MANAGING MUSIC PERFORMANCE ANXIETY: A PERFORMER'S PERSPECTIVE

by

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Abstract

Music Performance Anxiety (MPA) is a prevalent and potentially debilitating condition which can severely affect a musician's professional and personal life. It is experienced by a high percentage of musicians and occurs regardless of instrument, genre, level of experience, and age. Psychological disorders occurring along with MPA seem to be common, especially among the student and professional musician populations. Although many treatments have been tested by previous scholars, no one single non-pharmacological treatment has emerged as a definitive best.

The study team hypothesize that a blended, multi-modal intervention would help music students reduce their MPA. A pilot study and a second larger research study were conducted to assess the impact of an intervention for university music students struggling with MPA. The studies were mixed method studies, employing both quantitative and qualitative measures. The intervention, led by a trained psychotherapist who is also a professional violinist, included elements of Sports Psychology, Cognitive Behavioural Therapy, Exposure Therapy, and Mindfulness.

Pre-intervention interviews allowed for the identification of themes pertaining to the level of severity and manifestation of MPA. The post-intervention results demonstrated that this particular blended intervention program lowered participants' MPA scores, as measured by the Kenny Music Performance Anxiety Inventory (K-MPAI). The analysis of themes in the post-intervention, semi-structured interviews demonstrated that students perceived that their MPA decreased. Participants unanimously stated that they found the program to be helpful.

In order to support students in their endeavours to achieve professional careers in music, aspects concerning health and wellbeing must be considered. University music schools often fail

to adequately address the subject of MPA in their curricula. This thesis examines a possible approach towards recognizing its relevance.

Lay Summary

Performing musicians often experience a collection of anxiety symptoms during the performance process. A major concern is that this anxiety can begin to affect the personal lives of musicians, leading to mental health concerns. My research investigates whether a specific treatment plan could help university student musicians to recognize and to manage these anxieties in their musical and personal lives. The results showed promise in that students, when treated in a group setting, can experience improvements in their performance anxieties. Participants found the program to be helpful, expressing an interest in having a similar program included as part of the music school curriculum. Acknowledging that anxieties relating to performance occur in many music students, it is necessary to find and implement appropriate programs.

Preface

The research for this project was designed by myself in consultation with my supervising committee and with the collaborator for my research project, Paula Wise. Observations and experiences that I had during my own university music studies were the catalyst for the idea and were furthered with a thorough investigation of the current literature.

I conducted the literature review in order to gain further background on music performance anxiety and to understand the past and current research trends and findings in my topic area. I created the concept of testing a music performance anxiety intervention with students at the UBC School of Music, with the help and guidance from my committee and from Paula Wise.

Both Dr. Larry Frisch from the School of Population and Public Health as well as Paula Wise, a community psychotherapist and professional violinist, were collaborators for my research studies in Chapter 2. I did the recruitment and the intake of all participants, as well as conducting all pre- and post-intervention data collection. I also conducted the pre- and post-intervention semi-structured interviews with all participants. The intervention given to participants was led by Paula Wise, who specializes in the treatment of music performance anxiety. Following the completion of the studies, I tabulated the surveys and analyzed the data using common statistical techniques and the software SPSS. This took place under the guidance and supervision of Dr. Frisch. I analyzed the interview for themes using the NVivo, a common software used for the analysis of qualitative data.

The research studies were approved but the UBC Behavioural Research Ethics Board. The certificate numbers for the studies include: H18-01986 (October 2018) and H19-03607 (December 2019).

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List of Abbreviations

CBT – Cognitive Behavioural Therapy

DSM-V – Diagnostic and Statistical Manual 5

GAD-7 – Generalized Anxiety Disorder screener

K-MPAI – Kenny Music Performance Anxiety Inventory

MPA – Music Performance Anxiety

PHQ-9 – Personal Health Questionnaire – depression screener

Glossary

Behavioural therapy – a technique often used in the treatment of phobias to help reduce anxiety

Cognitive behavioural therapy (CBT) – A therapeutic treatment used in clinical and counselling psychology that aims to address thought patterns and behaviours in the treatment of anxieties.

Co-morbidity – when a condition is present concurrently and alongside another condition.

Diagnostic and Statistical Manual 5 – A reference book used by health care professionals in the diagnosis of psychological disorder.

Multi-modal – blending two or more techniques or theories.

Null-hypothesis – a term used in statistics indicating that there is no change.

NVivo – A computer software used for the analysis of qualitative data.

Parasympathetic nervous system – the part of the nervous system that is associated with rest and calm.

Psychopathology – a mental health disorder, such as anxiety or depression.

Psychotherapy – a treatment that specifically addresses mental health through talking.

Sports psychology – techniques used by athletes to assist in the mindset for performance.

SPSS – a computer software used to make statistical calculations of a data set or sets.

Sympathetic nervous system – the part of the brain that activates during anxiety-provoking situations.

Triangulation – Using one set of data (quantitative or qualitative) to validate another set of data.

Acknowledgements

The completion of this dissertation and of this degree would not have been possible without the assistance and guidance of many people. I would like to thank my supervisory committee, who have guided me through this degree and this research. Thank you to Dr. Terence Dawson for mentoring both my musical and academic journeys at UBC. Thank you to Dr. Larry Frisch, who provided the much-needed interdisciplinary guidance, allowing me to conduct two behavioural research studies and to develop my knowledge of research practises in the scientific field. Thank you to Professor Rena Sharon, who also provided musical, academic, and career guidance throughout my degree. Thank you to Dr. Alexander Fisher for your help in the development of the written thesis and in the editing process.

This degree and this research were funded by the Social Sciences and Humanities Research Council of Canada through a Doctoral Award and by the UBC Public Scholar Initiative. Both ensured funding to carry out the research studies and to continue devoting my attention to my research.

There are many others who have contributed to the completion of this research. Thank you to Paula Wise, both for her continued mentorship and for her keen involvement in the research study interventions. To every student who volunteered and participated in my research studies: your commitment of time and your full participation allowed me to collect the valuable data needed to complete this dissertation and research project.

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Anya Leenman, Angelina Lynne, Arwa Nemir, Eileen Padgett, Emily Richardson, Risa Tonita, and Sofie Tsatas as well as many others who have all supported me through my studies at UBC. Your conversations, words of encouragement, and advice have been invaluable and very much appreciated.

Thanks to Dr. Mark Vessey, principal of Green College, who was an academic mentor throughout my four-year residency at Green College.

Chapter 1: Literature Review

The DMA lecture can be found at: https://www.youtube.com/watch?v=aiB2xK-rz-s .

1.1 Introduction

Music Performance Anxiety (MPA) is a highly prevalent condition which can severely affect a musician's ability to achieve successful performances. It can impede the completion of a university music degree, derail any aspirations of a career in the concert realm, and lead to various psychological conditions. The critical extent of MPA's toll on performers' psychological wellbeing remains insufficiently understood and acknowledged. The psychological and professional toll of MPA on performers remains under-appreciated. Considering the severity and the negative consequences of uncontrolled MPA, it is alarming that knowledge about MPA is still limited.

Many authors and researchers have brought insights into MPA, its prevalence, its manifestation, and its treatment, but Dr. Dianna Kenny has been the most significant contributor to our understanding of MPA. She has investigated MPA treatments and is one of few who probe deeper into the issue of general psychological wellbeing along with MPA. Because of her significant impact in the field as well as her emphasis on psychological disorders along with MPA and potential treatment models, Dr. Kenny's work serves as a framework for my contributions to the field. Her numerous studies and her book are referenced throughout this dissertation in conversation with many other scholars and researchers in the field.

1.1.1 Defining MPA – Terms Used

There are many terms that can be used to describe the nervousness that is experienced about performance. These descriptors have evolved as research has increased and as stigma has

slowly decreased. The oldest and probably the most popular term used is "stage fright".[1] In 1982, Fogel viewed this term as trivializing or minimizing the actual condition, implying that it only applies on stage.[2] Kenny notes that sometimes stage fright is viewed as being more extreme, contrasting with the earlier view of Fogel.[3] Other scholars, such as Nagel, go as far as to consider "stage fright" as a "misnomer", pointing out that this is not just a fear of the stage, but rather an arousal response about mishaps and even humiliation.[4] In our present-day society, the term "stage fright" can elicit a sort of humorous or dismissive response from those not actively performing.

Other proposed terms have included "musical performance anxiety"[5] and even "music performer's stress syndrome".[6] The term music performer's stress syndrome implies that symptoms and implications go beyond just the stage. The word "stress", however, has become such a commonplace in our society that it may again minimize the severity of the problem. Music Performance Anxiety is commonly used by scholars and by musicians to describe the phenomenon and condition. By including the term anxiety, it creates links with other psychological anxiety disorders. Including the word "music" helps to differentiate the performance anxiety from sports or another performative art. With this in mind, and because of

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[1] Dale O. Fogel, "Toward effective treatment for music performance anxiety," *Psychotherapy: Theory, Research & Practice* 19, no. 3 (1982): 386.
[2] Fogel, "Toward effective treatment for music performance anxiety," 368-75.
[3] Dianna T. Kenny, "A Systematic Review of Treatments for Music Performance Anxiety," *Anxiety, Stress, and Coping* 18, no. 3 (2006), https://doi.org/10.1080/10615800500167258.
[4] Julie J. Nagel, "Treatment of Music Performance Anxiety via Psychological Approaches: A Review of Selected CBT and Psychodynamic Literature," *Medical Problems of Performing Artists* 25, no. 4 (2010): 141.
[5] Warren Brodsky, "Music Performance Anxiety Reconceptualized: A Critique of Current Research Practices and Findings," *Medical Problems of Performing Artists* 11, no. 3 (1996): 90.
[6]Paul G. Salmon, "A Psychological Perspective on Musical Performance Anxiety: A Review of the Literature," *Medical Problems of Performing Artists* 5, no. 1 (1990).

its broad use in the present day, I have chosen Music Performance Anxiety (MPA) to describe how some musicians feel leading up to, during, and after performance.

1.1.2 Definitions

The definitions of MPA vary as much as the list of possible terms. In 1985, Hamann, a prominent researcher in the area of music education stated that, "Performance Anxiety can be defined as a physical and mental deviation from a 'normal state' and is perhaps one of the most misunderstood areas of performance practice. Although musicians may agree that anxiety is present in public performances, they disagree about whether it can help or hinder a performer's ability."[7] He goes on to support the theory of heightening anxiety to improve performance rather than reducing it, citing examples of how skilled performers see no reduction in performance quality when in a stressful situation.[8]

The theory of anxiety as adaptive in performance has its major limitations. What Hamann neglects to take into consideration is the large spectrum of MPA, ranging from the mildly inconvenient to the extreme and debilitating. While some may benefit from the anxiety, others may not. Fehm explains the distinction between high and low MPA: "Some authors explicitly distinguish between low grades of anxiety or arousal, which are necessary to optimize the performance, and high grades of anxiety, which are characterized by a high psychological strain and impairment of the musicians' performance."[9] Hamann does not take into consideration those with significant impairment, as was typical with some of the early scholars of MPA.[10]

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[7] Donald L. Hamann, "The Other Side of Stage Fright," *Music Educators Journal* 71, no. 8 (1985): 26, https://doi.org/10.2307/3396494.
[8] Hamann, "The Other Side of Stage Fright," 28.
[9] Schmidt K. Fehm, "Performance anxiety in gifted adolescent musicians," *Journal of Anxiety Disorders* 20, no. 1 (2006): 99.
[10] Hamann, "The Other Side of Stage Fright."

More and more recent scholars focus on the distressing or debilitating aspects of MPA. Juncos, et al., define MPA as "a potentially debilitating condition affecting professional and student musicians alike."[11] This is different from Hamann's conclusion that experienced performers have less effects of MPA. Julie Nagel agrees with this concept, stating that, "performance anxiety privileges neither age nor experience."[12] Williamon et al. found that regularly performing concert pianists experienced a loss of complexity in the cardiovascular system, causing a stronger arousal response.[13] Skoogh and Frisk (2019) define MPA in this way: "When the tension becomes debilitating to the musician it is referred to as music performance anxiety".[14] Along similar lines, Daniéli, et al., state, "Music performance anxiety (MPA) is defined as persistent, intense, and distressing apprehension in situations involving music performance in public."[15] These scholars all define MPA using either the word debilitating or distressing. The focus of these definitions steers away from the results in performances and toward the inner psychological experience of MPA. Not only should the aim be to achieve successful performance, but to ensure longevity in a professional career, one's experience with performance must not cause significant and debilitating distress. The performer's experience needs to be addressed when managing MPA.

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[11] David G. Juncos et al., "Acceptance and Commitment Therapy for the Treatment of Music Performance Anxiety: A Pilot Study with Student Vocalists," *Frontiers in Psychology* 8 (2017): 986, https://doi.org/10.3389/fpsyg.2017.00986.
[12] Nagel, "Treatment of Music Performance Anxiety via Psychological Approaches: A Review of Selected CBT and Psychodynamic Literature," 141.
[13] Aaron Williamon et al., "Complexity of physiological responses decreases in high-stress musical performance," *Journal of the Royal Society Interface* 10, no. 89 (2013): 3-5, https://doi.org/https://doi.org/10.1098/rsif.2013.0719.
[14] Francisca Skoogh and Henrik Frisk, "Performance values – an artistic research perspective on music performance anxiety in classical music," *Journal for Research in Arts and Sports Education* 3, no. 1 (2019): 1, https://doi.org/10.23865/jased.v3.1506.
[15] Alini Daniéli et al., "Facial recognition of happiness is impaired in Musicians with high Music Performance anxiety," *Frontiers in Psychiatry* 9 (2018): 1.

In her recent book, *Transforming Performance Anxiety: Treatment Book*, Elizabeth Brooker defines MPA as follows:

> It is the arousal experienced when having to perform in front of an audience: the fear of being judged in a situation deemed to be threatening where individuals feel that they are on show or in the spotlight. A public performance of any kind may heighten the degree of anxiety experienced embracing a gamut of mental, emotional and physical feelings.[16]

This definition describes MPA in terms of what, where, who, and how by referencing the arousal response, the situations in which it occurs, and some ways in which it can manifest. Like Brooker, Nagel defines MPA in greater detail.

> Performance anxiety, or stage fright, is anxiety aroused about potential mishaps in performance that expose feared inadequacies before an audience, and which evoke feelings of embarrassment and humiliation. For affected musicians, performance anxiety can be emotionally devastating, as their career choice in music may be terminated or severely compromised.[17]

What is notable about Nagel's definition is that it is the first to link MPA to a compromised career or even career termination.

Dr. Kenny has proposed a definition and explanations of MPA. Her definition expands on concepts outlined in the definitions of Brooker and Nagel, addressing four different categories of symptoms, differences in MPA relating to performance setting, and the broad spectrum of MPA severity. Her proposed definition from her book chapter, "The Role of Negative Emotions in Performance Anxiety" from 2010, is cited by many scholars and in many sources that I have come across. It seems to clearly define MPA from a holistic point of view.

> *Music performance anxiety* is the experience of marked and persistent anxious apprehension related to musical performance that has arisen through specific anxiety-conditioning experiences. It is manifested through combinations of affective, cognitive, somatic, and behavioural symptoms and may occur in a range of performance settings but

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[16] Elizabeth Brooker, *Transforming Performance Anxiety Treatment Book* (New York, NY: Routledge, 2019), 3.
[17] Nagel, "Treatment of Music Performance Anxiety via Psychological Approaches: A Review of Selected CBT and Psychodynamic Literature," 141.

> is usually more severe in settings involving high ego investment and evaluative threat. 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 the musical performance.[18]

This explanation of MPA makes clear its persistence and severity on a spectrum, draws parallels with psychological terms, explains its manifestation, describes those affected and the potential duration, and mentions a possible negative outcome. In my view, Kenny's definition is a summation and expansion of the work and definitions of other scholars.

Although the definitions of MPA vary widely, common themes emerge. It seems clear that MPA has the potential to cause significant distress and be debilitating in severe cases. Most of these definitions imply some sort of anticipatory thinking, where the performer worries about the reception of their work by others. Manifestations of MPA include somatic symptoms (physical), cognitions (thoughts), behavioural changes (such as performance avoidance or lack of motivation), and an effective response (mood and emotions). MPA does not seem to be affected by age or experience, though Kenny hints to a partial connection. Performance quality deterioration can result, although not always.

1.2 Literature Review

This section is comprised of a review of the past and present literature relating to Music Performance Anxiety. I have reviewed numerous studies and articles by some of the leading scholars in the area of music performance anxiety and music psychology. To ensure a thorough

[18] Dianna T. Kenny, "The Role of Negative Emotions in Performance Anxiety," in *Handbook of Music and Emotion: Theory, Research, Applicatioons*, ed. John A. Sloboda (New York, NY: Oxford University Press, 2010), 433.

review of the literature, searches of the UBC library catalogue, databases including PsycINFO, PubMed, and Google Scholar were conducted.

Literature reviews on Music Performance Anxiety were also consulted in the presentation of this study. Ariadna Ortiz Brugués' book, *Music Performance Anxiety - A Comprehensive Update of the Literature* (2019) proved to be a valuable resource for finding past and more recent studies on the epidemiology of MPA, MPA Intervention Studies, Concepts of MPA, and assorted reports.[19] Kenny's "A Systematic Review of Treatments for Music Performance Anxiety" also helped to identify past studies in MPA interventions.[20] Bibliographies of articles were consulted as a further way of finding other resources and publications. Unpublished studies, doctoral theses, studies with major design flaws, or those involving small samples (less than 10) are not included in the literature review.

1.2.1 Prevalence of MPA and its Severity

Music performance pushes the upper limits of human physical and mental capacities.[21] In that context, it is no wonder that MPA is so commonplace. Famous artists such as Arthur Rubinstein, Vladimir Horowitz, Barbra Streisand, Maria Callas, Pablo Casals, Sergei Rachmaninoff, and John Lennon have openly discussed their personal experiences with this struggle.[22] The iconic 19th-century composer Frédéric Chopin left a poignant statement of his aversive performance experiences: "I am not fitted to give concerts. The audience intimidates

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[19] Ariadna Ortiz Brugués, *Music Performance Anxiety - A Comprehensive Update of the Literature* (Cambridge Scholars Publishing, 2019).
[20]Kenny, "A Systematic Review of Treatments for Music Performance Anxiety."
[21] Aaron Williamon, "A Guide to Enhancing Musical Performance," in *Musicial Excellence: Strategies and Techniques to Enhance Performance*, ed. Aaron Williamon (New York: Oxford University Press, 2004), 7.
[22] Andreas C. Andreas C. Lehmann, John A Sloboda, and Robert H. Woody, *Psychology for Musicians*, ed. Mario Wiesendanger, Jürg Kesselring, and Eckart Altenmüller (New York: Oxford University Press, 2007), 146.; Dianna T. Kenny, *The Psychology of Music Performance Anxiety* (New York, NY: Oxford University Press, 2011).

me, I feel choked by its breath, paralyzed by its curious glances, struck dumb by all of those strange faces."[23]

Several studies have investigated the prevalence of MPA among various populations. Some examine one particular population, such as professional musicians, music students, classical musicians, jazz musicians, amateur musicians, and so forth, while others are broader and report percentages for musicians as a whole. The results tend to vary tremendously among all populations of musicians. Obviously, some degree of variability is to be expected in research, but such a broad range perhaps speaks to the lack of understanding of MPA, the absence of a standardized definition, as well as its continued stigma. Reporting methods could greatly impact whether a musician would feel comfortable to truthfully self-report MPA. Differences in definitions and descriptions of MPA could result in either an over estimation or under estimation of its prevalence.

1.2.1.1 General Prevalence

Dr. Kenny compiled a systemic review of MPA treatments, which included a variety of statistical findings on the prevalence of MPA.[24] In a study by Lockwood of 2212 respondents, 24% reported the most severe form of MPA, 13% reported acute anxiety, and 17% reported suffering from depression.[25] At first glance, these numbers seem lower than other studies, but when one takes into consideration that this study was conducted in 1989, the results make more sense. Stigma around MPA and mental health existed to high degree in the past. Other similar

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[23] Zdzislaw Jachimecki, *Chopin, Fryderyk Franciszek: Polski slownik biograficzny* (Kraków: Polska Akademia Umiejętności, 1937), quoted in Kenny, *The Psychology of Music Performance Anxiety*, 1.
[24] Kenny, "A Systematic Review of Treatments for Music Performance Anxiety."
[25] Lockwood, A. H. "Medical Problems of Musicians." The New England Journal of Medicine 320, no. 4 (1989): 221, quoted in Kenny, "A Systematic Review of Treatments for Music Performance Anxiety," 86.

studies of music students from the late 1970s to 1990 found prevalence rates of 14-16%.[26] With this is mind, one can put these results into perspective.

In 1995, van Kemenade, et al. surveyed 155 symphonic musicians and found that 58.7% suffered from MPA, with no relationship found between gender, age, and years of professional experience.[27] One component of this study examined musicians' perceived rate of MPA. The researchers found that anxious musicians predicted a much higher prevalence of MPA among their colleagues (65%) compared with non-anxious musicians, who predicted a much lower prevalence rate (16%).[28]

Another study from the late 1990s surveyed 56 orchestras and found that 70 percent of musicians suffered from MPA that was significant enough to negatively impact their performance.[29] Of those respondents, 16% indicated that this was a weekly occurrence.[30]

A systemic review of prevalence rates of MPA was conducted in 2019, which included 43 studies and focused on musicians 16 years and older, professional musicians, music students, and music teachers. Researchers found a very large variation in rates of MPA, ranging from 16%-60%.[31] This review found mixed information regarding gender when considering MPA, with some studies showing higher and more frequent MPA in women while others showing no

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[26] Johannes F. L. M. van Kemenade, Maarten J. M. van Son, and Nicolette C. A. van Heesch, "Performance Anxiety among Professional Musicians in Symphonic Orchestras: A Self-Report Study," *Psychological Reports* 77, no. 2 (1995), https://doi.org/10.2466/pr0.1995.77.2.555.
[27] van Kemenade, Son, and Heesch, "Performance Anxiety among Professional Musicians in Symphonic Orchestras: A Self-Report Study," 557-58.
[28] van Kemenade, Son, and Heesch, "Performance Anxiety among Professional Musicians in Symphonic Orchestras: A Self-Report Study," 558.
[29] I. James, "Western orchestral musicians are highly stressed.," *Resonance: International Music Council* 26 (1998), quoted in Kenny, "A Systematic Review of Treatments for Music Performance Anxiety," 86.
[30] James, "Western orchestral musicians are highly stressed.", quoted in Brugués, *Music Performance Anxiety - A Comprehensive Update of the Literature*.
[31] I Fernholz et al., "Performance anxiety in professional musicians: a systematic review on prevalence, risk factors and clinical treatment effects," *Psychological Medicine* 49, no. 14 (2019): 2289.

correlation between gender and MPA. The review also found higher MPA in younger musicians compared with those older than 45 or 50.

