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The Impact of the Four Sources of Efficacy on Adolescent Musicians within a Self-Modeling Intervention

The purpose of this study was to investigate how Bandura's (1977) four sources of efficacy influence self-efficacy beliefs in adolescent musicians during a six-week self-modeling intervention. The study also explored the effects of a positive self-review self-modeling intervention on musician self-efficacy. Practice journals and semi-structured interviews were used to collect data from six adolescent pianists. Results indicate that mastery experience was most influential on self-efficacy beliefs in young musicians. Observing similarly skilled models, receiving positive feedback, and feeling calm or focused prior to performance increased self-efficacy in participants, while observing advanced models, making negative comparisons, and feeling anxious, distracted, or fatigued decreased self-efficacy. These results provide music teachers with several practical strategies that may facilitate stronger self-efficacy beliefs in students. Additionally, the self-modeling video increased self-efficacy when participants liked and related to their video or used the video to facilitate performance improvements. Music teachers can explore using both the performance and strategic functions of self-modeling videos as a possible tool to enhance self-efficacy in young musicians.

Keywords: self-efficacy, self-modeling, young musicians, sources of self-efficacy, music education

Introduction

From a young age, music students are asked to perform in concerts, performance exams, and other high-pressure situations and the stress of performance can cause young musicians to experience music performance anxiety (MPA) (Boucher & Ryan, 2011; Patston & Osborne, 2016). Various factors can affect MPA, including gender (Rae & McCambridge, 2004), experience (Boucher & Ryan, 2011), and a student's belief in their ability to perform well (Hendricks, Smith, & Legutki, 2015). As research suggests that musicians with higher self-efficacy beliefs experience less MPA (McPherson & McCormick, 2006), then providing students with strategies meant to enhance self-efficacy may also indirectly benefit MPA. This study explored the extent that self-modeling, a popular athletic intervention (Clark & Ste-Marie, 2007; Ste-Marie, Vertes, Rymal, & Martini, 2011), affects self-efficacy beliefs in young musicians.

Defining Self-Efficacy in Music

Self-efficacy is defined as the degree that people believe in their abilities to perform behaviors necessary for the successful completion of a task (Bandura, 1982). According to self-efficacy theory (Bandura, 1977), personal expectations of efficacy are task-specific and based on four sources of information: enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological or affective states. Enactive mastery experiences represent one's perceived success or failure of past experiences and are thought to have the strongest influence on self-efficacy. Repeated successes can develop strong efficacy expectations, reducing the negative impact of occasional failures. Vicarious experience information comes from observing others' behaviors. Watching other people perform tasks without negative consequences can increase one's belief that they can perform similar tasks with equal success.

However, since vicarious experience relies on inferences from social comparison, this source can be less dependable and more vulnerable to change compared to mastery experiences (Bandura, 1977, 1997). Verbal persuasion refers to feedback from others, where positive reinforcements and negative criticisms can alternately raise or lower efficacy expectations. While efficacy beliefs based on verbal persuasion are weaker than those based on personal experiences, verbal feedback can persuade people they are capable of mastering difficult situations when participating in conditions that facilitate effective performance (Bandura, 1977). Finally, physiological and affective states refer to physical and emotional reactions affecting perceptions of personal competency. People judge their vulnerability to stress partly on physiological arousal. Since high arousal often inhibits per-

formance, people are less likely to expect success when feeling tense and anxious (Bandura, 1982; Bandura, Reese, & Adams, 1982).

Self-efficacy studies with musicians (Bugos, Kochar, & Maxfield, 2016; Clark, Lisboa, & Williamon, 2014; McPherson & McCormick, 2006) suggest a positive relationship between self-efficacy and performance achievement (Hewitt, 2015; Ritchie & Williamon, 2012), as well as musical experience (Fisher, 2014; Ritchie & Williamon, 2011). Music studies have also investigated how Bandura's (1977) four efficacy sources influence beliefs and confirm that mastery experiences have the strongest influence on self-efficacy in musicians (Hendricks et al., 2015; Royo, 2014). Martin (2012) also found that music students with low efficacy beliefs talked about past failure experiences more often than high efficacy students, and vice versa. Compared to other sources, vicarious experience often had limited influence on beliefs (Moore, 2012; Zelenak, 2015), and some studies found that vicarious experience negatively influenced efficacy beliefs in students who compared their playing to other performers (Hendricks et al., 2015; Martin, 2012). However, vicarious experience positively influenced participants when they trusted and related to a model (Royo, 2014), suggesting that the model providing the vicarious experience may influence the observer's interpretation of the information.

Following mastery experiences, verbal persuasion had the strongest influence and was most effective when received from a trusted or familiar person (Royo, 2014). Clark and colleagues (2014) found that facilitative self-talk, a form of verbal persuasion, could enhance self-efficacy. Participant self-talk focused on the music when performances went well, but negative self-talk was more prevalent when performances went poorly, suggesting that self-talk may be linked to mastery experiences. Finally, physiological states had limited influence in efficacy studies (Moore, 2012; Zelenak, 2015), with participants most often citing fatigue as a state that negatively affected self-efficacy (Hendricks et al., 2015). However, this source is often discussed in the context of anxiety/arousal in musicians and a well-documented negative MPA/self-efficacy relationship (Dempsey & Comeau, 2019; Robson & Kenny, 2017) suggests that musicians with lower MPA experience stronger efficacy expectations, and vice versa.

Researchers have also investigated the impacts of self-efficacy interventions on musicians. Some interventions include: composition activities/instruction (Leung, 2008; Randles, 2006), ear playing instruction (Hartz & Bauer, 2016), improvisation instruction (Davison, 2010), piano training programs (Bugos et al., 2016), and self-regulation instruction (Mieder, 2018; Ritchie & Kearney, 2018). The intervention studies provide mixed results, particularly with younger mu-

sicians. Several studies observed positive efficacy effects following intervention, (Davison, 2010; Mieder, 2018), but others found no significant effects (Long, 2016; Miksza, 2015). Additionally, none of the studies investigated the individual effects of an intervention on the four efficacy sources. Since research demonstrates that Bandura's (1977) sources influence efficacy beliefs differently, exploring these sources within the context of an intervention can help us understand how to provide students with more effective efficacy enhancing strategies. Given the suggested relationship between self-efficacy and performance, increasing on-stage confidence in young musicians may also improve performance results.

