Music Performance Anxiety, Self-efficacy, and the Effects of Self-modeling on Young Musicians

Erin MacAfee

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Faculty of Health Sciences

University of Ottawa

Table of Contents

Abstract

Public performance is often a central component of music education for young musicians, and the demands of performing in festivals, exams, auditions, and recitals can cause young performers to experience music performance anxiety (MPA: Boucher & Ryan, 2011; Thomas & Nettelbeck, 2014). The current dissertation explored MPA in young musicians from a variety of perspectives, using four main research purposes. The first article examined the relationship between MPA and self-efficacy in young musicians and investigated the extent to which gender moderates the relationships between MPA, age, and self-efficacy in young musicians (aged 7-17 years). The results of statistical analyses indicated that while gender did not moderate the relationship between age and MPA, age had a significant main effect on MPA. There was no significant difference between males' and females' levels of self-reported MPA. Additionally, there were no significant main effects of age or gender on self-efficacy, or an effect of gender on the relationship between age and self-efficacy. A strong negative relationship between self-efficacy and MPA indicates that students with low levels of self-efficacy are more likely to have high levels of MPA. Next, the MPA/self-efficacy and MPA/age-related findings from article one led to the second and third articles of this dissertation which investigated a self-modeling intervention designed to target MPA and self-efficacy in adolescent musicians. Article two examined the relational changes between MPA, self-efficacy, performance quality, and behavioural anxiety in five adolescent piano students over a six-week intervention. The study also explored the effects of a positive self-review self-modeling intervention on adolescent musicians using quantitative methods. Results indicated that the relational changes between MPA, self-efficacy, and performance quality are complex. There were no observed relationships between MPA and self-efficacy or performance, suggesting that MPA can have both debilitative

and facilitate effects on these variables. Additionally, there was no relationship between MPA and behavioural anxiety, suggesting that students may appear less anxious than they feel. Finally, the results suggest that self-modeling has individual effects on musicians, meaning that self-modeling can provide teachers with a versatile strategy for reducing MPA, improving performance quality, and/or increasing performance confidence. Article three expanded on the self-efficacy results of article two and investigated how Bandura's (1977) four sources of efficacy influenced self-efficacy beliefs in adolescent musicians within a six-week self-modeling intervention. The study also explored the effects of a positive self-review self-modeling intervention on musician self-efficacy using qualitative methods. Results indicated that mastery experience was most influential on self-efficacy beliefs in participants. 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, suggesting that both the performance and strategic functions of modeling may be beneficial to musicians. Finally, the fourth and final article of the dissertation explored MPA from music teachers' perspectives by identifying and describing common coping strategies teachers use to support students with MPA. A quantitative content analysis of scientific and non-scientific MPA literature identified preparation, open communication, realistic expectations, exposure therapy, and deep breathing as the five most common coping strategies mentioned in the literature. Qualitative thematic analyses of literature and semi-structured interview

transcripts with piano teachers provided descriptions of the five commonly identified strategies. A comparison of literature and interview results suggests a gap between research knowledge of MPA and practical teaching application. While music teachers employ a variety of strategies to help students cope with MPA, they may also benefit from formal MPA training opportunities grounded in research to provide additional resources for effectively managing students with MPA. The four articles of the dissertation combine to give an overview of MPA in young musicians from several different perspectives. Findings from article one help identify students who may be more at risk to suffer from MPA, while self-modeling findings from articles two and three provide musicians and teachers with a viable strategy to help reduce MPA and increase self-efficacy. Finally, given that teachers can act as a front-line defense against MPA (Liu, 2016), findings from article four help identify areas where researchers can provide teachers with further MPA training, which will in turn help fortify young musicians against MPA.

List of Tables

Chapter 2

Chapter 3

Chapter 4

Chapter 5

List of Figures

Chapter 3

Statement of Contribution

I, Erin MacAfee, was primarily responsible for the research program of this dissertation, which included the conceptualization, literature review, participant recruitment, data collection, data analysis, and writing. As such, I am the first author on all four articles presented in the dissertation. My supervisor, Dr. Gilles Comeau, provided conceptual input, feedback, and guidance for every part of this dissertation. As such, he is the coauthor on all four articles. My thesis advisory committed consisted of Dr. Diane Ste-Marie and Dr. Donald Russell. Both individuals provided invaluable feedback at my thesis proposal and periodically throughout data collection and analysis, particularly for articles two and three. I received assistance with the statistical analysis in article one from Dr. Krystelle Shaughnessy. Finally, Meganne Woronchak contributed by coding several interview transcripts and practice journals to act as my inter-rater agreement researcher.

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Chapter 1: General Introduction

Introduction

For young musicians, public performance is often a central component of music education. The demands of performing in auditions, festivals, exams, recitals, and more, can cause young performers to experience music performance anxiety (MPA: Boucher & Ryan, 2011; Nusseck, Zander, & Spahn, 2015: Thomas and Nettelbeck 2014). The current dissertation explores MPA in young musicians from a variety of perspectives. The first perspective looks at several variables that may influence MPA in children and adolescents. While MPA researchers cite age (Patston & Osborne, 2016) and gender (Coskun-Senturk & Cirakoglu, 2017; Kenny, Driscoll & Ackermann, 2014) as two variables that can impact MPA, little is known about how age and gender interact to affect MPA severity in young musicians (Ryan, 2004, 2005). Music researchers have also studied the relationship between MPA and self-efficacy, finding a negative relationship where musicians with increased self-efficacy tend to exhibit decreased MPA (Craske & Craig, 1984; Hendricks, Smith, & Legutki, 2015; Miller & Chesky, 2004). Like MPA, while self-efficacy has been researched in young musicians (McPherson & McCormick, 2006; Ritchie & Williamon, 2011a, 2012), few studies investigate how gender may potentially affect age-related self-efficacy changes (Hendricks et al., 2015; Hewitt, 2015). The first article of this dissertation investigates the MPA/self-efficacy relationship in young musicians and examines the extent to which gender moderates the relationships between age and MPA, and age and self-efficacy in young musicians.

While article one results showed no significant differences between males' and females' self-reported MPA or self-efficacy, there was a significant effect of age on MPA, such that MPA increased with age in young musicians. Teenagers reported higher levels of MPA compared to children, and these findings indicate that both male and female adolescent musicians may benefit

from interventions designed to reduce MPA. While various MPA interventions have been tested with adult musicians (Burin & Osório, 2016; Kenny & Halls, 2018), fewer resources are available to help younger musicians manage MPA (Braden, Osborne, & Wilson 2015; Kenny & Osborne, 2006; Rae & McCambridge, 2004). Therefore, the second and third articles of this dissertation investigate an intervention designed to target MPA and self-efficacy in adolescent musicians. Research in sport literature suggests that self-modeling interventions may increase perceived self-efficacy in athletes (George, Feltz, & Chase, 1992; Rymal, Martini, & Ste-Marie, 2010; Ste-Marie, Vertes, Law, & Rymal, 2013). Considering these findings, the second and third articles of the dissertation explore the extent to which a self-modeling intervention can impact self-efficacy in adolescent musicians. As well, given the negative self-efficacy/MPA relationship reported in music literature and confirmed by article one results, articles two and three also explore whether a self-modeling intervention designed to increase self-efficacy will have a subsequent, positive effect on MPA. The second article examines the effects of self-modeling on MPA, self-efficacy, performance quality, and behavioural anxiety using quantitative methods. Article two findings suggest that self-modeling is a strategy that may reduce MPA, improve performance quality, and increase self-efficacy in adolescent musicians, and article three furthers the self-efficacy results of article two by using qualitative methods to explore how Bandura's (1977) four sources of efficacy influenced efficacy beliefs during the self-modeling intervention. The in-depth exploration of participant self-efficacy beliefs provides additional understanding of how and why a self-modeling intervention may affect adolescent musicians.

Finally, the fourth and last article of the dissertation explores MPA from a teacher perspective. Researchers suggest that MPA may be impacted by the student/teacher relationship,

(Liu, 2016), meaning that it is crucial for teachers to know how to provide students with proper MPA support. While some intervention studies, like the self-modeling intervention conducted in articles two and three, conclude with suggestion for music teachers (Osborne & Kenny, 2008), few studies examine whether teachers are implementing researcher recommendations (Jordan, 2016; Sieger, 2017). Therefore, article four of this dissertation examines MPA from music teachers' perspective by identifying common coping strategies used in current teaching practices.

Literature Review

The remainder of Chapter 1 reviews the relevant MPA, self-efficacy, and modeling literature to situate the research purposes of the dissertation within the greater context of music research. The first section of the literature review addresses key concepts of MPA. This section defines MPA and presents existing research on MPA in young musicians, factors affecting MPA in young musicians, and interventions designed to reduce MPA. Next, the section on self-efficacy provides an overview of Bandura's (1977) self-efficacy theory, followed by a review of existing literature on self-efficacy in young musicians, factors affecting self-efficacy in young musicians, self-efficacy intervention studies, and the self-efficacy/MPA relationship. The next section discusses modeling, and observational learning literature, sport studies on self-modeling, and music studies on self-modeling are reviewed in turn. Finally, the last section reviews scientific and non-scientific literature on teacher perspective on MPA. Chapter 1 concludes with research purposes and an outline of the organization of the remainder of the dissertation.

Exploring Music Performance Anxiety (MPA) in Young Musicians

Kenny (2011) comprehensively defined music performance anxiety (MPA) as:

> The experience of marked and persistent anxious apprehension related to musical performance that has arisen through underlying biological and/or physiological

> vulnerabilities and/or specific anxiety-conditioning experiences. It is manifested through combinations of affective, cognitive, somatic, and behavioural symptoms. It may occur in a range of performance settings, but is usually more severe in settings involving high ego investment, evaluative threat (audience), and fear of failure. It may be focal (i.e. focused only on music performance), or occur comorbidly with other anxiety disorders, in particular social phobia. It affects musicians across the lifespan and is at least partially independent of years of training, practice, and level of musical accomplishment. It may or may not impair the quality of performance. (p. 61)

Musicians of all ages can experience MPA, which can be influenced by various external and internal factors, such as gender (Coskun-Senturk & Cirakoglu, 2017; Ryan, 2005), performance experience (Boucher & Ryan, 2011), perfectionism (Patston & Osborne, 2016), and post-event rumination (Nielson, Studer, Hildebrandt, Nater, Wild, Danuser, & Gomez, 2018). Musicians suffering from MPA can present a variety of cognitive, somatic, and behavioural symptoms, including: increased heartbeat, sweating, shaking, changes in breathing or shortness in breath, numbness, dry mouth, muscle tension, disruptions in concentration or memory problems, and interfering negative thoughts (Brandfonbrener & Lederman, 2002; Hallam, Cross, & Thaut, 2009; Kesselring, 2006). Kenny's (2011) definition stating that MPA may or may not affect performance quality is supported by multidimensional anxiety theory, which proposes that cognitive and somatic MPA symptoms can have varying degrees of influence on performance quality (Miller & Chesky, 2004; Yoshie, Shigemasu, Kudo, & Ohtsuki, 2009).

Multidimensional Anxiety Theory. Multidimensional anxiety theory provides a framework that addresses two distinct and partially independent dimension of competitive sports anxiety: cognitive and somatic anxiety (Martens, Burton, Vealey, Bump, & Smith, 1990).

Cognitive anxiety is defined as "negative expectations and cognitive concerns about oneself, the situation at hand, and the potential consequences" (p. 120), and somatic anxiety is defined as "the physiological and affective elements of the anxiety experience that develop directly from autonomic arousal" (p. 121). In other words, somatic anxiety is how an individual perceives physiological symptoms (e.g. increased heart rate) that stem from the autonomic nervous system's fight or flight response. Multidimensional anxiety theory predicts that cognitive anxiety remains high and stable prior to a performance, but somatic anxiety remains low until immediately before a performance. Multidimensional anxiety theory also presents a third factor, self-confidence, which refers to an individual's global perception of confidence. All three factors are thought to relate to performance differently, where cognitive anxiety has a negative relationship with performance quality, somatic anxiety has an inverted-U relationship, and self-confidence has a positive relationship (Martens et al., 1990).

While originally proposed to address competitive sport anxiety, multidimensional anxiety theory has been tested in relation to MPA. Miller and Chesky (2004) and Yoshie and colleagues (2009) had musicians complete the In both studies, musicians completed the Competitive State Anxiety Inventory (CSAI-2), which is a test that measures cognitive anxiety, somatic anxiety, and self-confidence. Miller and Chesky observed two distinct components of anxiety in musicians, where cognitive anxiety was higher than somatic anxiety across varying performance conditions. As well, low self-confidence was associated with high cognitive intensity, where musicians with less self-confidence felt more cognitive anxiety prior to performance. Yoshie and colleagues (2009) also found that the relationship with performance quality differed between cognitive and somatic anxiety. While results indicated a negative relationship between performance accuracy and cognitive anxiety, no significant relationship was found between

performance accuracy and somatic anxiety. Results from both studies suggest the existence of multiple dimensions of MPA and provide support for the application of a multidimensional anxiety framework to MPA.

MPA in Young Musicians. Studies have found that adult musicians experience MPA (Kenny, Fortune, & Ackerman, 2011; Papageorgi, Creech, & Welch, 2011; Ryan & Andrews, 2009), as well as adolescent musicians (Nusseck et al., 2015; Papageorgie, 2006; Patston & Osborne, 2016) and children (Boucher & Ryan, 2011; Cose-Giallella, 2010; Ryan, 2004, 2005). Leblanc, Jin, Obert, and Siivola (1997) conducted one of the earliest MPA studies with adolescent participants, using self-report measures, heart rate monitors, and teacher evaluations to record symptoms of anxiety across three different performance settings. Anxiety was found to be a prevalent problem for participants, especially when performing in front of an audience. Nusseck and colleagues (2015) surveyed 7 to 20-year-old musicians with the Music Performance Anxiety Inventory for Adolescents (MPAI-A: Osborne & Kenny, 2005) and found that adolescent classical musicians reported high levels of MPA when performing. Studies with children also indicate that younger musicians may suffer from MPA. Boucher & Ryan (2011) suggest that three and four-year-old children can experience MPA after observing stress responses, increased cortisol levels, and behavioural anxiety symptoms on performance days. Similarly, Ryan (2005) administered the State-Trait Anxiety Inventory for Children (STAIC) to elementary school music students and found that A-State scores, which measure situational anxiety, were significantly higher on performance days compared to regular school days.

Gender and MPA in Young Musicians. As well as investigating the presence of MPA, researchers also examined factors that can influence MPA, including trait anxiety (Nusseck et al., 2015, Ryan, 2005), perfectionism (Kenny, Davis, & Oates, 2004; Patston & Osborne, 2016), and

gender (Osborne & Kenny, 2008; Sarbescu & Dorgo, 2014). Research on gender and MPA suggests that males and females may experience MPA differently. Female adult musicians typically report experiencing higher levels of MPA compared to males (Coskun-Senturk & Cirakoglu, 2017; Kenny, Davis, & Oates, 2004; Orejudo, Zarza-Alzugaray, Casanova, Rodriguez-Ledo, & Mazas, 2017), and research with adolescent musicians mirror these findings (Nusseck et al., 2015; Papageorgi, 2007; Patson & Osborne, 2016). Using a self-designed MPA questionnaire, Leblanc and colleagues (1997) found that female high school band musicians scored higher on the test prior to performance compared to male students. Leblanc and colleagues also used heart rate monitors to measure physiological symptoms of anxiety and found that gender to be significant predictor of heart rate during performance. Similarly, Osborne, Kenny, & Holsomback (2005) tested adolescent musicians using the MPAI-A (Osborne & Kenny, 2005) and found that females reported higher MPA scores than males.

While studies with adult and adolescent musicians suggest that females tend to experience higher levels of MPA, research investigating MPA and gender in younger musicians indicates a more complex pattern. Boucher (2008) tested three- and four-year-old musicians and found no significant differences in self-reported anticipatory stress, cortisol levels, or stressful behaviours associated with performance. Similarly, Errico (2012) compared self-report anxiety scores of slightly older students and found no significant differences between genders of fourth- and fifth-grade students' self-report MPA scores. However, after investigating physiological arousal, behavioural anxiety, and MPA in sixth-grade students, Ryan (2004) suggests that male and female students may experience and cope with MPA differently. While girls demonstrated higher levels of anticipatory anxiety through increased heart rates prior to performance, boys

experienced higher heart rates during performance. As well, boys displayed more anxious behaviours before and during performance, indicating higher levels of behavioural anxiety.

In a subsequent study, Ryan (2005) used the STAIC to test elementary school students in grades three to seven for overall anxiety related to music performance. Younger students in grades three and four reported no significant differences in anxiety scores between genders. However, grade five boys perceived higher levels of anxiety on performance days compared to grade five girls. Girls also reported an overall increase in anxiety in grade six, but boys did not experience a similar increase until grade seven. The results suggest an interaction between age and gender in young musicians, where gender is more influential on MPA at certain ages. Patston and Osborne (2016) investigated a potential age and gender interaction in adolescent musicians aged 12-19. After analyzing self-report MPA scores, age and gender were found to have significant main effects on MPA, but no interaction was found between the two variables. However, given that the sample only included adolescent musicians, it is possible that the inclusion of children may produce a different pattern of results.

MPA Interventions. Due to the prevalence of MPA among musicians, researchers have tested a variety of interventions designed to reduce MPA, including: breathing exercises (Deen, 1999; Su, Luh, Chen, Lin, Liao, & Chen, 2010), cognitive behavioural therapy (CBT: Braden, Osborne, & Wilson, 2015; Kendricks, Craig, Lawson, & Davidson, 1982; Osborne, Kenny, & Cooksey, 2007), improvisation instruction (Allen Jr., 2010), meditation and mindfulness (Blyskal 2018; Diaz 2018), mental skills training (Hoffman & Hanrahan, 2012; Sisterhen, 2005), relaxation techniques (Sweeney & Horan, 1982; Sweeney-Burton, 1997), researcher designed anxiety reduction programs (Conger, 1985; Errico, 2012; Gratto, 1998); systematic desensitization (Appel, 1976; Reitman, 1997), and virtual reality training (Bissonnette, Dubé,

Provencher, & Sala, 2011; Conklin, 2011; Crawford, 2011; Orman, 2003, 2004). With few exceptions (Crawford, 2011; Errico, 2012; Sweeney-Burton, 1997), results suggest that these interventions may successfully reduce MPA in both adult and young musicians. These findings support the results of Burin and Osório's (2016) systematic literature review, which found that most treatment modalities indicate tendencies towards positive MPA outcomes. For example, Braden and colleagues (2015) used self-report scores and behavioural anxiety ratings to test the effects of a cognitive behavioural group intervention on adolescent female instrumental students. Participants reported significant reductions in MPA following intervention, which was maintained at a two-month follow-up. Su and colleagues (2010) also used self-report measures to test the effects of relaxation breathing training on music students in grades 3 to 6. Results indicate that the relaxation breathing training was associated with a decrease in MPA prior to performance. Overall, the promising results of MPA intervention studies warrants further research into providing musicians with effective strategies to combat MPA.

While the current literature review section has defined MPA, explored factors affecting MPA in young musicians, and reviewed MPA intervention studies, one factor not yet discussed that is known to influence MPA is self-efficacy. The next section defines self-efficacy, discusses the effects of gender and age on self-efficacy in young musicians, and reviews interventions that have been designed to increase musical self-efficacy. The section ends with a discussion on how self-efficacy influences MPA in young musicians, and vice versa.

Defining Self-efficacy in Music

Self-efficacy is defined as the degree in which people believe in their abilities to perform behaviours necessary for the successful completion of a task (Bandura, 1982). While multidimensional anxiety theory discusses self-confidence as a factor contributing to anxiety, the

remaining dissertation will discuss self-efficacy. Despite often being used interchangeably in sport and music literature (Feltz & Öncü, 2014; Ritchie & Williamon, 2011b), self-confidence and self-efficacy are separate constructs. Self-confidence refers to a global belief in ability while self-efficacy refers to a situationally specific belief in ability (Bandura, 1986). The current research focuses on task-specific self-efficacy related to music performance. MPA describes anxiety experienced in the context of music performance and examining self-efficacy beliefs for the same task allows for a more direct exploration of the potential MPA/self-efficacy relationship.

Self-efficacy Theory. According to Bandura's (1977) self-efficacy theory, personal expectations of efficacy are task specific and based on four sources: personal mastery experiences, vicarious experiences, verbal persuasion, and physiological or affective states. Personal mastery experiences are based on the perceived success or failure of past experiences and are thought to have the strongest influence on self-efficacy. Perceived successes typically increase self-efficacy while perceived failures decrease self-efficacy. However, repeated successes can develop stronger efficacy expectations, reducing the negative impact of occasional failures (Bandura, 1977). Vicarious experiences involve the observation of others' behaviour. Viewing other people perform tasks successfully can increase one's belief that they can also perform the same task with similar results. However, this source is less dependable compared to mastery experiences since vicarious experiences rely on inferences made from social comparisons (Bandura, 1977, 1997). Verbal persuasion, the third source of efficacy, refers to feedback from others. With this source of efficacy, positive reinforcement can raise self-efficacy while negative criticisms can decrease self-efficacy. Efficacy expectations based on verbal persuasions are often weaker than beliefs based on mastery or vicarious experiences, but verbal

feedback can convince people they are capable of mastering difficult situations in facilitative conditions (Bandura, 1977). Finally, physiological or affective states refer to physical and emotional reactions to specific situations that can affect perceptions of personal competency. People judge their vulnerability to stress partly on physiological arousal, and since high arousal often inhibits performance, people are less likely to expect success when feeling tense and anxious (Bandura, 1982; Bandura, Reese, & Adams, 1982).

Music studies have investigated how Bandura's (1977) four sources of efficacy influence beliefs, and results confirm that mastery experiences have the strongest influence on self-efficacy in musicians (Hendricks et al., 2015; Royo, 2014). Martin (2012) used self-report measures and participant interviews to examine self-efficacy beliefs in middle school band students, and found that in relation to mastery experiences, students with low-efficacy beliefs discussed past failure experiences more often than high-efficacy students. The results suggest that students with lower efficacy expectations may be more likely to fixate on failure attempts. In comparison, vicarious experiences often had limited influence on efficacy beliefs (Moore, 2012; Zelenak, 2015) and some studies found that vicarious experiences negatively influenced students who compared their playing to other student performers (Hendricks et al., 2015; Martin, 2012). However, vicarious experiences positively influenced participants who trusted or related to the model (Royo, 2014), suggesting that the model providing vicarious experience may influence the observer's interpretation of information. Following mastery experiences, verbal persuasion was most influential and like vicarious experience, was most effective when received from a trusted person (Royo, 2014). Additionally, Clark, Lisboa, & Williamon (2014) interviewed university musicians and found that facilitative self-talk could enhance self-efficacy. While participant self-talk focused on the music when performance was successful, negative self-talk was more

prevalent during unsuccessful performances, suggesting a potential link between self-talk and mastery experiences. Finally, physiological states demonstrate limited influence in musical efficacy studies (Moore, 2012; Zelenak, 2015). Fatigue is the physiological state high school students attending an orchestra festival cited most often as having a negative affect on self-efficacy (Hendricks et al., 2015).

Self-efficacy in Young Musicians. Studies with musicians suggest that a variety of other factors may influence self-efficacy, including musical training (Bugos, Kochar, & Maxfield, 2016; Ritchie & Williamon, 2011b), self-reflective abilities (Miksza & Tan, 2015), and performance experience (Fisher, 2014; Ritchie & Williamon, 2011b). However, the extent that age affects self-efficacy in young musicians remains unclear. Fisher (2014) investigated singing self-efficacy in male choir students in grades six to eight and found a negative relationship between self-efficacy and years of choral experience. Similarly, McPherson and McCormick (2006) investigated self-efficacy in instrumental music students aged 9 to 19, finding a negative relationship between self-efficacy and musical grade level. The results suggest that students may experience a decrease in self-efficacy with age, as older students typically perform at higher, more challenging levels as they gain performance experience. However, White (2010) tested high school music students using the Generalized Self-Efficacy Scale and found a positive relationship between age and self-efficacy. Hewitt (2015) and Zelenak (2015) also compared self-report self-efficacy scores of middle and high school students and found no significant differences in self-efficacy scores between the two age groups. The conflicting study results suggest a need for more information to understand age-related self-efficacy changes in young musicians.

Gender and Self-efficacy in Young Musicians. Some studies with adult musicians investigating the effect of gender on self-efficacy suggest that males have higher levels of self-efficacy compared to females (Egilmez, 2015; Miller & Chesky, 2004; Wehr-Flowers, 2006). However, other studies have found no significant differences in self-efficacy between genders (Kreutz, Ginsborg, & Williamon, 2009; Ritchie & Williamon, 2011a; Sinden, 1999). Studies with younger musicians produce similar conflicting results. Leung (2008) found that male children have higher levels of self-efficacy compared to females, but other studies with younger musicians found no significant differences between genders (Clark, 2010; Randles, 2006, White, 2010) or females reported higher levels of self-efficacy (Randles, 2010; Ritchie & Williamon, 2011b). Performance setting may be one factor influencing gender-related self-efficacy differences. After investigating self-efficacy changes in high school musicians over the course of a three-day music festival, Hendricks and colleagues (2015) found a significant interaction between gender, orchestra level, and time. Male students had significantly higher levels of self-efficacy compared to females prior to audition and first rehearsal, but gender differences were no longer evident past the midpoint of the festival. Additionally, females in the higher and lower orchestras showed significant self-efficacy increases at different times during the festival, suggesting the performance setting may influence self-efficacy changes.

In addition to a possible performance setting/gender interaction, research also suggests that gender may moderate the relationship between self-efficacy and age in young musicians. Hewitt (2015) compared self-efficacy bias scores from middle and high school music students and found a significant interaction between gender and grade school level. Bias scores measured how under or overconfident a student felt before performing and were calculated by subtracting a student's self-report self-efficacy score from their actual performance score. Bias scores

indicated that females were more likely to be underconfident than males in middle school, but more likely to be overconfident than males in high school. Although Hewitt's (2015) bias scores differ from typical self-efficacy scores, the results warrant further investigation into the extent to which gender moderates the relationship between age and self-efficacy in young musicians.

Self-efficacy Interventions. Similar to MPA, researchers have also investigated the impacts of various interventions on musician self-efficacy, including composition activities/instruction (Leung, 2008; Randles, 2006), ear playing instruction (Hartz & Bauer, 2016), improvisation instruction (Davison, 2010), piano training programs (Bugos et al., 2016), researcher designed efficacy enhancing programs (Long, 2016), and self-regulation training (Mieder, 2018; Miksza, 2015; Ritchie & Kearney, 2018). The self-efficacy intervention studies provide mixed results, particularly with younger musicians. Davison (2010) investigated the effects of theory-based improvisation instruction on self-efficacy in middle school music students and found that self-report self-efficacy scores significantly increased following treatment. Similarly, adolescent band students reported a significant increase in self-report self-efficacy scores after participating in a self-regulation training program (Mieder, 2018). However, Long (2016) compared pre- and post-test self-report scores of middle and high school music students participating in a researcher designed program and found no significant differences, while Leung (2008) examined self-efficacy changes in primary school music students following a composition-based intervention, and found significant increases in self-report scores, but only in males and non-instrumentalists. The mixed results suggest a need for further research on self-efficacy interventions for young musicians. Self-modeling, an intervention commonly used with athletes, remains relatively untested with musicians and is a potential intervention for young musicians that bears further investigation.

The Relationship Between Self-efficacy and MPA. As stated above, self-efficacy is a factor known to influence MPA, and vice versa. In relation to Bandura's (1977) fourth source of efficacy, physiological or affective states, Bandura (1982) proposed that perceptions of self-efficacy affect emotional responses. Bandura believed that one's belief in their ability to successfully complete a task can influence their level of anxiety felt in relation to performing said a task. The relationship works in the opposite manner as well, in that one's perceived level of anxiety or arousal when performing a task can affect their belief in their ability to perform that task successfully. People with lower efficacy expectations typically experience higher levels of anxiety and stress, while people with stronger efficacy experience lower levels of anxiety or arousal (Bandura, 1997; Bandura et al., 1982). The described negative relationship between MPA and self-efficacy is well-documented in music literature (Egilmez, 2015; Miller & Chesky, 2004; Papageorgi et al., 2010), as studies with adult (Orejudo et al. 2017; Ritchie & Williamon, 2012; Robson & Kenny 2017) and younger musicians (Hendricks et al., 2015; McPherson & McCormick, 2006; Zelenak, 2015) indicate that low self-efficacy is linked to higher MPA. Hendricks and colleagues (2015) and McPherson & McCormick (2006) used self-report measures to investigate the effect of self-efficacy on MPA. Results from both studies indicate that higher levels of self-efficacy may help reduce MPA and also facilitate successful performance outcomes. Given these findings, it is possible that providing music students with strategies that increase performance self-efficacy may also reduce MPA and increase performance quality.