1.2.1.2 Student Groups

The range of MPA among music students also varies largely. One study showed that more than 70% of students reported that MPA had at least a moderately adverse influence on their performance.[32] Notably, music students who were not yet attending university showed distressing levels of MPA, comparable to the level found in university music students and professional musicians.[33] Another smaller study sent questionnaires to 60 music students with a response rate of 92% (55/60). The results showed a staggering 96% of students admitted to struggling with MPA, either before, during, or after performance or a combination of two or more of these three stages.[34]

When MPA becomes too painful for the musician, it is easy to leave or contemplate leaving a profession in music. MPA has been found to result in 20% of advanced music students quitting their studies due to its adverse effects.[35] Of those who continue their studies, 40-60% indicate that their performance level deteriorates because of the effects of MPA.[36] Teachers and professors were reported most frequently as the group of people who elicited the most anxiety, with 36.5% of respondents saying that this was because of their knowledge and 32.7% of students indicating the importance of their judgment.[37] In the same study, the researchers found

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[32] Fehm, "Performance anxiety in gifted adolescent musicians."
[33] Fehm, "Performance anxiety in gifted adolescent musicians," 107.
[34] Juwairiyah Binti Zakaria, Hanizah Binti Musibb, and Sariwati Mohd Shariffc, "Overcoming Performance Anxiety among Music Undergraduates," *Procedia - Social and Behavioral Sciences* 90 (2013): 226.
[35] Dalia G. Cirujeda, "Cómo superar la ansiedad escénica en músicos.," [Overcoming music performance anxiety.] *Mundimúsica Ediciones* (2004).
[36] Susan E. Marchant-Haycox and Glenn D. Wilson, "Personality and Stress in Performing Artists," *Personality and Individual Differences* 13, no. 10 (1992).
[37] Fehm, "Performance anxiety in gifted adolescent musicians," 104.

that performance elicited a strong anxiety response, yet students were rarely affected by MPA in their lessons.[38]

A French study published in 2011 surveyed 190 music students about their experience with MPA. Respondents could rate their MPA on a scale from Level 0 (meaning no MPA) to Level 4. Only 4% of students self-reported their MPA as a level 0. Levels 1, 2, and 3, had the most responses with 25% rating MPA as level 1, 40% as level 2 and 19% as level 3 while another 12% rated their MPA at level 4. The study probed into some of the academic and professional effects of MPA for these students. A total of 22% reported failing an exam because of their MPA, while 36% reported a poor grade and 49% a bad critique because of how MPA affected their performance. Avoidance behaviour, which can include trying to avoid an anxiety triggering situation, was always present in the case of 25% percent of participants because of the ways in which they were affected by MPA.[39]

A longitudinal study from Zurich looked specifically at the experience of first-year students who were making the transition from high school to higher education music studies. 105 students were surveyed at three different Swiss universities. The results showed a significant increase in exhaustion, especially among women, and an increase in depression scores, especially for men.[40] MPA scores during concert increased from the beginning of the school year to the end of the school year.[41]

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[38] Fehm, "Performance anxiety in gifted adolescent musicians," 104.
[39] Regina Studer et al., "Stage fright: its experience as a problem and coping with it," *Institute for Work and Health affiliated to both the University of Lausanne and the University of Geneva.* 84 (2011).
[40] Horst Hildebrandt, Matthias Nubling, and Victor Candia, "Increment of Fatigue, Depression, and Stage Fright During the First Year of High-Level Education in Music Students," *Medical Problems of Performing Artists* 27, no. 1 (2012): 45.
[41] Hildebrandt, Nubling, and Candia, "Increment of Fatigue, Depression, and Stage Fright During the First Year of High-Level Education in Music Students," 47.

Intriguingly enough, a study by Robson and Kenny found that music majors had higher levels of MPA (112.53/240 on the Kenny Music Performance Anxiety Inventory) compared with non-majors (98.04/240), but only by a small margin.[42] Although the result itself is not surprising, the fact that the difference is so small raises questions. Are the non-music majors still seeking a career in music? It could be presumed that they are not. Why are those pursuing a career only experiencing slightly higher levels of MPA? Is the decision to pursue a professional career in music more of a "survival of the fittest?" Did the non-music majors choose to be non-majors because of MPA? It is unfortunate that the authors did not probe further into these questions.

1.2.1.3 Gender and MPA

A Brazilian study of prevalence of MPA and associated psychopathology found there to be no real difference between men and women, although interestingly enough, they did find that women tended to experience more avoidance behaviour than men.[43] Kenny and Robson (2017) also found no statistically significant difference between genders and MPA scores.[44] In contrast, another article presenting the results of three studies reported a correlation between higher levels of MPA among females.[45]

Relatedly, among participants who volunteered for an MPA Intervention Program (Chapter 2), 36 were female and 13 were male. Almost three times more females volunteered. There is no way of knowing if this was because of lower MPA in men, merely an issue of

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[42] Kim E. Robson and Dianna T. Kenny, "Music performance anxiety in ensemble rehearsals and concerts: A comparison of music and non-music major undergraduate musicians," *Psychology of Music* 45, no. 6 (2017): 874.
[43] Ana Elisa Medeiros-Barbar, José Alexandre de Souza-Crippa, and Flávia de Lima-Osório, "Performance anxiety in Brazilian musicians: Prevalence and association with psychopathology indicators," *Journal of Affective Disorders* 152 (2013).
[44] Robson and Kenny, "Music performance anxiety in ensemble rehearsals and concerts: A comparison of music and non-music major undergraduate musicians."
[45] Okan Cem Çırakoğlu and Gülce Coşkun Şentürk, "Development of a Performance Anxiety Scale for Music Students," *Medical Problems of Performing Artists* 28, no. 4 (2013): 206.

scheduling, or a sign that women are more likely to seek treatment for mental health in general. When looking at the mean and median pre-intervention K-MPAI for volunteers (even those who did not participate in the study), we see virtually no difference. The mean K-MPAI of the women is 147.4 with a median of 153.5. Similarly, the mean K-MPAI of the men was 149.9 with a median of 154. There is very little difference between the severity of MPA between women and men who volunteered for the intervention research study. What is notable is that considerably far fewer men volunteered compared with women. This is not entirely surprising. A study out of Australia showed that of respondents who reported experiencing mental illness, 80.68% of females sought treatment compared to only 46.88% of males.[46]

1.2.1.4 Severity

"No category of performer is exempt from the experience of MPA. Whether a child, adolescent, or adult musician, whether amateur or professional, experienced or inexperienced, solo or ensemble, instrumentalist or singer, performers of all types and ages may suffer from MPA".[47] This quote by Dr. Kenny helps to point out how far-reaching and vast MPA is among musicians. We are not dealing with a problem faced by only a select population, but rather one that prevails despite age, experience, situations, and instruments. Knowing the commonality of MPA as an aspect of music performance helps us understand the severity of MPA.

A common myth portrays professional performers as being somehow exempt from the suffering of MPA, but the literature and accounts from performers themselves prove that not to

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[46] Dominiek Coates, Christine Saleeba, and Deborah Howe, "Mental Health Attitudes and Beliefs in a Community Sample on the Central Coast in Australia: Barriers to Help Seeking," *Community Mental Health Journal* 55 (2018): 480.
[47] Dianna T. Kenny, "Music Performance Anxiety: Origins, Phenomenology, Assessment and Treatment," Scholarly Journals, *Context* (2006): 56.

be the case. Students as well as professionals suffer from MPA to varying degrees. Canadian Pianist and UBC Professor Emeritus Robert Silverman spoke about his struggle with MPA in an interview with Reubart for his book *Anxiety and Musical Performance*. Published in 1985, this resource was ground-breaking at the time and is particularly relevant considering Reubart's professorship at UBC.[48] In 1998, The American Music Teacher magazine described it as, "an important contribution to the field of piano pedagogy".[49]

In Reubart's book, Silverman was quoted as saying, "no matter how long or how hard I practiced, I could never attain the secure feeling that my fingers would work well (or even passably) at any given performance. Almost inevitably, my initial 'warming-up' period during a concert was sheer torture."[50] Later, he mentions, "I often felt a total disconnect between my hands and my mind.".[51]

The spectrum of MPA can range from being a simple annoyance to being debilitating and extremely distressing.[52] It is important to recognize MPA as having varying degrees of severity as part of the process to establish treatment models. For those on the lower end, MPA can be performance-enhancing and exhilarating.[53] For these individuals, MPA causes little to no distress but instead has adaptive qualities that bring the performance to a higher level. On the other end

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[48] Reubart, Dale. Anxiety and Musical Performance : On Playing the Piano from Memory.1985.
[49] Cockey, Linda. ""Anxiety and Musical Performance on Playing the Piano from Memory," by Dale Reubart." American Music Teacher, 1998.
[50] Dale Reubart, *Anxiety and Musical Performance* (New York, NY: Da Capo, 1985), viii., quoted in Kenny, *The Psychology of Music Performance Anxiety*, 9.
[51] Reubart, *Anxiety and Musical Performance*, quoted in Kenny, *The Psychology of Music Performance Anxiety*, 9.
[52] Claudia Spahn et al., "Music performance anxiety in opera singers," *Logopedics Phoniatrics Vocology* 35, no. 4 (2010): 176, https://doi.org/10.3109/14015431003720600.
[53] Hamann, "The Other Side of Stage Fright."

of the spectrum, MPA can be debilitative and maladaptive.[54] According to the Catastrophe Theory by Hardy and Parfitt, instead of an inverted U shape for performance deterioration, as discussed in section 1.2.3.2, once anxiety reaches a certain level, performance quality deteriorates rapidly and abruptly.[55] This sudden performance deterioration is jarring and highly distressing to the performer and can easily cause an even larger spike in anxiety.

For those afflicted with higher levels of MPA, it can have a profound effect on both one's professional career and one's personal life.[56] Professionally, it can result in career devastation and potential career abandonment.[57] A study from 1994 looking at Canadian orchestral musicians found that 96% of respondents dealt with performance related stress,[58] with stress being the highest for those under 40 and those over 50. Nagel compares the psychological consequences of severe MPA to that of a severe, life-threatening illness, making the connection that career aspirations may be terminated in both cases.[59] Reporting on the work of opera singers, Spahn et al. explain that "The change from normal to pathological and clinically relevant MPA occurs when the singer is personally suffering a lot, and/or when he cannot deliver his optimal performance on stage."[60]

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[54] Ioulia Papageorgi, Susan Hallam, and Graham F. Welch, "A conceptual framework for understanding musical performance anxiety," *Research Studies in Music Education* 28, no. 1 (2007): 91, https://doi.org/10.1177/1321103X070280010207.
[55] Papageorgi, Hallam, and Welch, "A conceptual framework for understanding musical performance anxiety," 92.
[56] Ana Beatriz Burin and Flávia de Lima Osório, "Interventions for music performance anxiety: results from a systematic literature review," *Arch Clin Psychiatry* 43, no. 5 (2016): 116.
[57] Gladys Acevedo Sweeney and John J. Horan, "Separate and Combined Effects of Cue-Controlled Relaxation and Cognitive Restructuring in the Treatment of Musical Performance Anxiety," *Journal of Counseling Psychology* 29, no. 5 (1982): 486.
[58] Lee R. Bartel and Edward G. Thompson, "Coping With Performance Stress: A Study of Professional Orchestral Musicians in Canada," *The Quarterly* 5, no. 4 (1994): 72.
[59] Nagel, "Treatment of Music Performance Anxiety via Psychological Approaches: A Review of Selected CBT and Psychodynamic Literature," 142.
[60] Spahn et al., "Music performance anxiety in opera singers," 176.

Considering the relevant literature, suffering and/or performance quality deterioration, as reported by a musician, seem to be markers of severe and maladaptive MPA. What also needs to be considered are the physical consequences of MPA. Kenny and Ackermann (2015) make connections between physical pain, depression, and MPA in orchestral musicians.[61] Their study showed that performers with more severe performance-related musculoskeletal pain also had more elevated MPA scores along with the finding that performers taking beta blockers for MPA reported higher pain levels. When looking at trigger point pain scores and MPA, Kenny and Ackermann found that as MPA scores increased for females, so did trigger point pain scores, while in the case of men, as MPA scores increased, trigger point pain scores decreased. Although only correlations can be drawn from this study, it points to a possible link between MPA and performance-related musculoskeletal pain.[62]

1.2.1.5 Summary

From a review of the literature, no clear consensus has emerged on prevalence rate. A significant problem in identifying, de-stigmatizing, managing, and treating MPA has contributed to the ongoing challenge of determining accurate prevalence rates. That said, the fact that many of the above studies are finding prevalence rates of 50% or higher is an indication that work is needed in this area to find management and treatment options. The higher rates reported by Fehm among the student population indicate that there is certainly a need to find ways of helping this population.[63] The possible link to increased exhaustion, depression, and MPA in the first year of

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[61] Dianna Kenny and Bronwen Ackermann, "Performance-related musculoskeletal pain, depression and music performance anxiety in professional orchestral musicians: A population study," *Psychology of Music* 43, no. 1 (2015), https://doi.org/10.1177/0305735613493953.
[62] Kenny and Ackermann, "Performance-related musculoskeletal pain, depression and music performance anxiety in professional orchestral musicians: A population study," 51.
[63] Fehm, "Performance anxiety in gifted adolescent musicians."

higher education music study is also concerning.[64] Both the high prevalence rates and the effect on students, especially those early in their studies, demonstrates that there is a need for proper programs to prevent, manage, and treat MPA as proactive measures in prevention of possible dire consequences. De-stigmatizing MPA and finding effective treatment and management techniques for the student population have the potential to positively affect the future professional musician population. Sternbach and Woody agree that the prevalence and severity of MPA needs to be addressed in students. "We should be concerned about the long-term effects of elevated stress in students. Stress is widely recognized in the medical and occupational health communities as a contributing and even causal factor in all the major illnesses and diseases in the United States."[65] This statement reminds us that addressing MPA in the student population could have benefits extending far beyond successful performance.

1.2.2 Symptoms

Often, MPA is simply described through a series of physical symptoms, but that falls short of truly describing the experiences of sufferers. The ways in which MPA manifests are varied and can encompass over 50 different symptoms. In fact, MPA is characterized by a combination of behavioural, cognitive, somatic, and affective symptoms.[66] Those who experience MPA may have symptoms in one, some, or all of these four categories. The number, combination, and severity of the reported symptoms are part of what distinguishes severity levels of MPA.[67]

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[64] Hildebrandt, Nubling, and Candia, "Increment of Fatigue, Depression, and Stage Fright During the First Year of High-Level Education in Music Students," 47.
[65] David J. Sternbach and Robert H. Woody, "Stress in the Lives of Music Students," *Music Educators Journal* 94, no. 3 (2008): 42.
[66] Kenny, "The Role of Negative Emotions in Performance Anxiety," 433.
[67] Kenny, *The Psychology of Music Performance Anxiety*, 47-50.

1.2.2.1 Somatic Symptoms

Somatic symptoms represent the category that most people are familiar with. It represents a group of physiological responses and symptoms elicited by the body.[68] The symptoms include a racing heart, sweating fingers, clammy hands and feet, rapid breathing, breathlessness, nausea, diarrhea, vomiting, dry mouth, dizziness, physical pain, headaches, cold hands, and panic attacks.[69] These symptoms can range from being mildly distressing to severely distressing to the performer. Physical symptoms are often a result of arousal from the autonomic nervous system, also known as the sympathetic nervous system.[70] At a certain level, arousal symptoms can be activating and performance enhancing, but if too high, they can easily become distressing and debilitating.

1.2.2.2 Cognitive Symptoms

Zakaria, et al., described the cognitive symptoms of MPA in this way: “the mental symptom or known as subjective feelings and negative thoughts in the mind that disturbs one’s confidence, feelings and senses towards the performance”.[71] A performer’s subjective experience with the anxiety and their negative thoughts about performance are the two main components of cognitive MPA symptoms.[72] These often happen before and during a performance. Before a performance, the musician may catastrophize, a term used to describe imaging a very negative outcome such as mistakes, major memory lapses, or complete performance breakdown.[73] There

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[68] Kenny, *The Psychology of Music Performance Anxiety*, 49.
[69] Williamon, "A Guide to Enhancing Musical Performance," 10-11.
[70] Williamon, "A Guide to Enhancing Musical Performance," 10.
[71] Zakaria, Musibb, and Shariffc, "Overcoming Performance Anxiety among Music Undergraduates," 227.
[72] Williamon, "A Guide to Enhancing Musical Performance," 11.
[73] Dianna T. Kenny and Naomi Halls, "Development and evaluation of two brief group interventions for music performance anxiety in community musicians," *Psychology of Music* 46, no. 1 (2018): 67, https://doi.org/10.1177/0305735617702536.

is also a possibility of imaging negative outcomes directly related to MPA symptoms, including worrying about fainting on stage or a concern that hands may shake. The performance itself can be catastrophized as well as the manifestation of physical and behavioural symptoms associated with MPA. Some of the ramifications from negative thoughts include "poor concentration, diverting attention and wasting valuable resources, possibly also acting as a cue to increase anxiety further."[74]

Another component of cognitive symptoms of MPA includes concern about audience reaction or negative evaluation.[75] This can take on the form of fear of rejection by peers, fear of earning a poor grade because of a performance, and fear of humiliation from peers or from the audience in general. The concerns can happen before, during, or after a performance and frequently affect self-esteem and self-worth.[76] Some of the ramifications from negative thoughts and worries about audience reaction include distractions in performance and increased anxiety.[77]

1.2.2.3 Behavioural Symptoms

Behavioural symptoms of MPA are, unfortunately, often visible or apparent to the audience, adding a further layer of distress.[78] These can include more overt symptoms like shaking and trembling, restlessness, fidgeting, and facial expression.[79] Another very overt behavioural ramification from MPA is performance breakdown, when a performer experiences

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[74] Elizabeth Valentine, "The fear of performance," in *Musical Performance: A Guide to Understanding*, ed. John Rink (Cambridge: Cambridge University Press, 2012), 167.
[75] Kenny and Halls, "Development and evaluation of two brief group interventions for music performance anxiety in community musicians," 67.
[76] Williamon, "A Guide to Enhancing Musical Performance," 11.
[77] Williamon, "A Guide to Enhancing Musical Performance," 11.; Salmon, "A Psychological Perspective on Musical Performance Anxiety: A Review of the Literature," 2.; Valentine, "The fear of performance," 169.
[78] Zakaria, Musibb, and Shariffc, "Overcoming Performance Anxiety among Music Undergraduates," 226-27.
[79] Williamon, "A Guide to Enhancing Musical Performance," 11.

serious musical and technical issues in performance because of MPA.[80] Performance breakdown can be a behavioural manifestation or symptoms, such as trembling and shaking, can lead to a performance breakdown. For a pianist, hands shaking on the keys may result in a significant lack of technical control. Similarly, for a string player, a shaky bow can hamper both technique such as the ability to produce a clear and consistent tone. Behavioural manifestations of MPA can cause serious distress for the performer, not only because of their potential negative impact on performance but also because they are often visible to audiences. This often generates embarrassment and a feeling of self-consciousness.

When musicians suffering with MPA are unsure how to cope or manage their symptoms, avoidance behaviours can surface. Certain behaviours from MPA result in more conscious decisions that are not visible to the audience. Evading performance opportunities, an example of an avoidance behaviour, is a behavioural symptom of MPA.[81] This can be one way, especially in the student population, of minimizing the suffering and negative aspects of MPA.

Another set of behavioural manifestations includes over-practising and over-preparing.[82] Under-preparation can be a cause of MPA and will be discussed later. In the case of over-practising or over-preparing, the performer may go to extreme measures that are potentially harmful. This could include practising in place of getting proper sleep and proper meals, practising to the point of overuse injury development, or preparing obsessively to such an extreme that MPA actually increases. A final example of a less visible and more conscious

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[80] Kenny, *The Psychology of Music Performance Anxiety*, 49.
[81] Kenny and Halls, "Development and evaluation of two brief group interventions for music performance anxiety in community musicians," 67.
[82] Kenny and Halls, "Development and evaluation of two brief group interventions for music performance anxiety in community musicians," 67.

behavioural response to MPA can come in the form of self-medication or substance use. The prevalence of medication and substance use is explained later in Chapter 1.

The fight, flight, or freeze response is a behavioural manifestation of MPA and can be described using the newer Polyvagal Theory.[83] According to the Polyvagal Theory, the freeze response relates to the dorsal system of the parasympathetic nervous system and basically immobilizes the body in the face of threat. This includes slowing and lowering heart rate, blood pressure, digestion, and breathing in an effort to protect the body from danger. Fainting can be an example of what happens when the dorsal system is activated. This is a more intense physical response to fear and is used by the body to protect itself from extreme danger. Fight or flight is experienced during moderate fear. Fight or flight mobilizes the body and activates the sympathetic nervous system to allow for escaping a dangerous situation or fighting off a threat. Many somatic symptoms are derived from the fight or flight response. The final component is the ventral system, which promotes calm when we are not in the face of danger.[84] Polyvagal Theory can help us to understand the varying behavioural responses experienced by musicians suffering from MPA, ranging from symptoms of arousal to passing out on stage.

1.2.2.4 Affective Symptoms

Affective symptoms of MPA are discussed less often in the literature compared with somatic, cognitive, and behavioural symptoms. Kenny describes affective symptoms as the fourth symptom category of MPA.[85] Affect can be either positive or negative and relates to a series of emotions that one can feel, including happiness, anger, melancholy, or sadness.[86]

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[83] Kenny, *The Psychology of Music Performance Anxiety*, 21.
[84] Kenny, *The Psychology of Music Performance Anxiety*, 21.
[85] Kenny, "The Role of Negative Emotions in Performance Anxiety," 433.
[86] Kenny, *The Psychology of Music Performance Anxiety*, 28.

Negative affect relates to negative emotions that are experienced whereas positive affect relates to positive emotions or state of mind. To understand the affect, it is important to characterize the usage of emotions, mood, and traits terms in the context of this study. Emotions tend to be short-lived experiences that are rather difficult to control, whereas mood is a much longer and enduring state that can be controlled a bit more easily than the emotions. Traits are innate aspects of one's personality that are either inherited or are a result of lived experiences.[87] When performers have a negative response to either an upcoming performance or a past performance, their emotions and mood can become severely and negatively affected.[88] An example of this might be falling into a depressive episode after a performance that is deemed by the performer as unsuccessful or a failure.

1.2.3 MPA Complexity

The full complexity of MPA is not widely understood or valued. In order to fully comprehend the range of causes, implications, individuality of MPA, it is important to explore how MPA can be oversimplified, as well as the traits and factors that are commonly associated with MPA.

1.2.3.1 The Danger of Oversimplification

Many books and articles simplify MPA by relating it to the Yerkes-Dodson Inverted U.[89] The Yerkes-Dodson Inverted U works on the principle that both low and high levels of arousal – the result of an adrenaline rush – will produce less successful performance. A moderate level of

[87] Kenny, *The Psychology of Music Performance Anxiety*, 29.
[88] Kenny, *The Psychology of Music Performance Anxiety*, 68.
[89] Paul G. Salmon and Robert G. Meyer, *Notes from the Green Room* (California: Jossey-Bass Inc., 1992).

arousal, on the other hand, is ideal and will result in a more successful performance.[90] The implication is that every person will respond the same way to arousal levels. This comparison has flaws, as pointed out by Kenny. First, the development of the Yerkes-Dodson Inverted U comes from experiments conducted on mice.[91] Knowing this makes it a bit more difficult to view it as a valid and accurate representation of arousal and MPA. Kenny proposes that the inverted U curve could be different for each person, meaning that the optimal level of arousal for one person may be quite different than that of another. Dr. Kenny also proposes that factors such as amount of practice and experience versus inexperience could all impact the height of the inverted U, its position in relation to arousal levels, and how steep the decrease in performance quality would be with high arousal and MPA.[92] Kenny refers to MPA as a highly complex phenomenon and condition, influenced by a combination of "genetics, environmental stimuli and the individual's experience, emotions, cognitions and behaviours".[93] Each one of these factors could play a role in one's own unique inverted U relationship between arousal and performance.

It has become evident that MPA has many layers and dimensions of complex interactions and individual reactive specificities. It is important to realize MPA cannot be defined as a unidimensional phenomenon.[94] The fight or flight response in the face of an anxiety provoking stimuli, including the performance stage, is what Dr. Kenny refers to as "focal anxiety".[95] This is one of three subtypes of MPA identified by Kenny and the subtypes with the lowest severity.

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[90] Robert M. Yerkes and John D. Dodson, "The Relation of Strength of Stimulus to Rapidity of Habit-Formation," *The Journal of Comparative Neurology and Psychology* 18, no. 5 (1908).
[91] Kenny, *The Psychology of Music Performance Anxiety*, 138.
[92] Kenny, *The Psychology of Music Performance Anxiety*, 138-42.
[93] Kenny, *The Psychology of Music Performance Anxiety*, 68.
[94] Álvaro M. Chang-Arana, Dianna T. Kenny, and Andrés A. Burga-Léon, "Validation of Kenny Music Performance Anxiety Inventory (K-MPAI): A cross-cultural confirmation of its factorial structure," *Psychology of Music* 46, no. 5 (2018).
[95] Kenny, *The Psychology of Music Performance Anxiety*, 57.