Impacts of Modeling on Self-Efficacy

According to Bandura's (1986) social cognitive learning theory, learning occurs through the observation of social models. Modeling is the ability to imitate the actions of others and is the medium through which observational learning occurs (Williams, Davids, & Williams, 1999). The four components of observational learning are attention, retention, production, and motivation. For the first three components, learners must pay attention to relevant task features, cognitively organize and store modeled information, and then translate that information into behavior. The final component, motivation, is a key process in observational learning, as observers will only attend, retain, or produce behaviors that are perceived as important (Bandura, 1986; Schunk & Usher, 2012). Athletes use observational learning for three functions: skill, strategy, and performance. The skill function facilitates motor skill acquisition and performance, strategy function assists with strategy development and execution, and performance function helps optimize arousal and psychological performance states. Athletes use skill and strategy functions most often, but rarely use performance functions (Cumming, Clark, Ste-Marie, McCullagh, & Hall, 2005; McCullagh, Law, & Ste-Marie, 2012). However, while less popular among athletes, the performance function could have potential benefits for musicians struggling with psychological variables like MPA and self-efficacy.

Researchers suggests that perceived model similarity can influence attentional and motivational processes during observational learning (Schunk & Usher, 2012). Peer models that match the observer and model by age and/or gender can raise self-efficacy and increase motivation because observers tend to believe they can learn what the peer model was able to learn. Within peer models, there are skilled and unskilled models. Skilled models show the proper execution of a skill while unskilled models execute skills that contain errors (Schunk & Usher, 2012; Ste-Marie, Law, Rymal, Hall, & McCullagh, 2012). Self-modeling is another

type of modeling where individuals observe themselves engaged in adaptive behaviors. While other modeling provides observers with vicarious experience, self-modeling provides additional mastery experience, increasing the potential impact on self-efficacy (Bandura, 1986; McCullagh & Weiss, 2002). Positive self-review and feedforward are two kinds of self-modeling. Positive self-review videos are edited to remove errors and demonstrate current performance efforts. Feedforward videos are edited to depict an individual performing at a level not yet mastered (Dowrick, 1999).

Several studies examining the impact of self-modeling on athletic self-efficacy observed positive changes following intervention (Foltz, 2014; Ste-Marie, Rymal, Vertes, & Martini, 2011), but other studies found no significant differences (Law & Ste-Marie, 2005; Ram & McCullagh, 2003). Given that intermediate athletes could have less room for improvement compared to beginners, participant skill level in the above studies could account for the non-significant self-efficacy results (Law & Ste-Marie, 2005). Additionally, research suggests that the skilled models typically portrayed in self-modeling videos may be more effective on performance outcomes compared to psychological outcomes, which could limit self-efficacy effects (Schunk & Usher, 2012). Moody (2014) conducted the only feedforward self-modeling study with adolescent musicians and found that the videos had no significant self-efficacy effects after two weeks. Moody proposed that a longer time frame may be needed for effective change to occur, which is why the current study tests a six-week intervention. The current study also uses positive self-review videos instead of feedforward, as they are less time-consuming to create and therefore have greater potential practical application for music educators.

Purposes of the Study

The purpose of this study was to investigate how Bandura's (1977) four sources of efficacy information (i.e., enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological/affective states) influenced self-efficacy beliefs in adolescent musicians during a six-week self-modeling intervention. Additionally, the study explored the effects of the self-modeling intervention on musician self-efficacy. The study examined the following research questions: (a) How do Bandura's (1977) four sources of efficacy influence self-efficacy beliefs in adolescent piano students?, (b) To what extent does a self-modeling intervention for adolescent piano students affect self-efficacy?

Method

Participants

The Research Ethics Board of the researcher's home institution approved this study. Six adolescent piano students (four female, two male) between the ages of 12 and 16 participated. The original inclusion criteria required participants to be 13 to 17 years old and have recently completed a piano examination¹ at a grade five level or above. However, after recruitment challenges, the age limit was lowered to 12, and students with three performance-ready pieces were included, regardless of their recent piano exam experience. Participants also needed to have moderate to high levels of MPA, as assessed by the Music Performance Anxiety Inventory for Adolescents (MPAI-A) (Osborne & Kenny, 2005). Participants were recruited in person at Royal Conservatory of Music (RCM) examination centers in Ottawa or via email through the Ottawa chapter of the Ontario Registered Music Teachers' Association (ORMTA). Eight interested parents and students completed consent and assent forms. However, two students withdrew prior to the beginning of the study, leaving six participants (See Table 1). An injury prevented participant six (Donna) from performing partway through the study, but she was still able to complete all relevant data collection. Six full data sets were collected (See Table 2). Pseudonyms were assigned following data collection to protect participant identity.

All participants took piano lessons once per week with a private teacher and studied within the RCM or Conservatory Canada (CC) piano curriculum, which are Canadian methods for the study and assessment of music performance. Within these methods, students often take graded exams where they are required to perform a range of classical to contemporary repertoire, as well as demonstrate their proficiency in etudes, ear tests, sight reading, technique and theory. Some students take these exams every year, some take them every few years, and few never take exams at all. All participants in the current study had exam experience, as well as performance experience in several other settings. The first participant, Kim, was a 15-year-old female who completed her grade 6 RCM exam one month prior to the beginning of the study. Based on practice journal data, Kim's average practice session through the duration of the study lasted 14 minutes. The second participant, Sarah, was a 12-year-old female who completed her grade 8 RCM exam one month before starting the study. Sarah's average practice session lasted 24 minutes. Liam was 14-year-old male who completed his grade 6 RCM exam one month prior to the study, and his practice sessions also averaged 24 minutes. Ashley was a 16-year-old female playing grade 8 CC repertoire. Ashley mentioned completing CC exams in the past, but the grade and date of her last

exam are unknown. Ashley's average practice session lasted 50 minutes. Steve was a 14-year-old male who completed his grade 5 RCM exam several months before the study. Steve's practice sessions during the study averaged 31 minutes. Finally, Donna was a 14-year-old female who completed her grade 5 CC exam a year before starting the current study. Her average practice session during the study lasted 57 minutes. However, this average reflects baseline and intervention practice only as Donna was injured and unable to practice during the last phase of the study.