Research suggests that young musicians may experience decreases in self-efficacy with age, and studies also indicate that these self-efficacy changes may have a negative impact on MPA. As such, it seems vital that teachers provide young musicians with strategies that can

reduce MPA as well as increase performance confidence. Various interventions have been tested for effects on self-efficacy and MPA, but there remains room for further exploration in this research area. The next section of the literature review will discuss self-modeling, an intervention used in sport literature that may have the potential to induce positive MPA and self-efficacy effects in young musicians.

Self-modeling

Observational Learning. According to Bandura's (1986) social cognitive 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). Modeling allows observers to learn and perform skills that were unknown prior to model exposure (Bandura, 1986; Schunk & Usher, 2012). The four components of observational learning are attention, retention, production, and motivation. For the first three components, observers must pay attention to relevant task features, cognitively organize and store modeled information, and then translate stored information into behaviour. Motivation, the final component, is a key process in observational learning, as observers will only attend, retain, or produce behaviours that are perceived as important (Bandura, 1986; Schunk & Usher, 2012). Athletes use observational learning for three functions: skill, performance, and strategy. The skill function facilitates motor skill acquisition and performance, the performance function helps optimize arousal and psychological states, and the strategy function assists with strategy development and execution. Athletes use skill and strategy functions most often, but rarely use the performance functions (Cumming, Clark, Ste-Marie, McCullagh, & Hall, 2005; McCullagh, Law, & Ste-Marie, 2012). However, the performance

function could have potential benefits for musicians struggling with psychological variables like MPA and self-efficacy.

Perceived model similarity is a factor that can influence attentional and motivational processes during observational learning (Schunk & Usher, 2012). Peer models that are similar to the observer in age and/or gender can increase self-efficacy and motivation because observers tend to believe they can learn what a 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 contain errors (Schunk & Usher, 2012; Ste-Marie, Law, Rymal, Hall, & McCullagh, 2012). Self-modeling is another type of modeling where individuals observe themselves performing a task or behaviour successfully. There are two types of self-modeling: positive self-review and feedforward. Positive self-review videos are recordings of current performance efforts that have been edited to show only adaptive behaviours. These self-modeling videos provide observers with an example of the best performance they have produced thus far. In contrast, feedforward self-modeling videos depict skills or behaviours that have not yet been mastered. The feedforward videos are edited to produce footage of an individual performing at a level they have not yet achieved (Dowrick, 1999). All forms of modeling can affect perceived self-efficacy by acting as a source of vicarious experience. The observer's belief in their ability to perform a task can increase after watching a model successfully execute the same task, particularly if the model and observer are similar (McCullagh & Weiss 2002). Since self-modeling requires the observer to view themselves performing successfully, this type of modeling further increases potential self-efficacy effects by also providing mastery experience (Bandura, 1977, 1986).

Self-modeling Studies in Sport Literature. Sport literature has investigated the impact of self-modeling on a range of outcome variables, including anxiety (Law & Ste-Marie, 2005; Starek & McCullagh, 1999), performance outcomes (Foltz, 2014; Robertson, 2016; Vezzosi, 2017), self-efficacy (Clark & Ste-Marie, 2007; Ste-Marie, Vertes, Rymal, & Martini, 2011) and self-regulation skills (Clark & Ste-Marie, 2007; Rymal et al., 2010). Several studies testing performance anxiety in cheerleaders (Vezzosi, 2017) and figure skaters (Law & Ste-Marie, 2005) found no significant differences following a self-modeling intervention. Starek and McCullagh (1999) also tested the effects of self-modeling on adults in swimming lessons and found that while group performance improved following intervention, there were no significant differences in self-report state anxiety scores. However, individual participants reported increased anxiety following the self-modeling sessions, as well as increased self-efficacy and performance scores. According to Starek and McCullagh (1999), the performance results can potentially be explained as a function of arousal instead of anxiety. Researchers suggest that individuals have an optimal zone of pre- performance arousal or anxiety that facilitates peak performance (Hanin, 2000). To reach the optimal zone, individuals require a certain amount of arousal to maximize performance (Steptoe & Fidler, 1987). While intervention studies often aim to reduce anxiety, it may be more beneficial to teach performers, such as athletes and musicians, to distinguish between facilitative, performance-enhancing aspects and debilitative, performance-impairing aspects of arousal/anxiety (Mor, Day, Flett, & Hewitt, 1995).

Many studies have also tested the effects of self-modeling on athlete self-efficacy and observed positive quantitative (Bradley, 1993; Clark & Ste-Marie, 2007) and qualitative results (Foltz 2014; Ste-Marie, Rymal, Vertes, & Martini, 2011). However, other studies found no significant differences in self-efficacy following similar self-modeling interventions (Law & Ste-

Marie, 2005; Ram & McCullagh, 2003; Winfrey & Weeks, 1993). Law and Ste-Marie (2005) conducted a self-modeling plus physical practice study with intermediate level female figure skaters. Self-efficacy and anxiety were measured with self-report questionnaires and skating judges rated performance. No significant differences were found for self-efficacy, anxiety, or jump performance after intervention, but Law and Ste-Marie (2005) proposed that skill level may account for the non-significant results. Compared to beginners, intermediate athletes may have less room for improvement on performance or psychological variables, resulting in smaller or non-significant changes. Additionally, the skilled models typically portrayed in self-modeling videos may be more effective on performance outcomes compared to psychological outcomes, which could also account for limited self-efficacy and anxiety effects (Schunk & Usher, 2012).

Self-modeling Studies in Music Literature. Despite extensive research in sport literature, few music studies have investigated the effects of self-modeling. Davison (2010) explored the use of aural models when teaching improvisational skills to primary music students and found significant increases in self-reported self-efficacy post-intervention. Although the study did not include video or self-modeling, the results provide some support that young musicians may benefit from modeling interventions. Moody (2014) conducted a self-modeling study with twelve adolescent string musicians where participants viewed a feedforward video during one week of a two-week intervention. Participants who viewed their video the second week of the intervention reported significant self-efficacy increases, but results indicated no other significant changes in self-efficacy, MPA, or performance outcomes. Moody (2014) proposed that a longer intervention may be required for significant MPA and performance changes to occur. As such, the current study tests a longer, six-week intervention to further understand the effects of self-modeling on young musicians. In contrast to Moody (2014), the

current study uses positive self-review videos. Positive self-review videos are less time-consuming to create compared to feedforward videos, and therefore have greater potential practical application for music educators.

Self-modeling has been tested extensively in sport literature, and the current dissertation aims to explore the potential effects of self-modeling on young musicians. If self-modeling can successfully increase self-efficacy and reduce MPA in young musicians, this will provide music educators with a valuable tool to help students. The remainder of the literature review explores MPA from a teacher perspective, examining scientific and non-scientific literature to discover what music teachers already know about MPA and what tools teachers still need to effectively support young musicians.

Teacher Perspective on MPA

Scientific Literature on Teacher Perspective. Many MPA and self-efficacy intervention studies end with recommendations for music teachers, providing potential strategies to reduce MPA or increase self-efficacy in students (Braden et al., 2015; Osborne et al., 2007; Stern, Khalsa, & Hofmann, 2012) Many non-intervention studies end with similar recommendations to music educators on how to decrease MPA (Atlas, Taggart, & Goodell, 2004; Mitchell, 2011; Osborne & Kenny, 2008). Patston (2014) conducted a review of MPA literature and concluded the review with suggestions for teachers on how to help students cope with MPA throughout their developmental trajectory. At the end of a similar review, Slocumb's (2009) provides a list of strategies that music educators can use to teach brass players how to manage MPA symptoms. In both studies, researchers recognize the need to provide teachers, and indirectly students, with MPA coping skills. However, despite the suggestions available to music educators, few researchers have examined whether teachers are implementing literature

findings in their everyday teaching practice. Teachers often work closely with young musicians and can act as a front-line defense against MPA (Liu, 2016), making it important for researchers to understand MPA from a teacher's perspective as well as a musician's perspective. Jordan (2016) conducted a multiple case study examining how undergraduate music schools address MPA. Interviews with primary instrumental instructors revealed that teachers were the main resource for addressing student MPA. However, most teachers lacked formal training and felt unprepared to help students manage MPA. Liu (2016) and Sieger (2017) respectively interviewed three university music teachers and three public school instrumental teachers and also found that participants did not have formal MPA training. Instead, teachers drew from personal experience to provide students with coping strategies. Despite a lack of research knowledge or training, participants intuitively suggested several coping strategies that have been successfully tested in intervention studies, such as exposure therapy (Bissonnette et al., 2011; Crawford, 2011), meditation (Blyskal, 2018; Diaz, 2018), and visualization (Clark & Williamon, 2011; Hoffman & Hanrahan, 2012). These results suggest that music teachers have some tools to help students cope with MPA but could benefit from further training grounded in scientific, researched-based literature.

Non-scientific Literature on Teacher Perspective. Non-scientific, practice-based literature, in the form of magazine and newsletter articles written by private music teachers, provide further insight into teacher perspective. Many private teachers write non-scientific articles with the purpose of sharing personal MPA knowledge with other teachers. While non-scientific articles are typically based on informal observation and grounded in teachers' personal experience, the information provided often aligns with scientific MPA literature. For example, music teachers observe the same cognitive, physical, and behavioural MPA symptoms in their

students that are described in scientific literature (Hallam et al., 2009; Kenny, 2011), such as worry, memory difficulties, dry mouth, shaking hands, increased bodily tension, upset stomach, and elevated heart rate (Crappell, 2014; Ginsborg, 2019; Thio, 2009; Wan, 2016). Additionally, teachers in non-scientific literature describe several factors that may influence MPA in students, including self-efficacy (Boyett, 2019; Petrovich, 2003), perfectionism (Knerr, 2009; Nagel, 2015), and gender (Johnson, 2004; Knerr, 2009). These factors are also identified in scientific literature as potential variables affecting MPA (self-efficacy: McPherson & McCormick, 2006; Robson & Kenny, 2017; perfectionism: Kenny et al., 2004; Nielsen et al., 2018; gender: Nusseck et al., 2015; Ryan, 2005). Interestingly, when discussing the effects of gender on student MPA, Johnson (2004) admits that she recognizes that boys and girls may need different MPA strategies but does not know how to provide that for her students. This seems to echo a larger trend in that music teachers often accurately observe MPA symptoms and trends based on comparisons to scientific literature, but teachers require more training or knowledge to effectively manage student MPA. Identifying the tools that music teachers currently use to help young musicians cope with MPA will also help identify areas where teachers need more training, and this information can help researchers create training workshops focused on bridging the knowledge gap by disseminating research findings to music educators.

Purposes and Organization of Dissertation

The remainder of the dissertation will explore four main research purposes and will be organized as follows: Chapter 2 is presented in article format and examines the relationship between MPA and self-efficacy in young musicians. Chapter 2 also investigates the extent to which the effect of gender changes the relationship between MPA and age and self-efficacy and age in young musicians. Chapter 3 is presented in article format and investigates the relational

changes between MPA, self-efficacy, performance quality, and behavioural anxiety in adolescent musicians over a six-week intervention. Chapter 3 also explores the effects of a positive self-review self-modeling intervention on adolescent musicians using quantitative methods. Chapter 4 is presented in article format and explores how Bandura's (1977) four sources of efficacy (i.e. enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological/affective states) influence self-efficacy beliefs in adolescent musicians during a six-week self-modeling intervention. Chapter 5 is also presented in article format and explores MPA from a music teachers' perspective by identifying common coping strategies music teachers use to support students with MPA. Finally, Chapter 6 provides a general discussion of the main findings of the dissertation, and includes strengths and limitations, implications, and directions for future research.

Chapter 2: Music Performance Anxiety and Self-efficacy in Young Musicians: Effects of Gender and Age[1]

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Abstract

Performance anxiety affects many musicians and numerous studies have been conducted on music performance anxiety (MPA) in young performers. However, few studies have examined how age-related changes in MPA and self-efficacy may be affected by gender[2] as young musicians age. This study examined the extent to which gender moderates the relationships between MPA, age and self-efficacy in young musicians (aged 7-17 years). The results of statistical analyses indicated that while gender does not moderate the relationship between age and MPA, age had a significant main effect on MPA, such that MPA increased with age. There was no significant difference between males' and females' levels of self-report MPA. There were no significant main effects of age or gender on self-efficacy, or an effect of gender on the relationship between age and self-efficacy. A strong negative relationship between self-efficacy and MPA indicates that students with low levels of self-efficacy are more likely to have high levels of MPA. This has important implications for practice, as teachers could potentially target self-efficacy as a way of helping to buffer young musicians against negative effects of MPA.

Keywords: music performance anxiety, self-efficacy, gender, children, adolescents

[2] The term gender will be used throughout to mean the biological sex (male/female) assigned to individuals at birth

Music Performance Anxiety and Self-efficacy in Young Musicians: Effects of Gender and Age

Public performance from an early age is part of a musician's education and comes in various forms, including auditions, recitals, exams and festivals. Due to these demands, which are often a central component of music education, young performers have been shown in numerous studies to experience music performance anxiety (MPA: Boucher & Ryan, 2011; Nusseck, Zander, & Spahn, 2015; Patston & Osborne, 2016). However, despite the growing body of literature on MPA in children and adolescents, little is known as to how age and gender interact to affect the severity of MPA (Ryan, 2004, 2005). Similarly, while self-efficacy has been researched extensively in young musicians (McPherson & McCormick, 2006; Ritchie & Williamon, 2011a, 2012), few studies have examined age-related changes in self-efficacy potentially attributable to gender (Hendricks, Smith, & Legutki, 2015; Hewitt, 2015).

Music Performance Anxiety

The DSM-V describes social anxiety disorder as "a marked, or intense, fear or anxiety of social situations in which the individual may be scrutinized by others" (American Psychiatric Association, 2013, 300.23). The DSM-V also includes a specifier for performance-only social anxiety, which is when individuals have performance-related fears that typically impair their professional lives, but do not fear or avoid non-performance situations (American Psychiatric Association, 2013). While the recent inclusion of performance-only specifier in the DSM-V recognizes general performance anxiety as a clinical diagnosis, Kenny offers a more comprehensive definition specific to music, stating that MPA is:

> The experience of marked and persistent anxious apprehension related to musical performance that has arisen through underlying biological and/or psychological

> vulnerabilities and/or specific anxiety-conditioning experiences. It is manifested through combinations of affective, cognitive, somatic, and behavioural symptoms. It may occur in a range of performance settings, but is usually more severe in settings involving high ego investment, evaluative threat (audience), and fear of failure. It may be focal (i.e. focused only on music performance), or occur comorbidly with other anxiety disorders, in particular social phobia. It affects musicians across the lifespan and is at least partially independent of years of training, practice, and level of musical accomplishment. It may or may not impair the quality of performance (Kenny, 2011, p.61).

Musicians with MPA can suffer from a variety of cognitive, somatic, and behavioural symptoms of anxiety including: worry, disruptions in concentration, memory problems, interfering negative thoughts, increased heartbeat, sweating, shaking, numbness, dry mouth, shortness of breath or changes in breathing, muscle tension, and avoidance behaviours (Brandfonbrener & Lederman, 2002; Hallam, Cross, & Thaut, 2009; Kesselring, 2006). Different symptoms can have varying degrees of influence on performance (Miller & Chesky, 2004; Yoshie, Shigemasu, Kudo, & Ohtsuki, 2009) and the multidimensional anxiety theory further explains the cognitive and somatic dimensions of performance anxiety.

Multidimensional Anxiety Theory

Martens, Burton, Vealey, Bump, and Smith (1990) presented a multidimensional framework of anxiety that addresses two dimensions of competitive sports anxiety. Within this framework, cognitive and somatic anxiety are defined as two distinct and partially independent components of competitive performance anxiety. Martens and colleagues define cognitive anxiety as "negative expectations and cognitive concerns about oneself, the situation at hand, and the potential consequences" (p. 120), and somatic anxiety as "the physiological and affective

elements of the anxiety experience that develop directly from autonomic arousal" (p. 121). In other words, somatic anxiety is how the individual perceives his or her physiological symptoms, such as increased heart rate, that stem from the autonomic nervous system's fight or flight response. The third factor presented in the framework is self-confidence, which refers to the individual's global perception of confidence, and is thought to influence levels and types of anxiety.

Miller and Chesky (2004) and Yoshie and colleagues (2009) used the Competitive State Anxiety Inventory-2 (CSAI-2) to measure cognitive anxiety, somatic anxiety, and self-confidence in musicians in order to test multidimensional anxiety theory in relation to MPA. Miller and Chesky (2004) observed two distinct components (cognitive and somatic) of anxiety across different performance situations, and Yoshie and colleagues (2009) found that cognitive anxiety and somatic anxiety had different relationships with performance quality. The results indicate that cognitive anxiety had a negative relationship with technical performance accuracy while somatic anxiety had no significant relationship with performance accuracy. Both studies help demonstrate the existence of multiple dimensions of performance anxiety and provide support for the application of a multidimensional anxiety framework to MPA.

Music Performance Anxiety in Young Musicians

The occurrence of MPA in adult and university level musicians is well documented in music literature (for example, Fishbein, Middlestadt, Ottati, Strauss, & Ellis, 1988; Kenny, Driscoll, & Ackermann, 2014, 2016; Liu, 2016). These studies indicate that MPA is one of the most prevalent non-physical problems among professional and university level musicians, influenced by various internal (perfectionism, self-efficacy, etc.) and external (evaluations,

performance type, etc.) factors. Numerous studies have also examined MPA[3] in adolescent musicians. Leblanc, Jin, Obert, and Siivola (1997) conducted one of the earliest studies with teenage participants, using self-report measures, heart rate monitors, and teacher evaluations to measure MPA across three different performance settings. Leblanc and colleagues (1997) found anxiety to be a prevalent problem for teenage musicians, particularly when performing before an audience. Other studies have also found that adolescent musicians often struggle with high levels of MPA and that various factors such as musical genre (Thomas & Nettelbeck, 2014), trait anxiety (Nusseck et al., 2015), and perfectionism (Patston & Osborne, 2016) can influence MPA in young musicians. The prevalence of MPA in adolescent musicians is consistent with the development of the capacity for formal operational thought, which occurs as children move from the concrete operational phase (typically 7-12 years old) to the formal operational phase (adolescence to adulthood), according to Piaget (1970). Cognitive changes during this stage of development include increases in retrospection and self-evaluation, and formal operational thinking often develops in areas of particular interest to the adolescent. During this stage, adolescents develop the ability to imagine they know what other people are thinking, which sometimes leads to anxiety (Kenny, 2000). While the development of this capacity helps explain the MPA experienced by adolescent musicians, the absence of formal operational thought does not exclude younger children from experiencing MPA. Boucher (2008) observed that three and four-year old children exhibit stress responses, increased cortisol secretions, and behavioural symptoms of anxiety on performance days. Other studies have also found that children can

[3]The term MPA will be used throughout to refer to studies which measure MPA as a whole and do not differentiate between the components of anxiety. Any studies which measured components of anxiety separately, such as behavioural anxiety, cognitive anxiety, or somatic anxiety, or measured physiological arousal are specified in the paper

experience MPA on stage (Boucher & Ryan, 2011; Cose-Giallella, 2010; Kenny & Osborne, 2006; Ryan, 2004, 2005).

Music Performance Anxiety and Gender

Research investigating MPA and gender suggests that males and females may experience MPA differently. Kenny, Davis, and Oates (2004) investigated the effect of gender on MPA by having 32 opera singers complete self-report measures. Although there were no significant differences between males' and females' levels of MPA, subsequent studies using self-report measures have shown that the later experience higher levels of MPA compared to their male counterparts (Coskun-Senturk & Cirakoglu, 2017; Kenny et al., 2014; Orejudo, Zarza-Alzugaray, Casanova, Rodriguez-Ledo, & Mazas, 2017). By contrast, Tamborrino (2001), Stephenson and Quarrier (2003), and Robson and Kenny (2017) did not find differences in self-reported MPA between the genders. This may be due to the nature of the measures used. The measure used in Tamborrino's (2001) study was not designed specifically to test MPA. The scores obtained in the study conducted by Robson and Kenny (2017) were for self-reported MPA when playing in ensembles, which has been shown to evoke less MPA compared to solo performance (Nicholson, Cody, & Beck, 2015; Ryan & Andrews, 2009). Although these studies did not find an effect of gender on scores for self-reported MPA, Robson and Kenny (2017) found gender to be a significant predictor of MPA. Gender differences were also found when examining the relationship between anxiety sensitivity, which is the tendency of an individual to be experience fear in reaction to symptoms of arousal, and MPA in university musicians (Stephenson & Quarrier, 2003) such that it was stronger in females.

Studies examining the effect of gender on MPA in adolescent musicians also show that females report higher levels of MPA (Nusseck et al., 2015; Rae & McCambridge, 2004;

Sarbescu & Dorgo, 2014). Leblanc and colleagues (1997) measured MPA using a self-designed Personal Performance Anxiety Report and found that females scored higher on the scale than males immediately after performances. They used heart rate monitors to measure the physiological symptoms of anxiety and found gender to be a significant predictor of heart rate during performance. While heart rate monitors measure physiological arousal as opposed to somatic anxiety, it is still worth noting these results, as Hardy and Parfitt (1991) have shown that physiological arousal, according to heart rate, can follow a similar course to somatic anxiety. Similarly, Osborne, Kenny, and Holsomback (2005) tested adolescent musicians using the Music Performance Anxiety Inventory for Adolescents (Osborne & Kenny, 2005), and found that females scored higher for MPA scores than males.

However, MPA studies with younger musicians including investigations of the role of gender have indicated more complex patterns of MPA. Boucher (2008) found no significant differences between male and female 3 and 4-year olds' self-reported anticipatory stress, cortisol levels, or symptoms of behavioural anxiety. Similarly, Errico (2012) found no significant differences between male and female fourth- and fifth-grade students' scores for MPA. However, an investigation of physiological arousal, behavioural anxiety, and MPA in sixth-grade students suggested differences between the ways in which young male and female musicians experience MPA. While girls experienced more anticipatory anxiety before performances, as indicated by increased heart rates, the boys' heart rates exceeded the girls during performances. Boys also displayed more anxious behaviours before and during the performances, indicating higher levels of behavioural anxiety (Ryan, 2004).

A subsequent study conducted by Ryan (2005) used the State-Trait Anxiety Inventory for Children to investigate anxiety as experienced in relation to performance in elementary-school

students[4]. The study found no difference between boys' and girls' self-reported anxiety in the third and fourth grades but found that fifth-grade boys reported higher levels of overall anxiety on both regular (i.e. non-performance) and performance days. Sixth-grade girls also reported a significant increase in overall anxiety levels on performance days. However, boys did not report a similar increase until the seventh-grade. The results of these studies suggest an interaction between age and gender, whereby gender has a greater influence on MPA in young musicians at certain ages. Patston and Osborne (2016) examined the effects of age and gender on self-reported MPA scores in male and female adolescent musicians aged 12-19 years. While both age and gender had significant main effects on MPA scores, no interaction was found between the two variables. However, this study only investigated adolescent musicians and it is possible that the inclusion of child musicians might have produced a different pattern of results.

Self-efficacy

Another factor known to influence MPA is self-efficacy. The most common definition states that self-efficacy reflects the degree in which people believe in their abilities to perform behaviours necessary for the successful completion of a task (Bandura, 1982). According to Bandura's self-efficacy theory (1977), personal expectations of efficacy are based on four sources of information: enactive mastery experience, vicarious experiences, verbal persuasion, and physiological or affective states. Information from these sources can influence an individual's perceived feelings of self-efficacy for any given task. The fourth source of efficacy, physiological or affective states, is of particular importance when discussing the relationship between self-efficacy and anxiety. Bandura (1982) proposed that perceptions of self-efficacy affect emotional responses, such that individuals' perceived levels of arousal or anxiety when

[4] The elementary students from the study were from a junior school for prekindergarten through seventh-grade students (children aged 3-13)

performing a task affects their belief in their ability to complete the task successfully. The relationship works in the opposite direction as well, so that an individual's belief in his or her ability to execute a task successfully can influence the level of anxiety experienced in relation to that task (Bandura, 1977). People with low efficacy expectations typically experience higher levels of anxiety or stress, while people with stronger efficacy expectations generally experience lower levels of anxiety or arousal (Bandura, 1977, 1982; Bandura, Reese, & Adams, 1982).

The relationship between self-efficacy[5] and MPA has been well-documented in music literature on adult musicians (Orejudo et al., 2017; Papageorgi et al., 2010; Ritchie & Williamon, 2011a, 2012). In Sinden's (1999) study, 138 university students completed self-report measures representing four personality characteristics related to MPA. The results indicated that lower levels of self-efficacy were associated with higher levels of MPA. Of the characteristics examined, low self-efficacy and poor self-esteem had the highest influence on MPA. Craske and Craig (1984) tested Bandura's self-efficacy theory (1977) with 40 university students and found similar results. The students performed in two conditions: alone and in front of an audience of five judges. All participants showed a decrease in self-efficacy levels when performing in front of an audience, establishing a correlation between high levels of anxiety and low levels of self-efficacy.

Studies conducted with younger musicians found evidence of a similar relationship between MPA and self-efficacy (Hendricks et al., 2015; McPherson & McCormick, 2006; Zelenak, 2015). Using self-report measures, Hendricks and colleagues (2015) and McPherson and McCormick (2006) investigated the effect of self-efficacy on MPA. The results of both studies indicate that high levels of self-efficacy can help lower MPA and are conducive to

[5] The term self-efficacy will be used throughout to refer to task self-efficacy where the task is music performance. References to other types of self-efficacy will be specified in the text

successful performance outcomes. One implication of these findings for music teachers is that helping students gain greater confidence in their abilities could have a positive effect on performance quality and MPA.

Self-efficacy in Young Musicians

Studies with adult and younger musicians suggest that self-efficacy can vary according to performance context (Hendricks et al., 2015) and may be influenced by a variety of factors including musical training (Bugos, Kochar, & Maxfield, 2016; Ritchie & Williamon, 2011b), self-reflective abilities (Miksza & Tan, 2015), and self-talk (Clark, Lisboa, & Williamon, 2014). However, the extent to which age-related changes in self-efficacy occur, and when they occur in young musicians remains unclear. Fisher (2014) investigated singing self-efficacy in sixth- to eighth-grade male choristers, and McPherson and McCormick (20006) investigated self-efficacy in students learning piano, string, brass and woodwind instruments, ages 9-19. Fisher's results showed a negative relationship between self-efficacy and years of choral experience and McPherson and McCormick's results showed a negative relationship between self-efficacy and grade level of performance examination[6] (McPherson & McCormick, 2006). These results suggest a possible decrease in self-efficacy with age, as older students typically play at higher, more challenging grade levels as they gain experience. In White's (2010) study, high school students completed the Generalized Self-Efficacy Scale, which assesses self-efficacy among the general adult population, however, and found a positive correlation between age and general self-efficacy. Hewitt (2015) and Zelenak (2015) compared the scores of middle and high school music students on self-reported self-efficacy measures and found no significant differences

[6] Grade level of performance examination refers to the performance exams from the Australian Music Examinations Board completed by participants in the study

between the self-efficacy scores of the two age groups. More research is needed to understand the effects of age on self-efficacy in young musicians.

Self-efficacy and Gender

The results of some studies investigating the effect of gender on adult and university musicians' self-efficacy indicate that males have higher levels of self-efficacy than females (Egilmez, 2015; Miller & Chesky, 2004; Wehr-Flowers, 2006), while other studies found no significant differences between levels of self-efficacy in males and females (Kreutz, Ginsborg, & Williamon, 2009; Ritchie & Williamon, 2011a; Sinden, 1999). Gender differences in self-efficacy may depend on performance situation. Comparing males' and females' self-efficacy in two conditions, at a baseline-laboratory session where participants did not perform and immediately prior to a performance in front of a jury, Abel and Larkin (1990) found no significant difference between the groups in either condition. There was no significant difference between males' self-efficacy at baseline and just before performance, but females showed significant increases in self-efficacy from baseline to performance. Neilson (2004) also investigated gender differences, using scores for self-efficacy, and found an interaction between gender and degree programme. Males in performance and church music programmes of study had higher self-efficacy scores than females in the same programmes, but females studying music education had higher self-efficacy scores than males studying music education.

Similarly, self-efficacy research with young musicians provides conflicting results. When investigating primary school children, Leung (2008) found that males have higher levels of self-efficacy than females. However, with young musicians it is more common for results to indicate no significant differences between genders (Clark, 2010; Randles, 2006; White, 2006) or for females to report higher levels of self-efficacy (Randles, 2010; Ritchie & Williamon, 2011b).