With this form of MPA, some symptoms, especially somatic, appear while on the stage but do not cause huge distress and have little effect on performance outcome. This form of MPA can produce symptoms ranging from mild to severe, but it is often easily managed and is not generalized.[96]

A second subtype is found when MPA is co-morbid with signs of other social anxieties.[97] Social Anxiety Disorder is described in the Diagnostic and Statistical Manual V (DSM-5):

> In social anxiety disorder (social phobia), the individual is fearful or anxious about or avoidant of social interactions and situations that involve the possibility of being scrutinized. These include social interactions such as meeting unfamiliar people, situations in which the individual may be observed eating or drinking, and situations in which the individual performs in front of others. The cognitive ideation is of being negatively evaluated by others, by being embarrassed, humiliated, or rejected, or offending others.[98]

The "performance only" sub-category of social anxiety is applied when the criterion relates to public performance only and not to the personal life of the individual.[99] Kenny's sub-category 2 of MPA comes into play when the features of social anxiety, or some of the criteria, are also evident in areas in the personal and non-performance parts of life. Kenny describes some features of this form of MPA as: believing that the outcome will be negative before the performance takes place; being unable to self-evaluate one's own performance without bias, an expectation that the audience will negatively judge them or their playing by their performance; significant worries about a poor performance, a heightened awareness to the audience and their reactions; and an inability to seek comfort in the evidence that the performance was

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[96] Kenny, *The Psychology of Music Performance Anxiety*, 57-60.
[97] Kenny, *The Psychology of Music Performance Anxiety*, 64.
[98] American Psychiatric Association, *Diagnostic and statistical manual of mental disorders : DSM-5,* 5th ed. (American Psychiatric Association, 2013).
[99] Association, *Diagnostic and statistical manual of mental disorders : DSM-5*.

successful.[100] The key difference between subtype 1 and subtype 2 is that the latter includes tendencies of social anxiety in one's personal life expanding beyond the concert stage.

The third and most severe subtype describes cases where MPA is co-morbid with evidence of major depressive disorder and/or panic disorder.[101] Major depressive disorder is a mood disorder and is described in the DSM-5 as follows:

> It is characterized by discrete episodes of at least 2 weeks' duration (although most episodes last considerably longer) involving clear-cut changes in affect, cognition, and neurovegetative functions and inter-episode remissions. A diagnosis based on a single episode is possible, although the disorder is a recurrent one in the majority of cases. Careful consideration is given to the delineation of normal sadness and grief from a major depressive episode.[102]

Panic disorder is an anxiety disorder and is described in the DSM-5:

> In panic disorder, the individual experiences recurrent unexpected panic attacks and is persistently concerned or worried about having more panic attacks or changes his or her behavior in maladaptive ways because of the panic attacks (e.g., avoidance of exercise or of unfamiliar locations). Panic attacks are abrupt surges of intense fear or intense discomfort that reach a peak within minutes, accompanied by physical and/or cognitive symptoms. Limited-symptom panic attacks include fewer than four symptoms. Panic attacks may be *expected*, such as in response to a typically feared object or situation, or *unexpected*, meaning that the panic attack occurs for no apparent reason.[103]

It is evident that both major depressive disorder and panic disorder are debilitative psychological conditions that can affect both the personal and professional life of the sufferer. When MPA becomes so severe that criteria for major depressive disorder and/or panic disorder are met, MPA has now reached its most severe form, according to Kenny. Kenny describes this form of MPA as, "extreme combination of emotional, cognitive, and somatic anxiety".[104] The book about

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[100] Kenny, *The Psychology of Music Performance Anxiety*, 60.
[101] Kenny, *The Psychology of Music Performance Anxiety*, 64.
[102] Association, *Diagnostic and statistical manual of mental disorders : DSM-5*.
[103] Association, *Diagnostic and statistical manual of mental disorders : DSM-5*.
[104] Kenny, *The Psychology of Music Performance Anxiety*, 64.

Donny Osmond's life, *Life Is Just What You Make It: My Story so Far*, by Osmond and Romanowski includes a section entitled, "Music performance anxiety as a panic disorder". This section describes his experience with severe MPA with signs of panic disorder.

> Once the fear of embarrassing myself grabbed me, I couldn't get loose. It was as if a big bizarre and terrifying unreality had replaced everything that was familiar and safe. In the grip of my wildest fears, I was paralyzed, certain that if I made one wrong move, I would literally die. The harder I tried to remember the words, the more elusive they became. The best I could do was not to black out, and I got through the show, barely, telling myself repeatedly, 'Stay conscious, stay conscious'.[105]

Examining Kenny's model and subtypes of MPA, it seems apparent that subtypes 2 (MPA with social anxiety) and 3 (MPA with Major Depressive Disorder and/or Panic disorder) could cause tremendous distress and have significant impacts for performers. Less literature exists to describe the former two subtypes and less research has been conducted into their effective treatments.

Merely relating MPA to a standard inverted U curve fails to take into consideration its true complexity. Kenny's subtypes help to broaden our awareness of the severity of MPA, yet they fail to fully address the complexity of MPA as well. According to Kenny, the severity of MPA only increases with diagnosable psychological co-morbidity. Would a musician with signs of depression and anxiety, yet not meeting all of the criteria for a diagnosis of a psychological disorder, be considered to only have a focal anxiety? Although Kenny's model goes well beyond the Yerkes-Dodson Inverted U theory by addressing different subtypes, it still does not seem to fully address the vastness of the MPA experience.

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[105] Donny Osmond and Patricia Romanowski, *Life Is Just What You Make It: My Story So Far* (New York, NY: MCA Music, Ltd/Virgin Music (Publishers), ltd, 1990).

1.2.3.2 Traits and Associations as Factors in Complicating MPA

There are intrinsic factors that can pre-dispose one to MPA or that can exacerbate symptoms of MPA that are already occurring. Self-concept, self-esteem, and self-efficacy are three common terms, all with implications for MPA according to Dianna Kenny. [106] How one view's oneself is defined by the term self-concept. Does the performer view themself as a stronger or weaker musician? Do they view themselves as successful or as a failure? Self-esteem, on the other hand, relates to one's approval of oneself. Perhaps a performer views their musical skills as limited, but they are accepting of this, and it has little negative impact on their ability to perform. This is different from a performer who views themself in one way while wishing or wanting to be something else. Self-efficacy relates to our perceived level of control over a situation. Are we capable of producing what we want in a particular situation or is it beyond our control? These three factors are often intertwined and have the potential to impact the degree of suffering from MPA as well as successful performance. Dr. Kenny explains this connection. "When one experiences uncertainty about one's capacity to control outcomes (uncertain helplessness), one experiences anxiety; the experience of helplessness results in both anxiety and depression."[107]

Kenny argues that one's general pre-disposition to experience anxiety, also known as Trait Anxiety, is an intrinsic predictor of MPA.[108] According to Kenny, trait anxiety is the degree to which one is susceptible to an anxious response. If a performer has generally high trait anxiety, they will be more likely to exhibit symptoms of MPA.

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[106] Kenny, *The Psychology of Music Performance Anxiety*, 72.
[107] Kenny, *The Psychology of Music Performance Anxiety*, 73.
[108] Kenny, *The Psychology of Music Performance Anxiety*, 24.

Kenny proposes that anxiety sensitivity may be an even greater predictor of MPA. Anxiety sensitivity differs from Trait Anxiety in that it relates to how one experiences the symptoms of the anxiety rather than how likely it is that an event will cause apprehension. Whereas the event in and of itself is viewed as the danger with trait anxiety, the anxious response and the fear that the symptoms may be observable is what is feared most in anxiety sensitivity. Kenny predicts that anxiety sensitivity levels may account for the wide spectrum of severity of MPA among musicians.[109]

Kenny proposes that the family environment can play a part in the development of MPA, especially in the more severe forms.[110]

> In the case of young performers who are high in trait anxiety (the expression of the generalized biological vulnerability), who come from home environments in which expectations for excellence are high but support for achieving excellence is low (generalized psychological vulnerability), exposure to early and frequent evaluations and self-evaluations of their performances in a competitive environment (specific psychological vulnerability) may be sufficient to trigger the physiological, behavioural and cognitive responses characteristic of music performance anxiety.[111]

In some cases, practice or lack of adequate preparation is an extrinsic factor that influences MPA. While some might therefore propose that practice deficits are the core cause of all MPA episodes and outcomes, that supposition would be an extreme oversimplification. Rather, if a performer has not trained enough or has not mastered the repertoire for performance, the result can, in some cases, be doubt and worry (cognitive symptoms of MPA) and potential memory lapses, faulty technique and/or performance breakdown (behavioural symptoms of

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[109] Kenny, *The Psychology of Music Performance Anxiety*, 24.
[110] Kenny, *The Psychology of Music Performance Anxiety*, 72.; Dianna T. Kenny, Stephen Arthey, and Allan Abbass, "Identifying attachment ruptures underlying severe music performance anxiety in a professional musician undertaking an assessment and trial therapy of Intensive Short-Term Dynamic Psychotherapy (ISTDP)," *Springer Plus* 5, no. 1 (2016), https://doi.org/10.1186/s40064-016-3268-0.
[111] Kenny, "A Systematic Review of Treatments for Music Performance Anxiety," 184.

MPA). It is fairly easy to see how this could lead to discouragement and a drop in mood (affective symptoms of MPA). In this case, practice preparation needs to be fully addressed to improve symptoms of MPA.

It is easy to assume that practice is at the root of MPA, but that is not always the case. It is crucial to separate performance deterioration caused by anxiety from anxiety associated with lack of preparation. Lack of adequate preparation is certainly one possible cause of MPA and should be investigated. Sweeney and Horan describe anxiety relating to poor preparation as "reactive anxiety", rather than the adaptive or maladaptive forms of MPA that are not caused by poor preparation. [112] They explain that maladaptive anxiety requires psychological tools for its management and treatment, but anxiety due to lack of preparation (reactive anxiety) will have much less benefit from such approach. Reactive anxiety due to issues of preparation will benefit from methods for improving preparation and pre-performance skills. However, these will likely prove not to be enough for those with maladaptive MPA, resulting in potential discouragement and reduced motivation. It can be challenging to clearly decipher whether anxiety is reactive or maladaptive, but it is important to examine the situation closely. As is evident from the literature, genetic, environmental, and emotional factors can also be at play. A critical step towards this understanding was presented in 1990 by Paul Salmon when MPA research was less prevalent:

> The intense psychological distress associated with live performances is often attributed by clinicians and teachers to such factors as insufficient performance experience, faulty technique, inappropriate repertoire, or improper practice and preparation habits. However, it is clearly a condition that affects many veteran performers with exemplary skills and preparatory techniques as well.[113]

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[112] Sweeney and Horan, "Separate and Combined Effects of Cue-Controlled Relaxation and Cognitive Restructuring in the Treatment of Musical Performance Anxiety," 487.
[113] Salmon, "A Psychological Perspective on Musical Performance Anxiety: A Review of the Literature," 2.

Treating MPA as a signal of practice deficiency would be effective if practice is one of the underlying factors but could be counterproductive if practice is not the issue. As Nagel pointed out in her book *Managing Stage Fright: A Guide for Musicians and Music Teachers*, "The 'answers' for performance anxiety do *not* lie in 'practicing harder-or longer'. Students suffering from a maladaptive form of MPA rather than a reactive form of MPA cannot 'talk themselves out' of performance anxiety".[114]

1.2.3.3 Summary

When investigating and studying MPA, it is important to understand the spectrum of MPA, possible complicating factors, and both the intrinsic and extrinsic traits that can leave one more susceptible to the various degrees and expressions of MPA. Nagel sums up the complexity of MPA by saying, "Like a fugue, performance anxiety has many contrapuntal layers; like a musical composition, it has many themes - originating overtly and dramatically and/or subtly and quietly in the exposition of childhood."[115] Whether one has suffered from MPA, is a teacher or mentor of a student suffering, a musical colleague, a friend, or even a family member, understanding the multi-dimensionality of MPA is the first step in a management and treatment plan.

1.2.4 Co-Morbidity of MPA with Other Psychological Disorders

Research in MPA and co-morbid psychological disorders is beginning to emerge but is still in its early stages. Kenny remarked on the lack of research into MPA and co-morbid psychological disorders, attributing it to the lack of clear diagnostic criteria for MPA.[116] Since

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[114] Julie Jaffee Nagel, *Managing Stage Fright: A Guide for Musicians and Music Teachers* (New York, NY: Oxford University Press, 2017), 4-5.
[115] Nagel, *Managing Stage Fright: A Guide for Musicians and Music Teachers*, 5.
[116] Kenny, *The Psychology of Music Performance Anxiety*, 64.

Kenny's book was published in 2010, some research has been conducted in this area, including by Kenny herself, though many questions remain unanswered. Does MPA cause psychological disorders or do psychological disorders cause MPA? Does MPA with signs of a co-morbid psychological disorder respond differently or require a different approach to treatment? Could some conditions make musicians more treatment-resistant? These are questions that still have not been answered by the literature.

A study by Medeiros Barbar, et al., found that although amateur and professional musicians had no difference in their levels of MPA, one large difference between those two groups was the prevalence of psychopathology. Professional musicians were more likely to suffer from psychological disorders along with their MPA than amateurs.[117] This could indicate that prolonged and untreated MPA related to one's career trajectory may lead to psychological co-morbidity. It is also possible that those with psychological disorders are more likely to become professional musicians. Without randomized control studies, these questions are and will continue to be difficult, if not impossible, to answer. Since randomized control trials are impossible, we rely on correlation studies that assess those already in the professional field. Longitudinal studies could follow students from university through to a professional career to assess those who go on to a professional career and those who do not, but this would be incredibly time consuming and expensive, and no such study appears to exist at present. At this point in time, the higher psychopathology in professional musicians can only be observed and speculated upon.

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[117] Medeiros-Barbar, Souza-Crippa, and Lima-Osório, "Performance anxiety in Brazilian musicians: Prevalence and association with psychopathology indicators," 383.

The researchers of the present study also found that 13% of musicians had indicators for moderate or severe general anxiety, 19% had indicators for social anxiety, and 20% had indicators for depression. Only 24% had indicators of MPA using the original Kenny Music Performance Anxiety Indicator (K-MPAI), yet of those musicians, psychopathology indicators were higher. The research found moderate to severe general anxiety in 29% of those with MPA indicators, social anxiety in 43% of those with MPA indicators, and depression in 48% of those with MPA indicators.[118]

1.2.4.1 Depression

Mederios-Barbar, et al., attempted to make connections between psychopathology and MPA. Their study was able to connect depression and social anxiety with MPA, but not other pathologies. Their study found that musicians with social anxiety were 3.22 times more likely to develop MPA and that those with depression were 3.87 times more likely to develop MPA.[119] I have yet to identify any studies that investigate the prevalence of MPA co-morbid with anxiety disorders other than social phobia. Kenny's sub-types of MPA refer to co-morbid panic disorder, but to my knowledge, no literature exists to show the exact prevalence of musicians suffering MPA co-morbid with panic disorder, obsessive compulsive disorder, or generalized anxiety disorder.

1.2.4.2 Social Phobia

Kenny, et al., conducted a study of orchestral musicians in Australia, looking not only into their MPA levels, but also their psychological well-being. The response rate was quite high,

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[118] Medeiros-Barbar, Souza-Crippa, and Lima-Osório, "Performance anxiety in Brazilian musicians: Prevalence and association with psychopathology indicators," 383.
[119] Medeiros-Barbar, Souza-Crippa, and Lima-Osório, "Performance anxiety in Brazilian musicians: Prevalence and association with psychopathology indicators," 383-84.

with a range of 50-98% in each of the 8 orchestras surveyed. The results found that 33% of respondents had scores that could meet criteria for a diagnosis of social phobia, with men and women having similar scores (33.8% and 30.4% respectively). A brief questionnaire, known as the PRIME-MD, was given to the respondents. The results indicated that 32.2% needed further screening and investigation for depression. Looking at substance use, the study found that 91% of musicians reported drinking alcohol, with 14.5% reporting having drunk more than 14 drinks in the previous 7 days.[120] This is above the Canadian recommended level for alcohol intake.[121] Of all the respondents, 5% indicated that they drank daily while 26.5% drank on average 5-6 times per week. It seemed that those who drank more than 14 drinks over a seven-day period also scored higher on performance anxiety and social phobia scores. When comparing anxiety disorder and higher than recommended substance use rates with orchestral musicians compared with the general population, rates in musicians were almost triple that of the general population. This also shows that musicians seem to have more psychopathology and/or reduced psychological wellbeing compared with the general population.[122]

When compared with the general workforce, Vaag et al. (2016) found that musicians reported higher levels of distress, with an adjusted prevalence difference of 8.2 percentage points.[123] The highest scores were found amoung vocalists, keyboardists, and string players,

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[120] Dianna Kenny, Tim Driscoll, and Bronwen Ackermann, "Psychological well-being in professional orchestral musicians in Australia: A descriptive population study," *Psychology of Music* 42, no. 2 (2014): 43, https://doi.org/10.1177/0305735612463950.
[121] *Canada Low Risk Alcohol-Drinking Guidelines Brochure*, (Canada: Canadian Centre on Substance Use and Addiction, 2019).
[122] Kenny, Driscoll, and Ackermann, "Psychological well-being in professional orchestral musicians in Australia: A descriptive population study," 43.
[123] Jonas Vaag, Johan Håkon Bjørngaard, and Ottar Bjerkeset, "Symptoms of anxiety and depression among Norwegian musicians compared to the general workforce," *Psychology of Music* 44, no. 2 (2016).

while the scores of woodwinds, brass, and drum players seemed to be in line with the rates found in the general workforce.[124]

1.2.4.3 Anxiety Disorders

After a thorough review, no studies were found indicating prevalence rates for MPA co-morbid with anxiety disorders other than social phobia. Kenny has made the link with MPA and panic disorder, but it is unclear how many musicians suffering from MPA would also have co-morbid panic disorder, obsessive compulsive disorder, or generalized anxiety disorder.

1.2.5 Intervention Studies

A review of the literature shows a collection of intervention studies over the past 30 years, with the majority being behavioural, cognitive, cognitive-behavioural (CBT), as well as some studies combining more than one approach. More recent intervention studies have also included technology, such using virtual reality as a form of intervention for MPA. Some psychodynamic therapy interventions have also been tested, but the literature is more limited in this area.

The use of pharmaceuticals is widely acknowledged in the music world and has also been studied to a degree. Because of ethical research parameters, most of the literature surrounding pharmaceuticals for musicians has to do with prevalence and potential benefits and risks. It is far less common to find a study that tests pharmaceuticals with musicians.

Back in 1982, Fogal made an observation about the trends in MPA intervention studies at that time.

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[124] Vaag, Bjørngaard, and Bjerkeset, "Symptoms of anxiety and depression among Norwegian musicians compared to the general workforce," 237-39.

> Current treatment efforts seem to be directed toward reducing the physiological component of performance anxiety, whether through medication or through relaxation and desensitization. It remains to be seen whether these methods follow from a psychological understanding of musical performance itself. Methods originally applied to free-floating or phobic anxiety may not be appropriate or effective with performance anxieties in general or with music performance anxiety in particular.[125]

Although major scholars in the area of MPA have worked to define and distinguish MPA from other forms of phobic anxieties, there is still a reliance in the literature on the reduction of physiological symptoms using exposure therapy and CBT. These are identified treatments for anxiety disorders, but their efficacy in treating MPA remains unknown.

1.2.5.1 Cognitive Behavioural Therapy Studies

Cognitive Behavioural Therapy (CBT) is a popular psychotherapeutic approach and is used frequently in the treatment of anxiety.[126] A common characterization of CBT's principal frame is that our thoughts and beliefs have a profound effect on our feelings and actions.[127] The therapeutic frame involves modifying the thought process, with faulty thinking patterns being replaced with more productive ones to create change in how one acts and feels.[128]

Brugués has developed a comprehensive review of the literature for MPA, including intervention studies. She found that five CBT intervention studies have taken place and were published between 1982 and 2015.[129] A study by Kendrick, et al., from 1982 examined 55 piano students with MPA to see if CBT or behavioural intervention would yield better results compared

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[125] Fogel, "Toward effective treatment for music performance anxiety," 369.
[126] Gerald Corey, *Theory and Practice of Counselling and Psychotherapy*, 10th ed. (Boston, MA: Cengage Learning, 2017), 236.
[127] Corey, *Theory and Practice of Counselling and Psychotherapy*, 270.
[128] Corey, *Theory and Practice of Counselling and Psychotherapy*, 270.
[129] Brugués, *Music Performance Anxiety - A Comprehensive Update of the Literature*.

with controls.[130] The study found CBT to show more improvement than behavioural therapies, which in turn showed more improvement than controls.[131] A small study by Harris from 1987 investigated 17 students with MPA, finding CBT treatment to show more improvement following the intervention and at a later follow up compared with controls. CBT was shown to improve MPA scores among a group of 33 music students following a CBT combined intervention in a study from 1993, but performance quality remained the same as controls. A similar outcome was found in a study by Braden, et al., in 2015.[132] Osborne, et al., found that a behaviour-exposure intervention improved MPA to a small degree, but there was greater improvement when CBT was used.[133] The CBT intervention also improved performance avoidance habits more than the behavioural-exposure program, which improved compared with controls. Judges could not accurately identify the pre- versus post-performances of the CBT group but could more accurately identify the post-intervention performances of the behavioural-exposure group.[134]

Kenny also developed a review of treatments for MPA.[135] A comparison of a treatment review for MPA conducted by Kenny did not mention any further CBT study. These studies, although all small in scale without long-term follow up, show that MPA improved with CBT, perhaps even more so than with behavioural-exposure therapy. Two of the five studies investigated performance quality and found no improvement of performance quality. Although it

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[130] Margaret J. Kendrick et al., "Cognitive and Behavioral Therapy for Musical-Performance Anxiety," *Journal of Consulting and Clinical Psychology* 50, no. 3 (1982): 353.
[131] Kendrick et al., "Cognitive and Behavioral Therapy for Musical-Performance Anxiety," 359.
[132] Alice M. Braden, Margaret S. Osborne, and Sarah J. Wilson, "Psychological intervention reduces self-reported performance anxiety in high school music students," *Frontiers in Psychology* 6 (2015).
[133] Brugués, *Music Performance Anxiety - A Comprehensive Update of the Literature*; Margaret S. Osborne, Dianna T. Kenny, and John Cooksey, "Impact of a cognitive-behavioural treatment program on music performance anxiety in secondary school music students: A pilot study," *Musicae Scientiae* 11, no. 2 (2007).
[134] Osborne, Kenny, and Cooksey, "Impact of a cognitive-behavioural treatment program on music performance anxiety in secondary school music students: A pilot study," 70.
[135] Kenny, "A Systematic Review of Treatments for Music Performance Anxiety."

would seem that the performer's subjective experience changes, CBT does not necessarily lead to more successful performance, as measured by external judges.

1.2.5.2 Behavioural Interventions

A common technique used to treat phobias in general is Exposure Therapy, which is a component of Behaviour Therapy. Through this, people can overcome specific phobias, including a fear of spiders, heights, elevators, planes, etc. This model of exposure has often been used for MPA, although some researchers do not agree. Fehm states that,

> Neither the experience with public performances nor the frequency of actual performances was associated with the level of performance anxiety. This is in line with findings of other studies, and it points to the fact that mere exposure to public performance does not automatically lead to a decrease in anxiety.[136]

Simply exposing oneself to performance situations, in this view, will not change the performance anxiety and may even make it worse.[137]

A review of the literature seems to show that there has been more study of behavioural interventions compared with CBT interventions. Appel found that a systemic desensitization program was more helpful than musical analysis or no intervention on self-report MPA, but had the same response as musical analysis but a more positive effect than controls on performance quality.[138] A very early study by Wardle (1969) found that a systemic desensitization program helped to decrease heart rate compared to the control group, but no performance measures were evaluated.[139] Grishman (1989) found in their doctoral dissertation that MPA, state-anxiety, and

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[136] Fehm, "Performance anxiety in gifted adolescent musicians," 107.
[137] Kenny, "The Role of Negative Emotions in Performance Anxiety."
[138] Sylvia S. Appel, "Modifying Solo Performance Anxiety in Adult Pianists," *Journal of Music Therapy* 13 (1976).
[139] Alvin Wardle, "Behavior modification by reciprocal inhibition of instrumental music performance anxiety," in *Research in music behavior: modifying music behavior in the classroom*, ed. Clifford K. Madsen, R. Douglas Greer, and Jr. Charles H. Madsen (New York: Teachers College Press, 1975).

heart rate all decreased compared with controls after a program to regulate physical symptoms.[140] Again, in a study from 1999 that used visualized exposure as treatment, MPA scores were found to improve without noticeable improvements in performance quality. Kim (2007) discovered decreased anxiety scores but only slightly decreased MPA scores after desensitization treatment.[141]

A comparison with Kenny's review of treatments found only one additional study: a PhD Dissertation with only 18 participants but with no statistically significant findings.[142] Similar to what was discovered with CBT studies, behavioural interventions do seem to decrease MPA scores, though possibly only by a small amount, as well as physiological symptoms. What is not apparent and understudied is whether these interventions have a positive effect on performance quality.