Table 1
Demographic Variables for Intervention Participants

<i>Participant</i>	<i>Age</i>	<i>Gender</i>	<i>Piano level</i>	<i>Base MPA score</i>	<i>Modeled piece</i>	<i>Number of modeling video views</i>	<i>Days spent in B phase</i>	<i>Days spent in IN phase</i>	<i>Days spent in RB phase</i>
Kim	15	Female	6 RCM	68	2	9	14	14	17
Sarah	12	Female	8 RCM	39	3	9	14	14	16
Liam	14	Male	6 RCM	44	2	7	14	14	16
Ashley	16	Female	8 CC	67	2	7	15	13	14
Steve	14	Male	5 RCM	40	3	6	14	9	14
Donna	14	Female	6 CC	39	3	4	15	13	14

Note. RCM = Royal Conservatory of Music, CC = Conservatory of Canada, B phase = baseline phase, IN phase = intervention phase, RB phase = return to baseline phase, Modeled piece = piece receiving modeling treatment, Number of modeling video views = number of times participant watched modeling video during the IN phase (includes practice and performance).

Table 2
Data Collection for Intervention Participants

<i>Participant</i>	<i>B phase journals completed</i>	<i>IN phase journals completed</i>	<i>RB phase journals completed</i>	<i>Number of pieces performed in B concert</i>	<i>Number of pieces performed in IN concert</i>	<i>Number of pieces performed in RB concert</i>
Kim	8	8	8	3	3	3
Sarah	8	8	8	3	3	3
Liam	7	8	9	3	3	3
Ashley	5	8	8	3	3	3
Steve	7	3	6	3	3	3
Donna	7	4	7	3	0	1

Note. B phase = baseline phase, IN phase = intervention phase, RB phase = return to baseline phase.

Measurements

Practice Journals. Participants recorded their thoughts and feelings about practice and/or upcoming performances throughout the study in semi-structured, electronic practice journals (see Appendix 1). Participants wrote a minimum of three sentences per entry, and journal structure was based on pre-existing practice journals (Ali, 2010; Kim, 2008). Journals provided participants with 11 open-ended questions to facilitate writing. Three researcher-created questions addressed overall performance feelings and eight questions addressed Bandura's (1977) four sources of efficacy. The self-efficacy questions were based on pre-existing interview probes (Hendricks, 2014) and were for guidance only. Participants could choose to answer as many or few questions as they would like. However, if they chose to use the provided questions, they were asked to answer different questions each entry. Questions were reorganized by efficacy source in each new entry to encourage students to respond to different questions. Journals contained an additional modeling section during the intervention phase. In order to develop a positive association between participants and their videos, participants were asked to pick and describe different points they liked in the modeling video. Two modeling questions, adapted from Foltz's (2014) interview guide, were also added to the list of provided questions.

Semi-Structured Interviews. The researcher conducted semi-structured interviews with participants to explore how Bandura's (1977) four efficacy sources influenced thoughts and feelings before, during, and after performance (see Appendix 2). Pre-existing interview guides provided the basis for the current study's interview structure (Clark et al., 2014) and questions (Hendricks, 2014). When applicable, one or two probes from Hendrick's (2014) guide were chosen for each source and used to create open-ended questions for each interview section (before, during, or after). A modeling question exploring the perceived video effects was included in the intervention and return to baseline interviews. This question was adapted from Rymal's (2011) interview guide.

Procedure

Pre-Intervention. After obtaining informed consent and assent, participants satisfying the inclusion criteria completed a recording session at the researcher's institution. The purpose of the session was to create a self-modeling video. Participants recorded three pieces of their own choosing, and the modeling treatment was alternately assigned to piece two or three. Participants had 30 minutes per piece to record their performance and could repeat each piece as many times as

they wanted within 30 minutes. Following the session, participants received their recorded performances via email and selected their favourite performance for each piece. For the piece assigned the modeling treatment, the participant's favourite performance of that piece was then used as the positive self-review video for the rest of the study.

Baseline (B). During a two-week baseline (B) phase, participants practiced three pieces as they usually would before a concert. On the first day of the B phase, participants received eight journal entries via email. Participants wrote four entries per week and emailed each one to the researcher upon completion. Participants completed journals on days practice occurred, but outside of practice time. After two weeks, participants performed in a B concert at the researcher's institution. An interview was conducted with each participant immediately following the concert.

Intervention (IN). A two-week intervention (IN) phase began the day following the B concert. Participants received eight more practice journals via email that had an extra modeling section. Participants also received their self-modeling video and were asked to watch their video four times per week. Participants watched their video immediately before completing their practice journals during the first week, and before practicing their modeled piece during the second week. After two weeks, participants performed in the IN concert. This concert followed the B concert procedure, except that this time participants viewed their modeling video once on a researcher-provided laptop prior to their modeled piece performance. Another interview was conducted after the IN concert.

Return to Baseline (RB). A two-week return to baseline (RB) phase began the day following the IN concert that was identical to the B phase. Participants did not view their modeling videos nor did the journals contain modeling questions during the RB phase.

Data Analysis

The researcher transcribed all verbal, nonverbal and background content (McLellan, MacQueen, & Neidig, 2003) of the interviews. The transcription of non-verbal content provided context to the verbal content but did not add any additional meaning to the analysis. Therefore, the paper only discusses the verbal content of the interviews. The researcher adopted a three-pass-per-tape policy for all transcriptions to establish accuracy (McLellan et al., 2003), and performed member checks to establish credibility (Lincoln & Guba, 1985). Participants received password-protected transcripts via email. Three participants reviewed the transcripts and were satisfied, suggesting no further changes, but the researcher

was unable to contact the remaining participants. Interview transcripts and practice journals underwent a thematic content analysis. Following Braun and Clark's (2006) guidelines, the researchers deductively coded the data using Bandura's (1977) four sources of efficacy as broad themes. To start, the primary researcher reviewed the data and created a list of individual codes within each efficacy source. The researcher remained open to additional themes in the data (Creswell, 2007) but all codes fell within the four efficacy themes. Two researchers with qualitative coding experience and familiarity with Bandura's (1977) efficacy sources independently coded three transcripts, then met to compare and discuss results. Changes were made to the coding list as necessary, and the researchers achieved high agreement for everything but the self-talk code. After discussing and redefining this code, two more transcripts were independently coded. The researchers compared results again and were able to establish inter-coder agreement for all codes during the second coding round. The primary researcher coded the remaining data using the finalized coding list (see Table 3).