Studies of self-efficacy with young, as well as adult, musicians suggest that performance setting may influence gender differences. Hendricks and colleagues (2015) collected self-efficacy scores from high school musicians over the course of a three-day music festival. Findings revealed a significant interaction effect between gender, orchestra (level), and time, such that females in the higher and lower orchestras showed significant increases in self-efficacy at different times during the festival. Whilst male students had significantly higher levels of self-efficacy prior to audition and at the first rehearsal, this was no longer the case once the midpoint of the festival had been passed (Hendricks et al., 2015).

The findings of research indicate that, like MPA, gender may moderate the relationship between age and self-efficacy in young musicians. When comparing males' and females bias scores on measures of self-efficacy, Hewitt (2015) found a significant interaction between gender and school grade level. Bias scores measured how underconfident or overconfident a participant was before performing. Participants completed a self-efficacy measure prior to the performance which was then subtracted from a performance score measured by the Woodwind Brass Solo Evaluation Form to calculate a bias score. Females tended to be less confident than males in middle school but more confident than males in high school. Although the bias scores used in Hewitt's study differ from typical self-efficacy scores, the results warrant further research into the effect of gender on the relationship between age and self-efficacy in young musicians.

Research Questions

The purpose of the present study was to examine the relationship between MPA and self-efficacy in young musicians (7-17) and investigated the extent to which the effect of gender significantly changes the relationship between MPA and age in young musicians. Additionally,

this study aims to extend previous research by examining whether gender influences changes in self-efficacy as young musicians age.

Based on the review of literature, this study examined three research questions:

1. What is the relationship between MPA and self-efficacy in young musicians aged 7-17 years?
2. To what extent does gender moderate the relationship between age and MPA, as measured by the Music Performance Anxiety Inventory for Adolescents (Osborne & Kenny, 2005)?
3. To what extent does gender moderate the relationship between age and self-efficacy, as measured by the Self-Efficacy for Musical Performing – Children's Version Ritchie & Williamon, 2011b)?

Method

Participants

The study was approved by the Research Ethics Board of the researcher's home institution. A total of 134 students between the ages of 7 and 18 took part in this study. They were required to be between the ages of 6 and 17 and currently taking piano lessons from either a music school or a private piano teacher, have had a minimum of one year of consecutive piano lessons, and be fluent in English. Piano teachers from music schools and private studios were contacted via email and, once a school director or piano teacher expressed interest, selected respondents and parents of respondents received letters of invitation and completed consent forms. Of the 43 music schools or private music studios contacted, 25 chose to participate. The number of students participating per teacher ranged from one to eight, with an average of five respondents per teacher. After data collection, it was found that seven respondents had to be

excluded from the study because their ages fell outside the required range, they failed to report their age and/or gender, or they had not had at least two experiences of giving performances. Analysis was then carried out of data from a total of 127 respondents (72 female, 55 male).

Measurements

Two questionnaires were administered: the Music Performance Anxiety Inventory for Adolescents (MPAI-A; Osborne & Kenny, 2005) and the Self-Efficacy for Musical Performing – Children's Version (Ritchie & Williamon, 2011b). Respondents or their parents/caregivers also completed a third questionnaire to provide demographic information including age, ethnic background, performance experience and practice habits.

Music Performance Anxiety Inventory for Adolescents (MPAI-A)

The Music Performance Anxiety Inventory for Adolescents (MPAI-A) was created by Osborne and Kenny in 2005 and is used as a self-report measure of MPA in adolescents (see Appendix 2A). It has been validated for use with adolescents aged 12-19 years (Osborne & Kenny, 2005, Osborne et al., 2005). While it has not been validated for use with a younger population, the measure has been used in several studies investigating children as young as seven years old (Nusseck et al., 2015; Patston & Osborne, 2016; Su, Luh, Chen, Lin, Liao, & Chen, 2010). It has 15 questions representing the cognitive, somatic, and behavioural effects of MPA. Respondents use a seven-point Likert scale to answer each question, where 0 represents no perceived symptoms of anxiety and 6 represents extremely high levels of anxiety. Cronbach's alpha was.91, indicating that the measure is internally highly consistent and therefore strongly reliable. Item 10 of the scale is reverse scored (Osborne et al., 2005).

Self-efficacy for Musical Performing – Children's Version

The Self-Efficacy for Musical Performing – Children's Version questionnaire was created by Ritchie and Williamon in 2011b (see Appendix 2B). It is used with primary school-aged children to evaluate their beliefs in their ability to perform music. Respondents are asked to imagine themselves in a past performance situation and answer the questions accordingly. There are nine items in total on the questionnaire, and each question is answered using a seven-point Likert scale, where 1 represents "Not at all sure" and 7 represents "Completely sure" (Ritchie & Williamon, 2011b). This measure helps determine how children perceive their ability to perform music. While the protocol does not state explicitly that it is suitable for use with teenagers, comparison of the versions for children and adults shows that the two scales ask the same questions, albeit using different types of language. The wording of the Self-Efficacy for Musical Performing- Children's Version measure is not overly childish and was therefore used for both teenagers and children in this study. Cronbach's alpha was .87, indicating that the measure is internally consist and strongly reliable. Items 3, 4, 6, and 8 are reverse scored (Ritchie & Williamon, 2011b).

Demographic questionnaire

The demographic questionnaire was based on existing questionnaires used at the researcher's home institution. The information collected included age and gender and was used to check that respondents met the inclusion criteria.

Procedure

Piano teachers expressing interest in the study received a package containing consent forms for parents and students, and all the questionnaires. Once informed consent was obtained from parents and assent was given by students, respondents completed the MPAI-A followed by the Self-Efficacy for Musical Performing – Children's Version. Some respondents or their

parents contacted the researcher directly. In these cases, the questionnaires were administered by the researcher at the respondent's school or home. When the researcher was not able to administer the questionnaires personally, piano teachers were contacted personally by the researcher to explain the process of administering the questionnaires to students and instructed to administer them at the studio or music school at convenient times. The researcher and/or teachers were present to help respondents understand and complete the two questionnaires, a process that took each respondent approximately 20 minutes. While respondents were completing the two questionnaires, parents completed the demographic questionnaire. In some cases, teenage respondents completed the demographic questionnaire themselves. The researcher met with parents when she had administered the questionnaires to respondents and made herself available via email to clarify any questions. She collected completed questionnaires from schools and studios, other than those that were sent by post to her home institution. In total 134 sets of questionnaires were collected and data analysis was run on 127 of them using the program Statistical Package for Social Sciences (SPSS 24).

Results

What is the Relationship between MPA and Self-efficacy in Young Musicians?

Exploratory data analysis indicated that all assumptions of normality were met. A bivariate correlation analysis of scores on the MPAI-A and Self-Efficacy for Musical Performing measure was run to assess the relationship between MPA and self-efficacy. A statistically significant moderate negative relationship was found between MPA and self-efficacy in young musicians, $r = -.48$, $p < .01$, with MPA scores explaining 23% of the variation in self-efficacy scores.

To What Extent Does Gender Moderate the Relationship between Age and MPA in Young Musicians?

A hierarchical multiple regression analysis was run to assess the effect of gender as a moderator of the relationship between age and MPA. Age was measured as a continuous variable in the moderation analyses. Table 1 provides sample characteristics of the respondents included in the analysis.

Table 1

MPAI-A and SEMP descriptive statistics by age and gender

	MPAI-A				SEMP			
	N				*N*			
	Female	Male	Female Mean (SD)	Male Mean (SD)	Female	Male	Female Mean (SD)	Male Mean (SD)
All Ages	72	55	44.39(17.19)	38.80(18.49)	70	54	48.64 (6.74)	49.85 (7.83)
Children	38	32	39.61(15.69)	35.03(18.13)	38	31	49.74(6.85)	50.39(8.32)
Adolescents	34	23	50.00(16.78)	44.04(18.07)	32	23	47.34(6.47)	49.13(7.25)
7	3	1	27.33(10.02)	--	3	1	46.33(10.50)	--
8	2	3	23.00(2.83)	33.33(22.14)	3	3	53.33(4.04)	48.67(4.04)
9	7	5	39.14(15.93)	31.00(22.92)	7	5	46.86(3.24)	45.00(9.38)
10	5	10	44.20(15.02)	36.80(14.85)	6	10	47.00(7.27)	51.00(8.43)
11	10	4	35.60(15.91)	40.00(32.71)	9	4	52.11(7.88)	50.75(12.92)
12	11	9	47.82(14.76)	33.67(14.46)	10	9	51.20(6.76)	52.11(8.24)
13	14	5	48.00(17.50)	29.20(20.19)	13	5	47.62(5.92)	51.80(6.98)
14	6	5	49.17(8.95)	44.80(10.35)	5	4	49.80(8.32)	52.75(5.56)
15	6	5	59.17(19.28)	53.00(17.85)	6	5	45.00(4.90)	44.80(5.97)
16	8	5	46.13(21.10)	54.40(4.45)	8	5	47.13(7.72)	47.20(6.38)
17	0	3	--	35.33(27.39)	0	3	--	54.67(7.02)

Note. MPA measured by the MPAI-A (Osborne & Kenny, 2005) and self-efficacy by the Self-efficacy for Musical Performing – Children's Version (Ritchie & Williamon, 2011b).

Preliminary analyses indicated that all assumptions of normality, linearity, and collinearity were met. The interaction term explained an additional 0.2% of total variation,

which is not statistically significant, indicating that gender does not moderate the relationship between age and MPA in young musicians, $F(1, 123) = .25$, $p = .62$ (see Table 2).

Table 2

Moderation analysis using hierarchical regression to predict MPA

	B	*SE*	*β*	*t*
Constant	38.88	2.29		17.00
Age	1.91	.87	.27	2.20*
Gender	5.44	3.04	.15	1.80
Age x gender interaction	.60	1.20	.06	.50
R^2	.002			
F	.25			

Note. N=127. MPA measured by the MPAI-A (Osborne & Kenny, 2005). *$p < .05$

As such, the interaction term was dropped from the model. The new model indicated a statistically significant positive linear relationship between age and MPA, $b = 2.23$, $SE = .60$, $p < .01$. However, the new model showed that females did not have statistically significantly higher scores of MPA compared to males, $b = 5.43$, $SE = 3.03$, $p = .08$ (see Table 3).

Table 3

Multiple regression analysis predicting MPA

	B	*SE*	*β*	*t*
Constant	38.89	2.28		17.06
Age	2.23	.60	.31	3.74*
Gender	5.43	3.03	.15	1.80
R^2	.12			

Note. N=127. MPA measured by the MPAI-A (Osborne & Kenny, 2005). *$p < .05$

A two-way ANOVA was conducted to examine the effects of gender and age on MPA, with age being measured as a categorical variable. Age was divided into two groups for the analysis: children (ages 7-12) and adolescents (ages 13-17). These groups correspond with Piaget's concrete operational and formal operational developmental phases (see Table 1).

Assumptions of normality were met, and data representing outliers were adjusted to a new value that equalled ±1 of the closest normal data point. There was a statistically significant main effect of age, $F(1,123) = 9.99$, $p < .01$, $\eta^2_p = .075$, such that MPA increased from childhood to adolescence, but no main effect of gender, $F(1,123) = 2.92$, $p = .09$, $\eta^2_p = .023$, nor interaction between age and gender, $F(1,123) = .05$, $p = .82$, $\eta^2_p = .00$.

To What Extent Does Gender Moderate the Relationship between Age and Self-efficacy in Young Musicians?

A hierarchical multiple regression analysis was run to examine the effect of gender as a moderator of the relationship between age and self-efficacy in young musicians. Table 1 provides sample characteristics of the respondents included in the analysis. Assumptions of normality were met, and data representing outliers were adjusted to a new value that equalled ±1 of the closest normal data point. Results indicate that gender did not moderate the effect of age on self-efficacy scores, as evidenced by a non-significant interaction term that explained an additional 0.5% of total variation, $F(1, 120) = .58$, $p = .45$ (see Table 4).

Table 4

Moderation analysis using hierarchal regression to predict self-efficacy for musical performing

	B	*SE*	*β*	*t*
Constant	49.85	.99		50.33
Age	.18	.38	.06	.47
Gender	-1.21	1.32	-.08	-.92
Age x gender interaction	-.39	.51	-.10	-.76
R^2	.005			
F	.58			

Note. N=124. Self-efficacy measured by the Self-efficacy for Musical Performing – Children's version (Ritchie & Williamon, 2011b). *$p < .05$

Because of the non-significant result, the interaction term was dropped from the model. The new main effects model revealed a non-significant negative linear relationship between age and self-efficacy, b = -.04, SE = .26, p = .89. The new model also indicated that females did not have statistically significantly lower scores for self-efficacy when compared to males, b = -1.21, SE = 1.32, p = .36 (see Table 5).

Table 5

Multiple regression analysis predicting self-efficacy for musical performing

	B	*SE*	*β*	*t*
Constant	49.85	1.00		50.42
Age	-.04	.26	-.01	-.14
Gender	-1.21	1.32	-.08	-.92
R^2	.007			

Note. N=124. Self-efficacy measured by the Self-efficacy for Musical Performing – Children's version (Ritchie & Williamon, 2011b). *$p < .05$

A two-way ANOVA was conducted to examine the effects of gender and age on self-efficacy scores, with age being measured as a categorical variable (see Table 1). All assumptions of normality were met. There were no main effects of age, $F(1,120) = 1.91$, $p = .17$, $\eta^2_p = .016$, or gender, $F(1,120) = .85$, $p = .36$, $\eta^2_p = .007$, nor a significant interaction between age and gender, $F(1,120) = .19$, $p = .67$, $\eta^2_p = .002$.

Discussion

The present study asked three questions: 1) What is the relationship between MPA and self-efficacy in young musicians? 2) To what extent does gender moderate the relationships between age and MPA, and 3) age and self-efficacy?

First, a significant negative relationship was found between MPA and self-efficacy, indicating that MPA increases as self-efficacy decreases in young musicians. In other words, the more anxious performers feel, the less likely they are to believe that they will be able to play well. This finding confirms those of previous studies including those of Hendricks et al. (2015), Ritchie and Williamon (2011b), and Zelenak (2015). These in turn are congruent with the predictions of Bandura's (1977) self-efficacy theory which proposes that self-efficacy beliefs are influenced by enactive mastery experience, vicarious experiences, verbal persuasion, and – particularly – physiological or affective states that include anxiety and arousal as sources of information affecting the individual's task self-efficacy. That is, Bandura argued that a person's belief in their ability to complete a task successfully can affect their anxiety levels in relation to the performance of that task, and *vice versa*. Knowledge of the negative relationship between anxiety and self-efficacy can be used by teachers to help support their students, as a high level of self-efficacy may be one of the best defences against MPA.

Second, age was found to have a significant effect on MPA. The results suggest that MPA in young musicians increases with age (measured in years), and that adolescents experience significantly higher levels of MPA compared to children, confirming the findings of previous studies suggesting that age is a predictor of MPA in young musicians (Nusseck et al., 2015; Osborne et al., 2005; Patston & Osborne, 2016; Sarbescu & Dorgo, 2014). They can be explained by the stages of development postulated by Piaget (1970): as young people progress from childhood to adolescence, they develop the capacity for formal operational thought, which can lead to increased anxiety (Kenny, 2000).

No significant effect of gender was found on MPA, however, although the findings of previous studies suggest that female adolescent music students experience higher levels of MPA

than males (Nusseck et al., 2015; Patston & Osborne, 2016; Thomas & Nettelback, 2014). The non-significant differences between males and females in the present study could be attributable to the relatively small sample size or the inclusion of younger children in the study sample, as gender differences comparable to those found in adolescents have not been found by other researchers (Boucher, 2008; Errico, 2012; Ryan, 2005).

Gender had no significant effect on the relationship between age, measured in years of according to age-group (children and adolescents) and MPA. Patston and Osborne (2016) also investigated the potentially moderating effect of gender on the relationship between age and MPA in adolescent musicians only and obtained similar, non-significant results. While the present study found no differences attributable to gender between the MPA experienced by children in the concrete operational phase and adolescents in the formal operational phase (Piaget, 1970), it is possible that the influence of gender could be detectable in a study of young people in a narrower age range, that is, during the transition from childhood to adolescence, at the very end of the concrete operational phase and the very beginning of the formal operational phase. Ryan (2004, 2005) investigated MPA in boys and girls aged 9-13 years, and found they experienced it differently. Future investigations of the transition from childhood to adolescence could yield more promising results.

Third, age, measured by years and by age-group, had no significant main effect on self-efficacy, a finding similar to those of Hewitt (2015) and Zelenak (2015) who investigated differences between self-efficacy in middle school and high school students. Bandura's (1977) self-efficacy theory may help explain why age-related changes in self-efficacy are not observed in young musicians. It is possible that self-efficacy beliefs are more influenced by the four sources of efficacy information put forward by Bandura than age (and gender – see below).

These would therefore affect the changes in levels of self-efficacy experienced by young musicians as they move from childhood to adolescence. Since White (2010), Fisher (2014), and McPherson and McCormick (2006) found effects of age on self-efficacy in young musicians, however, further research on the topic is warranted.

Gender also had no significant main effect on self-efficacy, which is congruent with the results of several studies in the literature on self-efficacy (Clark, 2010; Randles, 2006; White, 2006). Again, these results can be explained by Bandura's (1977) theory. Another possible explanation is that other factors such as performance setting influence self-efficacy, and these might also moderate the relationship between gender and self-efficacy, as suggested by the findings of Hendricks et al. (2015). Other factors could include Bandura's four sources of efficacy information (Bugos et al., 2016; Clark et al., 2014; Hendricks et al., 2015), so future research could investigate the extent to which these sources moderate the effect of gender on self-efficacy in young musicians and thus the role of gender as a predictor of self-efficacy.

Finally, gender was not found to moderate the relationship between self-efficacy and age, measured in years, or by age-group. These results contradict those of Hewitt's (2015) study, which suggest that gender influences the different patterns of changing in self-efficacy experienced by middle and high school students as they age. However, Hewitt used measures of self-efficacy bias rather than self-efficacy so it is difficult to make a meaningful comparison between the findings of that study and those of the present study.

Limitations

The first limitation of the present study is its small sample size, given the number of factors investigated (MPA, self-efficacy, age, and gender); more respondents in the four categories (male and female children and adolescents) would have provided more statistical

power and potentially significant, and therefore generalizable results. The second limitation is the sampling procedure: letters of invitation were sent to local music schools and studio piano teachers, representing only a fraction of the population of teachers of child and adolescent musicians. As always, there may have been differences between those individuals who agreed and those who declined to participate. The third limitation is the way the questionnaires were administered. Most respondents completed them at the studio where they receive music lessons. While music teachers were instructed clearly as to how the questionnaires should be administered, responses might have been more consistent if all the questionnaires had been administered by the same individual in the same place, and there would have been no possibility that respondents were influenced by the presence of their teachers while completing the questionnaires.

Future Research

Further research on the relationships between MPA, self-efficacy, age and gender in young musicians should involve the participation of larger sample sizes. Investigations of the moderating effect of gender and age on the relationships between MPA and self-efficacy should focus on late childhood and early adolescence. Given the finding of a strong negative relationship between MPA and self-efficacy, researchers should evaluate the effectiveness of methods used by teachers for developing self-efficacy in young people in terms of preventing and managing MPA. For example, intervention studies reported in the literature on sport psychology (eg. Foltz, 2014; Ste-Marie, Rymal, Vertes, & Martini, 2011) could be adapted for musicians.

Conclusion

The results of this study indicate that many children and teenagers experience MPA for a variety of reasons. A strong relationship between MPA and self-efficacy was found, indicating high levels of MPA are linked with low levels of self-efficacy. Age had a significant effect on MPA while gender did not. Neither age nor gender had a significant effect on self-efficacy, and gender did not moderate the relationship between age and MPA or self-efficacy. These results extend our knowledge of the relationship between MPA and self-efficacy in young musicians. They have important implications for practice, in that music educators may potentially reduce the negative effects of MPA in young musicians by helping them develop self-efficacy in pedagogical contexts.

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Appendix 2A

Music Performance Anxiety Inventory for Adolescents (MPAI-A)

Please think about music in general and your major instrument and answer the questions by circling the number, which describes how you feel.

		Not at all			About half the time		All of the time	
1	Before I perform, I get butterflies in my stomach.	0	1	2	3	4	5	6
2	I often worry about my ability to perform.	0	1	2	3	4	5	6
3	I would rather play on my own, than in front of people.	0	1	2	3	4	5	6
4	Before I perform, I tremble or shake.	0	1	2	3	4	5	6
5	When I perform in front of an audience, I am afraid of making mistakes.	0	1	2	3	4	5	6
6	When I perform in front of an audience, my heart beats very fast.	0	1	2	3	4	5	6
7	When I perform in front of an audience, I find it hard to concentrate on my music.	0	1	2	3	4	5	6
8	If I make a mistake during performance, I usually panic.	0	1	2	3	4	5	6
9	When I perform in front of an audience I get sweaty hands.	0	1	2	3	4	5	6
10	When I finish performing, I usually feel happy with my performance.	0	1	2	3	4	5	6
11	I try to avoid playing at my own at a school concert.	0	1	2	3	4	5	6
12	Just before I perform, I feel nervous.	0	1	2	3	4	5	6
13	I worry that my parents or teacher might not like my performance.	0	1	2	3	4	5	6
14	I would rather play in a group or ensemble, than on my own.	0	1	2	3	4	5	6
15	My muscles feel tense when I perform.	0	1	2	3	4	5	6

Appendix 2B

Self-Efficacy for Musical Performing - Children's Version

Now, please mark how much you agree or disagree with each of the following statements, specifically thinking about how you perform during this activity.

	Not at all sure 0%						*Completely sure 100%*
1. I am confident that I can give a successful performance.	1	2	3	4	5	6	7
2. I have set important goals for this performance, and I can make those goals happen.	1	2	3	4	5	6	7
3. I am likely to avoid difficult or challenging things in the performance.	1	2	3	4	5	6	7
4. If I think the performance worries me too much, I cannot even attempt to perform.	1	2	3	4	5	6	7
5. If something unexpected happens during the performance, I can handle it well.	1	2	3	4	5	6	7
6. I can avoid this performance if the music looks or sounds too difficult for me.	1	2	3	4	5	6	7
7. I feel sure about my playing (or singing) for this performance.	1	2	3	4	5	6	7
8. I am likely to give up easily during the performance.	1	2	3	4	5	6	7
9. I am able to deal with problems that might come up during the performance.	1	2	3	4	5	6	7

Chapter 3: Exploring Music Performance Anxiety, Self-efficacy, Performance Quality, and Behavioural Anxiety within a Self-modeling Intervention for Young Musicians[7]

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Abstract

The purpose of this study was to investigate the relational changes between music performance anxiety (MPA), self-efficacy, performance quality, and behavioural anxiety in six adolescent piano students over a six-week intervention. Additionally, the study explored the effects of a positive self-review self-modeling intervention on adolescent musicians. Self-report measures, performance evaluations, and behavioural anxiety ratings were used to collect data. Results indicate that the relational changes between MPA, self-efficacy, and performance quality are complex. There were no observed relationships between MPA and self-efficacy or performance, suggesting that MPA can have both debilitative and facilitate effects on these variables. Additionally, there was no relationship between MPA and behavioural anxiety, suggesting that students may appear less anxious than they feel. Finally, the results suggest that self-modeling has individual effects on musicians, meaning that self-modeling can provide teachers with a versatile strategy for reducing MPA, improving performance quality, and/or increasing performance confidence.

Keywords: Music performance anxiety, self-efficacy, music performance, self-modeling, adolescent musicians, behavioural anxiety

Exploring Music Performance Anxiety, Self-efficacy, Performance Quality, and Behavioural Anxiety within a Self-modeling Intervention for Young Musicians

Public performance is often a central component of music education from an early age, and numerous studies indicate that young musicians experience music performance anxiety (MPA; Patston & Osborne, 2016; Thomas & Nettelbeck, 2014). While various interventions designed to reduce MPA have been tested with adult musicians (Burin & Osório, 2016; Kenny & Halls, 2018), fewer resources exist for younger musicians (Braden, Osborne, & Wilson, 2015; Su, Luh, Chen, Lin, Liao, & Chen, 2010). Given the negative relationship between MPA and self-efficacy documented in the music literature, (Dempsey & Comeau, 2019; Hendricks, Smith, & Legutki, 2015), it is possible that methods targeting self-efficacy could also reduce MPA in young musicians. This study aims to explore the extent to which self-modeling, a common athletic intervention (Rymal, Martini, & Ste-Marie, 2010; Ste-Marie, Vertes, Law, & Rymal, 2013), impacts MPA, self-efficacy, performance quality, and behavioural anxiety in young musicians.

Music Performance Anxiety

Kenny (2011) defines MPA as:

> The experience of marked and persistent anxious apprehension related to musical performance that has arisen through underlying biological and/or psychological vulnerabilities and/or specific anxiety-conditioning experiences. It is manifested through combinations of affective, cognitive, somatic, and behavioural symptoms. It may occur in a range of performance settings, but is usually more severe in settings involving high ego investment, evaluative threat (audience), and fear of failure. It may be focal (i.e. focused only on music performance), or occur comorbidly with other anxiety disorders, in

> particular social phobia. It affects musicians across the lifespan and is at least partially independent of years of training, practice, and level of musical accomplishment. It may or may not impair the quality of performance (p.61).

Numerous studies confirm that adult (Casanova, Zarza, & Orejudo, 2018; Kenny, Driscoll, Ackermann, 2016), adolescent (Patston & Osborne, 2016; Thomas & Nettelbeck, 2014) and child musicians (Boucher & Ryan, 2011; Kenny & Osborne, 2006) all experience MPA, which can be influenced by various internal and external factors, such as gender (Patston & Osborne, 2016; Rae & McCambridge, 2004), performance experience (Boucher & Ryan, 2011), and post-event rumination (Nielson et al., 2018). MPA is one of the most prevalent non-physical problems among musicians and can result in unhealthy coping mechanisms such as drug and alcohol abuse (Orejudo, Zarza-Alzugaray, & Casanova, 2018), the development of musculoskeletal pain or injury (Ackerman, Driscoll, & Kenny, 2012), or the early termination of music education (Orejudo et al., 2018). Studies examining younger musicians indicate that MPA increases with age, as both Patston and Osborne (2016) and Dempsey and Comeau (2019) found a main effect of age on self-report MPA scores in musicians aged 9-17 and 7-17 respectively. The progression of MPA from childhood to adolescence suggests a need for the development of preventative or reductive coping strategies specific to young musicians. Teaching young musicians to effectively manage MPA could potentially reduce negative health and psychological impacts in the future.

Various interventions designed to reduce MPA have been tested with musicians, including: acceptance and commitment therapy (Juncos et al., 2017), cognitive behavioural therapy (CBT: Braden et al., 2015; Osborne, Kenny, & Cooksey, 2007), eye movement desensitization and reprocessing (EDMR: Brooker, 2018), meditation and

mindfulness (Blyskal, 2018; Diaz, 2018), mental skills training (Clark & Williamon, 2011; Hoffman & Hanrahan, 2012), relaxation training (Sweeney & Horan, 1982; Sweeney-Burton, 1997), researcher designed anxiety workshops (Errico, 2012; Gratto, 1998), and virtual reality (Bissonnette, Dube, Provencher, & Sala, 2011; Crawford, 2011). With few exceptions (Crawford, 2011; Sweeney-Burton, 1997), results suggest that these interventions may successfully reduce MPA in adult and young musicians. These findings support Burin and Osório's (2016) systematic literature review, which found that most treatment modalities indicate tendencies towards positive MPA outcomes, warranting further research. In the review, CBT was the most commonly studied modality, and additional outcomes variables such as self-efficacy and performance quality were often tested alongside MPA. Two of the six CBT studies indicated that the intervention positively affected self-efficacy and performance quality in addition to MPA. Other studies produced similar findings, where MPA decreased following treatment while confidence or efficacy increased (Clark & Williamon, 2011; Kinne, 2016) or while performance quality increased (Juncos et al., 2017; Spahn, Walther, & Nusseck, 2016). However, several studies observed no effect or a negative effect on performance quality following treatment, despite observing a positive MPA effect (Braden et al., 2015; Osborne et al., 2007; Sweeney & Horan, 1982). The inconsistent relational results between MPA and performance quality are not necessarily unexpected given Kenny's (2011) assertion that MPA may or may not affect performance quality.

Additionally, several studies have also investigated the effect of MPA interventions on rater-observed behavioural anxiety. Kendrick, Craig, Lawson, & Davidson (1982) evaluated behavioural anxiety using a checklist which assessed how anxious participants appeared to outside observers and found that behavioural anxiety decreased alongside self-report MPA

scores following a CBT intervention. Other studies have provided similar results where both observable behavioural anxiety and self-report MPA decreased following treatment (Spahn et al., 2016; Sweeney & Horan, 1982). However, Braden and colleagues (2015) found that despite decreasing self-report MPA, CBT did not reliably reduce observed behavioural anxiety, a finding echoed by several other intervention studies (Hoffman & Hanrahan, 2012; Sweeney & Horan, 1982). The conflicting results call to question whether changes in self-perceived MPA correspond with changes in observable behavioural MPA. Overall, the promising MPA intervention results justifies further research to provide music students with additional strategies to combat MPA and investigating additional outcome variables alongside MPA will provide a more extensive understanding of the relationships between these variables.