1.2.5.3 Combined Intervention Studies

There have been numerous studies that combine different therapeutic techniques to treat MPA. The difficulty is that each combination of treatments is different, with rarely any exact replication of a combination of therapies. Brugués (2019) lists 8 combined intervention studies ranging from 1982 to 2018, with seven reported in published articles and one in a PhD dissertation.[143]

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[140] Alan Grishman, "Musicians' performance anxiety: The effectiveness of modified progressive muscle relaxation in reducing physiological, cognitive, and behavioral symptoms of anxiety" (PhD University of Pittsburgh, 1989).
[141] Youngshin Kim, "The Effect of Improvisation-Assisted Desensitization, and Music-Assisted Progressive Muscle Relaxation and Imagery on Reducing Pianists' Music Performance Anxiety," *Journal of Music Therapy* 45, no. 2 (2008).
[142] Kenny, "A Systematic Review of Treatments for Music Performance Anxiety."
[143] Brugués, *Music Performance Anxiety - A Comprehensive Update of the Literature*.

A study by Sweeney and Horan from 1982 tested a combination of cognitive restructuring and cue-controlled relaxation, both individually and in combination, with 49 participants plus controls. When alone, each of the two treatments lowered heart rates compared to controls. The cognitive restructuring intervention led to low debilitation scores, whereas the cue-controlled intervention resulted in lower behavioural anxiety index scores. The combined treatment using both interventions decreased MPA but seemed to reduce the effects of each of the interventions individually.[144] Nagel, et al., tested a combination of progressive muscle relaxation, cognitive therapy, and biofeedback using 12 participants and 8 controls. They found a significant reduction in MPA pre- versus post-intervention compared with controls.[145] Clark and Agras assessed combining CBT with a placebo vs CBT with the pharmaceutical Buspirone or using Buspirone on its own. The CBT groups, compared with Buspirone on its own, showed more positive results. The CBT group showed a greater decrease on subjective anxiety scores and a greater increase in performance quality compared with the CBT plus placebo and the CBT plus Buspirone group.[146] Niemann, et al., combined biofeedback with training in coping strategies, relaxation, and imagery and found significant improvements post-intervention on anxiety scales.

Brodsky and Sloboda tested counselling alone as a treatment for MPA compared with counselling in addition to relaxation and music. One main finding was that professional musicians were open and willing to participate in therapy. All groups showed improvements, with very few differences between the counselling only group and the combined group. All

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[144] Sweeney and Horan, "Separate and Combined Effects of Cue-Controlled Relaxation and Cognitive Restructuring in the Treatment of Musical Performance Anxiety," 490-92.
[145] Julie Jaffee Nagel, David P. Himle, and James D. Papsdorf, "Cognitive-Behavioural Treatment of Musical Performance Anxiety," *Psychology of Music* 17, no. 1 (1989): 17-19, https://doi.org/10.1177/0305735689171002.
[146] Duncan B. Clark and W. Stewart Agras, "The Assessment and Treatment of Performance Anxiety in Musicians," *American Journal of Psychiatry* 148 (1991): 601-04.

findings were maintained 2 months post-intervention.[147] Lazarus and Abramovitz dealt with a past sexual trauma in counselling while also combining CBT and exposure. The authors felt multi-modal therapy techniques allowed treatment to be more tailored to the client's needs. They felt that this was especially important in complex cases of MPA, such as when sexual trauma is involved.[148] Kenny and Hall compared a CBT treatment to an Anxiety Sensitivity Intervention (AS). Both groups showed less state anxiety and increased performance quality both following the intervention and at follow ups.[149]

A comparison was made with Kenny's review of treatments to ensure that the list was comprehensive. Kenny included the same list of studies apart from her latterly published study.[150] Catalogue searches provided no further studies for inclusion.

1.2.5.4 Other Interventions

Studies have been conducted using a wide array of interventions that are not necessarily part of the psychological realm. Techniques have included the use of Alexander Technique, workshops, meditation, neurolinguistic programming, yoga, improvisation-assisted desensitization, emotional management techniques, relaxation breathing, qigong, biofeedback, simulation training, and music therapy.[151] According to Brugués' findings, meditation on its own showed the least promise as an effective tool. Workshops, though beneficial, seemed to only help student better understand MPA. Many of the other interventions show modest improvements,

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[147] Warren Brodsky and John A. Sloboda, "Clinical Trial of a Music Generated Vibrotactile Therapeutic Environment for Musicians: Main Effects and Outcome Differences Between Therapy Subgroups," *Journal of Music Therapy* 34, no. 1 (1997): 20-22.
[148] Arnold A. Lazarus and Arnold Abramovitz, "A Multimodal Behavioral Approach to Performance Anxiety," *Journal of Clinical Psychology* 4, no. 4 (2004): 339-40.
[149] Kenny and Halls, "Development and evaluation of two brief group interventions for music performance anxiety in community musicians," 75.
[150] Kenny, "A Systematic Review of Treatments for Music Performance Anxiety."
[151] Brugués, *Music Performance Anxiety - A Comprehensive Update of the Literature*, 74-78.

either in MPA, in physiological measures such as heart rate, or in anxiety.[152] Kenny's analysis demonstrated that Alexander Technique, although shown to be slightly helpful, is perhaps not as strongly associated with significant decreases in MPA as some may believe.[153]

A few other studies have tried other, less common, therapeutic interventions, including Acceptance and Commitment Therapy,[154] Psychodynamic Therapy,[155] Ericksonian resource retrieval (a dissertation),[156] and hypnotherapy.[157] According to Kenny, the studies of Hypnotherapy, Acceptance and Commitment Therapy, as well as short-term intensive psychodynamic therapy have shown promise,[158] but very few studies have been conducted for each of these. The limited research makes it hard to fully understand the impact of these interventions at this time.

1.2.5.5 Pharmacology

Musicians often manage severe MPA with anti-anxiety medications (beta-blockers or benzodiazepines), either prescribed by a physician or obtained illegally. In one study the reported prevalence of drug use was 40% in professional musicians with severe MPA, and in one survey over half of music students report favorable attitudes toward such self-medication.[159] The use of pharmacological treatments for MPA is not a new trend. An early study by Fishbein, et al.,

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[152] Brugués, *Music Performance Anxiety - A Comprehensive Update of the Literature*, 74-92.
[153] Kenny, "A Systematic Review of Treatments for Music Performance Anxiety," 200.
[154] Juncos et al., "Acceptance and Commitment Therapy for the Treatment of Music Performance Anxiety: A Pilot Study with Student Vocalists."
[155] Kenny, Arthey, and Abbass, "Identifying attachment ruptures underlying severe music performance anxiety in a professional musician undertaking an assessment and trial therapy of Intensive Short-Term Dynamic Psychotherapy (ISTDP)."
[156] Joseph John Richard Jr, "The effects of Ericksonian Resource Retrieval on musical performance anxiety" (Doctor of Education West Virginia University, 1992).
[157] Kenny, "A Systematic Review of Treatments for Music Performance Anxiety," 199.
[158] Kenny, "A Systematic Review of Treatments for Music Performance Anxiety."
[159] Robert B. Wesner, Jr Russell Noyes, and Thomas L. Davis, "The occurrence of performance anxiety among musicians " *Journal of Affective Disorders* 18 (1990).

found that drugs were frequently used by 40% of those suffering from MPA, often with beta blockers being used without a prescription and presumably without medical supervision.[160] A study from 1989 surveying over 2000 orchestral musicians found that 20% struggled with alcohol use and around the same number used prescription or non-prescription drugs.[161] These statistics are concerning, especially considering the attitudes of self-medication. As Patston and Loughlan (2014) pointed out, "It is difficult to imagine another profession where up to 30% of workers believe that they require medication to do their job effectively."[162]

There seems to be less use of pharmaceuticals among music students, with one study showing that 96.8% of students never use illicit drugs to self-medicate for MPA and 91% were not using alcohol to self-medicate for MPA. The study did show that 18.8% had used medication, but half responded as using medication only exceptionally.[163] Looking at these, it would still indicate that approximately 1 in 10 students are using medication to control their MPA more often than exceptionally. Just under 1 in 10 are using alcohol as a coping mechanism. A study from 2018 found that 19.8% of students resorted to a pharmaceutical, most commonly beta blockers and benzodiazepine (12.5%) and/or a herbal products (7.6%) in order to cope with their MPA.[164] Even alcohol consumption prior to performance seems lower in the student population with one study finding a rate of 1.7%.[165] A small student-run survey of UBC large ensemble

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[160] M. Fishbein M and S.E. Middlestadt, "Medical problems among lCSOM musicians: Overview of a national survey," *Medical Problems of Performing Artists* 3 (1988).
[161] A Lockwood, "Medical Problems of Musicians," *The New England Journal of Medicine* 320, no. 4 (1989): 225.
[162] Tim Patston and Terence Loughlan, "Playing with performance: the use and abuse of beta-blockers in the performing arts," *Victorian Journal of Music Education* 1 (2014): 5.
[163] Studer et al., "Stage fright: its experience as a problem and coping with it," 765-66.
[164] Santos Orejudo Hernández, Francisco J Zarza-Alzugaray, and Oscar Casanova, "Music performance anxiety. Substance use and career abandonment in Spanish music students," *International Journal of Music Education* 36, no. 3 (2018): 464, https://doi.org/10.1177/0255761418763903.
[165] Hernández, Zarza-Alzugaray, and Casanova, "Music performance anxiety. Substance use and career abandonment in Spanish music students," 464.

musicians by Emily Richardson found that 10 out of 61 students at UBC indicated they self-medicated with either alcohol or illicit drugs before a performance. These numbers are lower than what has been seen in professional musicians, yet it is still high enough to be an indicator that students are seeking coping mechanisms. A concerning finding in the study by Hernández at al. (2018) was the correlation between substance use for MPA management (pharmacological or alcohol) and career abandonment of music students. In those who use substances, career abandonment rates are as high as 32.8%, compared with a rate of 11.8% among students who do not use substances as a coping mechanism.[166] If the student population can develop other ways of managing their MPA, it could lead to less career abandonment and potentially lower substance reliance once in the professional realm. This points at the need for more extensive research into non-pharmacological treatments as well as earlier invention with the young and emerging artist population.

Another concern is risk of negative consequences from using pharmacological treatment. Beta-blockers and benzodiazepines do not come without side effects, risks, and potential negative effects on performance. Benzodiazepines are known to be habit-forming with prolonged or inappropriate use and therefore must always be used under medical supervision.[167] They also can impair cognitive function and cause sedation, both of which can severely hamper musical performance.[168]

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[166] Hernández, Zarza-Alzugaray, and Casanova, "Music performance anxiety. Substance use and career abandonment in Spanish music students," 464.
[167] Paul Howard et al., "Benzodiazepines," *Journal of Pain and Symptom Management* 47, no. 5 (2014): 957.
[168] Falk Leichsenring and Frank Leweke, "Social Anxiety Disorder," *New England Journal of Medicine* 376, no. 23 (2017).

Beta-blockers, on the other hand, can be used "as needed" for performance and do not impair cognitive functioning.[169] As Patston and Loughlan explain, they work by reducing the excess activity in the sympathetic nervous system caused by adrenaline.[170] Although relatively safe, the authors go on to note that beta-blockers can pose a significant risk to one's health if they are not used under medical supervision. They lower heart rate and blood pressure, making it imperative that they are used under medical supervision and with careful monitoring. Problems arise, for example, when someone with bradycardia (a slow heart rate below 60 beats per minute) or someone with low blood pressure takes beta-blockers for a performance without medical consultation. Blood flow to the brain is reduced, causing confusion, light-headedness and possibly fainting. In the event of an unknown cardiac condition, a beta-blocker could cause worsening of an electrical problem in the heart or, in severe cases, congestive heart failure. For these reasons, it is imperative that beta-blockers only be taken after the evaluation and under the supervision of a medical doctor. Illicit beta-blocker use could come with serious consequences.

Beyond the cardiovascular effects of beta-blockers, there are also side effects related to cognition and gastrointestinal symptoms. Because Propranolol, a commonly used beta-blocker for performance, crosses the blood brain barrier, Patston and Loughlan explain the series of potential side effects. [171] Side effects can include light-headedness, weakness, fatigue, mental depression, and visual disturbances. Gastrointestinal side effects can include nausea, vomiting, abdominal cramps, and diarrhea. One can only imagine how these side effects could cause their own distress and impairment for performance. They may reduce symptoms of arousal on stage

[169] Leichsenring and Leweke, "Social Anxiety Disorder."
[170] Patston and Loughlan, "Playing with performance: the use and abuse of beta-blockers in the performing arts," 5.
[171] Patston and Loughlan, "Playing with performance: the use and abuse of beta-blockers in the performing arts," 7.

but could also produce side effects that create another set of problems. For some musicians, they may only experience the positive effects of a beta-blocker and be spared from side effects, but this will not be the case for everyone.

The severity of the issue at hand is evident when one considers the array of potentially health-altering – and even life-altering – risks of harm associated with pharmacological obtained or relying on alcohol to control MPA, and the side effects that come with pharmaceutical options. The urgent need for deep study to establish protocols for non-pharmaceutical options is clearly evident.

1.3 Conclusion

A comprehensive review of the literature shows that there exists a variety of studies and research publications that offer a broader understanding of MPA. What still appears to be lacking is a standardized definition and set of diagnostic criteria, a collection of more recent intervention studies, and a clear consensus on the treatment, management, and prevention of MPA. With prevalence rates high among student populations and continuing into the professional musician population, as well as evidence of increased susceptibility for psychological co-morbidity, there appears to be a need for greater research in these areas. Considering the side effects and potential negative consequences of using pharmacological treatments, there is a need to develop non-pharmacological alternatives for treating and managing MPA.

Chapter 2: Research Studies

This chapter will present the background and rationale for the research studies and research questions, which were derived from the literature review. Following this, the research question, methods, and results for both the pilot study and the main study will be presented. The purpose of the pilot study was to see if a non-pharmacological, multi-modal intervention would lead to any measurable change in MPA scores and/or any change in the participant's perception of their experience with MPA. The results and findings of the pilot study were used to guide the main study.

2.1 Background

Although many studies looking at non-pharmacological techniques for managing MPA have been conducted,[172] there are two main issues. First, no intervention has emerged as a definitive best approach and, secondly, many of the studies are from over 10 years ago. Musicians often manage severe MPA with anti-anxiety medications (beta-blockers or benzodiazepines), either prescribed by a physician or obtained illegally. There is a need to investigate possible non-pharmacological treatment alternatives.

Some therapies showed promise, but results were inconsistent, and the populations being studied varied significantly, from high school students to university level students and from amateur musicians to professional orchestral musicians. Studies looking at non-pharmacological

[172] Kenny and Halls, "Development and evaluation of two brief group interventions for music performance anxiety in community musicians."; Kendrick et al., "Cognitive and Behavioral Therapy for Musical-Performance Anxiety."; Appel, "Modifying Solo Performance Anxiety in Adult Pianists."; Wardle, "Behavior modification by reciprocal inhibition of instrumental music performance anxiety."; Grishman, "Musicians' performance anxiety: The effectiveness of modified progressive muscle relaxation in reducing physiological, cognitive, and behavioral symptoms of anxiety."; Nagel, "Treatment of Music Performance Anxiety via Psychological Approaches: A Review of Selected CBT and Psychodynamic Literature."; Nagel, Himle, and Papsdorf, "Cognitive-Behavioural Treatment of Musical Performance Anxiety."

MPA interventions have assessed the benefits of using just one therapy, with the two most common being Cognitive Behavioural Therapy and Exposure Therapy. Some studies have examined combining interventions,[173] but many date back to the 1980s and 1990s and no single combination has emerged as a best practice. Perhaps part of the reason why no one model has emerged is because MPA is complex and may not respond to the treatment of other focal anxiety. Is it possible that blending commonly used interventions together might have a different effect on participants?

Another factor was taken into consideration when forming the research questions. Music schools in Canada have not been fully addressing the issue of Music Performance Anxiety among their students. In the US, having a trained counsellor, psychologist, or psychotherapist on staff or having multiple musician wellness course offerings at music schools is becoming more common. Examples include the Juilliard School, the University of Southern California, and the Cleveland Institute of Music. University music programs have often brought in specialists to give one-off presentations, but little or no follow-up or individualized treatment has been evident. Some schools, including McGill University, the University of Toronto, and the Glenn Gould School, had created courses to address topics of musicians' health, but, apart from Glenn Gould, it did not seem that these were being taught by a specialist in the field of MPA or in musicians' health. Rather, it has appeared from course calendars that regular faculty or sessional instructors have been teaching these courses. Where are students to find help for MPA? It is a well-known fact that varsity athletes have access to a variety of physical and mental health services tailored

[173] Sweeney and Horan, "Separate and Combined Effects of Cue-Controlled Relaxation and Cognitive Restructuring in the Treatment of Musical Performance Anxiety."; Nagel, Himle, and Papsdorf, "Cognitive-Behavioural Treatment of Musical Performance Anxiety."; Clark and Agras, "The Assessment and Treatment of Performance Anxiety in Musicians."

to their needs, but why is the same not happening for musicians? Could a program taught by a specialist in the field of MPA and offered directly at the school prove to have an effect on student MPA scores and their perception of the severity of their MPA?

Furthermore, few researchers have examined the role of psychological co-morbidity as a factor in the assessment of intervention efficacy. It is difficult to imagine that MPA exists in isolation from other psychological disorders. Dr. Kenny is a prominent researcher in the field of MPA who has proposed some connections between MPA and psychological co-morbidity.[174] Some of Kenny's idea and framework have been used in the development of this intervention study.

2.2 Methods for Pilot Study

An initial pilot study was conducted between October of 2018 and April of 2019. The purpose of the pilot study was to evaluate the research questions and hypotheses with a small group of participants to see if a larger study would be beneficial.

2.2.1 Research Questions

In Study 1 from October 2018 to April 2019, funded by the UBC Public Scholar Initiative, we sought to investigate whether an established educational and psychological intervention program for MPA would be associated with changes in university music students' experiences of MPA. From past research in the field of performance theory and from literature in sports psychology, we hypothesized that a psychological intervention program blending cognitive behavioural therapy, sports psychology, mindfulness, and exposure therapies could

[174] Kenny, Driscoll, and Ackermann, "Psychological well-being in professional orchestral musicians in Australia: A descriptive population study."; Kenny, Arthey, and Abbass, "Identifying attachment ruptures underlying severe music performance anxiety in a professional musician undertaking an assessment and trial therapy of Intensive Short-Term Dynamic Psychotherapy (ISTDP)."

have the potential to improve university music students' perception of MPA. The main research question was, "Would a multi-modal group intervention program have an effect on MPA scores as measured by the Kenny Music Performance Anxiety Inventory (K-MPAI), and what would the participants' perception be of participating in such a program?"

2.2.2 Study Design and Recruitment

Study 1 was an evaluative study, looking at the effectiveness of a multi-model intervention on MPA in a select group of music students. The study was a pre-post-test repeated measure design without controls. It was a mixed-methods study, using both quantitative and qualitative measures to assess the effectiveness of the intervention. Triangulation was used to help validate the results.

Recruitment posters were placed around UBC School of Music and an email about the study, asking for volunteers, was sent through the UBC School of Music student listserv. Participants who were 18 years of age or older and currently enrolled as a student in the School of Music in either a Performance or General Studies degree were eligible. A total of twenty students volunteered to participate, but this initial study only had room for twelve. Names were drawn at random to select the twelve participants and a waitlist was formed with the remaining eight names.

2.2.3 Intervention Being Evaluated

Based on the literature review and the focus on testing a multi-modal program, a pre-established program developed by Paula Wise was chosen. In this program, she blended aspects of Cognitive Behavioural Therapy, Sports Psychology, Mindfulness, and Exposure Therapy which satisfied the program requirements as set out in the research questions. Paula was chosen as the intervention leader because of her unique experience as both a musician and

psychotherapist. In addition to her career as a professional musician, she has had a 15-year career as a Registered Clinical Counsellor, with a private practice focusing on Music Performance Anxiety and other anxiety disorders.

Paula modified her program to ensure that it was compact enough and a manageable time commitment for participants. It was agreed that the intervention would be delivered over six 2-hour sessions separated by a few weeks. Participants would also receive two one-hour, one-on-one coachings to tailor the skills learned in the group class to their particular needs. One of these would be in the first half of the course and the second would be in the second half of the course. The first class began October 26, 2018, with the sixth and final class taking place on April 5, 2019. Each session allowed for students to discuss broad or specific questions relating to their own performance struggles. Other participants would help to share ideas for mitigating the issue and Paula would ask the participants probing and thought-provoking questions to help them further understand the issue at hand and find a possible solution. Paula spoke about the importance of professional intervention.

> It is essential that all exploration of MPA be addressed with the utmost sensitivity. It is important not to minimize or shame this affliction that has been hidden in the musical community for so long. The human psyche is very complex and trauma can be blueprinted in the body without one's awareness. This can play out in MPA and be misinterpreted with simplistic solutions. Many music professors do not have the expertise nor the time to delve into the underlying causes for each individual student. What is needed is a safe and supportive venue with an experienced therapist, preferably one who knows the profession intimately, and who understands the delicate path to healing which can offer freedom to express and to have one's voice on stage.[175]

The structure of each class is presented in table 2.1.

[175] Paula Wise in discussion with the author, January 2022

Session	Components

1	**Introduction**
	• Group norms were established
	• Issues of confidentiality were addressed
	• A list of mental health resources and services were given to the participants to ensure safety
	CBT/Exposure Therapy
	• relaxation and breathing techniques
	  o Progressive muscle relaxation
	  o Butterfly breathing
	  o Abdominal breathing
	  o Qi Gong
	Sports Psychology
	• Exploration of motivation and intentions for performing and for music study

2	**CBT** • Breathing and nervous system regulation practice. • Mechanism behind MPA and the fear response • Acceptance of MPA • Strengths and qualities about your performance **Sports Psychology** • Centering – Don Greene and Wendy Palmer • Simulation training – using exercise to simulate physical symptoms of anxiety. **Exposure Therapy** Simulate physical symptoms, regulate nervous system, mini performance.
3	**Mindfulness** • Simple meditation technique – 10-points practice • Yoga breathing **CBT** • Exploring cognitive distortions • Deeper probe into distortions to find mistaken beliefs. **Sports Psychology** • Fixed vs. growth mindset. • Power thoughts • Acting “as if” another performer
4	**CBT** • Practice of relaxation, regulation, and breathing techniques. **Sports Psychology** • Visualization and mental rehearsal • Techniques for practice – technical, artistic, and performative practice.

Session	Components
4	Strategies for memorization
5	**CBT** • Review of breathing, relaxation, and regulation techniques • Participants pick which techniques they prefer. **Sports Psychology** • Using narratives in performance • Performance cues • Mantras **Mindfulness** • Setting mindset for performance **Exposure Therapy** • Information short performance with coaching through mindset preparation, regulation techniques, and performance directives.
6	**Exposure Therapy** • Class performance using techniques from the class with debrief and coaching following performance
	Summary • Review of the intervention • Questions Reminders

Table 2.1 – Intervention overview

2.2.4 Measures Taken to Evaluate the Intervention

The study employed both a standardized quantitative instrument, the Kenny Music Performance Anxiety Inventory (K-MPAI), along with pre/post-semi-structured interviews.[176] The K-MPAI is a tool created by Kenny to assess Music Performance Anxiety, taking into consideration eight different categories listed in descending order of total weight on the final score: proximal somatic anxiety and worry about performance, worry/dread (negative cognitions) focused on self/other scrutiny, depression/hopelessness (psychological vulnerability), parental empathy, memory, generational transmission of anxiety, anxious apprehension, and biological vulnerability. A series of 40 questions is presented using a Likert scale of 0-6. A copy

[176] Dianna T. Kenny, "Kenny Music Performance Anxiety Inventory (K-MPAI) and scoring form," (2016).

of the K-MPAI can be found in Appendix A. The scores on the K-MPAI can range from 0, meaning absolutely no MPA, to 240, indicating the most severe score. The scores are calculated using the score form that accompanies the survey. A copy of the scoring form for the K-MPAI can be found in Appendix B.