Table 3
Coding List and Definitions

<i>Codes</i>	<i>Definitions</i>
Enactive Mastery Experience	Self-efficacy information derived from performance of the given task
Performance	Enactive mastery information derived from concert experiences
Exam or Festival	Enactive mastery information derived from exam or festival experiences
Practice	Enactive mastery information derived from practice experiences
Vicarious Experience	Self-efficacy information derived from observation
Observation of Others	Vicarious information derived from observing/listening to others
Comparison	Vicarious information derived from measuring the quality of one's performance against another's performance
Observation of Self	Vicarious information derived from observing/listening to self
Verbal Persuasion	Self-efficacy information derived from social influence and appraisal
Encouragement/Negative Messages	Verbal persuasion information derived from communication that affirms or criticizes one's ability
Feedback	Verbal persuasion information derived from communication of performance gains and shortfalls
Self-talk	Verbal persuasion information derived from communication within oneself
Physiological and Affective States	Self-efficacy information derived from physical and emotional indicators
Inhibiting	Physiological/affective information that hinders performance
<i>Performance Anxiety</i>	Physiological/affective information derived from somatic, cognitive, or behavioral anxiety symptoms
<i>Other</i>	Physiological/affective information derived from other thoughts or feelings that inhibit performance
Facilitative	Physiological/affective information that helps performance
<i>Calm</i>	Physiological/affective information derived from calm or relaxed feelings
<i>Other</i>	Physiological/affective information derived from other thoughts or feelings that facilitate performance

Results

Eighteen transcripts and 127 practice journals underwent a thematic content analysis and Table 4 displays the codes identified by each participant. Since both sources describe similar content, journal and interview data are presented in combination when discussing each theme.

Table 4
Self-Efficacy Source Codes Represented by Participant

<i>Codes</i>	<i>Kim</i>		<i>Sarah</i>		<i>Liam</i>		<i>Ashley</i>		<i>Steve</i>		<i>Donna</i>		<i>Total</i>	
	<i>I</i>	<i>J</i>	<i>I</i>	<i>J</i>	<i>I</i>	<i>J</i>	<i>I</i>	<i>J</i>	<i>I</i>	<i>J</i>	<i>I</i>	<i>J</i>	<i>I</i>	<i>J</i>
Enactive Mastery Experience														
Performance	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Exam or Festival	X	X	X		X							X	X	2 4
Practice	X	X	X	X	X		X		X	X	X	X	4	6
Vicarious Experience														
Observation of Others		X	X	X	X	X	X		X		X		2	6
Comparison	X				X	X	X	X			X	X	3	3
Observation of Self	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Verbal Persuasion														
Encouragement/Negative Messages	X		X		X	X	X	X	X	X			5	3
Feedback	X	X	X		X	X	X				X	X	5	3
Self-talk	X	X	X	X	X	X	X		X		X	X	6	4
Physiological and Affective States														
Facilitative														
<i>Calm</i>	X	X	X	X	X	X	X	X	X	X	X	X	6	6
<i>Other</i>	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Inhibiting														
<i>Performance Anxiety</i>	X	X	X	X	X	X	X	X	X	X	X	X	6	6
<i>Other</i>	X	X	X		X	X			X		X	X	3	5

Note. I = Interview data, J = journal data. An x indicates which codes were identified by each participant.

Enactive Mastery Experience

Three codes related to enactive mastery experiences emerged from the data analysis: Performance, Exam or Festival, and Practice. These codes were cited most often by participants.

Performance. Responses indicated that perceived success and/or failure of past performances influenced self-efficacy for the participants in this study. When past performances were perceived as successful, participants were more likely to expect current performances to go well. Sarah wrote, “I’m a lot more confident about my pieces for my upcoming performances... I did really well on Thursday, so I’m hoping that I will do as well next time.” In contrast, when past

performances were unsuccessful, participants often expected similar results. Kim wrote, “The last few times I performed these pieces didn’t go well and I couldn’t play the way I usually do so I don’t think the upcoming performance will go any better than the previous ones.” For Kim, Liam, and Donna, negative current experiences seemed to override past experiences. When reflecting on his third piece performance, Liam stated, “I didn’t know if I would perform [the third piece] to my... potential...’cause the second piece wasn’t that good.” Despite having prior positive experiences, Liam felt less efficacious before performing his third piece when his second piece did not go as planned. In contrast, Sarah, Ashley, and Steve minimized the impact of negative mastery experiences by focusing on positive experiences. Ashley stated, “I focus on the positive ‘cause if I thought about the negative too much ... then I’d go up and I’d do that again.”

Exam or Festival. A decision was made during coding to separate exam and festivals from other performances due to the presence of an explicit evaluator at these events. However, perceived success and/or failure of exam and festival experiences had similar self-efficacy impacts on participants compared to other performances. Sarah wrote, “I feel like I did pretty well during my exam, so I have more confidence,” demonstrating that a successful exam experience increased self-efficacy. However, Donna stated, “Oh yeah, I performed it at [a local festival] and it went horrible. All my songs went so bad, and like... I probably thought it was gonna happen here again,” demonstrating that a failure experience decreased efficacy beliefs. Of note, Steve did not have a recent exam/festival experience, and therefore did not comment on this topic.

Practice. Similar to other mastery experiences, perceived success or failure during practice influenced efficacy beliefs in the current participants. Donna wrote, “Today my practice session went very well... I am confident that I will be able to perform well during my performance on Sunday.” However, practice experiences were less influential than performance experiences for some participants. Kim wrote that having a good practice session “doesn’t affect how I feel about the upcoming performance because my experience from previous performances...are more important.” Additionally, the act of practicing itself increased self-efficacy in some participants. Sarah said, “So, the first and the third piece, I was actually pretty confident because I practiced it like, more this week. But the second piece, I wasn’t as confident because I didn’t practice it as much.” Since practice is an integral part of music study, preparation by practice may be a useful strategy for increasing onstage confidence.