Self-efficacy

Bandura (1982) defines self efficacy as the degree in which people believe in their ability to perform the necessary behaviours for the successful completion of a task. According to Bandura's self-efficacy theory (1977), personal expectations of efficacy are derived from four sources of information: enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological/affective states. The fourth source, physiological/affective states, includes the experience of anxiety, making this source important when discussing the relationship between self-efficacy and MPA. Bandura (1977) proposed that an individual's belief in his or her ability to successfully execute a task can influence their level of anxiety in relation to that task, and vice versa. Generally, this means that people with low efficacy expectations will experience higher levels of anxiety and people with high efficacy expectations will experience lower levels of anxiety (Bandura, Reese, & Adams, 1982). Bandura's (1977) proposed anxiety/self-efficacy relationship has been well-documented in music literature, where studies indicate that lower

levels of self-efficacy are linked to higher MPA in adult (Orejudo, Zarza-Alzugaray, Casanova, Rodriguez-Ledo, & Mazas, 2017; Robson & Kenny, 2017) and younger musicians (Hendricks et al., 2015; McPherson & McCormick, 2006). Given these findings, it is possible that providing students with strategies to increase performance confidence may also reduce MPA.

Modeling

Bandura's (1986) social cognitive learning theory states that learning occurs through the observation of social models. Modeling is the medium through which observational learning occurs and is defined as a process where people observe and later imitate the actions of others (Williams, Davids, & Williams, 1999). Modeling can affect perceived self-efficacy by acting as a source of vicarious experience. The observer's belief in their ability to perform a task can increase after watching a model successfully execute the same task, particularly if the model is similar to the observer (Bandura, 1986; McCullagh & Weiss, 2002). Several types of modeling exist, including self-modeling, a process where individuals observe themselves engaged in adaptive behaviours (Dowrick, 1999). In addition to vicarious experience, self-modeling provides a source of mastery experience, as the observer is watching themselves perform successfully. Mastery experience is thought to be the strongest source of efficacy information (Bandura, 1977; Hendricks et al., 2015), so by providing mastery as well as vicarious experience, self-modeling has a strong potential to impact self-efficacy. Dowrick (1999) describes two categories of self-modeling: positive self-review and feedforward. Positive self-review videos depict current performance skills and are edited to show only adaptive behaviour. In contrast, feedforward videos use edited footage to depict an individual performing at a level not yet mastered (Dowrick, 1999).

Sport literature has investigated the impact of self-modeling on a range of outcome variables, including anxiety (Law & Ste-Marie, 2005; Starek & McCullagh, 1999), performance outcomes (Foltz, 2014; Vezzosi, 2017), and self-efficacy (Clark & Ste-Marie, 2007; Ste-Marie, Vertes, Rymal, & Martini, 2011). Self-modeling studies testing anxiety found no significant differences following treatment (Law & Ste-Marie, 2005; Vezzosi, 2017), and many of these studies also found no significant changes in self-efficacy (Law & Ste-Marie, 2005) or performance outcomes (Law & Ste-Marie, 2005; Vezzosi, 2017). In contrast, Starek & McCullagh (1999) observed increases in self-efficacy and performance scores despite finding no anxiety differences. Given that anxiety increased in several participants, it is possible that the performance results could be explained as a function of arousal instead of anxiety. Research suggests that individual have an optimal zone of pre-performance arousal or anxiety that facilitates peak performance (Hanin, 2000), meaning that performers, such as athletes and musicians, need a certain amount of arousal to maximize performance (Steptoe & Fidler, 1987). While many intervention studies aim to decrease anxiety, it may be more beneficial to teach performers to distinguish between facilitative, performance-enhancing aspects and debilitative, performance-impairing aspects of arousal/anxiety (Mor, Day, Flett, & Hewitt, 1995).

Many self-modeling studies testing self-efficacy observed positive quantitative (Bradley, 1993; Clark & Ste-Marie, 2007) or qualitative (Foltz, 2014; Ste-Marie, Rymal, Vertes, & Martini, 2011) changes in athlete self-efficacy, but other studies found no significant differences (Law & Ste-Marie, 2005; Ram & McCullagh, 2003; Winfrey & Weeks, 1993). Similarly, several self-modeling studies observed positive performance changes following the intervention (Foltz, 2014; Ste-Marie, Rymal et al., 2011) while other studies found no performance differences (Law & Ste-Marie, 2005; Winfrey & Weeks, 1993). Law and Ste-Marie (2005)

proposed that skill level could account for the non-significant self-modeling results. Intermediate athletes could have less room for improvement on performance or psychological variables compared to beginner athletes, resulting in smaller or non-significant changes (Law & Ste-Marie, 2005; Ram & McCullagh, 2003; Winfrey & Weeks, 1993).

Despite extensive research in sport literature, few music studies have investigated the effects of self-modeling. Moody (2014) conducted the only self-modeling study with musicians, where twelve adolescent string musicians viewed feedforward videos for one week of a two-week intervention. Moody (2014) found that self-efficacy increased only in musicians who viewed their video the second week of the intervention, but observed no other significant changes in self-efficacy, self-report MPA, or performance outcomes. Moody (2014) proposed that given the time frame of the study, a longer intervention may be required for significant MPA and performance changes to occur. The current study tests a longer, six-week intervention to further our understanding of the effects of self-modeling on MPA, self-efficacy, performance outcomes, and behavioural anxiety in young musicians. While Moody (2014) used feedforward videos, this study uses positive self-review videos, as the creation of these videos is less time-consuming, and therefore has greater potential practical application for music educators.

Purposes of the Study

The purpose of this study is to investigate the relational changes between MPA, self-efficacy, performance quality, and behavioural anxiety in adolescent musicians over a six-week intervention using a multiple case study design. Additionally, the study explores the effects of a positive self-review self-modeling intervention on adolescent musicians, and will examine the following research questions:

1. How do a) MPA and self-efficacy, b) MPA and performance quality, and c) MPA and behavioural anxiety change in relation to each other over the course of a six-week self-modeling intervention?
2. To what extent does a self-modeling intervention designed for adolescent piano students affect MPA, self-efficacy, performance quality, and behavioural anxiety?

Method

Participants

The study was approved by the Research Ethics Board of the researcher's home institution. Five adolescent piano students (3 female, 2 male) between the ages of twelve and sixteen years old participated. Originally, participants were required to be between thirteen and seventeen years old and needed to have recently completed a piano exam[8] at a grade five level or above. However, due recruitment challenges, the inclusion criteria were modified: the age limit was lowered to twelve, and students with three performance ready pieces were included, regardless of their piano exam experience. Additionally, participants 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 scoring 34 or higher, the average score for adolescent musicians (Osborne & Kenny, 2005), were eligible to participate. Recruitment took place at local Royal Conservatory of Music (RCM) examination centers in person or through the local Ontario Registered Music Teacher's Association (ORTMA) group via email. Eight interested parents and students respectively completed consent and assent forms prior to participation. However, two students withdrew before starting the study, and a playing-related

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

injury prevented a third from completing data collection. Full data sets were collected for the remaining five participants (See Table 1).

Table 1

Demographic variables for intervention participants

Participant	Age	Gender	Piano level	Base MPA score	Days spent in B phase	Days spent in IN phase	Days spent in RB phase	Modeled piece	Number of modeling video views
1	15	Female	6 RCM	68	14	14	17	2	9
2	12	Female	8 RCM	39	14	14	16	3	9
3	14	Male	6 RCM	44	14	14	16	2	7
4	16	Female	8 CC	67	15	13	14	2	7
5	14	Male	5 RCM	40	14	9	14	3	6

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).

Measurements

Music Performance Anxiety Inventory for Adolescents (MPAI-A)

The MPAI-A is a self-report MPA measure (Osborne & Kenny, 2005) that is validated for use with adolescents aged 12-19 (Osborne & Kenny, 2005; Osborne, Kenny, & Holsomback, 2005). Fifteen questions represent cognitive, somatic, and behavioural symptoms of MPA. The test uses a seven-point Likert scale, where 0 represents no perceived symptoms of anxiety and 6 represents extremely high levels of anxiety. Item 10 is reverse scored. Cronbach's alpha was .91, indicating high internal consistency and therefore strong reliability (Osborne et al., 2005).

Self-efficacy for Musical Performing – Children's Version (SEMP)

The Self-efficacy for Musical Performing – Children's Version (SEMP: Ritchie & Williamon, 2011) evaluates children's beliefs in their ability to perform music. Respondents answer nine questions while imagining themselves in a past performance situation, using a 7-point Likert scale where 1 represents "Not sure at all" and 7 represents "Completely sure". Items 3, 4, 6, and 8 are reverse scored. Although the SEMP was designed for children, the wording is not overly childish and was deemed suitable for use with adolescents. Cronbach's alpha was .87, indicating internal consistency and therefore strong reliability (Ritchie & Williamon, 2011).

Performance evaluations

Two Royal Conservatory of Music (RCM) piano examiners were given 45 videos organized into 15 groups. Each group contained the first, second, and third performance of each piece, organized in random order. The examiners independently scored the performances out of 100, based on the overall performance quality, a scoring system commonly used for piano exams and music festivals. The examiners were blind to condition (modeled versus unmodeled). Intraclass correlation (ICC) assessed interrater reliability at .78. Under the guidelines suggested by Koo and Li (2016), this indicates good reliability, and the two examiner scores for each performance were then averaged to produce a single evaluation score per performance.

Behavioural Anxiety Index (BAI)

Three independent judges received 15 groups of videos organized in the same manner as the performance evaluations. However, the original performance videos were edited into alternating 15-second observation and 10-second recording intervals. The observational intervals showed unedited performances while the recording intervals showed a black screen in order to facilitate evaluation. The judges used the Behavioural Anxiety Index (BAI: Brotons, 1994) to evaluate behavioural anxiety in participant performances. Adapted by Ryan (2000), the

BAI measures 25 behavioural anxiety symptoms in five categories: feet/legs, arms/hands, body, instrument, and head/face. Each time the judges observed a symptom during an observation interval, they placed a checkmark or "x" in the appropriate category during the following recording interval. A total BAI score for each video was calculated by adding the number of observed symptoms per observation interval, with a high BAI score indicating more behavioural anxiety and vice versa. ICC assessed interrater reliability at .75, indicating good reliability. The three judge scores were then averaged to form one BAI score per performance.

Procedure

Pre-intervention

After obtaining informed consent and assent, participants completed the MPAI-A to determine MPA eligibility. Students satisfying the inclusion criteria participated in a recording session at the researcher's home institution, with the purpose of creating a positive self-review video. Participants recorded three pieces of their own choosing and were informed that the order they recorded the pieces would be the order they performed the pieces later in the study. They were alternately assigned to receive the modeling video for piece two or three but were not aware of this assignment at the time of the recording session. Participants recorded one piece at a time and were given 30 minutes to record their first piece. They were instructed to play their piece as though they were giving a concert performance and could repeat this piece as many times as they wanted within 30 minutes. After 30 minutes, participants were asked to begin the next piece. However, participants could choose to move on to the next piece sooner if they were satisfied with the performances given. This procedure was repeated with the remaining two pieces. Following instruction, participants were left alone in the recording room, but were able to signal the researcher if needed. Each session lasted for a maximum of 90 minutes. Afterwards,

participants received separate videos of each recorded performance via email and were instructed to select their favourite performance of each piece. The favourite performance of the piece assigned the modeling treatment became the positive self-review video used during the study.

Baseline (B)

Participants completed a two-week baseline (B) phase where they practiced three pieces at home as they normally would in preparation for a concert. After two weeks, they performed their pieces at the B concert before a jury of 2-3 judges at the researcher's home institution. Performances were recorded for later evaluation. Prior to the first performance, participants completed the MPAI-A and SEMP with respect to their first piece. Once completed, participants performed their first piece then returned offstage to complete a second MPAI-A and SEMP for their second piece. This procedure was repeated for all three pieces.

Intervention (IN)

The two-week intervention (IN) phase began the day after the B concert. Participants were emailed the positive self-review video and asked to watch the video 4 times per week before practicing the piece in the video (modeled piece). Otherwise, participants practiced as they normally would. After two weeks, they performed at the IN concert, which followed the same procedure as the B concert. However, participants viewed their positive self-review video once on a researcher provided computer before completing the questionnaires for the modeled piece. After viewing the self-modeling video, participants resumed the B concert procedure.

Return to baseline (RB)

The two-week return to baseline (RB) phase began the day after the IN concert. The RB procedure was identical to the B procedure and ended with the RB concert. Participants did not view their positive self-review videos during the RB phase.

Results

All data was graphed and analyzed visually to gain an in-depth understanding of how the dependent variables (MPA, self-efficacy, performance evaluation, behavioural anxiety) changed within participant over the course of the intervention. After careful preliminary analysis, dependent variables were collapsed across piece for the first research question to allow for a clearer analysis of changes over time. Scores for the three pieces were averaged at each time point (B, IN, and RB concert) to produce one data point per concert, reducing participant data from nine data points per dependent variable to three. All original data points were included in the analysis for the second research question in order to compare changes in the modeled versus non-modeled pieces over time.

Participant One

Participant one was a 15-year-old female who performed her three pieces in an RCM exam one month prior to the beginning of the study. Participant one received a self-modeling video for her second piece (See Table 1).

MPA and Self-efficacy

The relational changes between MPA and self-efficacy for participant one are unexpected (See Figure 1), as the results indicate that the participant felt slightly less anxious at each concert, but also less efficacious. This contrasts music studies which suggest that self-efficacy increases as MPA decreases (Hendricks et al., 2015; Robson & Kenny, 2017), a finding observed in several intervention studies (Clark & Williamon, 2011; Kinne, 2016). MPA may possibly act in a facilitative manner for participant one, and what she perceived as decreased MPA could actually be decreased arousal. As Steptoe & Fidler (1987) suggest that a certain amount of

arousal enhances performance, participant one may have felt less able to perform well when less aroused, leading to decreased self-efficacy.

MPA and Performance Quality

The relational changes between MPA and performance quality for participant one (see Figure 1) support Kenny's (2011) statement that MPA may or may not affect performance quality. Various intervention studies support both the opposite directional changes from B to IN (Juncos et al., 2017; Spahn et al., 2016) and the parallel directional changes from IN to RB (Sweeney & Horan, 1982; Sweeney-Burton, 1997). Given the relational changes from B to IN, and the high base MPA score (see Table 1), it is likely that decreased MPA helped enhance her performance (Mor et al., 1995). While the changes from IN to RB indicate the opposite, these changes are smaller, making it more likely that MPA impairs performance for this participant.

MPA and Behavioural Anxiety

The relational changes between MPA and behavioural anxiety for participant one are expected (see Figure 1) and supported by findings in the literature (Kendrick et al., 1982; Spahn et al., 2016). Given that the MPAI-A includes behavioural anxiety symptoms, it is not surprising that decreased MPAI-A scores coincide with decreased BAI scores.

Self-modeling Video

Results suggest that the modeling video had a slight positive effect on MPA for participant one (see Figure 2), contrasting the non-significant anxiety results from other modeling studies (Law & Ste-Marie, 2005; Starek & McCullagh, 1999). However, given the small MPAI-A changes, it is difficult to attribute the MPA results to the modeling video with any certainty. The remaining dependent variables suggest no effect (self-efficacy) or negative effects (performance evaluation, behavioural anxiety) from the modeling video (see Figure 2). While

several studies also found non-significant self-efficacy results (Law & Ste-Marie, 2005; Winfrey & Weeks, 1993), the negative performance and behavioural anxiety effects are unexpected, warranting further research. Overall, the results suggest that the modeling treatment had few positive effects on participant one, but given her high base MPA, the participant may need a more extensive intervention in order to affect meaningful change on the dependent variables.

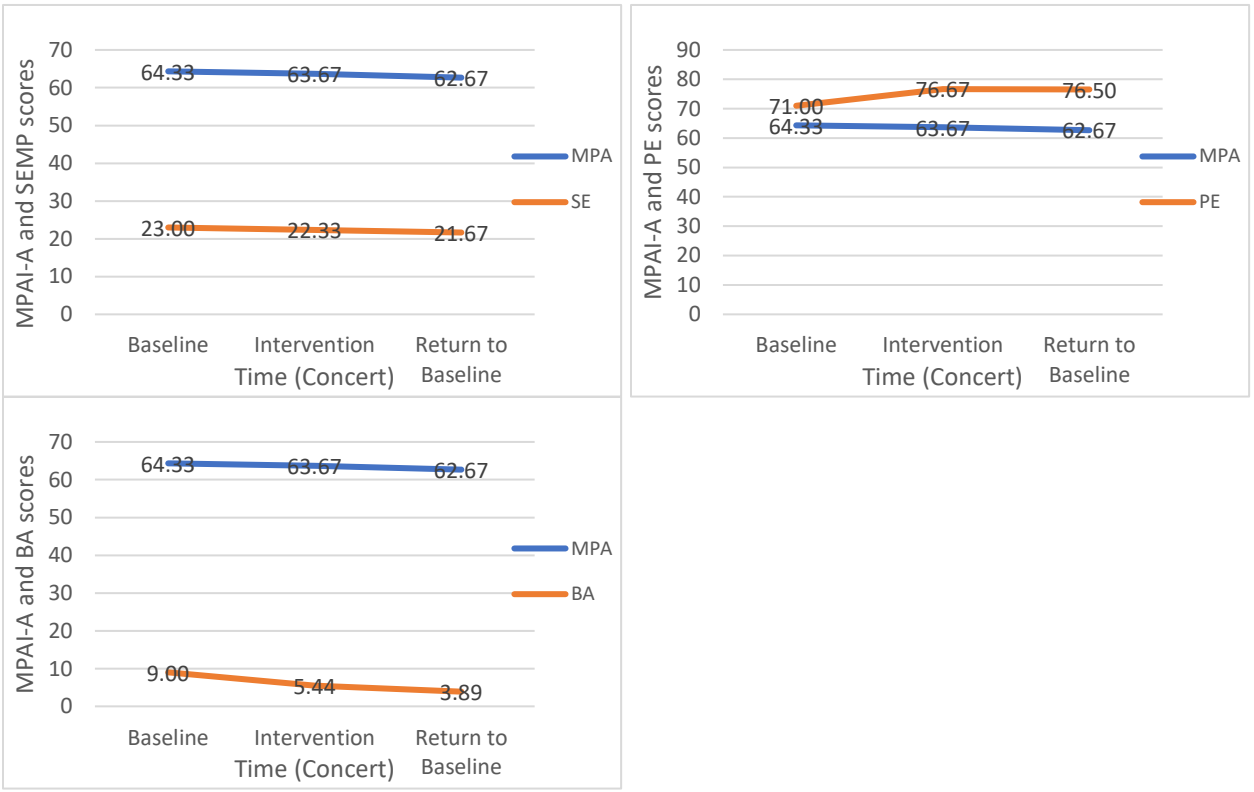

Figure 1. Changes in MPA and self-efficacy, MPA and performance quality, and MPA and behavioural anxiety over time for participant one. MPA = Music performance anxiety as measured by the MPAI-A (Osborne & Kenny, 2005), SE = Self-efficacy as measured by the SEMP (Ritchie & Williamon, 2011), PE = performance evaluations, BA = Behavioural anxiety as measured by the BAI (Brotons, 1994).

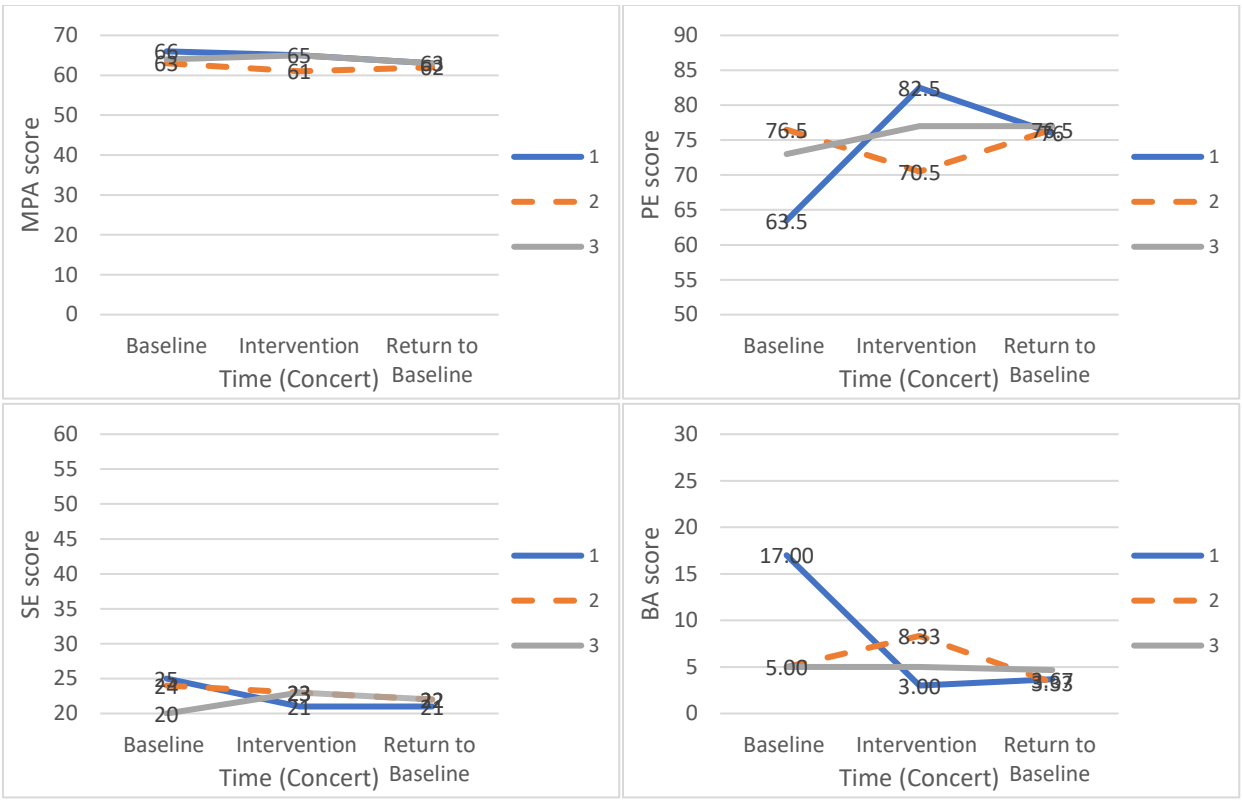

Figure 2. Comparing changes for participant one in MPA, self-efficacy, performance evaluations, and behavioural anxiety over time between modeled and unmodeled pieces. The modeled piece is indicated with a dotted line on the graph. MPA = Music performance anxiety as measured by the MPAI-A (Osborne & Kenny, 2005), SE = Self-efficacy as measured by the SEMP (Ritchie & Williamon, 2011), PE = performance evaluations, BA = Behavioural anxiety as measured by the BAI (Brotons, 1994). 1, 2, & 3 = Pieces 1, 2, and 3 in order of performance

Participant Two

Participant two was a 12-year-old female who performed her three pieces in an RCM exam one month prior to the beginning of the study. Participant two received a self-modeling video for her third piece (See Table 1).

MPA and Self-efficacy

The relational changes between MPA and self-efficacy for participant two present conflicting results over time (see Figure 3), which may be explained by the effects of the modeling video. When there was no modeling treatment (between IN and RB), participant two

felt less efficacious when feeling more anxious, a finding which reflects the MPA/self-efficacy relationship reported in various music studies (Hendricks et al., 2015: Robson & Kenny, 2017). However, when receiving the modeling treatment (between B and IN), participant two felt more efficacious despite feeling more anxious. Results suggest that the modeling video had a positive self-efficacy effect for participant two (see below), which may have influenced her relational MPA/self-efficacy changes.

MPA and Performance Quality

The relational changes between MPA and performance quality for participant two also support Kenny's (2011) definition (see Figure 3). While changes between B and IN indicate that increased MPA helped improve performance for the participant, these changes were small. Given the larger changes between IN and RB, where increased MPA appeared to impair performance, it is more likely that MPA has a debilitative effect for participant two.

MPA and Behavioural Anxiety

The relational changes between MPA and behavioural anxiety for participant two are unexpected (see Figure 3) but supported by several studies in the literature (Braden et al., 2015; Hoffman & Hanrahan, 2012). The MPAI-A measures several types of anxiety symptoms, which could account for the opposite directional changes in MPAI-A and BAI scores. Given that some MPA symptoms, such as worried thoughts, are not visible to outside observers, the BAI judges may not have been able to detect the same MPA changes perceived by the participant.

Self-modeling Video

Results suggest that the modeling video had a positive effect on self-efficacy for participant two, a finding supported by other modeling studies (Bradley, 1993; Clark & Ste-Marie, 2007). The remaining dependent variables suggest no effect (MPA, performance quality)

or negative effects (behavioural anxiety) from the modeling video (see Figure 4). Apart from self-efficacy, skill level may account for the remaining dependent variable results. Law & Ste-Marie (2005) proposed that intermediate athletes may experience smaller or non-significant changes during treatment because they have less room for improvement on psychological or performance outcomes. Participant two performed at a grade eight RCM level, which is considered intermediate among musicians. Skill level combined with a low base MPA score (see Table 1) may have reduced the impact of the self-modeling video for participant two, as she may not have had much room for improvement on the dependent variables (excluding self-efficacy).

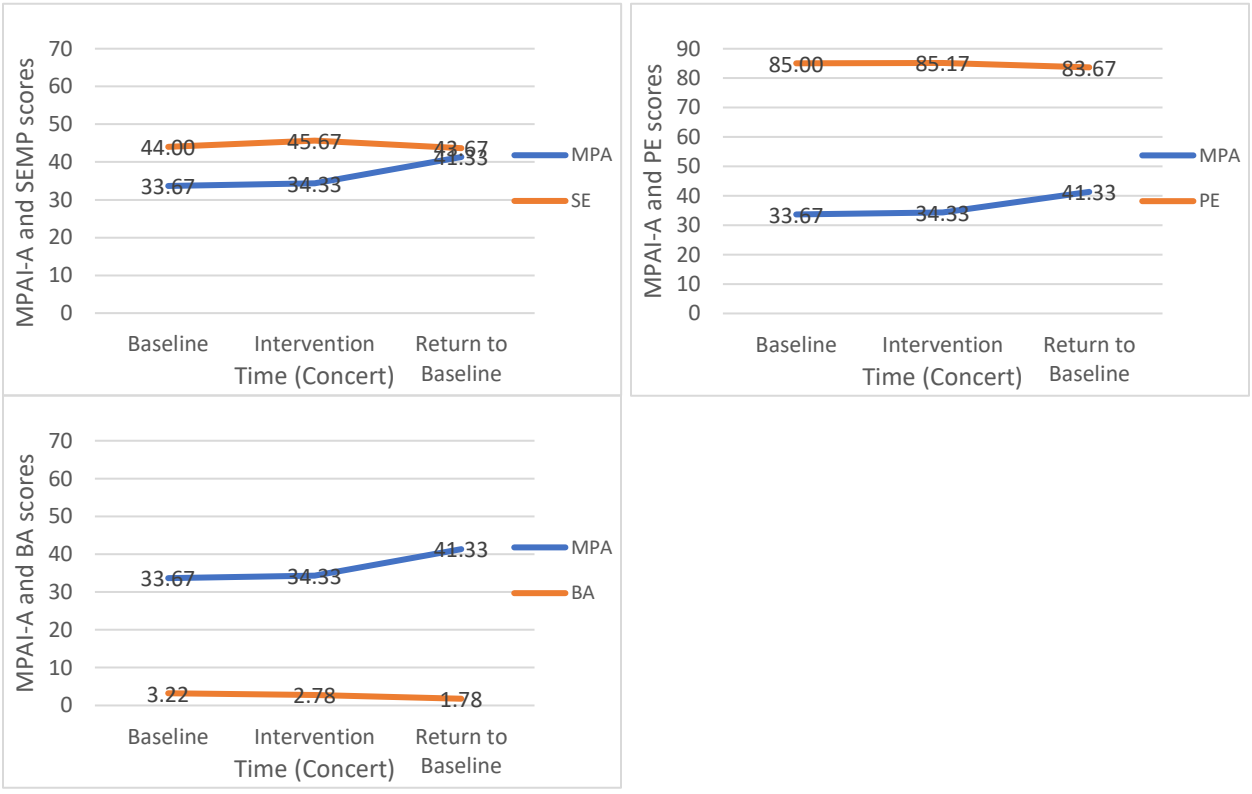

Figure 3. Changes in MPA and self-efficacy, MPA and performance quality, and MPA and behavioural anxiety over time for participant two. MPA = Music performance anxiety as measured by the MPAI-A (Osborne & Kenny, 2005), SE = Self-efficacy as measured by the SEMP (Ritchie & Williamon, 2011), PE = performance evaluations, BA = Behavioural anxiety as measured by the BAI (Brotons, 1994).