Pre- and post-semi-structured interviews were also used to assess the impact that the intervention had on the participants, their general thoughts about the program, and to probe deeper into some of the common themes surrounding MPA among students at the University of British Columbia.

The interview questions were:

Pre-Intervention Interview Questions

1. How is Music Performance Anxiety (MPA) currently affecting your ability to perform?
2. Is MPA in any way affecting your studies as a music student, and if so, how?
3. What is the most bothersome aspect of your experience with MPA?
4. What would you most like to achieve with this program?

Post-Intervention Interview Questions

1. How is Music Performance Anxiety (MPA) currently affecting your ability to perform?
2. Have you noticed any changes in your inner experience on stage, whether positive or negative, since participating in the intervention program? If so, what changes have you noticed?
3. Are you still affected by (most bothersome aspect of your experience from pre-interview)? Has there been any change in this?
4. How has this program been helpful?

5. Why or why not should this program be included as part of the curriculum for all music students?

2.2.5 Approach to Data Analysis

The K-MPAI scores were tabulated using the score sheet provided by Kenny. Tabulations were conducted manually by Emily Logan, and each was calculated three times to ensure accuracy of records. For each participant, a total score out of 240 was calculated as well as the scores for each individual subcategory. Scores were initially placed into a secured Microsoft Excel document for graph design and later transferred into SPSS for statistical calculation. Scores were tested using the Wilcoxon non-parametric test. The interviews were used to learn more about the participants' history with MPA, their needs, to understand their perception of the program, and to help guide a follow-up study.

The twelve participants were each given an individual meeting time with Emily Logan to go over and complete the consent form, take the K-MPAI, and to complete the initial interview. Interviews were hand-transcribed by Emily in real-time. Participants had a chance to review the notes to ensure accuracy. On all documents, participants were identified by a random number to ensure added confidentiality. Meetings took place in a private space to protect the identity and the anonymity of the participants. Only the co-investigator, Emily Logan, study team member, Paula Wise, and the other participants were aware of the identities of participants. Participants were told in the initial consenting meeting to maintain the privacy and confidentiality of other participants.

The quantitative part of this study required the comparison between pre-intervention and post-intervention scores. One of the most common statistical tools used to calculate change between two related samples is the t-statistic. This calculation is used when the population mean

is unknown. Unlike a measure like IQ, for which the population mean is known to be 100, in the case of this study, there is no way to know the mean of MPA scores of the general population. A tool like the t-statistic estimates the population mean when this is unknown. With a repeated-measure design, the null hypothesis assumption is that if the treatment or invention has no effect, the difference in the population mean between a pre-treatment and post-treatment measure would remain unchanged, or in other words, would be 0. T is calculated by subtracting the mean difference of the sample by the assumed mean population difference of 0 and dividing the result by the estimated standard error. The standard error is used to measure the sampling error of a data set. If we consider what a mean number represents, it is the point in the middle of the data. We need a way of knowing if the change in mean is due to a change correlated to the intervention or whether it is just because of sampling error. The standard error allows for that calculation. For a t-statistic where the population standard deviation is unknown, we must estimate the standard error. A t-statistic produces a Z score. The Z score tells us whether the data has shifted above (+) or below (-) the mean as well as how many standard deviations it is from the mean.[177] From this, the proportion, p value, is calculated.

A t-test assumes that a sample set has a normal distribution.[178] For study one, the small sample size meant that a normal distribution of the data was not likely achieved, therefore, a non-parametric statistical test was chosen. The Wilcoxon Signed Ranks Test, a non-parametric test, does not require the data to follow a normal distribution, but it is still able to assess for statistical change to the mean pre- and post-intervention. Like the t-statistic, it produces a Z score and from

[177] Frederick J. Gravetter and Larry B. Wallnau, *Statistics for Behavioural Sciences*, Ninth Edition ed. (Belmont, CA: Wadsworth, Cengage Learning, 2013), 141.
[178] Gravetter and Wallnau, *Statistics for Behavioural Sciences*.

that, a p value can be calculated. A negative Z score indicates a decrease from pre-intervention to post-intervention, whereas a positive Z score would indicate an increase.

Before beginning any data analysis, a confidence interval of 95% was chosen, meaning that we would be looking for a result of $p < .05$. The null hypothesis would be that there would be no resulting change from the intervention (K-MPAI pre-intervention - K-MPAI post intervention = 0). The resulting data is in Table 2.2 and Table 2.3.

2.2.6 Results of the Pilot Study

The study started with twelve participants and ended with nine participants. Three participants had to drop out of the study due to unforeseen class conflicts. Most of this had to do with changes to scheduling in term two that had not been anticipated by the students. The remaining nine participants included four graduate students and five undergraduate students. There were four piano majors, three wind and brass majors, one string major, and one voice major. The nine remaining participants were tested again using the K-MPAI following the completion of the intervention program and were interviewed about the experience.

The pilot study pointed to positive changes in MPA levels, as measured by the K-MPAI, especially for those who scored above a moderate level of MPA and for those who were in a program that emphasized performance, such as the General Studies or Performance programs, as opposed to academic streams at UBC. A total of nine participants completed the program resulting in 9 pairs of data sets.

PSA – Proximal somatic anxiety
WD – Worry/dread (negative cognitions)
DH – Depression/hopelessness
PE – Parental empathy
M – Memorization
GTA – Generational transmission of anxiety
AA – Anxious apprehension

	Overall K-MPAI score	PSA	WD	DH	PE	M	GTA	AA
Z	-1.779	-2.192	-1.963	-2.254	-1.511	-.426	-1.980	-1.054
p	0.075	0.028	0.050	0.024	0.131	0.607	0.048	0.292

Table 2.2 – K-MPAI section score changes

When looking at the resulting Wilcoxon calculation, it is apparent that the change in the K-MPAI scores from before the intervention to after the intervention was not statistically significant. P was greater than .05, therefore we fail to reject the null hypothesis. The overall K-MPAI scores had six negative ranks, meaning six scores decreased (improved), and three positive ranks, meaning three scores increased (worsened) following the intervention, but the resultant Z score was not enough to produce $p < .05$, instead producing $p=0.075$. What is notable is that $p < .05$ was found in three of the subcategories. These categories are: proximal somatic anxiety (PSA), depression/hopelessness (DH), and generational transmission of anxiety (GTA). Proximal somatic anxiety had eight negative ranks following the intervention and only one positive rank. The p value was 0.028 and therefore, the resultant decrease is statistically significant. Depression/hopelessness scores had seven negative ranks, one tie (retained the same score pre and post), and one negative rank. The resulting p score was $p=0.024$ and therefore, the resultant decrease is statistically significant. Generational Transmission of Anxiety also changed, which was interesting. This category looked at one's family history of anxiety. It would be unlikely that this would or should change between pre- and post-intervention. This subsection included questions relating to anxiety in the family, as perceived by the respondent. A possible explanation is that the intervention may have provided the participants with insights that helped them more accurately answer the questions relating to family history of anxiety. Perhaps they were unaware of definitions for anxiety before the intervention. It is also important to note that

this category was small and weighted considerably less than the other sections. The mere fact that there were very few questions for this category may have made it more vulnerable to inaccuracy in test-retest scores. Test-retest is the vulnerability of a survey or part of a survey to produce different results when participants retake the assessment.[179] Although the overall K-MPAI scores did not show a statistically significant change, the statistical changes, namely in proximal somatic anxiety and depression/hopelessness, point to possible shifts in MPA levels.

What was observed was that the two participants scoring below 120/240 on the K-MPAI showed very little change or experienced worsening of their performance anxiety scores. If we remove the two participants scoring below 120 on the initial K-MPAI measurement, there is a slight change in the results. Of the seven remaining data sets, five participants had negative ranks and 2 had positive ranks, but we failed to achieve a $p < .05$, so therefore we fail to reject the null hypothesis. The Wilcoxon non-parametric still did not show statistical significance when the two pre-intervention K-MPAI were eliminated from the calculation, but the p value did decrease. See Table 2.3 below.

	Overall K-MPAI score
Z	-1.859
p	0.063

Table 2.3 – Overall change to K-MPAI

More subjects and more data would be required to evaluate further whether participants scoring below 120 on the K-MPAI respond less well to a multi-modal intervention.

The interviews of the pilot study were used to assess whether students found the program helpful and to see if their subjective experience with MPA changed throughout the course of the

[179] Gravetter and Wallnau, *Statistics for Behavioural Sciences*.

program. All nine participants who completed the entire program indicated that the program was helpful and that it should be part of university curriculum.

2.2.7 Where the Results Led

What became apparent was that a second follow-up study would be needed to gain further understanding about the role of this specific intervention program. As predicted, a small sample of nine participants would not be large enough to produce a statistically significant result. The small data set made it difficult to know whether there would be statistically significant decreases in MPA with a larger group. Also, when looking at the subcategories of the K-MPAI, the statistical significance of the decrease in the Proximal Somatic Anxiety and Depression/Hopelessness led to the wondering about potential psychological wellbeing changes that could be correlated with a multi-modal MPA intervention. Without using depression and anxiety screeners as part of the pre- and post-testing, it would be hard to know if these subcategories could be related to psychological co-morbidity. A follow-up study, including more participants and using added screeners, would help to get a clearer picture.

Although the statistical significance of the data did not change when removing the data sets with pre-intervention scores below 120, it did seem like there could be a correlation between lower MPA scores and less improvement. Generally, such a conclusion makes sense if one considers that a certain level of MPA is needed for optimal performance. The aim of the intervention was to reduce levels of MPA that cause more distress or suffering. With that in mind, it was determined that setting a cut-off score for pre-K-MPAI scores might be appropriate for determining participant eligibility in a follow-up study.

2.3 Methods and Results for Study 2

2.3.1 Research Questions

The main purposes of this second study were to collect a larger data set, to focus on a modified criteria for inclusion, mainly in the area of initial K-MPAI scores, to further explore the area of co-morbidity, and to see if there would be any indication of which populations might respond best. Leading towards an expanded study, the research question, "Would a multi-modal group intervention program have an effect on MPA scores as measured by the Kenny Music Performance Anxiety Inventory and what would the participants' perception be of participating in such a program" remained. Secondary research questions included, "Does co-morbidity and/or pre-intervention K-MPAI scores have an effect on outcome?", "Does an MPA intervention have an effect on co-morbidity?", and finally "Do certain groups of participants respond best"?

2.3.2 Study Design and Recruitment

Study design and recruitment remained mostly unchanged between the pilot study and study 2. The number of participants was expanded to allow for a maximum of 30 participants. Criteria for eligibility saw only one change. Students scoring below 120/240 on the K-MPAI, indicating a lower level of MPA, did not qualify to participate. Participants were not made aware of this set criteria to avoid any potential over-inflation of pre-K-MPAI scores. A total of 21 participants volunteered and qualified.

2.3.3 Intervention Being Evaluated

The intervention itself remained identical in study 2. Because of the larger number of participants, two groups were formed to ensure that no group was larger than ten to twelve participants. This helped to keep consistency between the pilot study and study 2. The program

included six 2-hour classes as before, but because of time and budget constraints, participants only received one 30-minute individual coaching in study 2.

Students were divided, not by random but according to their class schedule, into one of two groups. The first group was smaller with 9 participants while the second group had 12 participants. Both groups received the identical intervention. The first five classes continued as planned as in-person activities in January, February, and March. The plan for the sixth session was to bring the two groups together for a performance class. Our fifth class, on March 13, 2020, marked the announcement of the closure of UBC due to the COVID-19 global pandemic. The university required that all in-person research cease immediately or transition online. The sixth session was conducted via Zoom with all 21 participants. This three-hour final session gave each of the students a chance to perform virtually for their colleagues and to go through a summation of what they had learned in the intervention.

2.3.4 Measures That Were Taken to Evaluate the Intervention

The methodology for study 2 was quite similar to that of study 1. It was also a pre-post-test repeated-measure design without controls. It was a mixed-methods study, using both quantitative and qualitative to measures to assess the effectiveness of the intervention. Triangulation was used to help validate the results.

Study 2 employed the Kenny Music Performance Anxiety Inventory (K-MPAI)[180] but also included questionnaires to assess generalized anxiety and depression. The GAD-7 (Generalized Anxiety Disorder - 7) is a brief standardized tool containing seven questions rated on a Likert scale. It has been validated and is widely used in medical research and in clinical

[180] Kenny, "Kenny Music Performance Anxiety Inventory (K-MPAI) and scoring form."

practice by physicians, psychiatrists, and psychologists.[181] A copy of the GAD-7 can be found in Appendix C. The PHQ-9 (Personal Health Questionnaire - 9) is also a validated and widely used tool in medical research and for clinical use to diagnose depression.[182] This tool has nine questions, also self-rated on a Likert scale from 0-3. A copy of the PHQ-9 can be found in Appendix D. The GAD-7 and the PHQ-9 were not used to make diagnoses of psychological co-morbidity, as this was beyond the scope and the intentions of the research team. They were instead used to give the researchers an indication of depression and anxiety scores among participants both before and after the intervention.

In addition to these three quantitative tools, pre/post semi-structured interviews would again be used, with slight modifications of the questions to address co-morbidity. These were modified to better align with the addition of co-morbidity as part of study 2. Below are the intervention questions used for study 2.

Pre-Intervention Interview Questions

1. Using a scale of mild, moderate, or severe, how would you rate your performance anxiety?
2. How is Music Performance Anxiety (MPA) currently affecting your ability to perform?
3. Does MPA affect your psychological wellbeing in anyway? And if so, how so?
4. Is MPA in any way affecting your studies as a music student, and if so, how?
5. What is the most bothersome aspect of your experience with MPA?
6. What would you most like to achieve with this program?

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[181] RL Spitzer et al., "A brief measure for assessing generalized anxiety disorder: the GAD-7," *Arch Intern Med.* 166, no. 10 (2006).
[182] Kurt Kroenke, Robert L Spitzer, and Janet B W Williams, "The PHQ-9 - Validity of a Brief Depression Severity Measure," *J Gen Intern Med.* 16, no. 9 (2001), https://doi.org/10.1046/j.1525-1497.2001.016009606.x.

Post-Intervention Interview Questions

1. Using a scale of mild, moderate, or severe, how would you rate your performance anxiety?
2. How is Music Performance Anxiety (MPA) currently affecting your ability to perform?
3. Have you noticed any changes in your MPA, whether positive or negative, since participating in the intervention program? If so, what changes have you noticed?
4. Has there been any noticeable change in your perception of your psychological wellbeing?
5. Are you still affected by (most bothersome aspect of your experience from pre-interview)? Has there been any change in this?
6. How has this program been helpful?
7. Why or why not should this program be included as part of the curriculum for all music students?

2.3.5 Approach to Data Analysis

The students were tested using the K-MPAI, the GAD-7, and the PHQ-9 both before commencing the intervention and 3 weeks following completion of the intervention. Post-intervention, all of the 3 tests were given online using the UBC survey tool Qualtrics. Scores were inputted from Qualtrics into a secured Excel spreadsheet. The K-MPAI scores were tabulated electronically by Qualtrics to ensure that no calculation errors would occur. For each participant, a total K-MPAI score out of 240 was calculated as well as a depression score out of 27 and a generalized anxiety score out of 21. As in study 1, scores were analyzed using the non-parametric test, the Wilcoxon Signed Ranks test. This was done through the software SPSS.

The interviews were used to learn more about the participants' history with MPA, their needs, and to understand their perception of the program. Interviews were recorded and audio files were transferred into NVivo. From there, interviews were transcribed and themed by Emily Logan in NVivo. NVivo organized the data into codes, known as themes, showing how many times each theme was referenced and the quoted text. An excel spreadsheet was created to tabulate themes. From there, work was done to triangulate between the quantitative and qualitative data. Themes were used to confirm the findings of the quantitative data, to further expand on the participants' perceptions of the program, to learn more about how MPA was manifesting among the participants, and to identify some common themes relating to MPA in general.

2.3.6 Results of Study 2

Of the 21 participants, fifteen were undergraduates and six were graduate students. This is roughly proportionate to the number of undergraduate versus graduate students enrolled in the UBC School of Music. Six of the participants were keyboard students, six were wind/brass students, six were string students, and three were voice students.

Following the recruitment, intake, and pre-testing phases, the study intervention began on January 24, 2020.

One participant did not respond to any of the emails about the post-intervention testing and interview and therefore their data set was incomplete. Two participants completed the survey tests but did not participate in a post-intervention interview. For the quantitative data, there are 20 complete sets of data and for the qualitative data, there are 21 complete pre-interviews and 18 complete post-interviews.

The initial analysis focused on the primary research question, "Would a blended group intervention program have an effect on MPA scores as measured by the Kenny Music Performance Anxiety Inventory?"

To begin the analysis, I initially calculated the measures of central tendency: mean, median, and mode. The mean, which is calculated by adding all the observed scores for one category and dividing by the number of observations, determines a middle value of the data.[183] Some of the issues that arise with calculating mean values is that they can be influenced by extreme values in the data set, known as outliers. This can pull the mean value away from the middle range of the scores. The mean is often not a number that even exists in the data set, which can cause some confusion. The median is another measure of central tendency that instead finds a middle value without being influenced by outliers.[184] The scores observed are ranked in chronological order. The observed score in the middle of the set or the average of the two middle observed scores (in the case of an even number of observed scores) forms the median. This value does not take into consideration extreme outliers. The mode is the observed score that repeats the most frequently. This is more useful when observations are limited to nominal values, like colours, or when only a limited number of ordinal value answers are possible. In the case of looking at MPA scores, the mode serves very little purpose. It was used in the qualitative analysis. When the mean, median, and, at times, the mode, are all the same or near the same value, it is an indication that the distribution of the data is closer to symmetry.[185]

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[183] Gravetter and Wallnau, *Statistics for Behavioural Sciences*.
[184] Gravetter and Wallnau, *Statistics for Behavioural Sciences*.
[185] Russo Riccardo, *Statistics for behavioural sciences: an introduction.*, 1st ed. (London, UK: Psychology Press, 2003), eBook, 21-25.

There are other measures that are important to look at when analyzing data. Knowing the range gives an indication of whether the data are all fairly close together or whether they are spread out. The range shows the smallest value of the data set and the largest value. In the case of extreme outliers, the range may give us a false impression of the data spread. To give a better sense of the range, quartile values can be given to show not only the middle value as calculated by the mean but also the 25th and 75th percentile value of the distribution.[186] Another value that can assist in understanding the spread of scores in a data set is the standard deviation. The standard deviation scores show whether the scores are all close to the mean or whether they are scattered apart.[187]

The mean, median, mode, range, variance, and standard deviation were first calculated for pre-intervention K-MPAI tests, the post intervention K-MPAI tests, and then for the difference between pre- and post-intervention K-MPAI test scores. Following this, the Wilcoxon Signed Ranks test was done using the statistical software SPSS.

2.3.6.1 Study 2 – Pre/Post K-MPAI

The mean and median were quite similar for the pre- and post-intervention K-MPAI respectively, but a bit of a difference was noted when analyzing the difference scores. Overall, the data pointed to a decrease in K-MPAI scores. The range became quite a bit larger post-intervention, showing that some participants may have benefited more or less than others. The largest decrease in scores or improvement in MPA was by 75 points and the largest increase in scores, or worsening of MPA, was at +22. It was noted that there was a much larger variance and

[186] Riccardo, *Statistics for behavioural sciences: an introduction.*, 27.
[187] Gravetter and Wallnau, *Statistics for Behavioural Sciences*, 107.

standard deviation in the post intervention data and the difference scores compared with the pre-intervention data. It shows that the response of participants was varied. The question would be whether the average trend of a decrease or an improvement in K-MPAI scores would have statistical significance.

	Pre	Post	Difference
Number	21	20	20
Mean	154.81	139.37	-14.8
Median	154	138	-11
Range	125 - 182	75-197	-75 - 22
Variance	342.46	893.17	639.22
Standard Deviation	18.51	30.41	25.28

Table 2.4 – Pre/Post K-MPAI scores and descriptive statistics

Like in study 1, the Wilcoxon Signed Ranks Test was used to assess statistical significance. The research question was converted into a null hypothesis.

H0 - A blended intervention has no change on K-MPAI scores (pre-K-MPA - post-K-MPAI = 0)

H1 - A blended intervention does change K-MPAI scores (pre-K-MPA - post-K-MPAI ≠ 0)

Before beginning analysis of the data, it was decided that $p < .05$ would be the parameter set. This is the p value most commonly used. The Wilcoxon Signed Ranks Test results showed that 13 participants had negative ranks, or improved scores with a mean of -11.54, while one score remained the same and 6 scores had positive ranks or worsening scores with a mean change of +6.67. The Z score of -2.214 resulted in a p value of $p=0.027$. We could therefore reject the null hypothesis. There was a statistically significant decrease (improvement) in K-MPAI scores post intervention when compared with pre-intervention.

2.3.6.2 Combining Study 1 and Study 2

Because the intervention and procedures for study 1 and study 2 were basically identical, it is possible to combine the two sets of data to assess change. This gives a total of 30 observed values before intervention and 29 observed values after intervention, which because of its larger sample size, can give some clearer sense of any observed changes. The table below shows the resultant values.

	Pre	Post	Difference
Number	30	29	29
Mean	149.02	131.07	-17.57
Median	154	137	-16
Range	79-182	73-197	N/A
Variance	516.34	1001.14	664.02
Standard deviation	22.72	31.64	25.77

Table 2.5 – Combined pre/post K-MPAI descriptive statistics

When observing the combined data, we can see that the pre-intervention and post-intervention means are slightly lower than when looking only at study 2. The difference score is larger here and the mean and median difference scores are quite similar. The range is quite a bit larger here and therefore our variance scores are also higher. The standard deviation scores are relatively in the same area as they were when looking at just study 2.

Again here, we are noting a decrease in MPA scores, and the question is whether this decrease is statistically significant. Because it could not easily be confirmed that the data fit a normal, bell curve distribution, it was decided to use a non-parametric test, the Wilcoxon Signed Ranks Test, that did not assume a normal distribution. Calculations were made using the statistical software SPSS. A total of 19 negative ranks show that 19 scores decreased (improved) from pre-intervention to post-intervention with a mean improvement of 17.45 points. The one tie

indicates that one score remained the same pre- and post-intervention. The 9 positive ranks show that 9 scores increased (worsened) from pre-intervention to post-intervention by an average of 8.28 points. This produces a Z score of -.2.927, which is larger than the Z score of study 2 alone. The p value of 0.003 is less than 0.05 so therefore the null hypothesis is rejected, and the data is considered statistically significant. The p value of data sets dropped from p=0.027 for study 2 alone to p=0.003 when the data was combined.

From this, we can conclude that the change in scores from pre-intervention to post-intervention is statistically significant. Because we did not conduct an experiment, causation cannot be implied from this result or any of the previous findings, but the data does imply correlation between an intervention and decreased MPA scores.

2.3.6.3 Changes to PHQ-9 and GAD-7 Scores

On both the PHQ-9 and GAD-7, a score of 10 or greater is reflective of a moderate level of depression (PHQ-9) or generalized anxiety (GAD-7). For the GAD-7, a score over 15 signifies severe generalized anxiety. A score between 15-19 on the PHQ-9 is indicative of moderate to severe depression, with a score above 20 signifying severe depression. A total of 10 out of 21 participants in study 2 scored 10 or higher on the PHQ-9 and 12 out of 21 participants scored 10 or higher on the GAD-7. In total, 14 out of 21 participants scored 10 or higher on at least one of the two screeners, meaning that two thirds of the participants scored at the level of having a diagnosable co-morbidity. Six participants had depression scores in the moderate range while three participants had depression scores in the moderate to severe range and one had a score in the severe range. Ten participants had generalized anxiety scores in the moderate range while two participants had generalized anxiety scores in the severe range. Five of the participants scored above 10 on the PHQ-9 and indicated suicidal thoughts within the previous 2 weeks.