Vicarious Experience

Vicarious experience included three codes: Observation of Others, Comparison, and Observation of Self.

Observation of Others. Three participants observed friends as peer models and reported that watching the models positively affected self-efficacy and increased motivation. After watching her friend perform, Sarah wrote, “I enjoyed watching her play because she played very well...I want to practice a lot so I can play that well in the future.” Five participants also observed peer or non-peer skilled models. Several of these participants felt that observation helped improve their playing. For example, Donna watched videos when she was first learning her piece to “learn the right rhythm,” and Kim listened to YouTube videos to “become more comfortable with the piece.” However, some participants felt less efficacious after observing skilled models. Ashley felt discouraged after watching videos “played by four-year-old ‘prodigies’” because the videos “never really sound like how I play it,” and Donna felt nervous after watching her sister perform more advanced repertoire because she felt she was “probably not going to place compared to her [sister].” Overall, peer models that matched participant skill level increased efficacy, but advanced models produced negative comparisons and decreased efficacy for the participants of this study.

Comparison. Negative comparisons decreased self-efficacy beliefs in participants. When another participant performed the same piece during the study, Kim said, “It makes me feel like, inferior... he’s playing a lot better than me.” Similarly, after her sister performed, Donna said, “Oh, she’s like a billion times better than me...So like, after going after someone that gets like, all the awards and scholarships, you like, look like trash.” In contrast, Liam wrote, “Well, playing well is relative....So if someone played really badly, then yeah, I would play pretty well...But if they play really well then I might have only a little chance of playing well,” demonstrating an awareness that comparisons to others changed how he felt about his performance. Participants with stronger efficacy beliefs did not mention comparison, suggesting that avoiding negative comparisons may protect efficacy beliefs.

Observation of Self. Five participants used the performance function of the modeling video. Two of these participants felt increased efficacy after viewing the video, like Sarah who said, “it [the video] gave me more confidence because I didn’t know I played like that...it sounded actually pretty, well, like, pretty good.” However, while Kim felt encouraged by the video, she said, “I hope I can play as well as this [video], but I don’t think I’ll be able to,” suggesting that the positive mastery/vicarious experience from the video was not enough to overcome her other negative

experiences. Two participants felt less efficacious after watching their videos when they focused on negative aspects of the modeled performance. Donna expressed, “when I watched before I practiced...[it] bummed me out ‘cause it went really bad,” and Ashley wrote, “I did not find it helpful as I have improved since the video.” Both statements suggest that it was important for the participants of this study to like their modeled performance and have a video that reflected their current performance accomplishments in order to effectively target self-efficacy. Three participants also used the strategic function when viewing their self-modeling videos. Sarah wrote that her video was, “a good way for me to improve. I was able to see all the good things in the video... I was also able to see the bad things, so I can improve and make it better,” and Steve said, “I saw where my mistakes were, and I tried to avoid them while I was performing.” Participants who used their modeling videos strategically spoke more positively about their video and appeared to experience an indirect increase in self-efficacy as a result of overcoming challenges. Two participants experienced a continued self-efficacy effect after they stopped viewing their video. The improvements Sarah and Ashley experienced from the modeling video continued through the RB phase, and Sarah said that “the third [modeled] piece was like, my most confident piece.” The remaining participants did not perceive any long-term effects once the modeling intervention ended.

Verbal Persuasion

Verbal persuasion included three codes: Encouragement or Negative Messages, Feedback, and Self-Talk. It is important to note that participants did not receive feedback following the study concerts, so most verbal persuasion codes refer to journal responses.

Encouragement or Negative Messages. Receiving encouragement increased self-efficacy in participants, and participants most often received encouragement from teachers, then parents and peers. After performing at school, Steve reported, “Everybody said I played really well, so I was very confident about my pieces,” demonstrating that verbal praise increased his efficacy beliefs. However, Liam wrote, “My teacher said that my songs are actually pretty good, but that was around a month ago so I don’t really know what she would say of them now,” suggesting that encouragement may need to be current in order to be helpful. Only one participant mentioned receiving a negative message from a teacher. After the RB concert, Ashley said, “I know my teacher doesn’t like it when I look around when I play a certain song,” suggesting that she received a negative message about this issue in the past. However, Ashley did not indicate if or how this message affected her efficacy beliefs.

Feedback. Participants received feedback most often from teachers, then parents and adjudicators. While most participants received neutral or instructive feedback during lessons, few participants indicated whether feedback affected their self-efficacy beliefs. However, Sarah said she likes getting feedback “because then I know what I have to work on, and I can work on it,” while Liam wrote, “I don’t really know if I am making any improvements on my playing abilities, because I get no feedback.” Both statements suggest that feedback helped Sarah and Liam gauge their progress and given that perceived improvements can provide positive mastery experiences, it is possible that receiving performance-enhancing feedback may have indirectly improved self-efficacy.

Self-Talk. Participant self-talk was often dependent on mastery experiences, in that self-talk was positive when participants perceived performances or practice sessions as successful, but negative during unsuccessful experiences. For example, Steve’s self-talk after performing well was, “I’m really good at playing the piano,” but after a poor performance, Donna told herself, “Oh, you’re gonna screw up again...you’ll just keep screwing up then.” As well, five participants used positive self-talk to facilitate performance and increase self-efficacy. Ashley used self-talk to increase focus as well as buffer against negative experiences by saying, “I was just listing off the chord progressions [during the performance] and if I messed one up, I’d just say, ‘Go to the next. Just don’t stop.’” Meanwhile, Sarah used self-talk to increase her self-efficacy by writing, “I’m just telling myself that I will do fine, because of my hard work, and I will not regret anything afterwards.”

Physiological or Affective States

Physiological or affective states included two codes: Facilitative and Inhibiting. The Inhibiting code contained two subcodes (Performance Anxiety, Other) while the facilitative code also contained two subcodes (Calm, Other).