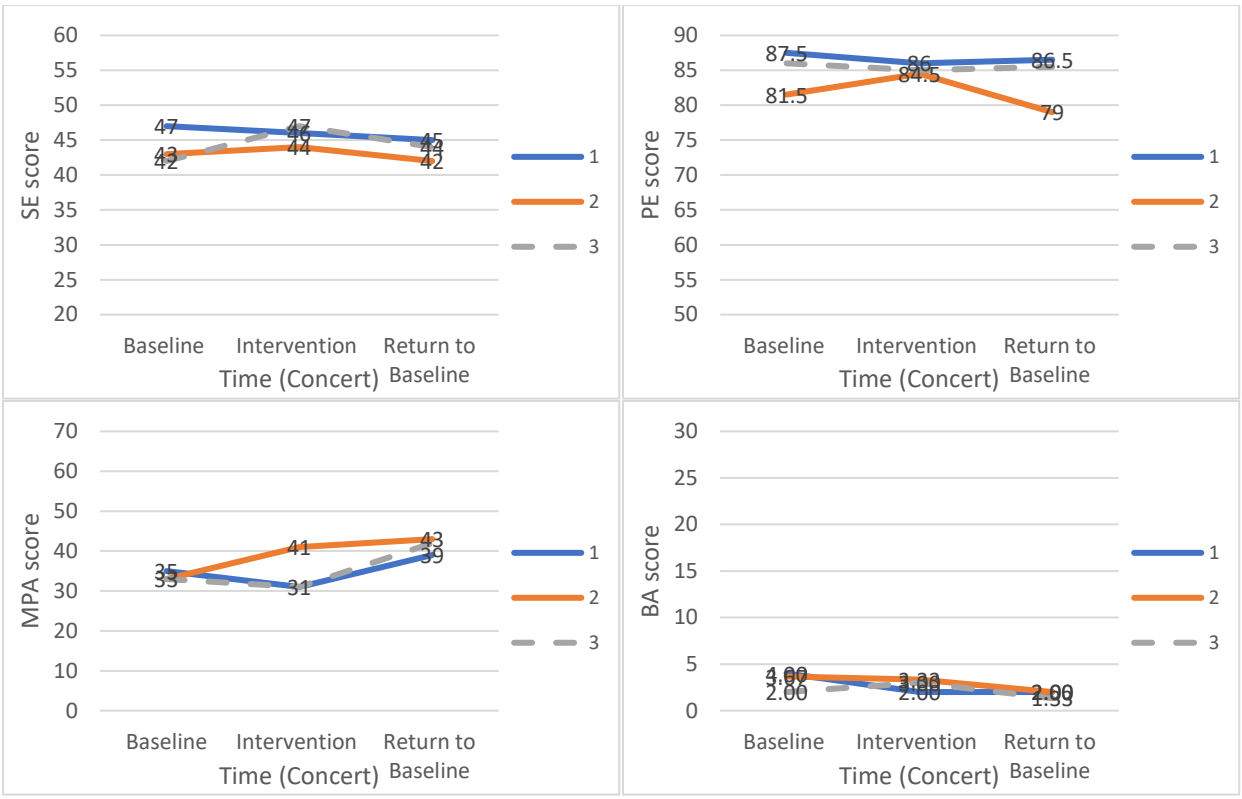

Figure 4. Comparing changes for participant two in MPA, self-efficacy, performance evaluations, and behavioural anxiety over time between modeled and unmodeled pieces. The modeled piece is indicated with a dotted line on the graph. MPA = Music performance anxiety as measured by the MPAI-A (Osborne & Kenny, 2005), SE = Self-efficacy as measured by the SEMP (Ritchie & Williamon, 2011), PE = performance evaluations, BA = Behavioural anxiety as measured by the BAI (Brotons, 1994). 1, 2, & 3 = Pieces 1, 2, and 3 in order of performance.

Participant Three

Participant three was a 14-year-old male who had performed his three pieces in an RCM exam one month prior to the beginning of the study. Participant three received a self-modeling video for his second piece (See Table 1).

MPA and Self-efficacy

The relational changes between MPA and self-efficacy for participant three are unexpected (see Figure 5), as with participant one (see above). MPA appears to act in a facilitative manner for this participant, which means the perceived MPA increase at IN could instead have been a performance-enhancing arousal increase, and vice versa at RB. With

increased arousal, the participant may have felt more able to give a successful performance, and therefore more efficacious before performing.

MPA and Performance Quality

The relational changes between MPA and performance quality for participant three continue to support Kenny's (2011) MPA definition (see Figure 5), and potentially support Hanin's (2000) individual zones of optimal functioning theory. Hanin (2000) proposed that peak performance occurs within an individual, optimal zone of pre-performance anxiety, and less successful performances can occur when individuals operate outside of their optimal zone. Results for participant three indicate that decreased MPA helped enhance performance, but only to a certain extent. By continuing to decrease after IN, perhaps the participant moved outside his optimal zone at RB, meaning he no longer had enough arousal/anxiety to perform optimally.

MPA and Behavioural Anxiety

The relational changes between MPA and behavioural anxiety are partially expected for participant three (see Figure 5). Literature findings support both the opposite directional changes from B to IN (Braden et al., 2015; Hoffman & Hanrahan, 2012), and the parallel changes from IN to RB (Kendrick et al., 1982; Spahn et al., 2016). Like participant two, participant three may have perceived changes in anxiety symptoms that were not visible to the BAI judges, which could account for the differing MPAI-A and BAI directional trajectories.

Self-modeling Video

Results suggest that the modeling video had positive effects (performance quality, behavioural anxiety), negative effects (MPA), and no effect (self-efficacy) for participant three (see Figure 6). While the self-efficacy results reflect existing findings in the literature (see participant one), optimal functioning theory (Hanin, 2000) may explain the remaining results.

The modeling video may have helped the participant enter his optimal zone (Hanin, 2000) by increasing his arousal as opposed to his anxiety (Starek & McCullaugh, 1993). Given that a certain level of pre-performance arousal enhances performance (Mor et al., 1995), the modeling treatment may also have had a beneficial effect on performance quality after increasing arousal.

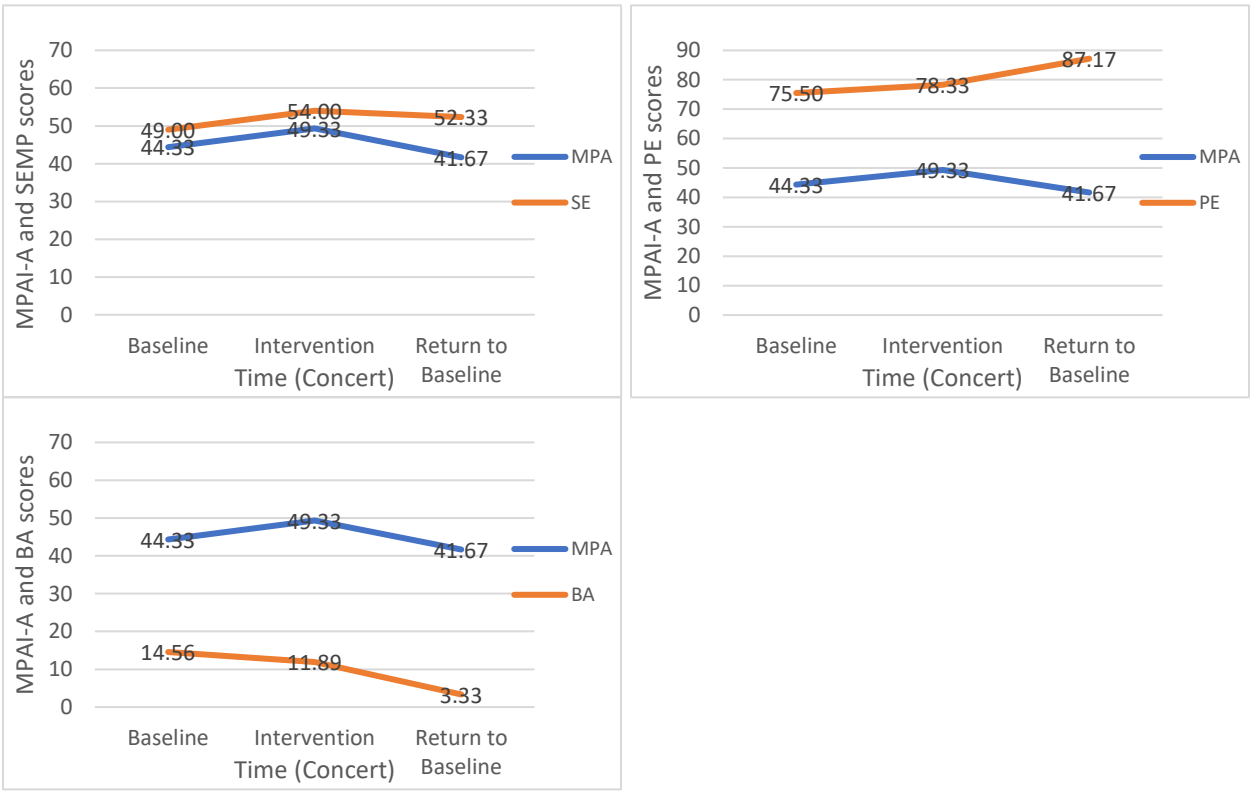

Figure 5. Changes in MPA and self-efficacy, MPA and performance quality, and MPA and behavioural anxiety over time for participant three. MPA = Music performance anxiety as measured by the MPAI-A (Osborne & Kenny, 2005), SE = Self-efficacy as measured by the SEMP (Ritchie & Williamon, 2011), PE = performance evaluations, BA = Behavioural anxiety as measured by the BAI (Brotons, 1994).

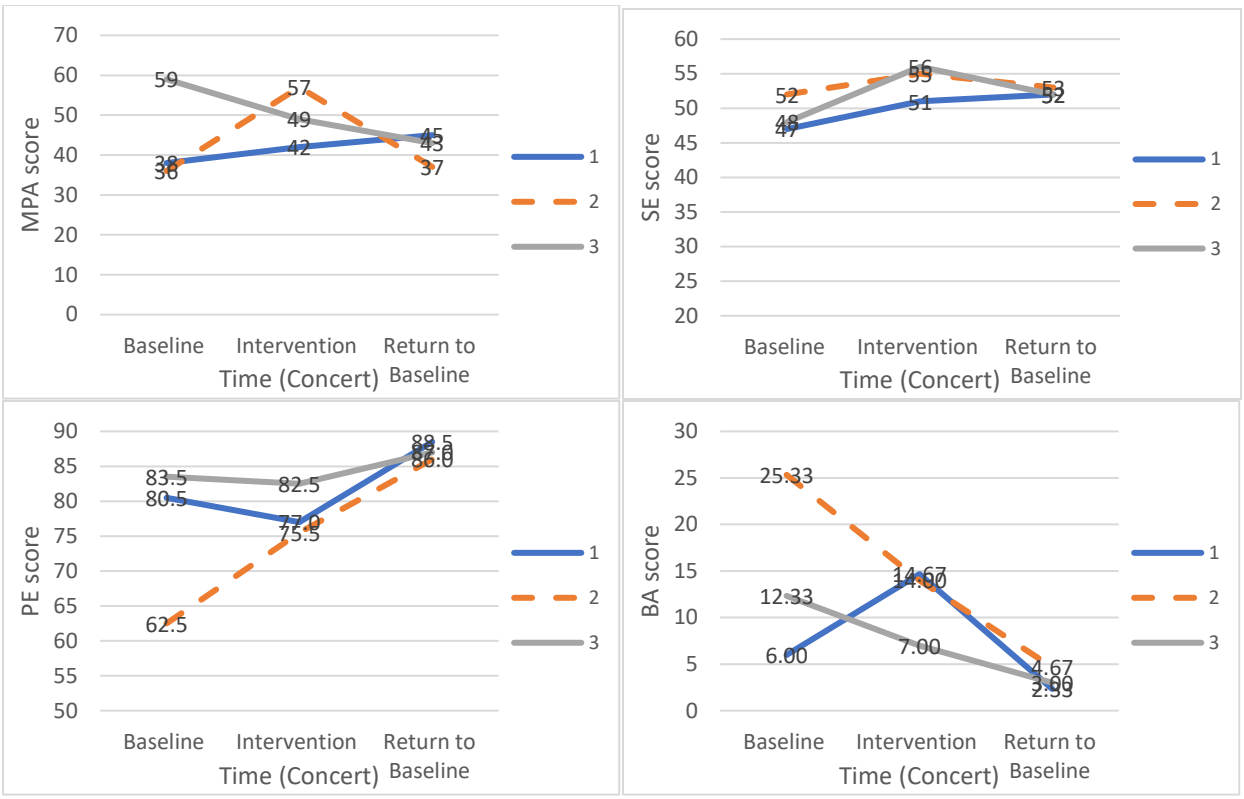

Figure 6. Comparing changes for participant three in MPA, self-efficacy, performance evaluations, and behavioural anxiety over time between modeled and unmodeled pieces. The modeled piece is indicated with a dotted line on the graph. MPA = Music performance anxiety as measured by the MPAI-A (Osborne & Kenny, 2005), SE = Self-efficacy as measured by the SEMP (Ritchie & Williamon, 2011), PE = performance evaluations, BA = Behavioural anxiety as measured by the BAI (Brotons, 1994). 1, 2, & 3 = Pieces 1, 2, and 3 in order of performance.

Participant Four

Participant four was a 16-year-old female who performed her three pieces at a music festival prior to the beginning of the study. Participant four received a self-modeling video for her second piece (See Table 1).

MPA and Self-efficacy

The relational changes between MPA and self-efficacy for participant four present conflicting results over time (see Figure 7), as with participant two (see above). Given that self-efficacy decreases were largest when MPA also decreased, MPA may act in a facilitative manner

for the participant. Like participant one (see above), participant four may have felt less able to perform well if the decreased MPA scores are an indication of decreased arousal.

MPA and Performance Quality

There is no clear pattern in the relational changes between MPA and performance quality for participant four (see Figure 7). This suggests that other variables, such as performance experience, may influence the relationship. Several studies have found that experience is a predictor of MPA (Biasutti & Concina, 2014; Ryan & Andrews, 2009), and given that she is the oldest participant, plays at an intermediate piano level, and has a high base MPA (see Table 1), participant four likely has significant experience performing while feeling anxious. In order to perform successfully, the participant may have developed strategies as a result of these experiences to prevent her MPA symptoms from impacting performance outcomes.

MPA and Behavioural Anxiety

The relational changes between MPA and behavioural anxiety are partially expected for participant four (see Figure 7). As with participant three (see above), the results suggest that participant four may have perceived changes in MPA symptoms not visible to the BAI judges.

Self-modeling Video

Results suggest that the modeling video had a positive effect on MPA for the modeled piece, as well as a positive spillover effect on the remaining, non-modeled pieces (see Figure 8). In contrast to the modeling literature (Law & Ste-Marie, 2005; Starek & McCullagh, 1999), the findings suggest that the self-modeling video reduced global MPA for the participant. Results indicate that the modeling video had no effect on self-efficacy, performance quality, or behavioural anxiety (see Figure 8). Participant four's skill level could account for why the modeling video did not influence the remaining dependent variables (see participant two).

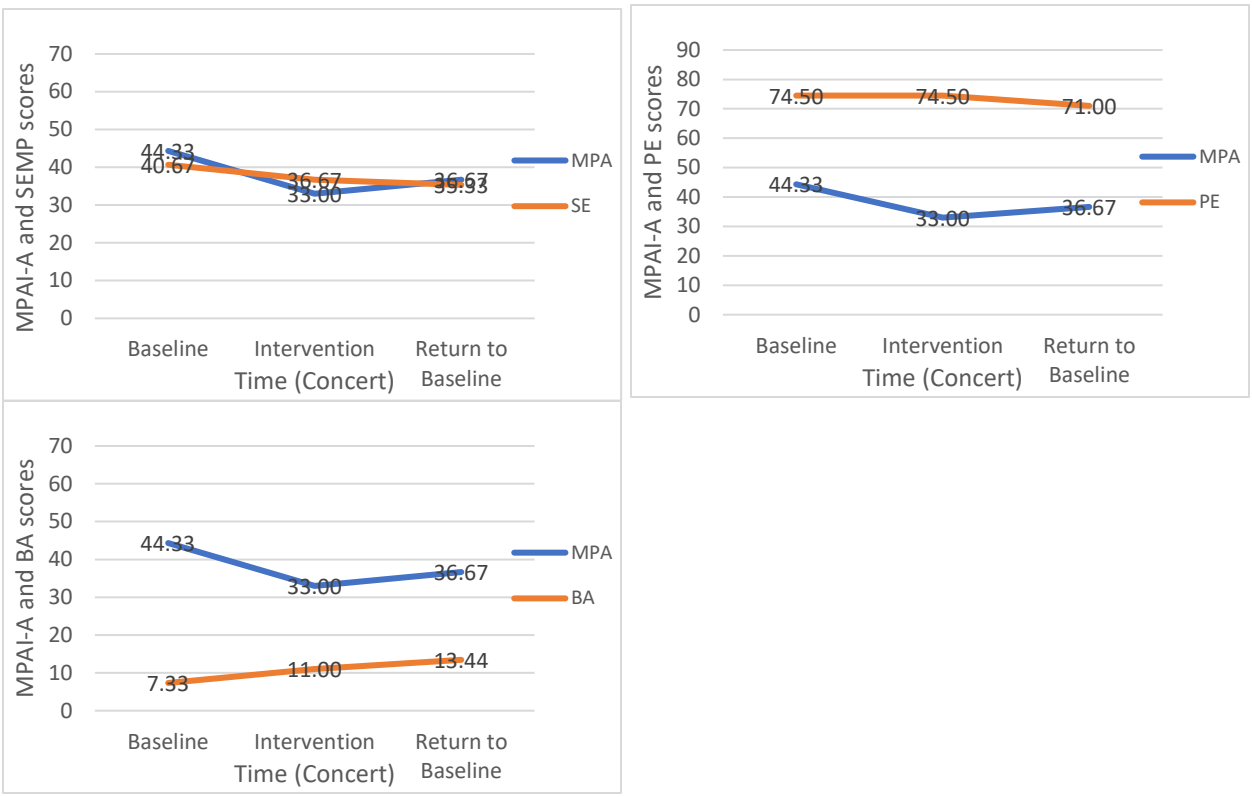

Figure 7. Changes in MPA and self-efficacy, MPA and performance quality, and MPA and behavioural anxiety over time for participant four. MPA = Music performance anxiety as measured by the MPAI-A (Osborne & Kenny, 2005), SE = Self-efficacy as measured by the SEMP (Ritchie & Williamon, 2011), PE = performance evaluations, BA = Behavioural anxiety as measured by the BAI (Brotons, 1994).

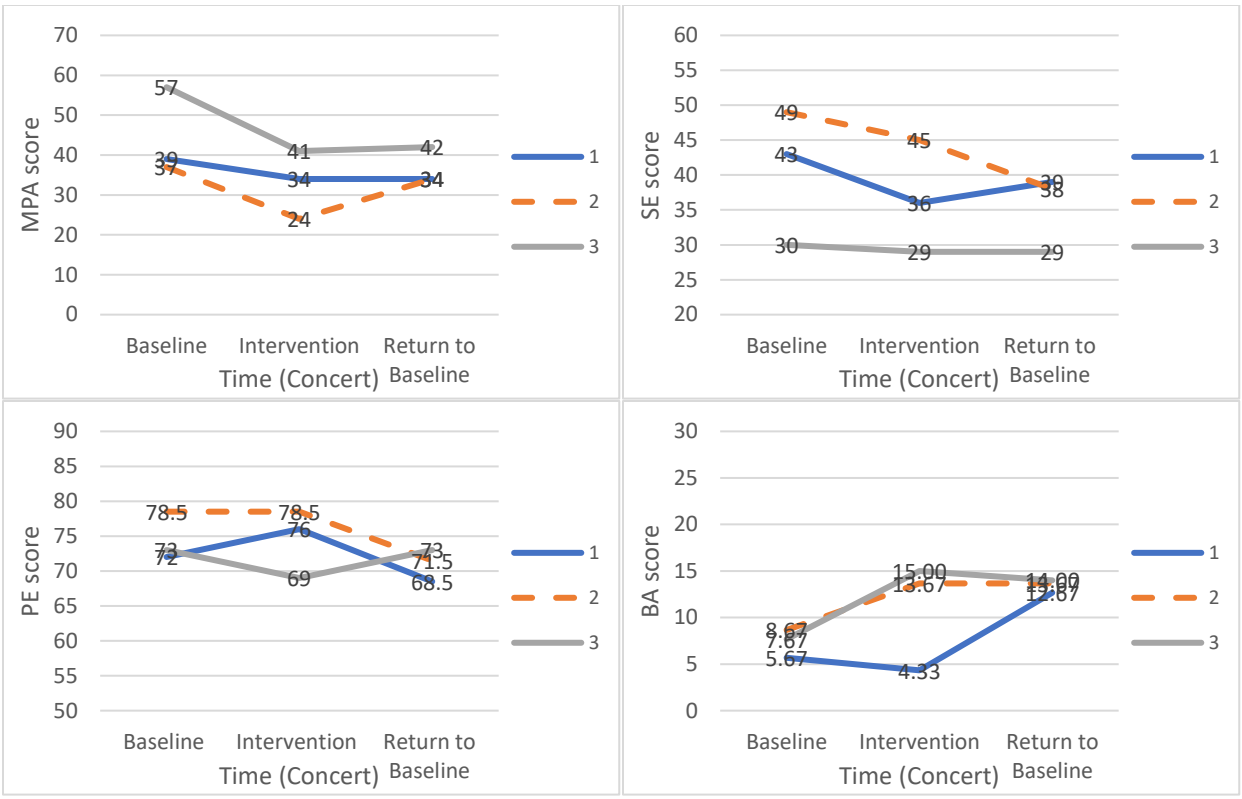

Figure 8. Comparing changes for participant four in MPA, self-efficacy, performance evaluations, and behavioural anxiety over time between modeled and unmodeled pieces. The modeled piece is indicated with a dotted line on the graph. MPA = Music performance anxiety as measured by the MPAI-A (Osborne & Kenny, 2005), SE = Self-efficacy as measured by the SEMP (Ritchie & Williamon, 2011), PE = performance evaluations, BA = Behavioural anxiety as measured by the BAI (Brotons, 1994). 1, 2, & 3 = Pieces 1, 2, and 3 in order of performance.

Participant Five

Participant five was a 14-year-old male who had three pieces memorized and performance ready at the beginning of the study. Participant five received a self-modeling video for his third piece. Due to scheduling conflicts, participant five spent less time in the IN phase compared to the other participants (See Table 1).

MPA and Self-efficacy

The relational changes between MPA and self-efficacy for participant five present conflicting results over time (see Figure 9), as with participants two and four. However, his self-efficacy changes were small, making it difficult to draw conclusions about the MPA/self-efficacy

relationship. Since the participant scored near the top of the SEMP, he may not have had much room to increase on the scale. With a different measure, it is possible that participant five's self-efficacy would have continued to increase as MPA decreased instead of remaining stable.

MPA and Performance Quality

The relational changes between MPA and performance quality for participant five also support Kenny's (2011) MPA definition (see Figure 9). However, like the SEMP scores, the changes in performance evaluations are small, making it difficult to draw conclusions. Given that the decreasing MPA scores did not appear to affect performance, participant five may have developed strategies to minimize the impact of MPA on performance (see participant four).

MPA and Behavioural Anxiety

The relational changes between MPA and behavioural anxiety are partially expected for participant five (see Figure 9). As with participants three and four (see above) the results suggest that participant five may have perceived changes in MPA symptoms not visible to the BAI judges. However, as with the other dependent variables, the BAI scores remained relatively stable, making it difficult to draw conclusions about the MPA/behavioural anxiety relationship.

Self-modeling Video

Results suggest that the modeling video had a positive, lasting effect on MPA and self-efficacy for the modeled piece, as well as a positive, lasting spillover effect on the non-modeled pieces. The remaining results suggest a positive effect (behavioural anxiety) or negative effect (performance quality) (see Figure 10). Except for performance quality, skill level may account for the other positive results (see participants two and four). Participant five performed at a less advanced piano level compared to the other participants (see Table 1), meaning he may have had more room to demonstrate improvement following the modeling treatment.

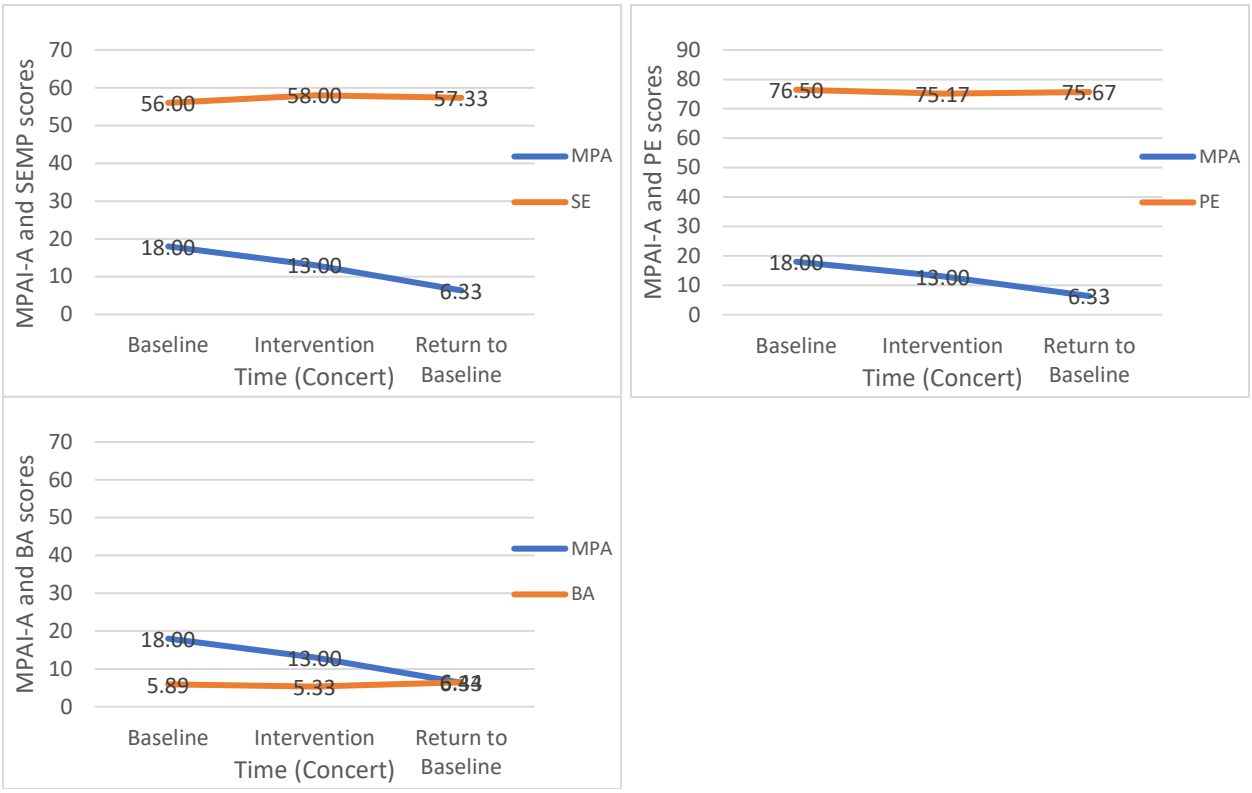

Figure 9. Changes in MPA and self-efficacy, MPA and performance quality, and MPA and behavioural anxiety over time for participant five. MPA = Music performance anxiety as measured by the MPAI-A (Osborne & Kenny, 2005), SE = Self-efficacy as measured by the SEMP (Ritchie & Williamon, 2011), PE = performance evaluations, BA = Behavioural anxiety as measured by the BAI (Brotons, 1994).