These participants were further screened for suicide risk as outline by the UBC Behavioural Research Ethics Board. If the risk was deemed a concern following the screening protocols, participants were reported using UBC's Early Alert System.

The mean PHQ-9 score pre-intervention was 9.62 with a median of 9, while the post-intervention PHQ-9 mean was 9.10 with a median of 9.5. There was a slightly higher variance among post-intervention scores, meaning that the data was spread a bit more. The mean difference was 0.00.

	Pre-PHQ	Post-PHQ	PHQ-Difference
Number	21	20	21
Mean	9.62	9.10	0.00
Median	9.00	9.50	0.00
Range	19	18	15
Variance	25.35	27.15	16.80
Standard deviation	5.03	5.21	4.10

Table 2.6 – Pre/Post PHQ-9 descriptive statistics

The null hypothesis is that there is no improvement in PHQ-9 depression scores. A Wilcoxon Signed Ranks Tests confirms what seems apparent from looking at the data. There is no statistically significant change in PHQ-9 depression scores following the intervention. Our Z score is -0.307 with a p value of p=0.759. This is well above p=0.05, therefore we fail to reject the null hypothesis.

	Pre/Post PHQ-9
Z	-0.307
p	0.759

Table 2.7 – Overall change to PHQ-9

Looking at GAD-7 scores, there seems to be evidence of some change. The mean pre-intervention GAD-7 generalized anxiety score is 9.52 with a median of 10. The mean post-intervention score is 7.55 with a median of 7. The higher variance score for the post-intervention

GAD-7 data shows that the data is a bit more spread from the mean compared with the data pre-intervention.

	Pre-GAD	Post-GAD	GAD-Difference
Number	21	20	21
Mean	9.52	7.55	-1.81
Median	10.00	7.00	-2.00
Range	16	16	15
Variance	15.52	20.79	15.26
Standard deviation	3.94	4.56	3.91

Table 2.8 – Pre/Post GAD-7 descriptive statistics

Next, the Wilcoxon Signed Ranks Test is used to assess statistical significance. The null hypothesis is that the GAD-7 do not improve with the intervention. The result is a Z score of Z= -1.904 with a p value of p=0.057. In this instance $p > 0.05$, so therefore we fail to reject the null hypothesis.

	Pre/Post GAD-7
Z	-1.90
p	0.057

Table 2.9 – Overall change to GAD-7

2.3.6.4 PHQ-9 Scores as a Predictor of Outcome

After assessing overall changes to K-MPAI scores, the next question to explore was whether pre-intervention mental health would be an indication of how a participant might respond to the intervention. Although the overall statistics show an improvement in MPA scores following the intervention, it is clear that some participants responded better than others. It is important to see if there could be any screening factors that would predict better or worse outcomes from a multi-modal intervention.

I first turned my attention to initial PHQ-9, depression, scores. Approximately half of the group had initial PHQ-9 scores above 10, while the other half scored below 10. I decided to calculate the statistics for both groups of participants: those with initial PHQ-9 scores greater or equal to 10 and those with PHQ-9 scores below 10. The table below shows the results.

	Pre-K-MPAI	Post K-MPAI	Difference
Number	10	9	9
Mean	161	160	-1.33
Median	171	152	+5
Range	127-182	135-197	-38 - +22
Variance	513.38	539.78	437.5
Standard deviation	22.66	23.23	20.92

Table 2.10 Participants with PHQ-9 scores greater than or equal to 10

	Pre-K-MPAI	Post K-MPAI	Difference
Number	11	11	11
Mean	148.63	122.82	-25.82
Median	151	125	-26
Variance	134.86	536.96	567.76
	Pre-K-MPAI	Post K-MPAI	Difference
Standard deviation	11.61	23.17	23.83

Table 2.11 Participants with PHQ-9 scores less than 10

A quick look at these tables shows a difference in the change in K-MPAI scores between the two groups. While the mean decrease was only 1.33 points for those scoring 10 or higher on the PHQ-9, the mean decrease was 25.82 for those scoring less than 10 on the PHQ-9. The variance scores and standard deviations are similar between the groups, apart from the pre-intervention K-MPAI scores of participants scoring less than 10 on the PHQ-9. Not only were their initial PHQ-9 scores lower, but the variance between the scores was significantly smaller. This means that the scores are closer together.

The null hypothesis is that pre-intervention K-MPAI scores minus post-intervention K-MPAI scores equals 0, showing no difference.

Using the Wilcoxon Signed Ranks Test, we see that in the group of participants scoring 10 or higher on the PHQ-9, there are 4 negative ranks (improved) and 5 positive ranks (worsened). This results in a Z score of Z= -0.059 with a p score of p=0.953. This far exceeds the set parameter of $p < 0.05$ and, therefore, we fail to reject the null hypothesis. Participants scoring 10 or higher on the PHQ-9 seem to have very little change in K-MPAI scores following the intervention.

	Pre/Post K-MPAI
Z	-0.059
p	0.953

Table 2.12 – Overall change for participants with a PHQ-9 greater than or equal to 10

Turning our attention to the other group, those scoring below 10 on the PHQ-9, we see some different results. Using the Wilcoxon Signed Ranks Test, we see 9 negative ranks, 1 positive rank, and 1 tie (one score remaining the same). This results in a Z score of Z= -2.599 and a p score of p=0.009. This fit the parameter of $p<0.05$, so therefore we reject the null hypothesis. There was a statistically significant decrease in K-MPAI scores among participants whose initial PHQ-9 score was below 10.

	Pre/Post K-MPAI
Z	-2.599
p	0.009

Table 2.13 – Overall change for participants with a PHQ-9 less than 10

2.3.6.5 GAD-7 as a Predictor of Outcome

Could GAD-7 scores also be a predictor of the outcomes of a multi-modal Music Performance Anxiety intervention? Once again, participants were divided into two groups, those

scoring 10 or higher on the GAD-7 (moderate level or higher anxiety) and those scoring less than 10 (mild or minimal anxiety).

	Pre-K-MPAI	Post K-MPAI	Difference
Number	12	11	11
Mean	158.92	149.55	-9.27
Median	159	147	-4
Range	130-182	86-197	-49 - +19
Variance	356.81	1032.27	477.42
Standard deviation	18.89	32.13	21.85

Table 2.14 – Participants with pre-intervention GAD-7 scores greater than or equal to 10

	Pre-K-MPAI	Post K-MPAI	Difference
Number	9	9	9
Mean	149.33	127.78	-21.65
Median	151	136	-26
Range	125-180	75-149	-75 - +22
Variance	306.50	503.44	828.03
Standard deviation	17.51	22.44	28.78

Table 2.15 – Participants with pre-intervention GAD-7 scores less than 10

The Wilcoxon Signed Ranks Test shows that both groups fail to reject the null hypothesis. For those scoring 10 or higher on the GAD-7, $Z = -1.112$ and $p = 0.266$. Looking at participants who initially scored less than 10 on the GAD-7, $Z = -1.963$ and $p=0.050$. In both cases, the condition of $p < 0.05$ cannot be satisfied.

This leads to the question of whether we can truly assess the effects of initial GAD-7 and PHQ-9 scores when some participants scored 10 or higher on both. Which one of the factors, if either, has a greater effect on predicted outcome of a multi-modal MPA intervention?

Only 4 participants scored 10 or higher on the GAD-7 while also scoring below 10 on the PHQ-9. Among these four participants, their respective decreases in K-MPAI scores were -1, -

19, -37, and -49. From this, we can observe a mean decrease in K-MPAI scores of 26.5 points. While one participant remained basically the same, 3 participants did seem to show improvement.

	Pre-K-MPAI	Post K-MPAI	Difference
Number	4	4	4
Mean	149.5	123	-26.5
Median	152.5	129	-28
Range	135-158	86-147	-1 - -49
Variance	113.67	724.67	441.00
Standard deviation	10.66	26.92	21

Table 2.16 – Participants with initial GAD-7 scores greater than or equal to 10 and PHQ-9 scores below 10.

Using the Wilcoxon Signed Ranks Test, we can assess if the difference is statistically significant and if it rejects the null hypothesis. We have four negative ranks, but because of the very small sample size, we do not get conclusive results. Instead, $Z = -1.826$ and $p = 0.068$, failing to reject the null hypothesis.

If we look at participants who scored lower than 10 on the GAD-7 and the PHQ-9, we see some interesting results.

	Pre-K-MPAI	Post K-MPAI	Difference
Number	7	7	7
Mean	148.14	122.71	-25.43
Median	151	125	-26
Range	125-165	75-144	-75 - +6
Variance	167.14	532.57	725.29
Standard deviation	12.93	23.08	26.93

Table 2.17 – Participants with initial GAD-7 and PHQ-9 scores below 10

Using the Wilcoxon Signed Ranks Test, Z = -1.992 and p = 0.046. In this case, we reject the null hypothesis. Participants scoring below 10 on both the GAD-7 and the PHQ-9 had statistically significant decreases in K-MPAI scores following the multi-modal intervention. Only two participants had a PHQ-9 score greater or equal to 10 while having a GAD-7 score below 10. One participant's K-MPAI pre- and post- scores decreased by 38 points while the other participant's score increased by 22. From this, it is impossible to make any conclusions or speculations.

When looking at the 7 participants whose initial PHQ-9 and GAD-7 scores were both 10 or greater, there is a mean increase of 0.57 and a median increase of 5. It is evident that these participants did not show improvement, yet they also did not worsen.

What this reveals is that generalized anxiety may not influence treatment outcome as does depression, however this was hard to decipher due to the fact that most participants with high generalized anxiety scores also had high depression scores. With the four participants scoring high on only generalized anxiety, there seemed to be improvement from the intervention, but the small number data sets make it difficult to find statistical significance. Without a larger sample size of participants scoring high only on the GAD-7 and not the PHQ-9, it is difficult to understand the possible role of the GAD-7 as a predictor of intervention outcome.

2.3.6.6 Initial K-MPAI as a Predictor of Outcome

One final consideration when looking at the data is to consider whether initial K-MPAI scores themselves are predictors of the outcome of a multi-modal intervention program. For this analysis, participant data was compared using the quartiles of the collected K-MPAI scores from study 1 and study 2 combined. Outcomes were analyzed for those participants whose initial K-MPAI scores were greater than 153, less than 153, and those between 134.5 and 162.5. We will

first look at those participants who scored above 153 pre-intervention on the K-MPAI, which would place them all in the category of severe MPA.

	Pre-K-MPAI	Post K-MPAI	K-MPAI difference
Number	16	15	15
Mean	165.25	144.73	-20.87
Median	161	138	-23
Range	154-182	94-197	-68 - +19
Variance	117.13	869.21	566.84
Standard Deviation	10.82	29.48	23.81

Table 2.18 – Participants with initial K-MPAI scores above 153

We see again here that there was a decrease in mean and median following intervention for this particular group. Once again, the variance and standard deviation are quite a bit larger post-intervention, indicating the wide spread of K-MPAI scores. Using the Wilcoxon Signed Ranks Test, we can assess for statistical significance of the change. The null hypothesis is that pre-K-MPAI minus post-K-MPAI = 0. Using the Wilcoxon, we see 12 negative ranks (improved) and 3 positive ranks (worsened). This produces a Z-score of Z= -2.671 and a p score of p=0.008. We reject the null hypothesis as $p < 0.05$. There is a statistically significant decrease in K-MPAI scores among participants with an initial K-MPAI score above 153.

The results for those scoring below 152 on the pre-intervention K-MPAI is different.

	Pre-K-MPAI	Post K-MPAI	K-MPAI difference
Number	14	14	14
Mean	130.47	116.43	-14.04
Median	134	125	-0.5
Range	79.2 - 151	73-149	-75 - +22
Variance	321.96	773.96	793.83
Standard Deviation	17.94	27.82	28.17

Table 2.19 – Participants with initial K-MPAI scores below 152

What is note-worthy for participants scoring below 152 is that the mean shows a decrease while the median shows that the results remain almost unchanged. Again here, the variance and standard deviation are larger post-intervention compared with pre-intervention. The Wilcoxon

Signed Ranks Test will be used to determine the Z and p values to assess for statistical significance. The results show 7 negative ranks (improved), 6 positive ranks (worsened) and one tie. The Z score is Z= -1.189 with a p score of p=0.235. We fail to reject the null hypothesis. It would seem that this group does not improve on K-MPAI scores following intervention.

Thirdly, participants scoring between the 25th and 75th percentile of initial K-MPAI scores were compared to assess for statistical change in K-MPAI scores. For this, the focus was on participants scoring between 134.5 and 162.5. This eliminates the most severe and the least severe cases and focuses on the middle group. The descriptive statistics are below.

	Pre-K-MPAI	Post K-MPAI	K-MPAI difference
Number	16	15	15
Mean	150.53	124.6	-25.29
Median	154	137	-23
Range	135-162	75-162	-75 - +6
Variance	88.04	599.83	700.86
Standard deviation	9.38	24.49	26.47

Table 2.20 – Participants with initial K-MPAI scores between 134.5 and 162.5

Here, we see mean and median decreases in K-MPAI scores when comparing pre- and post-intervention. It is also interesting to note that the variance and mean post-intervention, though still high, are slightly smaller than in the earlier two groups. Using the Wilcoxon Signed Ranks Test, there are 11 negative ranks and 4 positive ranks. The Z score is Z= -2.670 with a p score of p=0.008. We reject the null hypothesis here again. There is a statistically significant decrease in K-MPAI scores among participants in this group post intervention.

2.3.6.7 Pre-Intervention Interviews

All 21 participants from Study 2 completed the pre-interviews before beginning the intervention. The qualitative data confirms some of the findings from the quantitative data and adds more details. The median self-reported MPA level is moderate to severe, which reflects

very well what was found on K-MPAI scores. In the pre-interview, no participant reported an MPA level below moderate. It was evident that participants suffer from physical symptoms most commonly, yet psychological symptoms, such as worry, dread, and self-criticism, came up in the case of over half of the participants. What was very evident was that participants reported having performance difficulties, with performance quality deterioration being the main complaint. For some, this led to avoidance behaviours, with participants trying to avoid performance at any cost. A graduate performance student reported the following, “I feel like I don't want to play because what if…it doesn't sound like a [graduate] student, then I just don't play because I am worried about how it will come across, I guess.”

The qualitative data showed that MPA had a broader effect on participants than just on stage. About a third of participants spoke about lacking performance enjoyment that they once had. A third also felt that their MPA was holding them back, with 8 participants questioning their career choice and even their degree program. One participant said, “I can see and feel in the moment just how much it is limiting me. Especially if I am playing well right before a performance and when I am practising and I feel so in the zone and suddenly that jarring shift in the way I am playing snowballs into a bad performance.” Comments varied from questions about why they were studying music, to what the future would hold if they couldn’t get control of MPA, to wanting to quit their career and/or studies. A total of 5 participants voiced wanting to quit or change their studies in the pre-interview. Another related the experience to pain when saying, “It affects my decision to be doing what I am doing because when it is something that is constantly so difficult and something that seems so out of my control most of the time it makes me question my own motives. Am I enjoying it? Do I enjoy this.... It is very strange to feel that something that I think I love so much is also causing me so much pain.” Even just one physical

symptom can be immensely distressing for participants. “I have uncontrollable shaking; I have many times contemplated quitting this field because of it. My level of performance can vary from, you know, I feel like an accurate representation of myself to barely possible to sustain a sound. That is extremely frustrating, disappointing, and scary that my reliability in performance can vary so much.” This was quoted by a performance student.

The way in which MPA manifested for some performers was quite severe. There were several accounts of MPA in the interviews that went far beyond mild stage jitters. Shaking was commonly described by participants, but this can go beyond just being an annoyance. For this participant, the shaking was more severe and was associated with fear. “I have to hold the piano. I don't want to do that but sometimes when I am performing, I find I need to like...or I'll die almost. I need to hold on for dear life. The shaking and the going numb part are really...that part is kind of intense.” Some of the physical responses can become quite extreme, including the skin reactions mentioned by this participant. “I have physical responses that I am not able to control. In the past, it has manifested so far as hives on my hands.” A graduate performance student shares this description of performances for them. “Sometimes feel I might drop my instrument…It is an agonizing feeling. Shaking of my arms, shaking of my neck.”

A graduate student participant spoke about the tremendous pressure that they feel under. One was quoted as saying, “The most important thing as an ensemble player is to be absolutely reliable and never make an audible mistake…everybody is under that crushing pressure and you lose the musicality inevitably.”

For a few participants, their MPA had a negative impact on their self-image and feelings of self-worth. “Bad performance experiences or memories of that affect me quite deeply. They become a reflection of who I am as a player. It taints my image of myself.” Some participants

reported criticism of themselves to the point of self-deprecation. “When I have a bad performance, it reinforces the self-deprecation.”

Others felt that their MPA was negatively affecting their academic studies, either because they no longer were motivated for a career in music or because of a decrease in mood. A participant in the performance stream reported the following, “Whenever I have bad performances, I can physically feel my lower mood and then that causes me to be much less interested in going to class, studying, and meeting my friends. It subsides for a while but then after another bad performance, it can happen again.” It wasn’t only after a bad performance that participants were affected. “After if I don't feel good about a performance, it makes me not want to study or not want to go to class. Leading up to performances, when I am really anxious, I have a hard time concentrating in class.”

A total of 10 participants felt that they experienced mental health struggles. Some participants reported diagnoses of mental illness while others suspected generalized anxiety or depression. Falling into an acute depressive state was a common occurrence after a perceived “bad” performance for 7 participants. One participant was quoted as saying, “I can perform at the expected standard but the consequences after the fact are kind of extreme”. Another participant noted, “Whenever I do have a bad performance, I fall into depressive episodes very easily. One simple thing can set me off.”

Table 2.27 is a list of the themes discovered as well as their number of reports.

Theme	Number of Participants	Number of References
Avoid Performance	6	8
Bad Performance	6	10
Wants to Change Mindset	7	9
Lacking enjoyment	7	10
Mental Health Struggle	10	16
Holding Back	7	11

Theme	Number of Participants	Number of References
Focus	6	6
Memorization	4	5
Moderate MPA	8	8
Moderate to Severe MPA	7	7
Severe MPA	5	5
Physical Symptoms	18	30
Psychological Symptoms	11	16
MPA severity changes	8	11
Tried help for MPA in the past	5	6
Performance Difficulties	19	69
Self-Image	3	5
Preparation	2	2
Questioning Degree Program/Career	8	13
Wanting Skills or Tool	8	9
MPA relating to Music Education	5	5

Table 2.21 – Themes from pre-intervention interviews

2.3.6.8 Post-Intervention Interviews

Looking at the post interviews, a few of the themes that emerged in the pre-interviews did not come up again. This is probably because participants were focusing on the intervention, their current MPA, and what changes they had noticed. Two participants did not complete the post-intervention interview despite reminder emails.

Participants were asked to self-rate their MPA, using the categories mild, moderate, severe, or in-between two categories. In post-intervention interviews, participants were not reminded of their pre-intervention rating. Overall, we see the self-report MPA severity decrease a bit. Post intervention, four participants rated their MPA as mild or mild to moderate, categories that were not chosen by any participants in the pre-interview. Six participants now indicate that their MPA was moderate while eight were still either moderate to severe or severe. Overall, the median self-reported MPA severity level is moderate, down from moderate to severe in the pre-

intervention interviews. The mode for the self-reported MPA severity was also moderate, unchanged from the pre-interview, which also had a mode of moderate.

When comparing self-reported scores with K-MPAI scores, similar results emerged. Except for one, participants who said that they improved, all showed significant improvement on the K-MPAI. One participant, whose scores on the K-MPAI pointed to worsening MPA, self-reported improved MPA. Of the 5 participants whose scores stayed relatively the same, within 5 points of their pre-K-MPAI scores, four self-reported that their MPA was at a similar level to pre-intervention. One of those participants self-reported improved MPA. Pre/Post K-MPAI scores revealed that four participants had worse MPA. Of those, one self-reported a worse level of MPA, two reported a similar level of MPA, and one reported improved MPA. The general overall trend of the qualitative results of pre/post MPA matched somewhat closely the quantitative pre/post MPA severity results.

What proved most interesting were the themes that arose from participants regarding the intervention program itself. Seventeen out of eighteen participants stated that the intervention was helpful, while no participant explicitly or implicitly revealed the opposite sentiment. Some participants felt that certain parts were more helpful than other parts in improving their experience of MPA. Although the majority felt that the broad array of skills and techniques presented was a positive aspect of the program, two participants felt that they did not enjoy learning skills that they found less useful. On the other hand, this participant felt that having access to a variety of tools allowed for choice. “It felt like there were so many options for whatever works for you…it's not, ‘Okay this is what works so here you go and if it doesn't work for you, maybe you should try a little harder’, so yeah. I like how open ended it felt.”

Six participants indicated that just dialogue and a safe space to talk about MPA were helpful to them.

> I think it has been helpful in terms of just having a space where you can actually talk about [MPA] and actually see that it is not just you suffering from these things…I think the biggest thing for me was like the community because it felt like a safe space and, I don't know, it was good to be able to open up and hear other people's experiences and know that I am not alone in this. This is a universal thing that we deal with differently but at the core, everyone kind of deals with the same thing.

For some participants, they felt that having this safe space and more dialogue had the potential to change the environment of a music school, which, at times, can be rather competitive in nature. This participant felt that they no longer had to hide their MPA, which they described as, "part of themselves".

> I found [the intervention] so helpful, mostly the group therapy part of it, that we were sharing with other students in the school our different kinds of struggles with anxiety and performing. I just felt that when I came to the music building, it was a safer place and more community. I would walk down the halls and I felt like I wasn't ashamed and hiding this part of me. Actually, people knew about it, and they were actually safeguarding it. They were being respectful and sensitive. It was a beautiful feeling. And likewise, I felt supportive of the other members. We would just say hi. We don't even have to talk about it, but you just know when you look into each other's eyes that it is an informed hello, and it is a beautiful feeling.

Along similar lines, a total of ten participants thought that the intervention generally helped to normalize MPA, making them realize that they were not alone. One participant said in the post-interview, "I liked hearing other people's experiences and saying both, oh I do that exact same thing, so I am not the only one and I am not crazy, and I am not a lost cause." For one participant, this was tied in with self-image. "I think just seeing people go through the same things that I was going through and still go through and my perception of them, it made me realize that probably people don't think less of me even if I have what I think is a bad performance."

A shift in mindset towards MPA came up in interviews with ten participants as being a change that resulted from the intervention program. One participant was quoted as saying, in relation to a recent performance, “I didn't really feel like the world was ending so much in the moment. I felt a little more in control, like it was obviously still physically affecting me pretty intensely, but I would say that my mindset started to shift since joining [the intervention program].” One example of a shift in mindset is being able to gaze elsewhere, which in essence is changing the thought patterns to go in a more productive direction. One participant shared this experience. “I think it has been turning my attention away from the anxiety and more towards what I am able to change and how that has a more positive affect rather than focusing on the anxiety.”

Having a greater awareness of their own MPA, its triggers, and root causes was a helpful aspect for nine participants, though many acknowledged that the process takes time. One participant said, “I think I have a better understanding of what is going on. In the little bit of performing that I have done somewhat recently I felt like I had a little bit more control over keeping my brain in the game, but I also am very aware that it may be as long a process to undo the situation as it was to create it.” Another tied this in with the dynamics of a group intervention: “Yeah, I would say that [the intervention] was distinctly positive yeah in terms of having a better understanding. I think even just being able to have a dialogue around these issues is helpful.” This participant pointed out how this greater understanding helped. “It has been helpful in that there were many things that I like, many techniques that I learned, and also many realizations that[…]this is what affects me, and this is how I can avoid or cope with it.” For a couple of participants, although they felt that they had a better understanding, they would need more time to access the outcome. Here is an example, “I am a bit more self-aware of when the

anxiety starts and what is causing it, but I feel like it is still too early. I haven't worked on it enough to know that it is positive or negative, but it is just that now I am more aware of it."