Inhibiting States – Performance Anxiety. Like self-talk, performance anxiety was often dependent on mastery experiences for the participants of this study. The decreased efficacy beliefs from negative experiences also indirectly affected performance anxiety so that participants typically felt more anxious when they perceived a performance or practice session as unsuccessful. For example, Donna shared that the “prior two times that I played it, it went horrible. So, this time, it’s like, even more stress and pressure,” while Liam said that during his concert performance, “that nervousness escalated after the first little jumble of the first variation.” In contrast, some participants felt that anxiety caused failure experiences. Steve wrote, “I generally don’t make mistakes unless I am nervous,” suggesting that anxiety limited his ability to perform and likely decreased efficacy.

Inhibiting States – Other. Surprised, confused, tired, sick, angry, distracted, unmotivated, and injured were other inhibiting states that decreased participant self-efficacy, with tired and distracted cited most often. Four participants discussed how feeling tired negatively affected their performance and on-stage confidence. Steve wrote, “My practice session could have gone better but somehow, I was tired which caused me to make mistakes frequently.” Similarly, distraction could inhibit participant performance and decrease self-efficacy, like with Sarah, who wrote, “I kept messing up on some parts, and then couldn’t concentrate on my music.” Donna presented a unique inhibitive state when she suffered a playing related injury during the study. The injury impaired her playing ability and her subsequent performance experiences caused her self-efficacy to plummet. She stated, “I used to perform like, really well and I used to love performing. And now I hate it. ‘Cause like, I keep messing up,” demonstrating how the injury resulted in decreased self-efficacy and a diminished love of performing.

Facilitative States – Calm. Participants felt calm prior to performance when they felt efficacious about their pieces. For example, Liam said, “I wasn’t feeling that...stressed out because I know the song pretty well.” Several participants felt that being calm could facilitate a successful performance, and vice versa. Kim said, “I thought it [the performance] was a lot better than like, the previous two because I felt less like, nervousness,” while Sarah wrote, “I don’t feel that nervous when I think about the concert right now mainly because I felt like I did well yesterday,” suggesting that participants felt calmer and more efficacious after positive performance experiences. To achieve a calm state, participants used strategies such as practice, physical relaxation, or avoiding thinking about past performances. Sarah shared, “The third one [piece] was like, the least nerve-wracking because—probably because I practiced that the most. So, I felt like I was ready to do this performance,” indicating that these strategies increased both calmness and efficacy beliefs.

Facilitative States – Other. Focused, hopeful, happy, determined, relieved, and energetic were other facilitative states that increased participant self-efficacy, with focused and happy cited most often. Five participants focused on the music as a strategy to facilitate performance, like Sarah, who wrote, “I was really concentrated the whole time I was playing, and I think that helped a lot with improving the pieces.” Since perceived improvements provide positive mastery experience, focused practicing that resulted in performance improvements may have indirectly increased self-efficacy for the participants of this study. As well, Liam said, “I don’t think of past performances... ‘Cause if this went really badly, then I’d just get nervous for the next performance. And it wouldn’t go well,” suggesting that focusing

on current performances helped minimize the negative impact of failure experiences on his self-efficacy. Six participants stated they felt happy when they perceived performances as successful, suggesting that this facilitative state is linked with mastery experiences. For example, Liam said, “I felt good when I finished everything ‘cause I hadn’t made that many mistakes...it was all good and clean, so I was happy with that.” Participants experienced increased efficacy beliefs in conjunction with increased feelings of happiness following positive performance experiences.

Discussion

The current study asked two research questions: (a) How do Bandura’s (1977) four sources of efficacy influence self-efficacy beliefs in adolescent piano students?, and (b) To what extent does a self-modeling intervention for adolescent piano students affect self-efficacy?

First, enactive mastery experiences appeared most influential on efficacy beliefs for the participants of this study, supporting previous findings (Hendricks et al., 2015; Royo, 2014). Performance experiences perceived as successful increased self-efficacy, while experiences perceived as failures decreased self-efficacy. Current failure experiences often overshadowed past positive experiences, but some participants minimized the impact of failure experiences by purposefully focusing on past successes. Based on the participant responses in the current study, it may be useful for teachers to create environments that promote successful performance experiences for music students. However, it may be equally important to teach students to cope with failure experiences. As Martin (2012) found that low efficacy students talked about past failure experiences more often than high efficacy students, low efficacy students may be more likely to focus on negative experiences and less likely or able to focus on positive experiences. Since minor performance setbacks are often inevitable for young performers, teachers may want to provide students with focusing strategies to help protect efficacy beliefs from the impact of onstage mistakes.

Secondly, vicarious experience had limited influence on efficacy beliefs in the current study, confirming previous findings (Martin, 2012; Moore, 2012). Observing similarly skilled models increased motivation and efficacy in participants (Schunk & Usher, 2012; Ste-Marie et al., 2012), but observing advanced models or other students resulted in negative comparisons and decreased efficacy (Hendricks et al., 2015; Martin, 2012). Compared to athletes who typically engage the skill or strategy function of observational learning (Cumming et al., 2005),

the young musicians in this study used the performance or strategy functions. Participants engaging the performance function reported increased efficacy only if they liked their modeled performance and felt it reflected current performance accomplishments. Since model similarity affects the attentional and motivational processes of observational learning (Schunk & Usher, 2012), teachers must take care to create self-modeling videos that are relatable to their students. The strategy function helped participants identify and correct mistakes and the resulting performance improvements strengthened efficacy beliefs (Bandura, 1997). Teachers may wish to explore the strategy function of self-modeling with music students in an effort to enhance self-efficacy.

Thirdly, verbal persuasion had limited influence on participant self-efficacy, contrasting current literature (Hendricks, 2014; Royo, 2014). However, encouragement directly increased self-efficacy, which is consistent with Bandura's (1977) writings. Feedback facilitating performance enhancement also indirectly increased self-efficacy, as the resulting improvements provided positive mastery experience (Bandura, 1977). Self-talk was linked to mastery experiences (Clark et al., 2014), where positive self-talk was more prevalent during successful performances and vice versa, and participants also used positive self-talk to increase efficacy and enhance performance. As Clark and colleagues (2014) also observed that facilitative self-talk increased efficacy, self-talk may be another tool that can strengthen efficacy beliefs in young musicians.