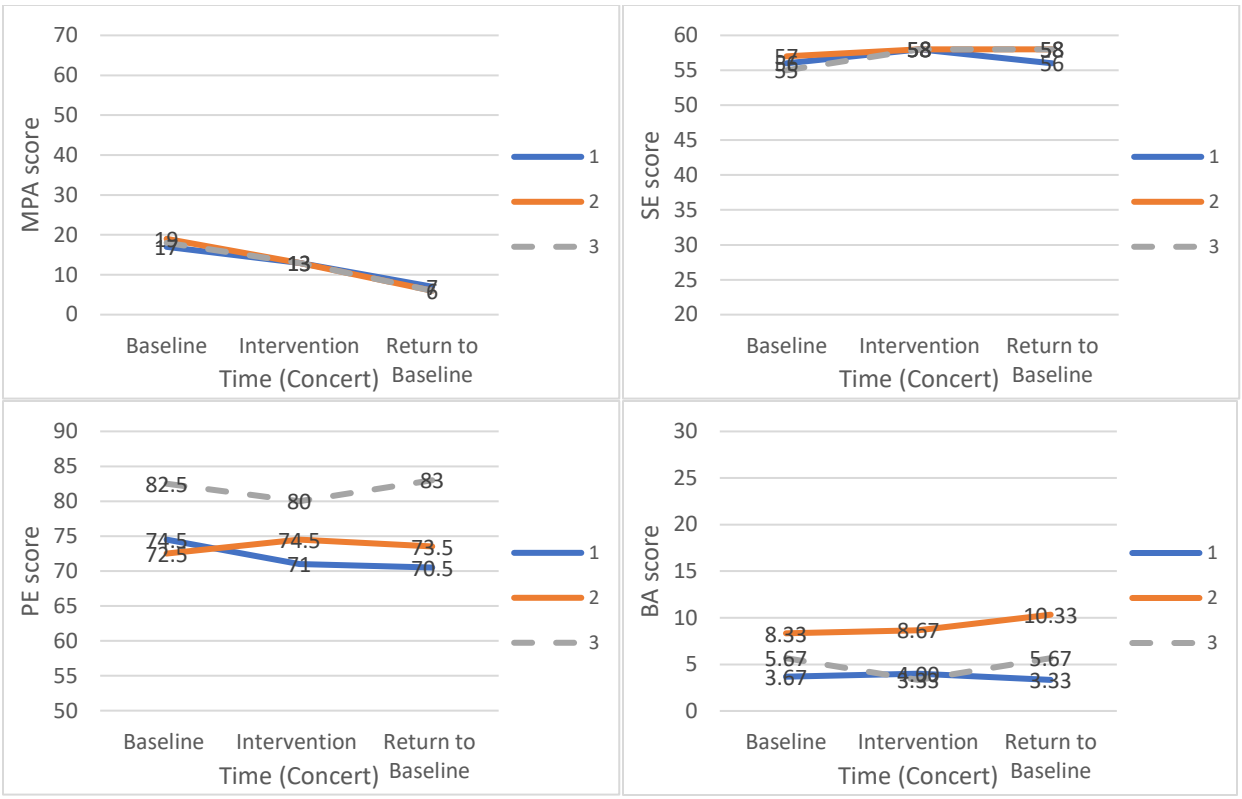

Figure 10. Comparing changes for participant four in MPA, self-efficacy, performance evaluations, and behavioural anxiety over time between modeled and unmodeled pieces. The modeled piece is indicated with a dotted line on the graph. MPA = Music performance anxiety as measured by the MPAI-A (Osborne & Kenny, 2005), SE = Self-efficacy as measured by the SEMP (Ritchie & Williamon, 2011), PE = performance evaluations, BA = Behavioural anxiety as measured by the BAI (Brotons, 1994). 1, 2, & 3 = Pieces 1, 2, and 3 in order of performance.

Discussion

The present study asked the following questions: 1) How do a) MPA and self-efficacy, b) MPA and performance quality, and c) MPA and behavioural anxiety change in relation to each other over the course of a six-week self-modeling intervention? 2) To what extent does a self-modeling intervention designed for adolescent piano students affect MPA, self-efficacy, performance quality, and behavioural anxiety?

First, the relational changes between MPA and self-efficacy in the current study indicate that participants often felt less efficacious about performing when feeling less anxious, and vice versa. This pattern was demonstrated at all three concerts by two participants, and at least two

concerts by the remaining participants. Hanin (2000) suggests that a certain amount of arousal or anxiety is necessary to facilitative peak performance and given that participants often felt more efficacious when MPA levels increased, our findings suggest that some participants needed a certain amount of facilitative anxiety to feel like they could perform well. The current results contrast a negative anxiety/self-efficacy relationship proposed by Bandura (1977) and found in previous studies with young musicians (Dempsey & Comeau, 2019; Hendricks et al., 2015). However, the former studies do not differentiate between facilitative and debilitative MPA and the negative relationship may refer to increased self-efficacy in the presence of decreased debilitative MPA. While reducing debilitative MPA can help musicians feel more efficacious, teaching students to identify and foster facilitative aspects of MPA may be just as beneficial.

Secondly, the relational changes between MPA and performance quality in the current study support Kenny's (2011) definition which states that MPA "may or may not impair the quality of performance" (p. 61). For all participants, increased MPA negatively impacted performance half of the time, and positively impacted performance the remaining times. A similar pattern was present when MPA decreased, echoing the inconsistent MPA/performance findings in other studies (Juncos et al., 2017; Spahn et al., 2016). Like self-efficacy, the results suggest that differentiating between facilitative/debilitative MPA could broaden our understanding of the MPA/performance quality relationship. If a certain amount of arousal or facilitative anxiety maximizes performance (Steptoe & Fidler, 1987), then decreasing MPA may be beneficial (see participants one and two), but only to a certain point (see participant three). After that point, a reduction in MPA may prove counterproductive. Additionally, results from participants four and five suggest that with experience, students may be able to develop strategies that minimize the impact of MPA on performance altogether. This gives hope that

further research can provide other students with similar tools to enable optimal performance, by focusing both on reducing debilitative and maximizing facilitative MPA.

Thirdly, the relational changes between MPA and behavioural anxiety often provide conflicting results, reflecting the findings in the literature (Braden et al., 2015; Kendrick et al., 1982, Spahn et al., 2016). Compared to MPA, behavioural anxiety changed equally in parallel and opposite directions across participants. The self-report MPA measures in the past and present studies could account for the mixed results, as they allow participants to report on a variety of perceived changes, including some which are not visible to outside observers. Future studies could explore a more direct comparison between perceived and observed behavioural anxiety symptoms by using a self-report measure specific to behavioural anxiety. However, important teaching implications arise from the knowledge that perceived and observed MPA can differ. Teachers should be aware that observation alone may not provide an accurate MPA assessment, as some students who do not appear anxious may still suffer from undetected MPA.

Finally, the self-modeling intervention has no clear effects on MPA, self-efficacy, performance quality, or behavioural anxiety across participants. The MPA results contrast the consistent non-significant anxiety results in the literature (Starek & McCullagh, 1999; Vezzosi, 2017), while the self-efficacy and performance results reflect mixed significant (Foltz, 2014; Ste-Marie, Rymal et al., 2011) and non-significant findings (Law & Ste-Marie, 2005; Winfrey & Weeks, 1993). No other modeling studies have examined behavioral anxiety to date. The results suggest that the modeling effects may be vulnerable to influence from outside variables, such as skill level and MPA severity. As mentioned above, participant five was the least advanced participant, meaning he may have had more room for improvement compared to more skilled participants (Law & Ste-Marie, 2005). A lower skill level could explain why participant five

demonstrated positive effects more consistently than the other participants. As well, participants five and two had the lowest base MPA scores and experienced positive self-efficacy effects, while participants with higher MPA scores experienced no self-efficacy effects. Since high MPA is linked with low self-efficacy in some studies (Orejudo et al., 2017; Robson & Kenny, 2017), any possible self-efficacy effects from the modeling video may not have been enough to compensate for the negative MPA effects. Overall, the modeling video affected participants differently, suggesting that self-modeling effects on musicians may be individual. While self-modeling may provide music teachers with a versatile strategy to improve MPA, self-efficacy, and/or performance quality, teachers should be aware that the effects may vary between students.

Limitations

The first limitation of the present study is sample size. Due to a small number of participants, the results are specific to the study and not generalizable to the population. The questionnaires are a second study limitation. The participants repeatedly completed the MPAI-A and SEMP during the study, and may have experienced respondent fatigue (Porter, Whitcomb, & Weitzer, 2004). Participants can become tired when completing multiple surveys, causing the quality of data to deteriorate. A final limitation is the time frame of the study. Some participants spent less time in the IN phase due to scheduling constraints, and therefore viewed their modeling video fewer times. Standardized time frames would provide more consistent and comparable data.

Future Research

Further research differentiating between facilitative and debilitative MPA could provide more insight into how MPA relates to self-efficacy and performance in young musicians. As well, research considering perceived and observed behavioral anxiety should explore a more

direct comparison by using self-report measures specific to behavioural anxiety. Future modeling research could examine the extent to which MPA moderates self-efficacy effects. Finally, further research could investigate self-modeling effects on an individual basis, as trying to find a group trend among musicians may not be the best approach.

Conclusion

The results indicate that the relational changes between MPA, self-efficacy, and performance quality within young musicians are complex. There were no observed relationships between MPA and self-efficacy or performance, suggesting that MPA can have both debilitative and facilitative effects on these variables. Additionally, there was no relationship between perceived MPA and observed behavioural anxiety. This provides practical implications for music teachers, who should be aware that students who do not appear anxious could be suffering from undetected MPA. Finally, the results suggest that self-modeling effects on young musicians may be individual. Teachers should consider using self-modeling on a case to case basis to help students reduce MPA, improve performance quality, and/or feel more confident performing.

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Chapter 4: The Impact of the Four Sources of Efficacy on Adolescent Musicians within a Self-modeling Intervention[9]

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Abstract

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 performance, 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 musicians. 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 is to investigate how Bandura's (1977) four sources of efficacy information (i.e., enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological/affective states) influence self-efficacy beliefs in adolescent musicians during a six-week self-modeling intervention. Additionally, the study explores the effects of the self-modeling intervention on musician self-efficacy. The study examines 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 examination[10] 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

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

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

Participant	Age	Gender	Piano level	Base MPA score	Modeled piece	Number of modeling video views	Days spent in B phase	Days spent in IN phase	Days spent in RB phase
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

Participant	B phase journals completed	IN phase journals completed	RB phase journals completed	Number of pieces performed in B concert	Number of pieces performed in IN concert	Number of pieces performed in RB concert
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 4A). 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 4B). 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

Codes	Definitions
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
Performance Anxiety	Physiological/affective information derived from somatic, cognitive, or behavioral anxiety symptoms
Other	Physiological/affective information derived from other thoughts or feelings that inhibit performance
Facilitative	Physiological/affective information that helps performance
Calm	Physiological/affective information derived from calm or relaxed feelings
Other	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

Codes	Kim		Sarah		Liam		Ashley		Steve		Donna		Total	
	I	J	I	J	I	J	I	J	I	J	I	J	I	J
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	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														
Calm	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Other	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Inhibiting														
Performance Anxiety	X	X	X	X	X	X	X	X	X	X	X	X	6	6
Other	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 (Royo, 2014; Hendricks, 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 efficacy 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.

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Appendix 4A

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 4B

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 experiences? 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 the 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?

Chapter 5: Teacher Perspective on Music Performance Anxiety: An Exploration of Coping Strategies Used by Music Teachers[11]

[11] Submitted to British Journal of Music Education

Abstract

The purpose of this study was to explore MPA from music teachers' perspectives by identifying and describing common coping strategies teachers use to support students with MPA. A quantitative content analysis of scientific and non-scientific MPA literature identified preparation, open communication, realistic expectations, exposure therapy, and deep breathing as the five most common coping strategies mentioned in the literature. Qualitative thematic analyses of existing literature and interview transcripts from five piano teacher participants provided descriptions of the five commonly identified coping strategies. A comparison of literature and interview results suggests a gap between research knowledge of MPA and practical teaching application. While music teachers employ a variety of strategies to help students cope with MPA, they may also benefit from formal MPA training opportunities grounded in research to provide additional resources for effectively managing students with MPA.

*Keywords***:** music performance anxiety, music teachers, music education, young musicians, coping strategies

Teacher Perspective on Music Performance Anxiety: An Exploration of Coping Strategies used by Music Teachers

Numerous studies show that young musicians often experience music performance anxiety (MPA) when asked to perform in public (Nusseck, Zander, & Spahn, 2015; Patston & Osborne, 2016). Research suggests that the student/teacher relationship impacts anxiety (Liu, 2016), making it crucial that teachers provide proper MPA support to young musicians. While many MPA intervention studies conclude with suggestions for music teachers (MacAfee & Comeau, 2020; Osborne & Kenny, 2008), few studies examine whether teachers are implementing researcher suggestions (Jordan, 2016; Sieger, 2017). Therefore, the current study explores MPA from a music teacher perspective and has two aims: to identify common coping strategies music teachers use to support students with MPA, and to explore how music teachers describe common coping strategies used in their teaching practice.

Music Performance Anxiety in Young Musicians

Kenny (2011) comprehensively defines MPA as:

> The experience of marked and persistent anxious apprehension related to musical performance that has arisen through underlying biological and/or psychological vulnerabilities and/or specific anxiety-conditioning experiences. It is manifested through combinations of affective, cognitive, somatic, and behavioural symptoms. It may occur in a range of performance settings, but is usually more severe in settings involving high ego investment, evaluative threat (audience), and fear of failure. It may be focal (i.e. focused only on music performance), or occur comorbidly with other anxiety disorders, in particular social phobia. It affects musicians across the lifespan and is at least partially

> independent of years of training, practice, and level of musical accomplishment. It may or may not impair the quality of performance (p.61).

Musicians with MPA can present a variety of cognitive, somatic, and behavioural symptoms including worry, memory problems, shaking, increased heart rate, changes in breathing, and avoidance behaviours (Hallam, Cross, & Thaut, 2009; Kenny, 2011; Kesselring, 2006). Researchers suggest that musicians of all ages experience MPA (Boucher & Ryan, 2011; Casanova, Zarza, & Orejudo, 2018; Thomas & Nettelbeck, 2014), and unaddressed MPA in young musicians can result in the early termination of music education (Orejudo, Zarza-Alzugaray, & Casanova, 2018). Several factors may influence MPA, including gender (Coskun-Senturk & Cirakoglu, 2017; Ryan, 2005), perfectionism (Kenny, Davis, & Oates, 2004; Patston & Osborne, 2016), self-efficacy (Hendricks, Smith, & Legutki, 2015; McPherson & McCormick, 2006), and age (Dempsey & Comeau, 2019; Patston & Osborne, 2016). With regards to age, Dempsey and Comeau, as well as Patston and Osborne, found that self-report MPA increased with age in 7-17-year-olds. The progression of MPA from childhood to adolescence coupled with the potential risk that MPA may cause students to end their music education early indicates that young musicians may benefit from learning effective MPA coping strategies.

Many researchers have investigated different interventions designed to reduce MPA. For example, researchers tested the efficacy of cognitive behavioural therapy (Braden, Osborne, & Wilson, 2015; Osborne, Kenny, & Cooksey, 2007), yoga and meditation (Blyskal, 2018; Stern, Khalsa, & Hofmann, 2012), and modeling (MacAfee & Comeau, 2020; Moody, 2014) and found that participating musicians reported positive MPA effects following intervention. These results provide music teachers with potential strategies to diminish MPA in students. Additionally, many non-intervention MPA studies end with recommendations to music educators (Atlas,

Taggart, & Goodell, 2004; Mitchell, 2011; Osborne & Kenny, 2008). Patston (2014) reviewed MPA literature and concluded with advice for teachers on how to help students cope with MPA throughout their developmental trajectory. Similarly, Slocumb's (2009) review of literature ends with a list of strategies music educators can use to teach brass players how to manage various MPA symptoms. In both studies, researchers recognize the need to provide teachers, and indirectly students, with MPA coping skills. However, despite the suggestions available to music teachers, few researchers have examined whether teachers are implementing literature findings in their everyday teaching practice.

Teacher Perspective on MPA

Teachers often work closely with young musicians, specifically in the context of private music teaching, and can act as a front-line defense against MPA (Liu, 2016). However, few scientific studies explore MPA from a teacher perspective. Jordan (2016) explored teacher perspective in a multiple case study examining how undergraduate music schools address MPA. Interviews with primary instrumental instructors revealed that teachers were the primary resource for addressing student MPA. However, most teachers felt unprepared to help students manage MPA as they lacked formal training and had not been taught MPA coping skills by previous teachers. Similarly, Liu (2016) and Sieger (2017) respectively interviewed three university music teachers and three public school instrumental teachers and found that participating teachers did not have formal MPA training. Instead, teachers drew from personal experience to provide students with coping strategies. Even without formal training, teachers intuitively suggested several coping strategies that have been tested in intervention studies, such as exposure therapy (Bissonnette, Dube, Provencher, & Sala, 2011; Crawford, 2011), meditation (Blyskal, 2018; Diaz, 2018), and visualization (Clark & Williamon, 2011; Hoffman & Hanrahan,

2012). These studies suggest that music teachers have some tools to help students cope with MPA but could benefit from formal training grounded in scientific, researched-based literature.

Non-scientific, practice-based literature, in the form of magazine and newsletter articles written by private music teachers, provide further insight into teacher perspective. Many private teachers have written non-scientific articles with the purpose of sharing MPA knowledge with other teachers. While non-scientific articles are typically based on informal observation and grounded in teachers' personal experience, the information provided often aligns with scientific MPA literature. For example, many teachers observe cognitive, physical, and behavioural MPA symptoms in students, such as worry, memory difficulties, dry mouth, shaking hands, increased bodily tension, upset stomach, and elevated heart rate (Crappell, 2014; Ginsborg, 2019; Thio, 2009; Wan, 2016), which are also described in scientific literature (Hallam, Cross, & Thaut, 2009; Kenny, 2011). Additionally, teachers in non-scientific literature describe self-efficacy (Boyett, 2019; Petrovich, 2003), perfectionism (Knerr, 2009; Nagel, 2015), and gender (Johnson, 2004; Knerr, 2009) as factors that may influence MPA in students. These factors have also been identified in scientific literature as potential variables affecting MPA (self-efficacy: McPherson & McCormick, 2006; Robson & Kenny, 2017; perfectionism: Kenny, Davis, & Oates, 2004; Nielsen et al., 2018; gender: Nusseck et al., 2015; Ryan, 2005). Interestingly, when discussing the effects of gender on student MPA, Johnson (2004) admits that while she recognizes that boys and girls may need different MPA strategies, she does not know how to provide that for her students. This seems to echo a larger trend in that music teachers are accurately observing symptoms and trends in student MPA based on comparisons to scientific literature but often lack the training needed to help their students effectively manage MPA.

Purpose of the Study:

To provide teachers with applicable MPA training, it is first helpful to understand what teachers are currently doing to assist students with MPA. The purpose of this study is to explore MPA from music teachers' perspectives by identifying and describing common coping strategies music teachers use to support students with MPA. The study examines the following research questions: (a) What are the five most common strategies music teachers use to support young musicians with MPA based on a quantitative content analysis of scientific and non-scientific literature?, (b) How do music teachers describe the five most common MPA coping strategies (as identified in the previous question) based on a thematic analysis of scientific and non-scientific literature, (c) How do piano teachers describe the five most common MPA coping strategies (as identified in the first question) based on a thematic analysis of semi-structured interviews?

The remainder of the paper is presented in three parts. The first part will present the quantitative content analysis of scientific and non-scientific literature. The second part will present the qualitative thematic analysis of scientific and non-scientific literature. The third part will present the thematic analysis of piano teacher interviews, followed by a discussion synthesizing the results of parts one, two, and three.

Part One: Quantitative Content Analysis of Scientific and Non-scientific Literature

Method

Sample

A basic quantitative content analysis examined the common strategies in the literature that music teachers use to support young musicians with MPA. The population for the analysis included scientific literature looking at MPA from a teacher's perspective and non-scientific literature written by music teachers. ProQuest databases and Google Scholar were systematically searched using the keywords "music performance anxiety" combined with

"teacher" to identify scientific literature. These searches yielded 374 and 670 results respectively, and the researcher reviewed titles and abstracts of the first 100 references from each search to determine relevance. Relevant literature included all literature referencing MPA coping strategies used by teachers or teacher perspective on MPA. Twenty scientific sources were identified as potentially relevant and included in the sample. Searches were also conducted in two popular magazines for music teachers, *Clavier Companion* and *American Music Teacher*, to identify non-scientific literature. A different set of keywords was used to identify non-scientific articles written by teachers: *anxiety, stage fright, fear,* and *nervous.* These searches yielded 32 and 52 results, respectively, and all results were reviewed for relevance. Twenty-three non-scientific sources were included in the sample, for a total of 43 sources.

Data analysis

The identified sample underwent a quantitative content analysis, which is when existing texts are analyzed by calculating the frequencies of specific units appearing in the literature. Researchers focused on manifest content only and identified specific meaningful passages of materials as recording units (Drisko & Maschi, 2015). Recording units for the current analysis were any passages related to MPA coping strategies employed by music teachers, and an MPA strategy was defined as any intervention, method, or philosophy a teacher used to reduce student MPA. Thirty-three of the 43 sample sources contained recording units, and each unit was inductively assigned a code related to type of MPA strategy. For example, a recording unit discussing teachers providing low-pressure performance situations to reduce anxiety was coded as "exposure to performance." After coding, a frequency count totalled the amount of times each code appeared in the sample, with each code being counted one time per source. The frequency count determined the five codes appearing most often in the literature.

Results

Thirty-one coping strategies were identified during the quantitative content analysis. The five most frequently coded coping strategies are preparation, open communication, realistic expectations, exposure therapy, and deep breathing (See Table 1).

Table 1

MPA coping strategies used by music teachers identified in scientific and non-scientific literature

Strategy	Scientific articles identifying strategy	Non-scientific articles identifying strategy	Total articles identifying strategy
Preparation	9	11	20
Open communication	7	8	15
Realistic expectations	4	9	13
Exposure to performance	6	7	13
Deep breathing	6	7	13
Imagery/ Visualization	7	5	12
Physical relaxation techniques	6	4	10
Focus	4	6	10
Using different strategies	3	5	8
Meditation/ mindfulness	3	4	7
Self-talk	3	4	7
Goal setting	6	0	6
Positive feedback	3	3	6
MPA education	3	2	5
Modeling	2	3	5
Build positive support network	2	3	5
Teach flow	3	2	5
Beta blockers	1	3	4
Foster self-confidence	2	2	4
Create safe environment	2	2	4
Cognitive behavioural therapy	4	0	4
Care for physical body	2	2	4
Focus on joy of music making	3	1	4
Teach problem solving	2	1	3
Teach performance reflection	2	1	3
Humour	1	1	2
Psychological counselling	1	1	2
Distract from anxious thoughts	1	1	2
Provide “back-up plan”	0	2	2
Collaborative playing	0	1	1
Teach improvisation skills	1	0	1

Note. MPA = Music performance anxiety. See Appendix 5A for full list of scientific and non-scientific articles identifying each coping strategy

Part Two: Qualitative Thematic Analysis of Scientific and Non-scientific Literature

Method

Sample

A qualitative thematic analysis explored how music teachers describe common MPA coping strategies in scientific and non-scientific literature. The sample consisted of all articles identified in part one as related to one of the five frequently coded coping strategies. Eleven scientific and twenty non-scientific articles were included, for a total of 31 sources.

Data Analysis

All articles were deductively coded (Braun & Clark, 2006), using the five most frequently coded strategies identified in part one as broad themes. After reviewing the data, the researcher created a list of codes within each theme. Two researchers with qualitative coding and music teaching experience independently coded three articles with the initial coding list. The researchers compared results and achieved high agreement for all codes. After establishing inter-coder agreement, the primary researcher coded the remaining data using the final coding list (See Table 2). While Creswell (2007) suggests remaining open to addition themes, the researchers focused on the five identified themes to limit the scope of the paper.

Table 2

Coding list and definitions

Codes	Definitions
Preparation	**Using musical or non-musical preparation to decrease MPA**
Musical preparation	Helping students prepare for the musical aspects of performing

Performance preparation	Helping students prepare for performance and non-musical aspects of performing
Open communication	**Using open student-teacher communication to decrease MPA**
Communication about MPA	Discussion about causes, symptoms, treatments, and coping strategies for MPA
Fostering open communication	Strategies teachers can use to foster open communication with students
Avoid MPA discussion	Avoiding MPA discussion with students
Realistic expectations	**Helping students set realistic expectations to decrease MPA**
Performance expectations	Encouraging students to set realistic, non-perfectionistic performance goals
Learning expectations	Encouraging students to set realistic, non-perfectionistic music learning goals
Exposure to performance	**Providing positive performance opportunities to students to decrease MPA**
Graded mastery experiences	Providing students with low-pressure performance opportunities
Frequent performance opportunities	Providing students with frequent performance opportunities
Deep breathing	**Using deep breathing as a physiological technique to decrease MPA**
MPA effect on breathing	Describing physiological effects of MPA on student breathing
Benefits of deep breathing	Describing how students can benefit from using deep breathing techniques
Breathing techniques	Describing different deep breathing techniques

Results

Thirty-one scientific and non-scientific articles were coded in the qualitative thematic analysis using the five strategies identified in part one (preparation, open communication, realistic expectations, exposure to performance, deep breathing) as broad themes. Since both sources describe similar content, scientific and non-scientific data are presented in combination.

Preparation

Twenty articles described preparation as an effective MPA coping strategy (see Appendix 5B). Teachers identified poor preparation as a large contributor to student MPA, and propose

that “one way to cope with anxiety is being well prepared for each aspect of the music: the structure, basic technique, interpretation, memory, and performance” (Liu, 2016, p. 123). Descriptions of preparation fell into two categories: musical and performance preparation. Teachers described musical preparation as helping students learn their pieces well to promote musical security before performing onstage. Several different techniques were used to musically prepare students, such as providing proper practice instructions, using analytical activities to enhance student understanding of the music, and teaching proper memorization. Teachers described performance preparation as helping students prepare for non-musical aspects of performance. This can include teaching students to manage performance malfunctions, providing dress rehearsals, and addressing other aspects that can contribute to MPA. Teachers suggest training students to deal with potential performance problems, such as distractions or memory slips. Additionally, dress rehearsals can increase student comfort in the performance space by allowing students to “test-run” their piece and have the added benefit of ensuring that students are musically prepared. Finally, teachers discuss addressing any remaining non-musical aspects, such as shoes and clothing, introductions and bowing, and proper sleep and nutrition. Kirchner (2004) states that “attending to these [non-musical] matters will help reduce any last-minute panic on the day” (p. 22). While teachers believe that preparation may decrease MPA, they also acknowledge that preparation will not necessarily eradicate MPA.

Open Communication

Fifteen articles described open teacher-student communication as an effective strategy to buffer against MPA (see Appendix 5B). Descriptions of open communication fell into three categories: communication about MPA, fostering open communication, and avoiding MPA discussion. Teachers in the literature felt it was their responsibility to discuss MPA symptoms,

causes, and treatments with students. For example, Johnson (2004) suggests that teachers should proactively discuss MPA as "waiting to have the 'how to cope' talk after a performance disaster is too little, too late" (pg. 81). Teachers also describe the importance of creating a safe environment as students are more likely to speak honestly about MPA when they feel comfortable. Suggestions for creating a safe environment include listening, validating fears, sharing personal experience, and normalizing MPA. While most teachers in the literature prefer proactive MPA communication, several teachers avoided MPA discussion with younger students for fear that "it would inadvertently increase the possibility of occurrence" (Sieger, 2017, p. 45). Teachers feared that introducing the concept of MPA to students who had not yet experienced symptoms could unintentionally increase MPA.

Realistic Expectations

Thirteen articles described setting realistic expectations as an effective strategy to manage MPA (see Appendix 5B). Descriptions of realistic expectations fell into two categories: performance expectations and learning expectations. Teachers suggest perfectionistic expectations can increase MPA in students and agreed that, "striving for perfection (versus appreciating competence and playing 'as well as you can') is a ticket to experiencing performance anxiety" (Nagel, 2015, p. 46). Teachers combat perfectionism induced MPA by helping students set realistic performance expectations that focus on intrinsic rather than extrinsic goals. Teachers suggest helping students set intrinsic goals such as playing through a piece without stopping or working towards performing expressively rather than perfectly. Johnson (2004) states, "It's really never too soon … to let the student know that one wrong note does not nullify the other 683 beautifully played ones" (p. 81). Teachers in the literature also describe setting realistic learning goals, as unrealistic expectations, such as assigning a piece that

is too challenging, can result in failure experiences and decreased performance self-efficacy. Realistic learning expectations can include choosing appropriate repertoire, setting reasonable learning timeframes, and setting manageable practice goals.