A similar theme that emerged with six participants was that they felt more accepting of their MPA. In the account of one participant, "my relationship with my performance anxiety is changing. I am much more accepting like this is just part of me and it is not the end of the world, and I am still loveable." This acceptance became self-compassion or kindness towards oneself in the case of many participants. "What I have noticed is that I am kinder to myself a lot more when it comes to [MPA][…] I am working with myself a lot more rather than like an angry schoolteacher rapping on the student's knuckles". Another participant shared the following: "The really helpful thing for me has been being kinder to myself and[…] having a better attitude towards music and performing." For one participant, this shift meant learning to restructure her thought patterns. "I have learned to talk back to myself because often times I have thoughts that are really toxic."

Many participants spoke about having more tools to manage MPA. This is an important finding, as in the pre-interviews, a desire to gain tools or skills was a common theme that emerged. Here is the account of one participant: "So I would say that I feel like I have a lot more strategies to draw upon." For another participant, having these tools has been "life changing". "I would say [the intervention] was life changing in a lot of ways. I know that I will still struggle with performance. It was not like a magic cure, but it definitely gave me some good tools to work with. I just feel like I have a better handle on it now."

Seven participants shared experiences of improved performances in their post-intervention interviews and attributed this to their time in the intervention program. Another five

participants indicated that they had more performance confidence and trust in their ability to perform successfully. Here is an account from one of the participants,

> I also had a performance[…]that went really well, and I was really happy about that. And I would say that part of the reason why it went well was being able to discuss things in the intervention study. Like being able to talk openly about it, gain some strategies, and yeah just to realize that it is totally normal and also what I can do to improve and to actually use it as something to help me when I am performing and not only hinder me.

For one participant in particular, this trust grew because of the group experience.

> I definitely have built up some trust. The most important thing that was in that last performance that was collaborative is that I told myself that I was allowed to make mistakes and I start to trust that it would still sound good no matter what. I think that really came from that last group class that we had[...]Something clicked in my brain, and I was realizing that other people sounded amazing to me, but they were really anxious, and I did not know where their mistakes were and I was like, man you sound great. And I was like, wait a second, maybe that is true for me too!

Overall, five participants indicated that not much had changed for them, and in most of these cases, they attributed this to the lack of performing as the result of the emerging Covid-19 global pandemic.

One participant indicated that they enjoyed performing more, though this was not a specific question and therefore harder to assess on a broader level. Another participant mentioned having greater focus in performance.

Table 2.28 includes a list of themes that appeared in post-intervention interviews.

Theme	Number of Participants	Number of References
Avoid Performance	4	5
Bad Performance	0	0
Lacking enjoyment	1	1
Mental Health Struggle	6	7
Holding Back	0	0
Moderate MPA	6	6
Moderate to Severe MPA	4	4
Severe MPA	4	4
Physical Symptoms	4	4
Psychological Symptoms	3	3

Theme	Number of Participants	Number of References
Performance Difficulties	6	6
Self-Image	1	1
Questioning Degree Program/Career	1	1
MPA relating to Music Education	3	8
Mild MPA	1	1
Mild to moderate MPA	3	3
Intervention was helpful	17	26
Dialogue and safe space	6	17
Include in curriculum	18	26
It helped to normalize MPA	10	13
Not much changed	5	9
Performance Improved	7	11
Skills learned		
Acceptance	6	11
Awareness/Understanding	9	18
Mindset	10	16
Confidence/Trust	5	8

Table 2.22 – Themes from post-intervention interviews

2.3.7 Confounding Variables

One major confounding variable of Study 2 that could not have been predicted was the global threat of the COVID-19 pandemic. UBC was shut down in mid-March of 2020, resulting in the cancellation of many performances and all end-of-term recitals and juries. This has made it difficult to get a clear sense of the effectiveness of the intervention in the short-term, as some of the participants were not having a chance to perform and practice the skills that they have learned in the class. Living in a time of unprecedented global uncertainty is also likely to have a negative effect on depression and anxiety, especially for those who already show propensity towards these disorders. It is not possible to know how much Covid-19 positively or negatively affected general wellbeing and/or performance anxiety.

There are other factors to consider as well. Is there perhaps a natural trend toward improved MPA as the term progresses for students? Because our study did not use controls, it is

hard to know for sure whether the improved MPA scores were due to the intervention or due to a natural phenomenon that is perhaps at play. The qualitative interview results, with a clear sense that participants found the program helpful, help to substantiate the validity of the quantitative data, but without controls in the intervention, it is impossible to know for sure.

A third element that could potentially be at play is the effect of expectation. Perhaps students expected that this program would help their MPA and therefore, just their perceived expectations influenced the outcome as well.

2.4 Conclusion

The results of these intervention studies show that a multi-modal intervention for MPA was correlated with decreasing MPA scores using the K-MPAI, participant perception of improved MPA, and participant perception of the program as being helpful. Subgroup analysis shows correlation between initial depression scores and MPA severity with treatment outcome. A discussion of the findings and a presentation of considerations will be presented in Chapter 3.

Chapter 3: Discussion

A discussion of the findings from the research studies, their connection to the literature, and their implications in the treatment of MPA among university music students, will be presented in this chapter. The quantitative and qualitative data will be interpreted followed by a discussion of the discovered subgroups. Treatment and intervention modalities and formats in the context of the university music school setting will be examined. Pedagogical considerations for managing MPA in the teaching studio will also be addressed.

3.1 Discussion of the Study Results

The research studies conducted by the author and her study team confirmed the hypothesis that MPA would improve by means of a multi-modal intervention program when led by a trained professional in counselling psychology and music. Statistical significance was achieved in overall K-MPAI scores, particularly with participants from certain sub-groups. What can we learn from this and how can it be applied to the treatment of MPA among university music students? This question, along with a discussion of the results, will be the focus of section 3.1.

3.1.1 Quantitative Results

When the study began, it was not known whether a blended intervention in a group setting would prove to be helpful to music students. The literature showed that other interventions using one or more of CBT, Behavioural Therapy, Psychodynamic Therapy, Mindfulness, and Sports Psychology proved at least somewhat beneficial. Would we see a change in K-MPAI scores with a blended intervention and what would the students' perception of such a program be?

The quantitative data did show an overall change that was statistically significant in study 2 as well as when the data from studies 1 and 2 were combined. Study 1 on its own did not show enough decrease in overall K-MPAI scores to be statistically significant, partially because of the small sample size, though we saw two main subsections of the K-MPAI decreasing. This indicated to the author that some change was happening, but it was unclear exactly as to what or why. Without a measurement criterion for looking at performance improvement, it is impossible to say whether this decreased MPA would lead to greater performance success among the participants.

The statistically significant decrease in study 2, as well as when the data for study 1 and 2 were combined, suggested that indeed something had changed for the participants. Over the course of the intervention, MPA improved for the majority of participants, some rather significantly, yet a few participants saw no improvement or slight worsening of MPA. A few questions remained. For one, is it possible that all students have a naturally declining MPA score over the course of an academic term? No studies have examined the relationship between MPA scores and varying points in the academic term, so it is impossible to know for sure. In order to address this, a group of controls would have been needed as a comparison. Due to the limitations of the volunteer base, it was decided that using controls would not be feasible. It also seemed unethical to assign some students who were struggling with MPA to the control group, who would receive no treatment and others to the intervention group. It was decided that all volunteers would have the option of being in the study group.

Using the assumption that controls would have experienced no improvement in MPA scores over the course of the academic term, we can then assume that this blended intervention program does correlate with decreased MPA scores. To further explore this, it is necessary to

look for sub-groups in the quantitative analysis and look to the qualitative results for further depth of understanding.

After noting decreases in the depression and hopelessness section of the K-MPAI in study 1, it was decided that a further investigation into co-morbidity could answer more questions about a blended group intervention program. Despite some small indications from study 1, there was no statistical change in either the PHQ-9 depression scores or the GAD-7 generalized anxiety scores pre- and post-intervention in study 2. The mean remained essentially unchanged. As would be expected in any sample, a subset of students showed improved depression scores, while another showed worsening depression scores, but overall, many students stayed within 2 or 3 points of their pre-intervention score. The mean PHQ-9 score dropped by 0.5 points while the median increased by 0.5 points. This change is not enough to be significant. Anxiety scores differed from the depression scores. Although there was no statistically significant change, some observations were noted. First, several participants saw decreases in their GAD-7 scores by more than 5 points. Twelve participants had decreasing scores while only 5 had increasing scores and 3 remained the same. The mean did drop by almost 2 points, but this was still not enough for statistical significance. A larger study would have greater power and could better determine if GAD-7 scores are indeed positively affected by a blended intervention.

If we take into consideration the timing of Study 2, we might find more significant information about the wellbeing of the intervention participants. Pre-intervention scores were collected in January of 2020, just over 2 months before the world experienced the beginning of the Covid-19 pandemic. Post intervention scores were collected in mid to late April, about one month into the Covid-19 pandemic. In a time when many people were experiencing worsening

mental health, the research study participants remained consistent in their depression and anxiety scores. This leads to questions that cannot be answered for certain. Is it possible that the intervention was protective against mental health struggle associated with the global pandemic? Had scores improved during the intervention and worsened only again with the pandemic? These questions cannot be answered, unfortunately, due to the timing of the study. If the intervention did in fact protect participants from worsening mental health during the Covid-19 pandemic, then it is possible that the tools they acquired provided them with enough resources to handle stressful life situations. This would need further study but is potentially a very important observation and is worth further investigation in the future.

The take-away from the quantitative results is that participants' scores improved, particularly for those with lower depression scores or higher initial MPA scores. The quantitative data does not show which components of MPA improved or how the improvement affected the performer. Qualitative data was able to help answer parts of these questions.

3.1.2 Qualitative Results – A Triangulation of the Data

As this was a mixed methods study, it was important not only to interpret the qualitative results, but also to triangulate the qualitative data with the quantitative data. Doing so validated some of the findings from the quantitative data and also added some further details. On a basic level, it is apparent that self-reported levels of MPA reflect the K-MPAI scores fairly closely. During both pre-intervention and post-intervention interviews, participants rated their MPA on a scale of mild to severe. The pre-invention responses were all moderate or higher, which is aligned with the K-MPAI scores of 120 and above. The post intervention responses included two new categories: mild and mild to moderate. This aligns well with the quantitative data showing a decrease in the mean K-MPAI scores. The two participants whose post-intervention K-MPAI

was below 120 rated their MPA as mild (K-MPAI 83) and mild to moderate (K-MPAI of 116). There seems to be good correlation between K-MPAI scores and participant perception of anxiety.

Comparing the K-MPAI results with participant perception of MPA rating showed some alignment between the quantitative and qualitative data. One student did not clearly answer the question in interviews relating to MPA severity level, so only 17 sets of data exist. Students were not reminded of what severity level they had answered in their pre-intervention interview. A total of 7 of the 17 gave a lower severity level to their MPA post intervention, including 5 who also showed quantitative decreases in K-MPAI scores. 9 participants gave the same label to their MPA severity, including 3 participants who had improved K-MPAI scores, 4 participants whose K-MPAI scores remained almost unchanged, and 2 participants who had worsening K-MPAI scores. Only one participant indicated a worsening level of MPA, which was in line with their K-MPAI scores. When asked directly about the intervention, 17 out of 18 participants clearly stated that yes, the intervention was helpful in improving their MPA scores. This expands further on the findings of the quantitative data. First, it helps to confirm the findings of the quantitative data analysis, but also it shows that participants may not need to have improved scores or even improved MPA for the program to provide some benefit.

Looking at solely whether a student indicated mild, moderate, severe, or an in between category may not be the best measure of improvement. The fact that almost all the participants were clear in describing the intervention as helpful should be noted. Whether “helpful” leads decreased MPA is subject to interpretation. If the goal is to help in the management of MPA, having the intervention described as “helpful” is important. Participants felt that it had an important impact.

What the qualitative analysis allowed for was the identification of common themes and traits among the participants struggling with MPA. These can help explain impacts and areas of improvement that the participants noted. In the pre-intervention, the most common theme was unsurprising: 19 out of 21 participants reported performance difficulties. Performance difficulties ranged from performance quality deterioration, unreliable performances, and struggle with evaluated or judged performances. It was evident that this was the largest and most common difficulty among the student participants.

As is evident from the table of themes – somatic, cognitive, behavioural, and affective symptoms were present among the participants. From the interviews, it seemed that somatic and affective symptoms caused greater distress with this group of participants, as many described instances and anecdotes of how physical symptoms or a sharp decrease in mood had a negative effect on them.

Approximately half of the group reported mental health struggles, either directly or indirectly relating to their performances. We can also compare this with the K-MPAI, as high scores on the K-MPAI represent more severe MPA, which is often associated with co-morbidity. Many questions on the K-MPAI relate to depression and generalized anxiety. The high mean K-MPAI scores pre-intervention, as well as the frequent references to mental health struggles in the interviews, match. Mental health struggle references were surprisingly high, yet in line with the results found in some studies reviewed for the literature review.

Post-interviews contained many of the same questions as pre-interviews, while also adding questions about the participants' thoughts on the program. The program was seen almost unanimously as helpful and an important addition to music school curriculum. Participants described the ways in which the intervention was helpful: more tools to manage their MPA; a

greater awareness and understanding about their MPA and its sources; more acceptance of their anxiety; a shift in mindset and increased confidence and trust. Although some had not had the chance to perform much or at all because of Covid-19, seven participants reported noticing improvements in their performances.

The pre-interviews confirmed parts of what were found in the literature review. MPA manifests in different ways, with varying combinations of categories of symptoms. No two participants provide identical descriptions of their own struggle with MPA. MPA can then be seen as an umbrella term to describe a phenomenon that encapsulates a wide variety of manifestations, severity, and underlying causes. The pre-interview also demonstrated a keen openness by students to learn tools or ways to improve their MPA. From the responses in the post-interview, this common goal shared by many of the participants seemed to have been met, with 14 out of 18 participants mentioning the increase of tools that they had developed.

3.1.3 Summary

The two research studies did not consider external performance quality ratings as part of the methodology. Instead, the focus was on self-reported measures and reports of change in personal experiences with MPA. Some may argue that although the program seemed successful, it may have had no measurable impact on performance quality. Neither the quantitative data nor the qualitative data can measure changes in performance outcomes. The question that follows is what is most relevant and most important in the long term? Is the purpose of an intervention solely to produce more students who are winning competitions and actively engaging in the performance world? Or rather, is the goal to promote health and wellbeing of students? Perhaps both could be goals, especially for students aspiring for a high-level professional career.

The literature reviews made clear that MPA causes distress among musicians in all stages of their journey, be that in their studies or in a professional career. The literature also indicated MPA as a reason why some students abandon a career in music. This was confirmed in the interviews, where many students, even those in performance or graduate level degrees, questioned their career path. The pain and suffering can become too much. The purpose of this research has been to help identify possible ways to promote psychological health in the hopes of positively changing the student experience of MPA in music school and to help ensure career longevity. The qualitative and quantitative data collected suggest that the intervention program did shift students' perspective, perception, and coping mechanisms for MPA. For some, this may open the door for more performance success or a chance at a career in the professional music world, but that is not the only goal when addressing MPA. The goal of these studies rests in wellbeing. With the literature review showing high rates of mental health struggle among musicians and my research study showing 14 out of 21 participants scoring above moderate for depression and/or anxiety, it is evident that the psychological wellbeing of musicians and students is suffering.

The full impact of the intervention on a participants' long-term health and wellbeing as a musician will not be known unless further studies are conducted in the future. The improvement in MPA noted in both the quantitative and qualitative has the potential to increase if the participants keep using the tools that they learned and perhaps speak more openly about the topic with their peers and colleagues.

3.2 Identifying Subgroups

The literature review in Chapter One gave a clear picture of the breadth of research conducted into MPA. Observations that were noticed included the frequent reliance on only a

handful of studies to assess the prevalence of MPA, limited literature to fully describe the severity, and no clear agreement on treatment and management of MPA. What became clear was that there is still a lack of literature studying MPA with co-morbidities, which is why my research study focused on this specifically.

3.2.1 High initial PHQ-9

Two previous studies mentioned in the literature review drew attention to co-morbid depression with MPA. Kenny based her third and most severe sub-type of MPA on this combination. From my research study, 10 of the 21 participant volunteers showed scores of moderate or severe depression. This rate is similar to Medeiros-Barber's findings that 48 percent of those with MPA indicators showed signs of depression.[188] Having a treatment or management program to address this population is very important.

What I discovered in my research study was that participants with co-morbid depression did not show improvement on quantitative measures following the specific intervention design of my study. Those with moderate or higher levels of depression were the subgroup of participants that showed little response, yet also no major worsening of MPA scores. This points to the likelihood that some other tailored intervention would be needed to address MPA in this population. Perhaps a group class intervention is less effective for those with depression. It is possible that they would respond better to one-on-one therapy that would also address their depression along with their MPA. Another possibility is that the combination of techniques addressed in the intervention, many of which required practice and focus on anxiety

[188] Medeiros-Barbar, Souza-Crippa, and Lima-Osório, "Performance anxiety in Brazilian musicians: Prevalence and association with psychopathology indicators," 383.

management, may have been challenging to adopt for someone with underlying depression. The intervention itself could be the issue or the depression may be interfering with the participant's ability to assimilate the new skills. This would require further study with this population of MPA sufferers.

If we triangulate the quantitative findings with the qualitative findings, a slightly different picture emerges. Although 6 participants worsened on the K-MPAI, only 1 participant mentioned worsening MPA in the post-intervention interviews. All the others noted their MPA as being about the same, even though their scores worsened. This may show that perhaps the K-MPAI cannot measure accurately all possible shifts, including awareness and understanding. It is possible that the reported experience of similar MPA level, but with new tools, may lead to longer-term changes that were not so quickly evident on a repeated K-MPAI.

3.2.2 Higher Initial GAD-7 Scores

Although an attempt was made to see if any connection could be found between pre-intervention GAD-7 scores and intervention, the quantitative literature did not provide clear answers. The qualitative data may provide some further insight. Eleven full data sets show the results of those with GAD-7 at the moderate level or higher. The qualitative data shows that 5 of the 11 participants had improved scores, with 4 having stayed about the same, and 2 having worsening scores. With the exception of one, all of the participants who improved on the K-MPAI scores also showed improvement in their self-ratings. Of those whose scores stayed around the same, one noted improvement in self-report and three showed similar levels in self-report. Of the two that had worsening K-MPAI scores, one described improved MPA in post-interviews while another described worsening MPA. In this case, the qualitative data does not add a lot more information to our quantitative data. Looking at the qualitative data for the four

participants scoring moderate or higher only on the GAD-7, the qualitative data showed that two improved and 2 stayed the same.

There are no clear answers to the question of the role of generalized anxiety scores and treatment effectiveness. More research would need to be conducted in this area.

3.2.3 Lower Initial K-MPAI Scores

Another finding from my behavioural research study was the fact that participants with lower MPA scores pre-intervention, those who scored in the first or second quartile (lowest 50%), responded less well to the intervention. The overall change in mean K-MPAI scores pre- and post-intervention was not statistically significant; however, there was a large range of difference scores, from a decrease of 75 points (improvement) on the K-MPAI to an increase of 22 (worsening). Although this group had no statistically significant change overall, their qualitative responses indicated that they found the program helpful and that they felt that their MPA improved. A key point that emerged from the literature review helps to possibly explain this. Hamann referred to anxiety as adaptive, in that it can actually enhance performance.[189] What he neglected to acknowledge was that high levels of anxiety can become maladaptive. Despite some of its flaws and limitations as discussed in Chapter 1, the Yerkes Inverted U theory demonstrates that a modest degree of anxiety can be performance enhancing.[190] Kenny's description of the lowest severity sub-type of MPA, MPA as a Focal Anxiety, also acknowledges that this level can sometimes be performance-enhancing.[191] It could be that some participants in this group possibility suffer more from the focal anxiety sub-type. This could be especially true

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[189] Hamann, "The Other Side of Stage Fright."
[190] R. M. Yerkes and J. D. Dodson, "The relation of strength to stimulus to rapidity of habit formation," *Journal of Comparative Neurology and Psychology* 18 (1908).
[191] Kenny, *The Psychology of Music Performance Anxiety*, 57-58.

taking into consideration that 5 of the 9 participants showed no sign of significant co-morbidity of generalized anxiety or depression.

When I consider the literature along with the results that I found, it seems as if those with lower anxiety levels have less room for improvement. They still need a certain, healthy level of anxiety to ensure their performance success. This may explain why the quantitative scores had such a wide range and no overall mean change. If the goal is not to eliminate but rather to manage MPA at a reasonable level, perhaps there was not much room for improved scores among participants with pre-K-MPAI scores in the lowest quartile. What is important to note are the positive responses in the semi-structured post-intervention interviews. The participants with lower initial K-MPAI scores who improved less after intervention still indicated that they found the intervention helpful and all of them stated that it should be included in university curriculum. Many used the words “aware” or “awareness” to help describe a change that had taken place.

My interpretation of these results, when triangulating the qualitative and quantitative data, is that those with lower MPA scores may not see large improvements on a measure, but may still benefit from the exposure to tools, strategies, and psycho-educational material. It is important to remember that these participants volunteered because they self-reported having MPA. None of these participants deemed the program to be unhelpful or harmful; on the contrary, all of them seemed pleased to have participated. Not only would this population of students be presented with skills and information to help their current MPA, but it could also help prevent them from developing worsening MPA and/or psychological co-morbidity. The literature review showed that professional musicians have higher rates of psychological co-morbidity compared with other musician populations and compared with the general public. It is

possible that early invention before MPA becomes more severe could equip these students and provide better health for career longevity.

3.2.4 High Initial K-MPAI Scores

Participants whose pre-intervention K-MPAI scores were in the third or fourth quartile responded quite well to the intervention. There was a statistically significant decrease in MPA scores, showing improvement for this group of students. The mean for this category dropped from 165.25/240 to 144.73/240. This brings these participants down to the level of the participants scoring below the 50% quartile. Study 2 allowed us to explore PHQ-9 scores, which revealed a lack of response, either positive or negative, from those with moderate or higher depression scores. In the group of students scoring in the upper 50% quartile on initial K-MPAI scores, 6 had moderate or higher depression scores, 5 had scores showing mild to no depression, and 3 were in Study 1 where no PHQ-9 scores were collected. Four of the six participants in this grouping who also had higher PHQ-9 scores showed very little improvement or even worsening scores. Had these participants with initial K-MPAI in the upper quartiles, who also had PHQ-9 scores above 10, been removed, the post-intervention mean for those with the highest initial K-MPAI scores would have dropped to 127.9, a change of almost 40 points.

The results point to the possibility that the specific intervention chosen for my research study may have the potential to reduce MPA scores in music students with higher initial MPA scores. The response seems even more significant for participants without signs of co-morbid depression. Being able to reduce MPA scores in those with more severe cases is a potentially significant finding. It may help these students continue their studies with less distress and may help students lead into a healthier professional career. It also has the potential to reduce the

number of music students quitting or changing career paths because of immense struggle with MPA.

Next, I considered the response of those with initial K-MPAI scores in the second or third quartile. This group had an initial mean K-MPAI of 150.53 which dropped to 124.6 post-intervention. This was a mean difference of -25.29 points. These results make it seem as if this group responded best to treatment, but there is one additional consideration: all of the participants in the 4th quartile for their initial K-MPAI score also scored at the moderate or higher level on the PHQ-9 depression screener. This makes it hard to tell if the highest K-MPAI scores were the reason for less response or whether the depression scores were the reason. At this point, it is only speculation.

3.2.5 No Co-Morbidity

Out of the 21 participants in study 2, only 7 had initial PHQ-9 and GAD-7 scores below 10. These participants saw a decrease from an initial K-MPAI mean of 148.1 to a post intervention K-MPAI of 122.7. This decrease was statistically significant and shows that participants without signs of co-morbidity responded well to this intervention.

3.2.6 Summary

What the results show us is that screening students before placing them in an intervention might be useful. It could be useful to identify students with co-morbidities, especially those with depression. The intervention did not prove effective for these students, but a possible key could be to treat the depression alongside the MPA. Having a student receive proper psychological support for their depression alongside an MPA intervention, or perhaps before an MPA intervention, could potentially make a difference. There is not enough data to draw conclusions in this area, but rather some predictions or hypotheses can be made about how to manage those

with co-morbid depression. Generalized anxiety seems less influential on participant response to treatment, but studies with a greater number of participants in this category would be required to confirm these findings. Screening for panic disorder and social anxiety disorder were not conducted; therefore, it is impossible to make any predictions about these co-morbidities.