Finally, in contrast to other studies (Moore, 2012; Zelenak, 2015), physiological states influenced the self-efficacy of the current study participants. The most prevalent inhibiting state was performance anxiety (Robson & Kenny, 2017), followed by fatigue (Hendricks et al., 2015) and distraction. In contrast, calm was the most common facilitative state, followed by focus. In general, participants felt less efficacious when experiencing inhibiting states, and more efficacious when experiencing facilitative states (Bandura, 1982; Bandura et al., 1982). As a result, participants felt that facilitative states enabled successful performances, and vice versa, and used proactive strategies like physical relaxation or practice to induce facilitative and reduce inhibiting states prior to performance. These insights may provide teachers with strategies to implement in their teaching practice that may support efficacy beliefs in students.

Limitations

While the current study design provided the opportunity for an in-depth exploration of efficacy beliefs, the sample size limits the transferability of the findings to the overall population. Given the small sample, generalizations about ef-

ficacy beliefs in adolescent piano students from the current results are not possible. A second limitation is the number of times participants viewed their modeling video. Since participants watched their videos at home, there was no way for the researcher to ensure that participants viewed their videos as instructed. As a result, not all participants watched their video eight times, resulting in inconsistent exposure. A third limitation is the timing of data collection. Verbal persuasion appeared least frequently during coding, and since participants completed interviews and practice journals at times where feedback was not regularly available, this efficacy source may not have been fully represented in the data. A fourth limitation is the study location. The current study was in Ottawa, but students from other regions who use different pedagogical methods may also experience different self-efficacy influences. Finally, while the study is grounded in Bandura's self-efficacy theory (1977), there are likely other variables influencing self-efficacy that were not considered.

Future Research

Future research should examine the differences between high and low efficacy students and their perceptions of mastery experiences to provide more information on how to best support young musicians suffering from low self-efficacy. As well, researchers could further investigate the strategic function of self-modeling to better understand the possible efficacy effects experienced by musicians. Finally, future research can explore how positive self-talk, calming, and/or focusing strategies can be used as tools to protect efficacy beliefs in young musicians.

Conclusion

Of the four efficacy sources (Bandura, 1977), there were indications that mastery experience was most influential on self-efficacy beliefs in young musicians. As such, teachers may wish to create environments that promote successful performance experiences and teach students how to cope with failure experiences. Additionally, observing similarly skilled models, receiving positive feedback, and feeling calm or focused increased participant self-efficacy, while observing advanced models, making negative comparisons, and feeling anxious, fatigued, or distracted decreased self-efficacy. The findings provide music teachers with several strategies that may foster efficacy beliefs in students. Finally, watching a self-modeling video increased self-efficacy when students liked and related to their video or used the video to facilitate performance improvements. Teachers can explore both performance and strategic functions of self-modeling in an effort to enhance self-efficacy in young musicians.

Endnote

¹Piano exams refer to exams conducted by the Royal Conservatory of Music (RCM) or Conservatory Canada (CC) that evaluate musical and performance proficiency.

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Appendix A

Practice Journal – Baseline Phase

Please complete this journal entry after you have completed your regular practice session. Journals should be completed the same day practice occurs and can be completed anytime after the practice has ended.

Section One

Name: _____

Date: _____ Time of practice session: _____

Length of practice session: _____ Time of journal completion: _____

Section Two

Please complete this section of the journal by writing about how you feel about the upcoming performance. You may talk about any thoughts or feelings relating to your concert pieces, your practice session today, or the performance you are preparing for. Please write a minimum of three sentences for your entry. Below is a list of questions to help guide you with your writing. Feel free to answer as many or as few questions as you would like. The questions are here to give you ideas about what to write about, but you are not required to answer any of the questions listed below. However, if you choose to answer some of the questions listed below, please be sure to answer questions that have not been answered in previous journal entries (i.e. Pick new questions to answer for each journal entry).

- Do you feel good about how your practice session went? Why or why not?
- Did you come across any problems while practicing today? What were they? How confident do you feel that you will be able to solve these problems before the concert?
- How confident do you feel about your pieces for the upcoming performances?
- Do you think you will be able to play well during the concert? What evidence do you have for your answer? (E.g. Did you feel good about your exam performance?)
- Are there passages in your pieces that you feel you've improved on? Where are they and how did you manage to make these improvements?
- Have you heard any friends, peers, or classmates perform or practice recently? Did you enjoy watching them? Why or why not?

- Have you watched any videos or listened to recordings of your pieces done by other musicians? Did you find the videos or recordings helpful?
- What does your teacher say about your pieces? Do you agree or disagree with them?
- What kinds of things do you say to yourself when you're practicing your pieces? What kinds of things do you say to yourself when you think about the concert?
- How did you feel during practice today (e.g. Excited, nervous, tired, frustrated, happy)? Does this affect how you feel about the upcoming concert?
- Do you feel nervous when you think about the concert? What makes you feel nervous? What do you do to help calm your nerves?

Practice journal – Intervention phase

Please complete this journal entry after you have completed your regular practice session. Journals should be completed the same day practice occurs and can be completed anytime after the practice has ended.

Section One

Name: _____

Date: _____ Time of practice session: _____

Length of practice session: _____ Time of journal completion: _____

Did you watch your modeling video today? (Yes/No): _____

Time video was viewed: _____ Place video was viewed: _____

Please pick a point in your video performance that you thought you played well and describe what you like about it. Be specific about why you like it. For example, do you think you played the dynamics very beautifully in that part, or do you think your phrasing was especially musical? Please pick a part of the video that you have not yet written about (i.e. Pick a new point to talk about for each journal entry).

Section Two

Please complete this section of the journal by writing about how you feel about the upcoming performance. You may talk about any thoughts or feelings relating to your concert pieces, your practice session today, your modeling video, or the performance you are preparing for. Please write a minimum of three sentences for your entry. Below is a list of questions to help guide you with your writing. Feel free to answer as many or as few questions as you would like. The questions are here to give you ideas about what to write about, but you are not required to answer any of the questions listed below. However, if you choose to answer some of the questions listed below, please be sure to answer questions that have not been answered in previous journal entries (i.e. Pick new questions to answer for each journal entry).

