the score. S exp she will not be starting on the first p
17:22	17:43	T → TS	evaluation	T asks S if she worked on particular and points at score. T asks if it is be clearer. S says yes. T claims 'This is music' and reads out the cringewort 'For the Advancing pianist'

Episode 6			19:47 to 23:30	
Start	**End**	**Initiated**	**Category**	**Notes**
19:47	19:49	T	goal setting	T hip-checks S and asks what they n to make the piece cleaner.
19:50	20:38	T → TS	goal setting	T demonstrates how to *play* the pie LH, phrasing the RH melody in one b S if she understands what she mean breath', S says 'yes'. T demonstrates to 'get into the mood of the piece'.
20:39	20:40	T → TS	goal setting	T pulls out iSCORE asking 'What's yo
20:41	20:52	S → ST	evaluation	S says 'I wasn't good on this part' an why. T asks if she was uncomfortab
20:53	21:17	T → TS	task strategies (FAIL)	T tries out the passage herself and s awkward if one has figured out the Asks S to try out the RH only and sh
21:18	21:20	T → TS	goal setting	T suggests she practices it so it is cle
21:21	22:01			T & S talk about S's role in upcoming
22:02	22:10	T	goal setting	T asks S what they have to work on 'homework'. T reiterates 'phrasing'
22:11	23:02		direct instruction	T asks S to do some 'phrasing'. S pla asks which hand has more melody. T explains that this is why the RH ne shaped. S plays and T evaluates.

23:03	23:30	**T**	**goal setting**	T explains what the music should so writes the goals in iSCORE.