Knowing the severity of MPA seems key to predicting decreases in MPA scores, but not the perceived benefit as expressed by the student. From the semi-structured interviews, we saw those participants with both low and high MPA scores found the program helpful, despite differences between these two groups on quantitative K-MPAI scores. Further studies investigating the difference between these two groups, as well as the perception of improved MPA, would be needed to better understand this.

3.3 Proposed Treatment

My research study discovered varying levels, severities, and forms of manifestation of MPA, which aligns well with the literature. From purely a quantitative perspective, there was a range of MPA scores, showing that some participants had milder MPA while others had more severe levels of MPA. The same was true with co-morbidity, with some participants showing no signs of co-morbidity while others scoring high on depression, anxiety, or both scales. The qualitative interview showed that some participants only had a collection of physical symptoms, while others struggled mainly with cognitions, and yet others had a combination of both. Some participants showed behavioural modifications because of their MPA, such as avoidance of performance or over preparation, while other participants were not affected by MPA in this way. A few participants related MPA to negative affect symptoms, reporting periods of decreased mood following performance. If we take the findings from the literature and from my study into

consideration, I will propose that MPA needs to be seen as an umbrella term representing a wide variety of causes, manifestations, and consequences.

From the literature review, not one particular modality has emerged as being a reliable treatment to address the distress and negative performance outcomes of MPA. It seems that participant perception and experience of MPA is an area of treatment assessment that is severely lacking in the literature. If MPA is a term that represents a varied and evolving condition, it is no wonder that studies have failed to find one reliable treatment approach. The concept of combining modalities is not new, as other studies have taken the same approach. The problem is that many of the combined studies use a wide range of both psychotherapeutic modalities and alternative therapies. There do not appear to be studies with identical combined therapy treatments.

What is notable is that these combined studies, like the single modality studies, did show some promise. When groups were tested using just one modality or a combination of two or more modalities, often the multi-modal approach proved to have a greater impact, except in the case of the study using pharmacological treatment.

Both the vastness of the term MPA and the results of past studies suggest that perhaps a more holistic approach to MPA treatment is necessary. CBT can address the cognitions while behavioural therapy can provide regulation techniques and corrective experiences while performing. Sports psychology can give participants insight into the preparation process for performance and, when tailored for musicians, can address issues of practice as well as mindset preparation. CBT and sports psychology emphasize goal setting, which can help create an organized process and progression through treatment. The concept of motivation and ignition, a key element of sports psychology, can help musicians reconnect with core reasons and purposes

for their continued studies and/or career in music. Psychodynamic therapy can probe deeper into a musician's past, helping to address personality traits, past environmental impacts, and childhood experiences with MPA. This deeper work can be a bridge that links work in other modalities together. Do all musicians need an equal amount of each of these and will they respond identically? The answer is no! The concept of combining therapies in group intervention is to allow participants to experience a larger variety of approaches so that their needs and specific MPA is perhaps more likely to be addressed. If students were doing individual treatment, the exact combination and amount of these therapies would need to vary based on individual experience.

3.4 Treating MPA with Awareness of Co-Morbid Psychological Disorders

Another question and theme that both the literature review and my research studies bring to light is the prevalence of MPA with co-morbid psychological disorders. The literature review fails to answer how this should best be addressed. Should MPA be treated and managed separately from the psychological co-morbid disorder, or should they be treated concurrently? My research study also failed to provide an answer to this question, as it was discovered that depression did impact overall response to the MPA intervention.

As I am not a psychologist, I am not qualified to make recommendations on the treatment of psychological co-morbidity. However, I did make some observations along the way. As participants spoke about their own mental health struggles in interviews, they often related it back to their MPA. Either they felt that their disorder was the cause of their MPA, negatively affected their MPA, or was caused by their MPA. There is no way to determine the directionality. It is like the chicken-and-egg theory, which asks which of the two came first. My observation from the interviews is that psychological co-morbidity often seems intertwined with

MPA in some ways. This perhaps suggests that musicians could benefit from concurrent treatment of both their MPA and any other co-morbid psychological disorders. When MPA is left solely to discussions with mentors or in studio classes, where teachers are often not trained in clinical psychology, the co-morbidities go unrecognized and are not factored in. With MPA being so complex, with the many traits and factors associated with the development of MPA, and with the high prevalence of co-morbidity along with MPA, professional psychological intervention seems the most prudent approach to MPA management.

3.5 Using Group Interventions

Two other themes that emerged from the post-intervention interviews were "safe space" and "normalized MPA". Participants indicated that they felt the group setting allowed for open dialogue in an environment where participants felt that others understood and respected their personal experiences. Clear group norms, established at the beginning of the intervention, set the expectation that all participants would be respectful of others and would keep the shared experiences of other participants confidential. A total of 6 participants indicated that just having this safe space for sharing about MPA in fact helped improve their MPA. A total of 10 participants mentioned in the post-intervention interview that the group setting allowed MPA to be more normalized. Participants suddenly felt like they were not in this struggle with MPA alone. Participants who mentioned one or both themes indicated that this was a positive element of the group intervention.

There were instances in which participants felt that a group environment would not be helpful. Some of the participants mentioned that if a course in MPA was mandatory for all students, there would be students in the group who did not want to discuss or learn about MPA. This was perceived as a negative for students, perhaps threatening the concept of a safe space.

The insights from the post-intervention interview help to clarify the setting in which an intervention is perceived as helpful for students. A group of people, all of whom want to be in the group because of a shared experience with MPA, help to create a sense of safety for participants. This would lead me to believe that focus groups or optional intervention programs would be more useful in music school than mandatory group intervention settings. Only one of the participants reflected on the group norms, including the confidentiality aspect, mentioning that this helped to create safety. Whether this had an effect on the participants is unknown. No participant reflected on the group norms and the privacy agreement as negative aspects of the intervention.

3.6 Applications in the Teaching Studio

With such high prevalence rates of MPA among the student population, there is no doubt that MPA will enter into the teaching studio. As teachers, it is vital to be prepared for MPA struggles to become apparent in some students. Often students may go to their teachers as a first point of contact about their MPA. How MPA is handled in the teaching studio could have an immense effect on MPA management and treatment. Although my research did not focus on how teachers could address MPA, I have compiled some thoughts on this subject from my combined research.

3.6.1 How to Address MPA with Sensitivity

From a pedagogical standpoint, there are many things that teachers can do to help their students with MPA. One of the first things that can be done is to foster open discussion about MPA. There still seems to exist a climate of shame or silence around severe MPA struggles. Many participants in my research studies mentioned that having a safe space to freely speak about MPA was one part of what helped them. The key here is to ensure the space is safe. This

can take on many different meanings, but a few key elements could help make students feel more comfortable. First, students must consent to speaking about MPA in a group setting. For the intervention study, students volunteered to be part of a group to discuss MPA. Some students may be more comfortable keeping MPA discussions in one-on-one settings. It is important to be sensitive and aware that group discussion may be uncomfortable for some students. Allowing some discussion about MPA as part of the lesson time might help these students develop confidence discussing MPA before transitioning to discussion in a group setting.

One key element that emerged from the literature review and from the research studies from chapter 2 was the complexity and vastness of MPA. MPA can exist on its own or with other psychological disorders, including depression, generalized anxiety, social phobia, and panic disorder. Music teachers are not typically equipped with the training or qualifications to be diagnosing or treating psychological disorders. Being able to recognize some of the signs can be helpful, as it allows the teacher to offer suggestions for appropriate referral. Completing professional development or continuing education courses in mental health first aid and mental health awareness could be tremendously beneficial.

Another key component to managing the complexity of MPA in a teaching studio is to have an awareness that MPA manifests in many ways and on a large spectrum of severity level. Asking questions and engaging in an exploration of what MPA is for the student can help the teacher have a better understanding of the effects that MPA is having on the student. Questions such as, “tell me how MPA is affecting you. What do you experience leading up to, during, and after a performance?” It is important not to assume that MPA is affecting the student in the same way as other students or in the same way as the teacher.

3.6.2 When to Refer

Knowing when to refer a student for professional help is crucial. The first step in this process is to develop a network of contacts. There are online MPA coaches offering one-on-one sessions with musicians, including Don Greene, Noa Kageyama, and Madeline Bruser[192]. There may also be individuals in the community who are trained specifically to treat MPA, like Paula Wise,[193] who led the intervention program for the research studies, although this is less common. Working with a sports psychologist who has experience with performing artists and/or musicians is another possible option. In all cases, it is vital to investigate the person's qualifications. Coaches and psychotherapists can legally work without a license. While some of these individuals may possess graduate degrees in counselling psychology or certified life coaching diplomas, others may not have these or similar credentials. There are licensing bodies for both coaches and psychotherapists, including the International Coaching Federation, The Canadian Counselling and Psychotherapy Association, the BC Association of Clinical Counsellors, and the College of Psychologists. These agencies require a minimum standard for membership, helping to ensure that their members have appropriate training and qualifications. As teachers develop a list of referrals for MPA, it is imperative to assess the qualifications and training of each professional.

3.7 Overall Summary

Common themes of MPA emerged as a result of analyzing data from the studies conducted at UBC. While it is not possible to generalize this for all music schools, some insight

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[192] Don Greene, *Audition Success* (New York, NY: Routledge, 2001)., "Bulletproof Musician," 2021, https://bulletproofmusician.com/start-here/., "Art of Practising," 2019, 2021, https://artofpracticing.com/.
[193] "WiseWorks," 2017, 2021, http://www.paulawise.com/.

into the complexity and variety of manifestations of MPA were realized. The initial hypothesis was confirmed, showing that a blended, multi-modal intervention would help music students reduce their MPA. Where the study was not a full experiment, it cannot be stated that the intervention indeed caused MPA levels to decrease among participants, but it is possible to confirm a correlation in this case. Some contributions that this research brings to the literature include the identification of possible groups of students who may not respond as well to this sort of intervention; a consideration of the impact of co-morbidity on an intervention; and the identification of students' wishes for treatment programs.

An overwhelming majority of participants commented in post-intervention interviews that the intervention was helpful and should be included in music school curriculum. The literature supports the tremendous distress caused by MPA and the benefit of interventions. With such an overwhelming appreciation for this type of program by the students, it demonstrates just how much music schools need to further address MPA beyond isolated presentations and discussions with studio teachers.

Funding limitations prevented me from recruiting a larger sample and assessing more than one intervention. A larger sample may have provided more accurate insight into the changes observed post intervention as well as the themes about MPA that came up in the pre-intervention semi-structured interviews. Recognizing the potential for unconscious bias, there is no way to know for sure if the participants responded truthfully to the questionnaires or answered truthfully in the interviews. Steps were put in place to allow for confidentiality and anonymity, including the use of identifying numbers rather than names and giving questionnaires online so that the researchers were not in the room while the participant completed surveys. There is always a limitation to self-reported measures in that questions can be misinterpreted and MPA itself,

which lacks formal diagnostic criteria, can be challenging to assess. The impact of the covid-19 pandemic on the second study remains unknown. Where the results from Study 2 showed similar patterns to Study 1, we can assume that the pandemic did not play a large role in shifting the results, but it is impossible to know for sure.

There are many areas for future research stemming from the results of this study. The question of how to treat MPA along with psychological co-morbidity remains. A further study, perhaps with one group showing no signs of co-morbidity and a second group showing signs of potential co-morbidity might help to answer this question. It would also be worthwhile to compare a single modality intervention with a multi-modal intervention in a study, much like what has been done by some authors, to see if a multi-modal approach is indeed superior.

Chapter 4: Conclusion

The literature and the pre-intervention findings of my research studies are a testament to the immensity and severity of MPA. The literature review uncovered high prevalence rates of MPA; provided a clear sense that the severity level can be debilitating; demonstrated frequent co-occurrence of generalized anxiety and depression with MPA; reported higher instances of self-medication and substance use compared with the general population; and included anecdotes and accounts of severe MPA among professional artists.

Hearing the personal accounts from students within the UBC School of Music confirmed the findings found in previously published literature. As is evident from participant quotes and the recurring themes from the interviews, many students within the UBC School of Music were attempting to cope with severe manifestations of MPA. In the pre-intervention semi-structured interviews, main themes and reactions included: distressing physical symptoms, a significant decrease in the enjoyment of music; questioning of a career choice that caused so much "pain"; performance avoidance; a staggering 67 references to performance difficulties; feelings of despair; and a high prevalence of reported mental health struggles.

MPA is not merely a phenomenon that we read about in the literature; it is very present and causing debilitating symptoms for students right at UBC. I can only conclude that students studying at other institutions would elicit similar findings to those prevalent in the research group at the UBC School of Music.

The two research studies were developed to investigate whether a specific, multi-modal intervention would show benefits for students and how co-morbid psychological disorders might best be taken into account.

A multi-modal intervention comprising of CBT, Sports Psychology, Exposure Therapy, and Mindfulness was shown to be efficacious in reducing symptoms of MPA as measured by a well-established measurement tool, the K-MPAI. The efficacy of this particular intervention appears higher when participants enter treatment with a formally measured severity of MPA above a cut-off level of 120 on the chosen measurement tool. The response to treatment was better in participants who had no, or lesser degrees, of depression as measured by a well-studied standard depression inventory. In many cases, the qualitative results matched the quantitative results, showing the perception of improvements noted by students. Participants unanimously expressed that the intervention proved helpful and should be included as part of the curriculum. The use of a mixed-methods approach combining qualitative and quantitative outcomes helped triangulate that these research findings were reflected in participants' lived experience of the treatment program.

Personally, I found the experience of the research studies to be far more challenging to me than I ever would have imagined. I was in a position to hold the experiences of each and every participant as they revealed their inner struggles with MPA. The process was, at times, difficult. I felt a desire to help every participant while acknowledging the limitations of my role. I had to learn to sit back, witness, be present, and validate the journeys that each participant shared with me, but after the interview was over, I had to let go of their struggles. In order to conduct unbiased and ethical research, I needed to step back from any personal involvement with the participants. Not only was stepping back required for the research process, but it was a personal necessity. I could not carry all of the struggles from thirty participants in confidence on my own. This could have easily led to personal burn-out had I not been attentive to this.

After analyzing the results and realizing the positive impact that the intervention had on many participants, I felt a sense of gratification that my research studies had impacted the lives of thirty students. I was moved by the many notes and comments of thanks that I received from participants who wanted to share how grateful they were to be provided with an intervention for MPA. I am left with a strong desire to deepen and further research into MPA among the student population. Many questions were answered through the research studies for this dissertation, yet many questions remain unanswered.

The accounts of the students and the results of the study should send a clear message to music schools. MPA is a serious issue that is career- and life-altering if not addressed and treated. If music schools are striving to produce high-level students who will go on to careers as professional musicians, why is this major issue being neglected? Why is it being left to students and studio teachers to work out MPA struggles? If we truly want to produce a generation of successful and healthy music professionals, the acknowledgement, management, and treatment of MPA must be included in the curricula. Management and treatments need to be left to professionals who are well qualified to treat MPA and psychological disorders. MPA cannot be solely left to music teachers, most of whom have little to no training in counselling or clinical psychology. The immense psychological toll that MPA has on students, and the corresponding need for professional treatment clearly remains underappreciated.

Suffering does not have to be part of the artistic training, the artistic life, or the artistic profession. If students, teachers, professors, and school administrators all work together and begin looking to the literature and to the research as a guide, we can work to create better health, wellbeing, and career longevity for musicians.

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Appendices

Appendix A

Below are some statements about how you feel generally and how you feel **before or during a performance**. Please circle one number to indicate how much you agree or disagree with each statement.

		Strongly Disagree						**Strongly Agree**
K_1	I generally feel in control of my life	6	5	4	3	2	1	0
K_2	I find it easy to trust others	6	5	4	3	2	1	0
K_3	Sometimes I feel depressed without knowing why	0	1	2	3	4	5	6
K_4	I often find it difficult to work up the energy to do things	0	1	2	3	4	5	6
K_5	Excessive worrying is a characteristic of my family	0	1	2	3	4	5	6
K_6	I often feel that life has not much to offer me	0	1	2	3	4	5	6
K_7	Even if I work hard in preparation for a performance, I am likely to make mistakes	0	1	2	3	4	5	6
K_8	I find it difficult to depend on others	0	1	2	3	4	5	6
K_9	My parents were mostly responsive to my needs	6	5	4	3	2	1	0
K_10	Prior to, or during a performance, I get feelings akin to panic	0	1	2	3	4	5	6
K_11	I never know before a concert whether I will perform well	0	1	2	3	4	5	6
K_12	Prior to, or during a performance, I experience dry mouth	0	1	2	3	4	5	6
K_13	I often feel that I am not worth much as a person	0	1	2	3	4	5	6
K_14	During a performance I find myself thinking about whether I'll even get through it	0	1	2	3	4	5	6
K_15	Thinking about the evaluation I may get interferes with my performance	0	1	2	3	4	5	6
K_16	Prior to, or during a performance, I feel sick or faint or have a churning in my stomach	0	1	2	3	4	5	6
K_17	Even in the most stressful performance situations, I am confident that I will perform well	6	5	4	3	2	1	0
K_18	I am often concerned about a negative reaction from the audience	0	1	2	3	4	5	6
K_19	Sometimes I feel anxious for no particular reason	0	1	2	3	4	5	6
K_20	From early in my music studies, I remember being anxious about performing	0	1	2	3	4	5	6

		Strongly disagree						Strongly Agree
K_21	I worry that one bad performance may ruin my career	0	1	2	3	4	5	6
K_22	Prior to, or during a performance, I experience increased heart rate like pounding in my chest.....	0	1	2	3	4	5	6
K_23	My parents almost always listened to me	6	5	4	3	2	1	0
K_24	I give up worthwhile performance opportunities	0	1	2	3	4	5	6
K_25	After the performance, I worry about whether I played well enough.....	0	1	2	3	4	5	6
K_26	My worry and nervousness about my performance interferes with my focus and concentration.....	0	1	2	3	4	5	6
K_27	As a child, I often felt sad	0	1	2	3	4	5	6
K_28	I often prepare for a concert with a sense of dread and impending disaster.....	0	1	2	3	4	5	6
K_29	One or both of my parents were overly anxious.....	0	1	2	3	4	5	6
K_30	Prior to, or during a performance, I have increased muscle tension.....	0	1	2	3	4	5	6
K_31	I often feel that I have nothing to look forward to	0	1	2	3	4	5	6
K_32	After the performance, I replay it in my mind over and over...	0	1	2	3	4	5	6
K_33	My parents encouraged me to try new things	6	5	4	3	2	1	0
K_34	I worry so much before a performance, I cannot sleep.....	0	1	2	3	4	5	6
K_35	When performing without music, my memory is reliable.....	6	5	4	3	2	1	0
K_36	Prior to, or during a performance, I experience shaking or trembling or tremor.....	0	1	2	3	4	5	6
K_37	I am confident playing from memory.....	6	5	4	3	2	1	0
K_38	I am concerned about being scrutinized by others	0	1	2	3	4	5	6
K_39	I am concerned about my own judgement of how I will perform.....	0	1	2	3	4	5	6
K_40	I remain committed to performing even though it causes me great anxiety.....	0	1	2	3	4	5	6

Appendix B

K-MPAI© (Kenny, 2009, 2011) FACTORS	*SCORE*	*%*
1. ***Proximal somatic anxiety and worry about performance***		
K_10 Prior to, or during a performance, I get feelings akin to panic		
K_12 Prior to, or during a performance, I experience dry mouth		
K_14 During a performance I find myself thinking about whether I'll even get through it		
K_16 Prior to, or during a performance, I feel sick or faint or have a churning in my stomach		
K_22 Prior to, or during a performance, I experience increased heart rate like pounding in my chest		
K_26 My worry and nervousness about my performance interferes with my focus and concentration		
K_28 I often prepare for a concert with a sense of dread and impending disaster		
K_30 Prior to, or during a performance, I have increased muscle tension		
K_34 I worry so much before a performance, I cannot sleep		
K_36 Prior to, or during a performance, I experience shaking or trembling or tremor		
K_40 I remain committed to performing even though it causes me significant anxiety		
TOTAL/66		
2. Worry/dread (Negative cognitions) focused on self/other scrutiny		
K_7 Even if I work hard in preparation for a performance, I am likely to make mistakes		
K_15 Thinking about the evaluation I may get interferes with my performance		
K_18 I am often concerned about a negative reaction from the audience		
K_21 I worry that one bad performance may ruin my career		
K_25 After the performance, I worry about whether I played well enough		
K_32 After the performance, I replay it in my mind over and over		
K_38 I am concerned about being scrutinized by others		
K_39 I am concerned about my own judgment of how I performed		
TOTAL/48		
3. ***Depression/hopelessness (Psychological vulnerability)***		
K_1 I generally feel in control of my life (-)*		
K_2 I find it easy to trust others (-)*		
K_3 Sometimes I feel depressed without knowing why		
K_4 I often find it difficult to work up the energy to do things		
K_6 I often feel that life has not much to offer me		
K_8 I find it difficult to depend on others		
K_13 I often feel that I am not worth much as a person		
K_31 I often feel that I have nothing to look forward to		
TOTAL/48		
4. Parental empathy		
K_9 My parents were mostly responsive to my needs (-)*		
K_23 My parents always listened to me (-)*		
K_27 As a child, I often felt sad		
K_33 My parents encouraged me to try new things (-)*		
TOTAL/24		
5. Memory		
K_35 When performing without music, my memory is reliable (-)*		
K_37 I am confident playing from memory (-)*		
TOTAL/12		
6. Generational transmission of anxiety		
K_5 Excessive worrying is a characteristic of my family		
K_19 Sometimes I feel anxious for no particular reason		
K_29 One or both of my parents were overly anxious		
TOTAL/18		
7. Anxious apprehension		
K_11 I never know before a concert whether I will perform well		
K_17 Even in the most stressful performance situations, I am confident that I will perform well (-)*		
K_24 I give up worthwhile performance opportunities due to anxiety		
TOTAL/18		
8. Biological vulnerability		
K_20 From early in my music studies, I remember being anxious about performing **TOTAL/6**		
OVERALL TOTAL/240		

Appendix C

General Anxiety Disorder (GAD-7)

NAME DATE

1. Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all sure	Several days	Over half the days	Nearly every day
• Feeling nervous, anxious, or on edge	☐ 0	☐ 1	☐ 2	☐ 3
• Not being able to stop or control worrying	☐ 0	☐ 1	☐ 2	☐ 3
• Worrying too much about different things	☐ 0	☐ 1	☐ 2	☐ 3
• Trouble relaxing	☐ 0	☐ 1	☐ 2	☐ 3
• Being so restless that it's hard to sit still	☐ 0	☐ 1	☐ 2	☐ 3
• Becoming easily annoyed or Irritable	☐ 0	☐ 1	☐ 2	☐ 3
• Feeling afraid as if something awful might happen	☐ 0	☐ 1	☐ 2	☐ 3
Add the score for each column				
TOTAL SCORE *(add your column scores)*				
	Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
2. If you checked off any problem on this questionnaire so far, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	☐ 0	☐ 1	☐ 2	☐ 3

Scoring *Add the results for question number one through seven to get a total score.*
If you score 10 or above you might want to consider one or more of the following:
1. Discuss your symptoms with your doctor,
2. Contact a local mental health care provider or
3. Contact my office for further assessment and possible treatment.

Although these questions serve as a useful guide, only an appropriate licensed health professional can make the diagnosis of Generalized Anxiety Disorder.

A score of 10 or higher means significant anxiety is present. Score over 15 are severe.

GUIDE FOR INTERPRETING GAD-7 SCORES

Scale	Severity
0-9	None to mild
10-14	Moderate
15-21	Severe

GAD-7 developed by Dr. Robert L. Spitzer, Dr. K. Kroenke. et.al.

Appendix D

Patient Health Questionnaire (PHQ-9)

Name: _____ Date: _____

Over the last 2 weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

For office coding: Total Score _____ = _____ + _____ + _____

Total Score _____

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

☐ Not difficult at all ☐ Somewhat difficult ☐ Very difficult ☐ Extremely difficult