Exposure to Performance

Thirteen articles described exposure to performance as an effective MPA coping strategy (see Appendix 5B). Descriptions of exposure fell into two categories: graded mastery experiences and frequent performance opportunities. Teachers suggest that exposure to performance can decrease MPA as it helps "students to become desensitized to the uniqueness of high-stakes music performance (Jordan, 2016, p. 104). Teachers describe graded mastery experiences, which are when "exposure is introduced incrementally beginning with low-intensity performance situations, such as playing for a friend in one's home, and graduating to higher-intensity experiences, such as playing in a larger venue (Garner, 2004, p. 57). The positive mastery experience gained from low-intensity performances can increase self-efficacy and decrease MPA for subsequent higher-intensity performances. Teachers stress the importance of providing low-intensity opportunities in supportive settings, as students are less likely to feel anxious performing in a positive environment. Teachers also suggest that students should perform frequently, indicating that on stage comfort typically increases the more often students perform. Frequent exposure also allows students to "gradually gain practice coping with negative symptoms associated with anxiety" (Garner, 2004, p. 57), and as students gain more experience performing successfully despite MPA symptoms, their confidence in coping with MPA increases.

Deep Breathing

Thirteen articles described deep breathing as an effective strategy to manage MPA (see Appendix 5B). Descriptions of deep breathing fell into three categories: MPA effect on breathing, benefits of deep breathing, and breathing techniques. Teachers in the literature state that MPA can interfere with normal breathing patterns when "the sympathetic branch of the autonomic nervous system begins to work harder and cause symptoms such as increased heart rate, respiration, dizziness and muscle tension" (Boyett, 2019, p. 11). To combat physiological MPA symptoms, teachers suggest using deep breathing to regulate the autonomic nervous system and promote relaxation. Teachers described deep breathing as a practical strategy because it can be "applied in several settings" (McKinney, 2008, p. 27), and a versatile strategy because it can be combined with other coping skills such as progressive muscle relaxation or visualization. While practical and versatile, teachers stress that students should practice deep breathing prior to performing, as "it will be impossible to execute under pressure unless the student has planned this into his or her performance" (McKinney, 2008, p. 28). Teachers in the literature described several deep breathing techniques including centered breathing, counting the breath, and breath awareness.

Part Three: Qualitative Thematic Analysis of Piano Teacher Interviews

Method

Participants

The Research Ethics Board of the researcher's home institution approved this study. Five private piano teachers between the ages of 22 and 57 participated. Participants were required to have at least one year of teaching experience and needed to currently be teaching private piano lessons. All participants belonged to the Ontario Music Teachers Registered Association (ORMTA) and were recruited in person at an ORMTA conference in Ottawa. Additionally, all

participants studied under the Royal Conservatory of Music (RCM) curriculum and taught piano lessons at private home studios. Helen was a 24-year old female who had an RCM elementary piano pedagogy certificate as well as a grade 10 RCM piano performance certificate. She was currently completing a Bachelor of Music. Isaac was a 36-year old male who had an RCM Associate Diploma (ARCT) certificate in piano performance as well as a Bachelor of Music. Janet was a 47-year old female who had an RCM ARCT certificate in piano performance and an Associate Teacher's diploma from Conservatory Canada (CC). Janet also had a Master's degree in Piano Performance and Pedagogy. Kristina was a 57-year old female who had an RCM ARCT certificate in piano pedagogy. Finally, Leah was a 27-year old female who had RCM ARCT certificates in piano performance and piano pedagogy and had a Bachelor of Music in Piano Performance (See Table 3).

Table 3

Demographic variables for interview participants

Participant	Age	Gender	Years teaching	Current number of students	Age range of students
Helen	22	Female	2	12	6 years old to 65 years old
Isaac	36	Male	15	45	6 years old to 83 years old
Janet	47	Female	32	30	4 years old to 70 years old
Kristina	57	Female	40	35	Average 8 to 10 years old
Leah	27	Female	12	27	6 years old to adult

Measurements

Semi-structured interviews. The researcher conducted semi-structured interviews to explore which coping strategies participants use to support students with MPA, as well as determine participants' general MPA knowledge (see Appendix 5C). Liu's (2016) pre-existing interview guide provided the basis for the current interview guide. Applicable questions from Lui's guide were adapted for the study, while several questions not pertaining to the project were

removed. As well, several researcher-created questions on coping with MPA were added to fully explore participants' teaching experiences helping students manage MPA. While the analysis focused on the five strategies identified in part one, the researcher did not ask specific questions related to these strategies. Instead, the interviews consisted of general questions related to MPA knowledge and strategies, which avoided biasing participant responses towards the strategies identified in part one. This allowed the researcher to determine if participants currently used the identified strategies, and if so, explore how they described them.

Procedure

The researcher recruited participants in-person on the first evening of an ORMTA conference. Conference attendants were provided with information on the current study and interested participants were asked to contact the researcher either in-person or via email. Once the researcher was contacted by potential participants, the researcher arranged to meet participants in-person on the second day of the ORMTA conference. After obtaining informed consent, participants completed semi-structured interviews in the hotel lobby where the conference was held. Interviews lasted between 15 and 25 minutes and were recorded using a recording program on the researcher's cell phone. Following the interviews, audio files were transferred to the researcher's computer and password protected, and pseudonyms were assigned to protect participant identity.

Data Analysis

The researcher transcribed all verbal, nonverbal, and background content in the interviews (McLellan, MacQueen, & Neidig, 2003). Upon review, the non-verbal content did not add additional meaning to the verbal content and was excluded from the analysis. The researcher adopted a three-pass-per-tape policy to establish transcription accuracy and performed

member checks to establish credibility (Lincoln & Guba, 1985; McLellan et al., 2003). After transcription, the researcher conducted a qualitative thematic analysis on the five interview transcripts using the method and coding list established in part two (See Table 2).

Results

Preparation

All five interview participants described preparation as an effective MPA coping strategy (see Appendix 5D). Interviewed teachers reported similar elements as teachers in the literature, such as using musical and performance preparation to reduce student MPA. Teachers described the importance of dress rehearsals and learning how to manage performance malfunctions so that "they [students] can do it even if something goes wrong" (Leah). Interviewed teachers also acknowledged that some students "prepare so well, and still things go wrong" (Janet), suggesting that students may need additional MPA coping strategies.

Open Communication

All five interview participants described open teacher-student communication as an effective strategy to buffer against MPA (see Appendix 5D). Interviewed teachers' descriptions of open communication differed from literature descriptions. Most participants shared a belief that teachers should discuss MPA with students, but student-teacher MPA communication only occurred if a student was already exhibiting MPA symptoms or if a performance was impacted by MPA. Otherwise, participants avoided MPA discussion with students who did not exhibit MPA symptoms for fear of inadvertently increasing MPA. For example, Helen stated, "For students that do get nervous, then I will talk about the nervousness of performance because they already know what it is," but Leah stated, "If the kid is totally happy to go onstage and play, I

wouldn't say, 'What if you get nervous?' Because then they might realize that they can get nervous."

Realistic Expectations

All five interview participants described setting realistic expectations as an effective strategy to manage MPA (see Appendix 5D). Similar to teachers in the literature, interviewed teachers agreed that perfectionistic performance expectations can increase student MPA. However, participants discussed intrinsic versus extrinsic goals more explicitly, and acknowledged the practical consequences that can stem from unsuccessful performances. For example, Kristina described how an unsuccessful university entrance audition could mean that a student must put their life on hold for a year. She highlights how intrinsic goals, like performance enjoyment, can help protect self-efficacy against the negative effect of unsuccessful extrinsic evaluations. In contrast to teachers in the literature, interview participants did not discuss realistic learning expectations.

Exposure to Performance

All five interview participants described exposure to performance as an effective MPA coping strategy (see Appendix 5D). Interviewed teachers reported similar elements as teachers in the literature, such as using graded mastery experiences and frequent performance opportunities to help decrease MPA. The teachers highlighted that low-intensity opportunities should be provided in supportive settings to help reduce MPA. For example, Helen's students gather before studio recitals to play musical games, which helps create a non-threatening atmosphere. Interviewed teachers also agree that performing frequently can help increase student comfort on stage. As Leah states, "Exposure is helpful for any fear, right? Just do it, a lot."

Deep Breathing

Three interview participants described deep breathing as an effective strategy to manage MPA (see Appendix 5D). While teachers in the literature often discussed deep breathing, this coping strategy was only briefly acknowledged by three interviewed teachers. For example, Krista indicated that she instructs students to "breathe, relax, and play the piece." While her comment indicates an awareness that deep breathing can benefit students during performance, the interviewed teachers did not describe how or why students might implement this coping strategy.

Discussion

The current study asked three research questions: (a) What are the five most common strategies music teachers use to support young musicians with MPA based on a quantitative content analysis of scientific and non-scientific literature?, (b) How do music teachers describe the five most common MPA coping strategies (as identified in the previous question) based on a thematic analysis of scientific and non-scientific literature, (c) How do piano teachers describe the five most common MPA coping strategies (as identified in the first question) based on a thematic analysis of semi-structured interviews?

A quantitative content analysis of scientific and non-scientific literature identified thirty-one strategies music teachers use to reduce MPA. The results suggest that teachers use a variety of tools to help students manage MPA. Of these strategies, preparation, open communication, realistic expectations, exposure therapy, and deep breathing were coded most frequently. Qualitative thematic analyses revealed that preparation was the coping strategy discussed most often by teachers in the literature and interviewed teachers. Teachers from both data sets agreed that poor preparation is a contributor to MPA, and therefore used musical and performance

preparation to reduce student MPA. Several study results support the idea that preparation can buffer against MPA (Clark & Williamon, 2011; Osborne & Kenny, 2008), and research also indicates that professional musicians combat MPA with preparation (Dempsey & Comeau, 2017). However, literature and interviewed teachers also suggest that preparation may not alleviate all MPA symptoms, an observation supported by Kenny's (2011) definition that MPA is "at least partly independent of preparation, experience, or practice" (p. 60). Since preparation may not eradicate MPA, teachers could consider providing additional coping strategies.

Open student-teacher MPA communication was the second most frequently discussed coping strategy from the quantitative analysis. The qualitative analysis revealed that teachers in the literature believe that proactive MPA discussion can increase student awareness, as well as encourage students to share their MPA experiences honestly with teachers. Literature teachers used tools such as validating fears, listening, and normalizing MPA to promote open student-teacher communication. In contrast, interviewed teachers avoided MPA discussion with younger students or students who did not exhibit MPA symptoms for fear that introducing the concept of MPA could unintentionally increase MPA. However, this belief could be problematic as comparisons between self-report MPA and observed behavioural anxiety symptoms indicate that self-perceived and observed MPA can differ (Braden et al., 2015; MacAfee & Comeau, 2020; Spahn, Walther, & Nusseck, 2016). Given that teacher observation may not accurately detect MPA, direct communication may be a more effective way for teachers to support students.

Setting realistic expectations was the third most frequently discussed coping strategy from the quantitative analysis, along with exposure therapy and deep breathing. The qualitative analysis suggests that teachers in the literature use realistic performance and learning expectations to help students combat perfectionism induced MPA. Since several study results

suggest a positive perfectionism/MPA relationship (Kenny et al., 2004; Nielsen et al., 2018), setting realistic expectations is a practical strategy teachers can use to address this research finding. In contrast, interviewed teachers discussed realistic performance, but not learning expectations, and were motivated to help students set intrinsic performance goals by the potential consequences of extrinsic evaluations. The differences between literature and interviewed teachers suggests a gap between research knowledge and practical application and indicates a need for methods of communicating research findings to practicing music educators.

Exposure therapy was the fourth strategy identified in the quantitative analysis. Qualitative analyses suggest that literature and interviewed teachers offer students graded mastery experiences and frequent performance opportunities to increase comfort on stage. Students are more likely to succeed in low-intensity environments, and the resulting positive mastery experiences can increase self-efficacy for subsequent performances (Hendricks et al., 2015; Royo, 2014). Given findings that indicate a negative self-efficacy/MPA relationship (McPherson & McCormick, 2006; Robson & Kenny, 2017), increases in self-efficacy following exposure therapy may also decrease MPA. Exposure therapy can also help students feel more confident in their ability to manage MPA. When students perform successfully despite MPA, the positive mastery experience will likely help them feel more efficacious the next time they have to cope with MPA symptoms (Bandura, 1993).

Deep breathing was the final strategy identified in the quantitative analysis. A qualitative analysis revealed that teachers in the literature viewed deep breathing as a practical strategy to help regulate physiological MPA symptoms. Literature teachers described several different breathing exercises for students, demonstrating the versatility of the strategy. However, the qualitative analysis of interview transcripts demonstrated that interviewed teachers had minimal

awareness that deep breathing could benefit student performance or manage MPA. Again, the differences between literature and interviewed teachers suggests a gap between research knowledge and application when it comes to effectively supporting students with MPA.

Limitations

The sample size of the interviewed participants limits the transferability of the findings to the overall population. Generalizations about all music teachers are not possible in the current study. A second limitation is participant recruitment. Given that potential participants were asked to contact the researcher, it is likely that the teachers who chose to participate were already interested in the topic of MPA. As such, the interview data may not represent the views of teachers who are not interested or are less knowledgeable about the topic. A third limitation is the non-scientific literature sample size. The literature search was limited to two music magazines for the scope of the paper, but a wider range of non-scientific literature may be found in other magazines. The semi-structured interviews are a fourth limitation. The researchers did not ask questions about specific strategies for fear of biasing participant responses. While general interview questions allowed the current study to explore whether teachers are aware of and implementing MPA strategies from the literature, the absence of specified questions means that the interview data may not fully represent participant knowledge on the identified strategies. Finally, a fifth limitation is the study location. All interviewed teachers were from Ontario, and teachers from other regions may use different coping strategies. However, despite these limitations, this study offers important exploratory findings that can guide future research on MPA from music teachers' perspective.

Future Research

While the current study focused on five coping strategies, future researchers could investigate other strategies to gain a wider perspective on current MPA teaching practices. Additionally, future researchers could examine strategies used by teachers from different regions and pedagogical backgrounds to further investigate teacher perspective on MPA. Future researchers could also conduct a similar study with more non-scientific review and interview participants to continue to expand the scope of research. Finally, future researchers could use scientific literature to develop MPA training workshops for music teachers.

Conclusion

A quantitative content analysis of scientific and non-scientific literature revealed thirty-one strategies music teachers use to help students manage MPA, indicating that teachers employ a variety of tools to combat student MPA. Of these strategies, preparation, open communication, realistic expectations, exposure therapy, and deep breathing appeared most frequently in the literature. Two qualitative thematic analyses revealed that descriptions of these strategies varied between teachers in the literature and interviewed teachers, which suggests a gap between research knowledge and practical application. Providing teachers with formal training opportunities grounded in MPA research could bridge the knowledge gap and supply music teachers with additional resources to effectively manage student MPA.

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Appendix 5A

Table 4

MPA coping strategies used by music teachers identified in individual scientific and non-scientific references

Strategy	*Articles*	*Total*
Preparation	Boyett (2019); Brundage (2014); Crappell (2014); Dawson (2015); Garner (2014); Ginsborg (2019); Kirchner (2004); Kirchner et al. (2008); Knerr (2009); Kramer (2007); Liu (2016); Malebranche (2012); McKinney (2008); Mitchell (2011); Patston (2014); Robertson & Eisensmith (2010); Sieger (2017); Slocumb (2009); Snow (2017); Thio (2009)	20
Open communication	Anonymous (2012); Boyett (2019); Dawson (2015); Hendricks et al. (2014); Johnson (2004); Kramer (2007); Liu (2016); Malebranche (2012); McAllister (2015); Nagel (2018); Nagel (2017b); Patston (2014); Petrovich (2003); Sieger (2017); Slocumb (2009)	15
Realistic expectations	Brundage (2014); Johnson (2014); Jutras (2009); Kirchner (2004); Knerr (2009); McAllister (2015); Mitchell (2011); Nagel (2018); Nagel (2017a); Nagel (2015a); Patston (2014); Robertson & Eisensmith (2010); Sieger (2017)	13
Exposure to performance	Boyett (2019); Garner (2014); Jordan (2016); Kirchner (2004); Knerr (2009); Kramer (2007); Liu (2016); Malebranche (2012); McKinney (2008); Mitchell (2011); Petrovich (2003); Robertson & Eisensmith (2010); Thio (2009)	13
Deep breathing	Boyett (2009); Jordan (2016); Kirchner (2014); Kramer (2007); McAllister (2015); McKinney (2008); Mitchell (2011); Nagel (2018); Petrovich (2003); Robertson & Eisensmith (2010); Sieger (2017); Slocumb (2009); Snow (2017)	13
Imagery/ Visualization	Boyett (2019); Jordan (2016); Kirchner (2004); Kramer (2007); Liu (2016); Malebranche (2012); McAllister (2015); Mitchell (2011); Petrovich (2003); Sieger (2017); Slocumb (2009); Snow (2017)	12
Physical relaxation techniques	Anonymous (2012); Boyett (2019); Jordan (2016); Kirchner (2004); Malebranche (2012); McAllister (2015); Mitchell (2011); Petrovich (2003); Robertson & Eisensmith (2010); Slocumb (2009)	10
Focus	Crappell (2014); Kirchner (2004); Kirchner et al. (2008); Knerr (2009); McKinney (2008); Robertson & Eisensmith (2010); Sieger (2017); Slocumb (2009); Snow (2017); Thio (2009)	10
Using different strategies	Boyett (2019); Brundage (2014); Dawson (2015); Johnson (2004); Jordan (2016); Kramer (2007); Petrovich (2003); Sieger (2017)	8

Meditation/ mindfulness	Anonymous (2012); Boyett (2019); Kirchner (2014); Liu (2016); McAllister (2015); Petrovich (2003); Robertson & Eisensmith (2010)	7
Self-talk	Jordan (2016); Kirchner (2004); Kirchner et al. (2008); Kramer (2007); Nagel (2017b); Petrovich (2003); Slocumb (2009)	7
Goal setting	Kirchner et al. (2008); Malebranche (2012); Mitchell (2011); Patston (2014); Robertson & Eisensmith (2010); Slocumb (2009)	6
Positive feedback	Kirchner et al. (2008); Kramer (2007); Malebranche (2012); Petrovich (2003); Sieger (2017); Thio (2009)	6
MPA education	Dawson (2015); Jordan (2016); McAllister (2015); Patston (2014); Slocumb (2009)	5
Modeling	Kirchner (2004); Kramer (2007); Malebranche (2012); Mitchell (2011); Petrovich (2003)	5
Build positive support network	McAllister (2015); Nagel (2017b); Patston (2014); Petrovich (2003); Sieger (2017)	5
Teach flow	Boyett (2019); Parente (2015); Petrovich (2003); Sieger (2017); Slocumb (2009)	5
Beta blockers	Finch (2012); Kirchner (2014); Malebranche (2012); Petrovich (2003)	4
Foster self-confidence	Crappell (2014); Liu (2016); Mitchell (2011); Thio (2009)	4
Create safe environment	Hendricks et al. (2014); Jutras (2009); Mitchell (2011); Nagel (2017b);	4
Cognitive behavioural therapy	Boyett (2019); Jordan (2016); Malebranche (2012); Robertson & Eisensmith (2010)	4
Care for physical body	Kramer (2007); Malebranche (2012); McAllister (2015); Patston (2014)	4
Focus on joy of music making	Malebranche (2012); Mitchell (2011); Nagel (2017a); Slocumb (2009)	4
Teach problem solving	Malebranche (2012); Nagel (2017b); Patston (2014)	3
Teach performance reflection	Malebranche (2012); Patston (2014); Snow (2017)	3
Humour	Jutras (2009); Malebranche (2012)	2
Psychological counselling	Jordan (2016); Petrovich (2003)	2
Distract from anxious thoughts	Kramer (2007); Malebranche (2012)	2
Provide “back-up plan”	McKinney (2008); Snow (2017)	2
Collaborative playing	Thio (2009)	1
Teach improvisation skills	Boyett (2019)	1

Note. MPA = Music performance anxiety. Articles = The scientific and non-scientific articles containing recording units pertaining to the relevant MPA coping strategy. Total articles = total number of articles containing recording units related to the relevant MPA coping strategy

Appendix 5B

Table 5

Codes identified in thematic analysis of scientific literature and non-scientific literature

Articles	*Preparation*			*Open Communication*				*Realistic Expectations*			*Exposure to Performance*			*Deep Breathing*			
	P	*MP*	*PP*	*OC*	*CM*	*FO*	*AD*	*RE*	*PE*	*LE*	*EP*	*GM*	*FP*	*DB*	*ME*	*BB*	*BT*
Anonymous (2012)				x													
Boyett (2019)	x	x		x	x						x	x		x	x		
Brundage (2014)	x		x					x									
Crappell (2014)	x	x	x	x													
Dawson (2015)	x		x			x											
Garner (2014)	x	x	x								x	x					
Ginsborg (2019)	x																
Hendricks et al. (2014)				x		x											
Johnson (2004)				x	x		x	x									
Jutras (2009)								x	x	x							
Jordan (2016)						x					x	x		x		x	x
Kirchner (2004)	x		x					x		x	x			x	x	x	x
Kirchner et al. (2008)	x																
Knerr (2009)	x	x						x		x	x	x	x				
Kramer (2007)	x	x	x	x		x					x	x	x	x			x
Liu (2016)	x	x	x	x		x					x	x	x				
Malebranche (2012)	x	x	x	x		x			x		x	x			x	x	x
McAllister (2015)				x				x	x					x		x	
McKinney (2008)	x		x								x			x		x	x
Mitchell (2011)	x							x	x		x			x		x	
Nagel (2018)				x	x	x		x	x					x		x	
Nagel (2017a)								x									
Nagel (2017b)				x		x		x	x								
Nagel (2015)								x									
Patston (2014)	x			x				x	x	x							
Petrovich (2003)				x							x	x	x	x		x	

Robertson & Eisensmith (2010)	x		x					x	x					x		x	x	
Sieger (2017)	x			x	x	x	x	x	x		x	x	x	x		x	x	
Slocumb (2009)	x			x		x								x	x	x		
Snow (2017)	x		x											x		x		
Thio (2009)	x		x								x	x						
Total	20	7	12	15	4	10	2	14	9	4	13	10	5	13	4	12	7	

Note. P = Preparation, MP = Musical preparation, PP = Performance preparation, OC = Open Communication, CM = Communication about MPA, FO = Fostering open communication, AD = Avoid MPA discussion, RE = Realistic expectations, PE = Realistic performance expectations, LE = Realistic learning expectations, EP = Exposure to performance, GM = Graded mastery experience, FP = Frequent performance opportunities, DB = Deep breathing, ME = MPA effect on breathing, BB = Benefits of deep breathing, BT = breathing techniques . An x indicates which codes were identified in each article

Appendix 5C

Semi-structured Interview Guide

Good morning/afternoon. Thank you for agreeing to participate in this project. Today we will be conducting a short interview to explore your thoughts on performance anxiety. As well, we will also be discussing strategies you use in your teaching practice to help students cope performance anxiety. Are you ready to get started?

Teacher Background

- First, could you describe your teaching background?
    - How long have you been teaching?
    - How many students do you currently teach?
    - How old are your current students?

Performance Anxiety Issues

We're going to talk a little about what anxiety is and how it presents in your students.

- How would you define performance anxiety?
    - Could you describe any common mental or physical symptoms of anxiety you observe in your students?
- In your opinion, what kinds of situations make students nervous when performing?
    - Audience, evaluation, unfamiliar setting, etc.
- Throughout your teaching experiences, what are the effects of anxiety on student performance?
    - Are they positive/negative
    - What kinds of things do they affect (technique, expression, memorization, etc.)
- In your experience, are there specific characteristics that might make a student more prone to performance anxiety?
    - Males versus females?
    - Age (children versus teenagers)?
        - If age is a factor influencing anxiety, at what age do you observe that students begin to feel nervous about performing?
    - Self-confidence/self-efficacy?

Preparing for performances/Coping with MPA

Next, we're going to talk about ways you help your students prepare for performances and cope with MPA leading up to performances.

- How do you prepare your students to cope with MPA before performing a big concert or competition?
    - Could you describe any coping strategies you have found particularly successful in helping ease performance anxiety in young musicians?
- When your students face obstacles or challenges when preparing for performance, how do you try to help them overcome these challenges?
    - If they overcome challenges, do you observe an impact on the students' feelings about the upcoming performance?

- Do you give your students any advice or encouragement leading up to their public performance?
    - What kinds of advice/encouragement do you give?
- Some say there is a connection between memorization and anxiety. Do you observe performance anxiety stemming from memorization issues/worries in your students?
    - If so, how do you help your students deal with anxiety around memorization?
- Do you ever have students watch videos or recordings of themselves or other musicians leading up to performances?
    - Why or why not?
    - If yes, what affects, if any, do you observe when your students watch recordings?
        - Effects on anxiety?
        - Effects on self-efficacy/self-confidence?

During Performance

- Do you discuss with your students how to manage performance anxiety that occurs while they are performing (anxiety experienced during performance)?
    - What types of strategies do you suggest for your students when they are nervous *during* a performance?
- Many students indicate that focusing or concentrating on the music during a performance helps them combat performance anxiety. Do you believe this is true?
    - If yes, do you have any specific teaching techniques you use to help teach students to focus while onstage?

Comments

- Do you think there is any way to prevent MPA from developing in students?
    - Why or why not?
    - If yes, what can be done to prevent MPA from developing?
- In your opinion, do you think MPA should be addressed at an early on in a student's musical education?
- Anything else that you would like to add to this topic?

Appendix 5D

Table 6

Codes identified in thematic analysis of interview transcripts

Participants	*Preparation*			*Open Communication*				*Realistic Expectations*			*Exposure to Performance*			*Deep Breathing*			
	P	*MP*	*PP*	*OC*	*CM*	*FO*	*AD*	*RE*	*PE*	*LE*	*EP*	*GM*	*FP*	*DB*	*ME*	*BB*	*BT*
Helen	x	x	x	x			x	x	x		x	x	x				
Isaac	x	x	x	x		x		x	x		x	x	x				
Janet	x	x	x	x	x	x	x	x	x		x	x	x	x			x
Kristina	x	x	x	x	x			x	x		x	x	x	x		x	x
Leah	x	x	x	x	x		x	x	x		x	x	x	x			x
Total	5	5	5	5	3	2	3	5	5	0	5	5	5	3	0	1	3

Not. P = Preparation, MP = Musical preparation, PP = Performance preparation, OC = Open Communication, CM = Communication about MPA, FO = Fostering open communication, AD = Avoid MPA discussion, RE = Realistic expectations, PE = Realistic performance expectations, LE = Realistic learning expectations, EP = Exposure to performance, GM = Graded mastery experience, FP = Frequent performance opportunities, DB = Deep breathing, ME = MPA effect on breathing, BB = Benefits of deep breathing, BT = breathing techniques . An x indicates which codes were identified in each transcript

Chapter 6: General Discussion

Overview of Purpose

The goal of this dissertation was to explore MPA in young musicians from several different perspectives, and this was done using four main research purposes. The first purpose was to examine the relationship between MPA and self-efficacy in young musicians and investigate the extent to which gender moderates the relationships between age and MPA/self-efficacy in young musicians. The second purpose was to investigate relational changes between MPA, self-efficacy, performance quality, and behavioural MPA in adolescent musicians over the course of a six-week self-modeling intervention, as well as explore the effects of the self-modeling intervention using quantitative methods. The third research purpose was to explore how Bandura's (1977) four sources of efficacy (i.e. enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological/affective states) influenced self-efficacy beliefs in adolescent musicians during the six-week self-modeling intervention. Finally, the fourth research purpose investigated MPA from a teacher's perspective by identifying common coping strategies music teachers use to support students with MPA. The results of these purposes have been presented in article format in Chapters 2 to 5. The remainder of Chapter 6 will present the overall dissertation findings. The first section of the discussion summarizes each articles' results and discusses how the article findings relate to one another. The next section presents the strengths and limitations of the dissertation. The final section of Chapter 6 concludes with implications and suggestions for future research.

Summary of Findings

Chapter 2 presents the first article, which investigated the relationship between MPA and self-efficacy in young musicians and explored the extent to which gender moderates the relationships between age and MPA, and age and self-efficacy. A significant negative

relationship was found between MPA and self-efficacy, indicating that higher levels of MPA are associated with low levels of self-efficacy. Age, measured in years and according to age group (children and adolescents), was found to have a significant effect on MPA. Results suggest that MPA increases with age in young musicians and that adolescents experience significantly higher levels of MPA compared to children. Gender did not have a significant effect on MPA, nor did gender have a significant effect on the relationship between age and MPA. Similarly, neither age nor gender had a significant effect on self-efficacy, and gender did not moderate the relationship between self-efficacy and age.