- How did you feel during practice today (e.g. Excited, nervous, tired, frustrated, happy)? Does this affect how you feel about the upcoming concert?
- Do you feel nervous when you think about the concert? What makes you feel nervous? What do you do to help calm your nerves?
- Do you feel good about how your practice session went? Why or why not?
- Did you come across any problems while practicing today? What were they? How confident do you feel that you will be able to solve these problems before the concert?
- How confident do you feel about your pieces for the upcoming performances?
- Do you like watching your modeling video? Why or why not?
- Do you find watching yourself perform on the video helpful? Why or why not?
- Do you think you will be able to play well during the concert? What evidence do you have for your answer? (E.g. Did you feel good about your exam performance?)
- Are there passages in your pieces that you feel you've improved on? Where are they and how did you manage to make these improvements?
- Have you heard any friends, peers, or classmates perform or practice recently? Did you enjoy watching them? Why or why not?
- Have you watched any videos or listened to recordings of your pieces done by other musicians? Did you find the videos or recordings helpful?
- What does your teacher say about your pieces? Do you agree or disagree with them?
- What kinds of things do you say to yourself when you're practicing your pieces? What kinds of things do you say to yourself when you think about the concert?

Appendix B

Semi-Structured Interview Guide – Baseline Phase

General feelings about the performance

- I would like to explore how you feel about the performance you just gave. I am going to ask you some questions about your thoughts and feelings before, during, and after the concert.
- How do you feel about the performance overall? Why do you think it went well/did not go well?

Before the concert

- I would like you to think about the few minutes backstage just prior to the performance. Could you explain what you were thinking and feeling right before you performed?
 - *Personal mastery experience*
 - *Thinking about past practice sessions, past successful/unsuccessful performances*
 - *Vicarious experiences*
 - *Did watching or listening to peers' influence thoughts/feelings*
 - *Verbal persuasion*
 - *Thinking about feedback received prior to concert from teachers or friends*
 - *Personal self-talk (positive/negative)*
 - *Physiological or affective states*
 - *Feelings of anxiety, nervousness, fear, excitement, calm, etc.*
 - *If anxiety mentioned, what types of cognitive symptoms were experienced? Somatic symptoms?*
- *How confident would you say you felt before the performance?*

During the concert

- Now think back to when you first sat down to begin your performance. Could you explain what you were thinking and feeling while you performed your pieces?
 - *Personal mastery experience*
 - *Thinking about the pieces – thinking about things that went well/did not go well during previous performances, was there worry about memory, difficult parts, etc.*
 - *Vicarious experience*

- *Verbal persuasion*
 - *What was your self-talk like during the performance (positive/negative)?*
- *Physiological or affective states?*
 - *Feelings of anxiety, nervousness, fear, excitement, calm, etc. during the performance*
 - *Cognitive or somatic anxiety symptoms experiences?*

After the concert

- When you finished your performance, what kind of thoughts and feelings did you experience?
 - *Personal mastery experience*
 - *How does reflection on the performance just passed influence feelings and thoughts*
 - *Vicarious experience*
 - *Did watching the other performer's change how you feel about your performance?*
 - *Verbal persuasion*
 - *What kinds of feedback did you receive after the performance?*
 - *Personal self-talk (positive/negative)*
 - *Physiological or affective states*
 - *Feelings of anxiety, nervousness, disappointment, frustration, relief, relaxation, satisfaction, etc.*
 - *If anxiety mentioned, what types of cognitive or somatic symptoms are still present?*
- If you think about performing your pieces again, how confident do you feel right now that you would play well?

Semi-Structured Interview Guide – Intervention and Return to Baseline Phase

General feelings about the performance

- I would like to explore how you feel about the performance you just gave. I am going to ask you some questions about your thoughts and feelings before, during, and after the concert.
- How do you feel about the performance overall? Why do you think it went well/did not go well?

Before the concert

- I would like you to think about the few minutes backstage just prior to the performance. Could you explain what you were thinking and feeling right before you performed?
 - *Personal mastery experience*
 - *Thinking about past practice sessions, past successful/unsuccessful performances*
 - *Vicarious experiences*
 - *Did watching or listening to peers' influence thoughts/feelings*
 - *Verbal persuasion*
 - *Thinking about feedback received prior to concert from teachers or friends*
 - *Personal self-talk (positive/negative)*
 - *Physiological or affective states*
 - *Feelings of anxiety, nervousness, fear, excitement, calm, etc.*
 - *If anxiety mentioned, what types of cognitive symptoms were experiences? Somatic symptoms?*
- How confident would you say you felt before the performance?
- Knowing that you watched your video before the concert, do you think that the video had an influence on how you felt before you performed?
 - *What did it influence*
 - *Why do you think it influenced you the way it did?*

During the concert

- Now think back to when you first sat down to begin your performance. Could you explain what you were thinking and feeling while you performed your pieces?

- *Personal mastery experience*
 - *Thinking about the pieces – thinking about things that went well/ did not go well during previous performances, was there worry about memory, difficult parts, etc.*
- *Vicarious experience*
- *Verbal persuasion*
 - *What was your self-talk like during the performance (positive/negative)?*
- *Physiological or affective states?*
 - *Feelings of anxiety, nervousness, fear, excitement, calm, etc. during the performance*
 - *Cognitive or somatic anxiety symptoms experiences?*

After the concert

- When you finished your performance, what kind of thoughts and feelings did you experience?
 - *Personal mastery experience*
 - *How does reflection on the performance just passed influence feelings and thoughts*
 - *Vicarious experience*
 - *Did watching the other performer's change how you feel about your performance?*
 - *Verbal persuasion*
 - *What kinds of feedback did you receive after the performance?*
 - *Personal self-talk (positive/negative)*
 - *Physiological or affective states*
 - *Feelings of anxiety, nervousness, disappointment, frustration, relief, relaxation, satisfaction, etc.*
 - *If anxiety mentioned, what types of cognitive or somatic symptoms are still present?*
- Knowing that you watched your modeling video these past two weeks to help you prepare for the concert, do you think that the video had an influence on how you performed today?
 - *What did it influence?*
 - *Why do you think it influenced you the way it did?*
- If you think about performing your pieces again, how confident do you feel right now that you would play well?