Article one has important implications, as the findings of a significant negative MPA/self-efficacy relationship confirms results of previous studies (Miller & Chesky, 2004; Ritchie & Williamon, 2011b; Zelenak, 2015). Additionally, the findings expand on previous research by providing further insight into how age and gender may affect MPA (Patston & Osborne, 2016; Ryan, 2005) and self-efficacy (Hendricks et al., 2015; Hewitt, 2015) in young musicians. The results of article one also provided justification for several decisions made during articles two and three. The age related MPA results suggest that adolescents may be more at risk to suffer from MPA compared to children and may benefit from further MPA support. As such, articles two and three tested a self-modeling intervention aimed at reducing MPA in adolescent piano students aged 12-16. Additionally, male and female students were included in the intervention, as the lack of gender effects on MPA in article one indicates that both genders may benefit from MPA support. Next, the results of a negative relationship between MPA and self-efficacy suggests that a high level of self-efficacy may be one of the best defenses against MPA. Given these results, the intervention tested in articles two and three was a self-modeling intervention primarily designed to increase self-efficacy. These articles explore whether

potential self-efficacy increases following the self-modeling intervention can also have a positive effect on MPA. Finally, the lack of significant effects of age or gender on self-efficacy indicate that other factors may influence self-efficacy changes experienced by young musicians. Researchers suggest that Bandura's (1977) four sources of efficacy is one such factor that may influence self-efficacy (Bugos et al., 2016; Clark et al., 2014; Hendricks et al., 2015), so article three further explored the effects of these sources on efficacy beliefs in intervention participants.

Chapter 3 presented the second article, which investigated the effects of a six-week self-modeling intervention and explored relational changes between outcome variables over the course of the intervention. When examining relational changes, there were no observed relationships between MPA and self-efficacy or MPA and performance quality. A visual examination of these relational changes suggests that MPA may have both a facilitative and debilitative effects on self-efficacy and performance quality. Similarly, no relationship was observed between self-report MPA and behavioural anxiety, indicating that observation alone may not accurately assess self-perceived MPA. Finally, the self-modeling results showed no clear effects on MPA, self-efficacy, performance quality, or behavioural anxiety across participants. These results suggest that the effects of self-modeling on young musicians may be individual, making it a potentially versatile tool to help improve MPA, self-efficacy, and/or performance quality.

In contrast to the negative MPA/self-efficacy relationship found in article one and previous research (Hendricks et al., 2015; Miller & Chesky, 2004), the relational changes in article two indicated that participants often felt less efficacious about performing when feeling less anxious, and vice versa. Similarly, while performance improved approximately half the time with decreased MPA, performance deteriorated the remaining times when participants felt less

anxious. These results indicate that some performers may need a certain amount of arousal to facilitate performance and feel efficacious when performing (Hanin, 2000). While facilitative and debilitative anxiety is often discussed in relation to optimal performance in sport literature, music literature rarely differentiates between facilitative/debilitative anxiety. The results of article two suggest that future MPA studies may want to explore the effects of facilitative versus debilitative anxiety on musicians to better understand the MPA/self-efficacy relationship. Findings from article two also provided justification for the remaining articles of the dissertation. While the results of the self-modeling intervention were individualized, several participants showed positive self-efficacy effects, particularly those with lower base MPA scores or those playing at a lower musical level. To gain further understanding of the self-efficacy results of article two, article three examined how Bandura's (1977) four sources of efficacy influenced participant efficacy beliefs within the self-modeling intervention. Additionally, the behavioural results of article two suggest that outside observers may not be able to accurately observe self-perceived MPA. This has important implications for teachers, as it means that a student who does not appear anxious may still be suffering from undetected MPA. This finding led to an exploration of teacher perspective in article four to understand how teachers in real life perceive student MPA and to examine what teachers are doing to help students cope with MPA.

Chapter 3 presented the third article, which explored how Bandura's (1977) four sources of efficacy (i.e. enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological/affective states) influenced self-efficacy beliefs in adolescent musicians during the six-week self-modeling intervention. Of the four efficacy sources, the results indicated that mastery experiences may be the most influential on self-efficacy beliefs in musicians. As such, students may benefit from performance environments that promote successful experiences and

from learning how to cope with failure experiences. Additionally, observing similarly skilled models, receiving positive feedback, and feeling calm or focused increased participant efficacy while observing advanced models, making negative comparisons, and feeling anxious, fatigued, or distracted decreased self-efficacy. Finally, viewing a self-modeling video increased student self-efficacy when participants liked and related to their video, or used the video to facilitate performance improvements. These results indicate that both the performance and strategic functions of self-modeling may enhance self-efficacy in young musicians.

The results of article three expand on the self-efficacy results of article two and suggest that the four sources of efficacy information may influence the effectiveness of a self-modeling intervention. For example, article three results suggest that the positive mastery and vicarious experience information provided by self-modeling (McCullagh & Weiss, 2002) may not be enough to overcome the negative impact of past failure experiences. Likewise, some physiological/affective states appeared to negatively impact self-efficacy, overriding any potential benefits of the self-modeling intervention. The possibility that other sources of efficacy information are more influential than information provided by self-modeling may explain why the self-efficacy results, and in turn, MPA results, varied among participants in article two. Next, while the dissertation mainly focused on the performance function of observational learning (McCullagh et al., 2012), article three findings indicate that both performance and strategic functions of self-modeling may be beneficial to musicians. Article two findings suggest that self-modeling is a versatile tool and being able to use both performance and strategic functions to benefit self-efficacy contributes to the intervention's flexibility. Additionally, findings from article three suggest that certain physiological/affective states, such as anxiety, can decrease self-efficacy. This supports the negative MPA/self-efficacy relationship found in article

one, where participants felt less efficacious when feeling more anxious. While these results were contrasted in article two, it may be that the participants in article three were not able to distinguish between facilitative and debilitative symptoms of MPA, and only identified with negative aspects related to anxiety (Hanin, 2000). Finally, the results of article three provided several strategies that teachers can use to help foster self-efficacy beliefs and therefore decrease MPA. These results further justified the decision to explore teacher perspective in article four, in order to examine if teachers are aware of these tools and currently using them to support young musicians.

Chapter 5 presented the fourth and final article, which investigated MPA from a teacher's perspective by identifying common coping strategies music teachers use to support students with MPA. A quantitative content analysis of scientific and non-scientific literature revealed thirty-one strategies music teachers employ to help students with MPA, suggesting that teachers have a variety of tools to help combat student MPA. Of these strategies, preparation, open communication, realistic expectations, exposure therapy, and deep breathing appeared most frequently in the literature. However, two qualitative thematic analyses revealed that descriptions of these strategies varied between teachers in the literature and interviewed piano teachers, which suggests a gap between research knowledge and practical application. It may be beneficial to provide teachers with formal training grounded in MPA research as this could help bridge the knowledge gap and supply teachers with additional resources to manage student MPA.

Article four offers a teacher's perspective on MPA, which has been significantly lacking in MPA research up to this point. The exploratory findings provide a starting point for future researchers to expand the scope of literature in this area. The results of this article also help support several findings from the previous articles in the dissertation. First, findings in article

four indicate that teachers frequently use exposure therapy, where students are provided with graded mastery experience and frequent performance opportunities as a strategy to decrease MPA. Exposure therapy provides positive performance experiences, which can translate into positive, efficacy-enhancing mastery experiences. Increasing self-efficacy through exposure therapy may in turn reduce MPA, based on the negative MPA/self-efficacy efficacy findings of article one. While teachers in article four did not explicitly discuss this relationship with regards to exposure therapy, it appears that some teachers accurately intuit the connection between self-efficacy and MPA. Secondly, findings from article four help validate the importance of testing a self-modeling intervention in articles two and three. Only five of thirty-one sources mentioned modeling as a strategy to help students combat MPA. While many music teachers may be unaware of the potential benefits of self-modeling, the positive results of articles two and three provide teachers with another tool to reduce MPA and help students feel more confident performing. Thirdly, aside from deep breathing and exposure therapy, many of the interventions tested in MPA research were not mentioned or were not mentioned frequently in article four by teachers in the literature or during interviews. For example, virtual reality training has been investigated as a MPA reducing intervention (Bissonnette et al., 2011; Conklin, 2011; Crawford, 2011), but none of the data sources in article four listed this as a strategy used by practicing music teachers. This finding implies a gap between existing MPA research and practical teaching experience, as teachers may be either unaware of MPA intervention research, or do not find it applicable to real-life teaching. Finally, article four found that many teachers avoid discussing MPA with students who do not exhibit MPA for fear of unintendedly increasing MPA. However, this finding has important practical implications when combined with findings from article two. Article two found discrepancies between observed behavioural anxiety and

self-reported MPA, meaning that it may not be possible for teachers to accurately assess MPA without communicating with students. Teachers relying on observation to detect MPA may be missing opportunities to help students who do not outwardly appear anxious.

The results of the dissertation expand the scope of research on MPA in young musicians and provide several important practical implications for music teachers and students. The results also help identify ways that researchers can disseminate current MPA literature to maximize knowledge and practical applications. While these findings provide valuable contributions to the field, as with any research, there are strengths and limitations of the dissertation, which will be discussed in the following section.

Strengths and Limitations

A strength of the dissertation is the multiple methods of data collection used to explore MPA in young musicians. Self-report questionnaires, interviews with adolescent pianists and music teachers, participant journals, and pre-existing literature sources were used to gather data throughout the dissertation. The variety of data collection methods provided different types of quantitative and qualitative data, which in turn provided a richness in data that allowed us to explore MPA from multiple perspectives. As a result, the dissertation presents a more comprehensive view on MPA in young musicians compared to the perspective gained from a more limited data set.

Similarly, another strength of the dissertation is the multiple methods of data analysis. While articles one and two mainly focused on quantitative data analysis, articles three and four primarily used qualitative data analysis methods. Quantitative analysis allowed researchers to investigate the question of "what", by exploring the interactions between MPA, self-efficacy, gender, and age in young musicians, as well as the effects of the self-modeling intervention.

Meanwhile, qualitative methods allowed researchers to explore the question of "how", by examining how the self-modeling intervention affected self-efficacy in participants and how teachers were intervening against student MPA. Again, this strength allows the dissertation to provide a more complete view of the research topic, particularly with regards to the self-modeling intervention.

A third and final strength of the dissertation are the sample sizes used during data collection. Articles two, three, and four used small participant samples, which allowed for an in-depth study of the topic at hand. The small sample sizes provided an opportunity to explore the research purposes in a more nuanced way, giving insight into the experiences of the participants that may have been lost with larger sample sizes and statistical analysis. In contrast, the small sample sizes can also be considered a limitation of the dissertation. While article one had a larger sample size compared to the other articles, given the number of variables explored (MPA, self-efficacy, age, and gender), more participants in each category (male, female, child, and adolescent) would have provided more statistical power. The small sample sizes of articles two, three, and four also limit the transferability of findings, and generalization about all young musicians or music teachers are not possible with the current dissertation. Similarly, the non-scientific literature sample size in article four was limited to articles from two music magazines. However, a wider range of non-scientific literature may be found in other magazines, meaning that the sample of non-scientific literature used in article four may not be fully representative of the population. This also limits the transferability of findings.

Study location is a second limitation of the dissertation. All music students and teachers who participated in the studies were from Ontario and used Canadian pedagogical music methods for learning or teaching. Music students and teachers for other regions who use

different pedagogical methods may experience different influences on MPA or self-efficacy, use different MPA coping strategies, or experience a self-modeling intervention differently. Similarly, a third limitation is the sampling procedure. For article one, letters of invitation were sent to local music schools and studio piano teachers. For articles two and three, participants were recruited from local RCM examination centres or through the local ORMTA group, and for article four, participants were recruited from a local ORMTA convention. For all articles, the sampling procedures took place from specific groups or areas, meaning that the individuals invited to participate in the study represent only a fraction of the population being studied. Additionally, there may have been differences between the individuals who agreed to participate in the dissertation studies and those who declined.

A fourth limitation of the dissertation are the self-report measures used in articles one and two. For article two, the participants repeatedly completed the MPAI-A and SEMP during the study, which may have resulted in respondent fatigue (Porter, Whitcomb & Weitzer, 2004). For the MPAI-A, while it is a validated measure (Osborne & Kenny, 2005, Osborne et al., 2005), the standard deviations for the scores in article one were much higher compared to the SEMP, indicating more variability in the MPAI-A scores. A different measurement tool may have provided more accurate data. As well, the MPAI-A does not contain subscales that differentiate between types of MPA symptoms. A different questionnaire that contains subscales for cognitive and somatic symptoms, such as the CSAI-A (Martens et al., 1990), may be more suitable to explore the multidimensional aspects of MPA and their relation to other variables.

The interview data from articles three and four provide a fifth limitation. While semi-structured interviews offered the researcher flexibility to explore participant thoughts and beliefs, the interviews still relied on open-ended questions and prompts given by the researcher. As

such, it is always possible that different questions or prompts may have elicited further knowledge or insights into the interview topics that were not expressed by participants in the current interviews. For article three, there were fewer questions on self-modeling compared to the four sources of efficacy, and the questions were also more general. As such, the interviews gathered less data on self-modeling which was also less specific compared to the data for the first research question. For article four, because participants were not directly asked about the specific strategies discussed in the qualitative thematic analysis, it is possible that the interview data does not fully represent participant knowledge on the identified strategies. Additionally, the interview timing may have affected data collection, particularly for article three. Participants were asked about verbal persuasion at a time when that information source was not readily available, which may have left that source of efficacy information underrepresented in the data.

Finally, a sixth limitation pertains to the modeling videos in the self-modeling intervention. Due to scheduling constraints, some participants spent less time in the intervention phase and therefore viewed their modeling video fewer times. Additionally, since participants viewed their video at home, there was no way for the researcher to ensure participants viewed their videos as instructed. Standardized time frames and additional measures ensuring participants watched the videos at the appropriate times would provide more consistent and comparable data. The next section discusses how future research can address the limitations of the current research, as well as expand on several significant findings of the dissertation.

Future Research

Future research on the relationships between MPA, self-efficacy, age, and gender in young musicians should involve the participation of larger sample sizes. Similarly, future researchers could conduct a similar study to article four with more non-scientific literature

review and interview participants. Larger sample sizes in both areas would continue to expand the scope of research. In contrast, findings from article two suggest that self-modeling may affect young musicians on an individual basis, meaning that trying to find a group trend may not be the best approach. While articles two and three provided promising results for self-modeling, further research with small samples sizes can provide the in-depth knowledge that is needed to understand how best to utilize this tool with young musicians. The strategic function of self-modeling is one area that can be explored in future studies with single-subject or case-study designs. While the current dissertation set out mainly to explore the performance function, findings suggest that musicians may also benefit from the strategic function. Future studies could focus on discovering how and why the strategic function of self-modeling may be useful to young musicians suffering from MPA or low self-efficacy. One way to do this would be to use the findings from article three to design an interview guide with more specific questions related to the functions of self-modeling that would allow further insight into the effects on adolescent musicians.

In addition to exploring the benefits of self-modeling, future researchers can also examine other MPA or self-efficacy interventions or strategies that can support young musicians. The findings from article one that indicate a significant, negative relationship between MPA and self-efficacy open a new avenue of study, as educating teachers on how to strengthen student self-efficacy may also have positive effects on MPA. Article three findings suggest that positive self-talk, calming, and/or focusing strategies may be beneficial to self-efficacy, so future researchers may want to explore the effects of these strategies on self-efficacy and consequently MPA. Another area for future researchers to explore is the development of a workshop for music teachers. The differences between literature and interviewed teachers highlighted in the

findings of article four suggests a gap between research knowledge and practical application and indicates a need for methods of communicating research findings to practicing music educators. A training workshop grounded in scientific MPA research, which also includes self-efficacy enhancing strategies, could provide teachers with more resources to effectively manage student MPA.

Next, findings from article two suggest that MPA may have both facilitative and debilitative effects on self-efficacy and performance quality in young musicians. While sport literature often differentiates between arousal and anxiety in relation to optimal performance (Hanin, 2000), music literature rarely differentiates between facilitative/debilitative symptoms of MPA. Therefore, future research that differentiates between facilitative and debilitative symptoms could provide more insight into how MPA relates to self-efficacy and performance in young musicians. Understanding the differences between facilitative/debilitative MPA could also help teachers better identify the strategies that will best help students cope with their individual MPA. For example, differentiating between facilitative/debilitative MPA may help teachers assess whether an individual student would benefit most from a strategy that increases facilitative, performance-enhancing arousal or an intervention that decrease debilitative, performance-impairing anxiety.

Finally, the findings of article four suggest that some teachers avoid MPA discussion with students who do not exhibit MPA symptoms, which assumes that teachers can accurately observe and assess student MPA symptoms. However, the findings of article two suggest that perceived, self-report MPA may differ from observed behavioural MPA, meaning that teachers may not be able to accurately assess MPA through observation alone. This has important implications for teachers, as they may need to use additional tools to assess MPA. Future

researchers can explore other strategies teachers can use to assess and manage student MPA, such as open communication and other strategies discussed in article four. As well, future researchers considering perceived and observed behavioural anxiety should explore a more direct comparison by using self-report measures specific to behavioural anxiety. This will help increase our understanding of where perceived and observed MPA may differ.

Conclusion

The current dissertation explored MPA in young musicians from a variety of perspectives. Article one explored the first perspective, which examined variables that may influence MPA in children or adolescents. The results provide valuable insight into how age and gender affect MPA and self-efficacy in young musicians and confirmed a negative MPA/self-efficacy relationship found in previous literature (Miller & Chesky, 2004; Ritchie & Williamon, 2011b). These results extend our knowledge of the relationships between age, gender, MPA, and self-efficacy, and have importance implications for practice, as music educators may potentially reduce the negative effects of MPA by helping students develop self-efficacy in pedagogical contexts.

Given the implications from article one, articles two and three investigated the effects of a self-modeling intervention designed to target self-efficacy, and subsequently MPA, in adolescent musicians. The results of article two indicate that the relational changes between MPA, self-efficacy, and performance quality within young musicians are complex. Combined with findings from article one, the results suggest that while high levels of MPA may have debilitative effects on variables such as self-efficacy and performance quality, MPA may also have facilitative effects. Additionally, there was no relationship between perceived MPA and observed behavioural MPA, which provides practical teaching implications for music teachers.

Teachers should be aware that students who do not appear anxious could be suffering from undetected MPA. Finally, the results suggest that self-modeling may have individual effects on young musicians, and that teachers can consider using self-modeling on a case to case basis to help students reduce MPA, improve performance quality, and/or feel more confident performing.

Article three found that when students liked and/or related to their self-modeling video or used the video to facilitative performance improvements, self-efficacy increased. Considered with the results of article two, this suggests that teachers can explore both the performance and strategic functions of self-modeling in an effort to enhance self-efficacy, and subsequently MPA, in young musicians. Within the self-modeling intervention, there were indications that each of the four sources of efficacy (Bandura, 1977) influenced self-efficacy beliefs differently in young musicians. The subsequent findings provide music teachers with several strategies that may foster efficacy beliefs in students.

Finally, article four expanded on MPA/self-efficacy strategies suggested for teachers in previous articles by exploring MPA from a teacher perspective. Data from teachers in the literature and interviewed teachers was analyzed to determine what MPA strategies teacher already use in their day-to-day teaching, and to examine whether teachers implement MPA researcher recommendations in their everyday teaching practice. Results indicate that music teachers use a variety of strategies to help students manage MPA, but comparisons between teachers in the literature and interviewed teachers suggest a gap between research knowledge and practical application. Providing teachers with formal training workshops based on scientific MPA literature, such as the findings of articles one, two, and three, may help bridge the knowledge gap and equip teachers with additional tools to support students suffering from MPA.

The four articles of the dissertation combine to give an overview of MPA in young musicians from several different perspectives. Gender, age, and self-efficacy findings from article one help identify students who may be more at risk to suffer from MPA, while findings from articles two and three provide musicians and teachers alike with a viable strategy to help reduce MPA and increase self-efficacy. Finally, given that teachers can act as a front-line defense against MPA (Liu, 2016), findings from article four help identify areas where future researchers can provide teachers with further MPA training and support, which will in turn help fortify young musicians against MPA.

Chapter 7: References[12]

[12] Chapter 7 contains references for Chapters 1 and 6. All other references are included within each article.

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Chapter 8: Appendices

Appendix 8A

Demographic Questionnaire

Survey of Performance/Musical Background
Parent or Guardian Questionnaire

General Information

Parent or Guardian's Name	
Child's Name	
Piano Teacher's Name	
Date	

This form is to be filled out by the child's parent(s) or guardian(s)

NOTE

Rest assured that this information will remain strictly confidential. Only the members of the research team will have access to this information. Only group data (e.g. group averages) will be made public when the results of this study are presented in scientific conferences or similar contexts.

PLEASE CIRCLE OR ENTER YOUR RESPONSES TO THE QUESTIONS PRESENTED BELOW

SECTION 1: DEMOGRAPHIC INFORMATION

QUESTIONS	YOUR RESPONSE
Gender of your child	◯ Female ◯ Male
Age of your child	
Birth date of your child (month and year)	
Ethnic background of your child's mother (or adoptive mother if child is adopted)	• Caucasian • Asian (e.g. Chinese, Japanese, Korean, South-east Asian) • East Indian, Pakistani • African-American /Black • Hispanic • Middle-Eastern • Mixed White and Asian • Other
Ethnic background of your child's father (or adoptive father if child is adopted)	• Caucasian • Asian (e.g. Chinese, Japanese, Korean, South-east Asian) • East Indian, Pakistani • African-American /Black • Hispanic • Middle-Eastern • Mixed White and Asian • Other
Ethnic background of your child's piano teacher	• Caucasian • Asian (e.g. Chinese, Japanese, Korean, South-east Asian) • East Indian, Pakistani • African-American /Black • Hispanic • Middle-Eastern • Mixed White and Asian • Other
How would you rate your child's overall academic abilities in school?	• Higher than most students • Higher than average • About average • Lower than average • Lower than most students

SECTION 2: CHILD'S MUSICAL HISTORY

How old was your child when piano lessons began? (years and months)	
Name of the piano book(s) that your child used when piano lessons began?	
Name of the piano book(s) your child is currently using?	
What is the present level of your child?	Grade level _____ Suzuki book _____ Other _____
Has your child participated in any public performances?	• Yes • No
How many performances has your child participated in?	• 0 • 1 • 2 • 3 • 4 • more than 4
Has your child participated in a music school's/piano teacher's recital before?	• Yes • No
If yes, how many times?	• 1 • 2 • 3 • 4 • more than 4
Has your child participated in the Kiwanas music festival before?	• Yes • No
If yes, how many times?	• 1 • 2 • 3 • 4 • more than 4
Has your child participated in other types of performances?	• Yes • No
If yes, what other types of performances has your child participated in?	• School concerts/recitals • Church concerts • Other music festivals • Other
Has your child taken any piano exam so far?	• Yes • No
If so, which type of exam has your child taken?	• Royal Conservatory of Music Piano Exam • Conservatory of Canada Piano exam • Other _____
Can you provide the grade level of your child's last piano exam?	
Can you provide the date of your child's last piano exam?	

Can you provide the results of your child's last piano exam? (This can be given as a grade, percentage, or rating such as bronze, pass, etc.)	
Who attends your child's recitals/concerts?	• Parents • Siblings • Grandparents • Friends • Other _____
In your opinion, do you think your child will continue to play piano as an adult?	• Absolutely • Most likely • Probably • Maybe • Not likely
How would you rate your child's piano playing abilities?	• Higher than most students • Higher than average • About average • Lower than average • Lower than most students

SECTION 3: CHILD'S PIANO PRACTICES

In your home, does your child have access to a quiet and conductive space for practicing?	• Never • Seldom • Sometimes • Often • Always
This year, on average, how many days a week does your child practice?	
This year, on average, how long is each practice session?	

SECTION 4: OTHER MUSICAL EXPERIENCES

Does your child attend summer music camps?	• Never • Seldom • Sometimes • Often • Always
Does your child attend master classes or workshops?	• Never • Seldom • Sometimes • Often • Always

Does your child participate in any kind of collective music-making, such as duets, accompanying other performers, small ensemble, etc.?	• Never • Seldom • Sometimes • Often • Always
Does your child participate in any kind of informal performances such as "family and friends," playing in retirement homes, etc.?	• Never • Seldom • Sometimes • Often • Always
Do you (or your spouse) attend professional classical concerts with your child?	• Never • Seldom • Sometimes • Often • Always
Do you (or your spouse) attend other concerts with your child?	• Never • Seldom • Sometimes • Often • Always • What kind? _____

THANK YOU FOR TAKING THE TIME TO FILL OUT THIS FORM

Appendix 8B

Behavioural Anxiety Index (BAI)

Video Name:

Category	Behaviour	Video Segment											
		#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
Feet and legs	Shuffles												
	Taps												
	Shifts												
	Moves												
	Other (Specify):												
Arms and hands	Clutches body												
	Clutches hands												
	Clutches legs												
	Moves fingers												
	Touches self												
	Practice on leg												
	Extraneous movement												
	Other (Specify):												
Body	Sways												
	Deep breathes												
	Rocks												
	Other (Specfiy):												
Instrument	Memory slip/Blatant error												
	False start												
Face	Moistens lips												
	Swallows												
	Moves head												
	Bats eyes												
	Jaw Movement												
	Other (Specify):												

Behavioural Anxiety Index (BAI) (continued)

Video Name:

Category	Behaviour	Video Segment											
		#13	#14	#15	#16	#17	#18	#19	#20	#21	#22	#23	#24
Feet and legs	Shuffles												
	Taps												
	Shifts												
	Moves												
	Other (Specify):												
Arms and hands	Clutches body												
	Clutches hands												
	Clutches legs												
	Moves fingers												
	Touches self												
	Practice on leg												
	Extraneous movement												
	Other (Specify):												
Body	Sways												
	Deep breathes												
	Rocks												
	Other (Specfiy):												
Instrument	Memory slip/Blatant error												
	False start												
Face	Moistens lips												
	Swallows												
	Moves head												
	Bats eyes												
	Jaw Movement												
	Other (Specify):												

Behavioural Anxiety Index Definitions

Feet and Legs

1. Shuffles: Prolonged movement between the two feet.
2. Taps: Moving the foot up and down in place.
3. Shifts: Switching places between feet (i. e. changing from having the right foot behind the left to the left foot behind the right).
4. Moves: Any extraneous foot or leg movement that does not fit into the above categories (e. g. moving one foot from right to left or back to front).
5. Other: Any feet or leg(s) behavior/movement that does not fit into the above categories.

Arms and Hands

1. Clutches body: Holding the body or arms with hand(s).
2. Clutches hands: Holding hands together or holding one wrist with the opposite hand.
3. Clutches legs: Holding leg(s) with the hand(s).
4. Moves fingers: Any finger movement that does not include hand displacement
5. Touches self: Use of hand to touch any body part other than the other hand and not include clutching of body, hands, or legs (e. g. brushing hair from face is a 'touches self' behaviors).
6. Practice on leg: 'Playing' the piano on the leg(s).
7. Extraneous movement: Hand or arm movement other than those listed.
8. Other: Any hand. arm. or finger movement/behavior that does not fit into any of the above categories.

Body

1. Sways: Moving body from left to right.
2. Deep breathes: Visibly taking a deep breath (chest heaving).
3. Rocks: Moving body forwards and backwards.
4. Other: Any other body behavior/movement that does not fit into any of the above categories.

Instrument

1. Memory slip/Blatant error: An obvious mistake that could be attributed either to a memory lapse or a technical error.
2. False start: Stopping playing close to the beginning and restarting.

Head/Face

1. Moistens lips: Licking the lip(s) with the tongue or moistening a lip by turning it inside the mouth.
2. Swallows: Visible swallowing motion.
3. Moves head: Any head movement.
4. Bats eyes: Multiple eye shutting and opening in close succession.
5. Jaw movement: Visible clenching or other moving of the jaw.
6. Other: Any facial behavior/movement that does not fit into any of the above categories.

Appendix 8C

Ethics Approvals[13]

File Number: 05-14-14 **Date (mm/dd/yyyy):** 10/12/2017

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

Ethics Approval Notice

Social Sciences and Humanities REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

First Name	Last Name	Affiliation	Role
Gilles	Comeau	Arts / Music	Supervisor
Erin	Dempsey	Health Sciences / Human Kinetics	Student Researcher

File Number: 05-14-14

Type of Project: Master's Thesis

Title: Music Performance Anxiety in Children and Teenagers: Effects of Perfectionism, Self-Efficacy and Gender

Renewal Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
06/09/2017	06/08/2018	Renewal

Special Conditions / Comments:
N/A

[13] Ethics approval obtained under author's maiden name (Dempsey).

File Number: H08-17-06 **Date (mm/dd/yyyy):** 10/02/2017

Université d'Ottawa University of Ottawa
Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Ethics Approval Notice

Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

First Name	Last Name	Affiliation	Role
Gilles	Comeau	Arts / Music	Supervisor
Erin	Dempsey	School of Human Kinetics	Student Researcher

File Number: H08-17-06

Type of Project: PhD Thesis

Title: The effects of self-modeling on self-efficacy and music performance anxiety in young musicians

Approval Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
10/02/2017	10/01/2018	Approval

Special Conditions / Comments:
N/A