Mindsets: Case Studies on Incremental and Entity Theories in Undergraduate Music Students

by

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Abstract

American psychologist Carol Dweck coined terms for two dichotomous theories of intelligence––entity and incremental theories—which depict the general trends of learners. Fixed mindset learners internalize entity theories and view their intelligence or ability as a fixed, stable unit that is incapable of growth past the individual's own genetic limitations. Growth mindset learners believe in incremental theories and see their intelligence as dynamic, wherein their abilities are a direct product of their efforts. Dweck argues that adopting an incremental theory of learning (a growth mindset) can be beneficial to the learning process. Combining this body of psychological literature with auxiliary areas of psychology (e.g. self-determination theory), I conducted two case studies to analyze how these beliefs manifested in second-year instrumental music majors at Canadian post-secondary institutions. Through a six-week research period of one-on-one lessons, independent practice sessions, and interviews, I investigated the participants' respective upbringings, their methods of framing goals, and their responses to challenges and criticisms with the aim of understanding how music students' beliefs about mindsets affect their learning, as well as how music teachers may be able to maximize growth-oriented thinking in their interactions with students. After an analysis of the data, I concluded that the nurturing of growth mindsets had a positive effect on the students' respective levels of patience, self-compassion, and

resilience in dealing with the learning challenges inherent in music performance. The data highlighted how the participants' implicit theories of intelligence were instilled in them by their parents and educators throughout their childhoods, and how growth-minded beliefs may be further nurtured through empathetic and process-oriented guidance.

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Introduction

1.1 Portrait of a researcher and research rationale

In the summer between the two years of my Master of Music (MMus) degree in Piano Performance and Pedagogy, I stumbled upon a blog article by Sal Khan of the non-profit educational organization, Khan Academy, which provided a synopsis of Carol Dweck's research about growth and fixed mindsets.[1] At the time, I was looking for potential pedagogical topics for my MMus thesis and this article resonated strongly enough with me that I decided to dive further into the literature.

As I learned about the dichotomy between growth and fixed mindsets and the variety of manifestations within each belief, I started to reflect on my own patterns of thinking. When I was a child, I did very well in school. I was quick to understand many concepts and consequently, received high marks. As such, I was frequently told that I was smart and, just like the many fixed-oriented kids who participated in the psychological studies, developed a particular conception about intelligence and talent: that being smart simply meant that I did not have to work and that I would understand most things easily. This mindset was not problematic in early childhood but started to affect my learning as early as adolescence. My views about intelligence led to having unrealistic academic expectations, where I envisioned that learning was an instantaneous process. The result of this was that I never had to develop a work ethic or a solid foundation of learning strategies to tackle challenges. Even worse, because I had no experiences of struggling with material, I did not possess the patience to be able to sit with problems in order to fully consolidate them. As schoolwork gradually increased in difficulty, I began to avoid tasks that I did not quickly understand because, as has been outlined by Dweck and her co-authors, I

[1] Sal Khan, "The Learning Myth: Why I'll Never Tell My Son He's Smart," *Khan Academy*, August 19, 2014, https://www.khanacademy.org/partner-content/talks-and-interviews/talks-and-interviews-unit/conversations-with-sal/a/the-learning-myth-why-ill-never-tell-my-son-hes-smart.

was afraid of displaying a lack of intelligence because it ran against my internalized identity (i.e. being smart meant that I should always find success without hindrance).

All of these thoughts were recursively perpetuated by educators as well. I was the youngest sibling in my family, and my older sister was a high achiever from an early age. She was class valedictorian when she graduated from high school, so I was frequently compared to her by my teachers. I recall a vivid memory in early high school in which I was having difficulty with a specific concept in precalculus and acknowledged that I needed to seek help from my math teacher. When I approached him to ask about the possibility of a quick after-class tutorial, he responded by asking me if my sister and I were related. When I said "yes," he simply asked me to return to my seat and never offered to help at all. Whether or not my interpretation is accurate, I assumed that he expected me to understand everything and do well solely because my sister did. I felt ashamed after this interaction, and my fixed-oriented mindset made me question whether or not I was actually intelligent. I was not properly equipped to cope with failure, so moments like these significantly hampered my future performance in a cumulative way, where I directly associated subsequent bad academic outcomes with a lack of ability.

The literature resonated strongly with me because the findings within the psychological studies accurately reflected my experience as a learner. Whenever I encountered abstract ideas that took more time to consolidate due to the nature of the content, I would get discouraged after feeling I had reached a plateau. In retrospect, for many of these topics, I am confident that I would have understood them with more patience and persistence; at the time, however, my response to this was to simply avoid these endeavours altogether. Even though my marks were still objectively good, I perceived frustration, mistakes, and failures as negative things and resigned myself to thinking that I was not capable of excelling in certain courses. I ultimately ended up focusing singularly on pursuits such as music as a result of this aversion.

While reading Dweck's research,[2] I realized that this perspective hindered me until the final year of my university undergraduate degree. Somewhere between my first and second year of post-

[2] Lisa S. Blackwell, Kali H. Trzesniewski, and Carol S. Dweck, "Implicit Theories of Intelligence Predict Achievement Across an Adolescent Transition: A Longitudinal Study and an Intervention," *Child Development* 78, no. 1 (2007): 246-263, doi: 10.1111/j.1467-8624.2007.00995.x.; Carol S. Dweck,

secondary studies, I made a conscious decision to put as much effort into academics as I possibly could. I was maintaining a 4.0 GPA and was doing better than I ever had in secondary school; however, by my fourth year, I was so fixated on upholding this GPA that I avoided enrolling in some valuable courses because of certain professors' reputations for being difficult graders. I understand now that even though I was doing well, I still desperately felt that I needed to prove my intelligence through my marks and regretfully forewent important learning opportunities in response. During my fourth year, my fixed mindset manifested into serious doubts about whether I was "good enough" to have a musical career. I subsequently took time off after graduation to consider a career change, but ultimately ended up in graduate school. After reading Sal Khan's blog article,[3] I was persuaded by the argument that nurturing a growth mindset was highly beneficial to learning, so I aspired to modify my behaviours to think in more malleable terms.

In the musical domain, I experienced a few major fixed-oriented response patterns. For example, I always felt an overwhelming sense of performance anxiety, as I often perceived recitals as some kind of public test that I needed to pass in order to prove that I was a proficient pianist. In lessons, I found that when my teacher provided me with critiques, my first reaction was to feel extremely defensive, even when I did not outwardly express these sentiments. In these moments, I questioned whether or not I possessed any semblance of talent or ability. I found that having to perpetually wrestle with these negative self-cognitions was emotionally exhausting. As a teacher, I was not immune to preconceived notions about a student's level of ability either, and as much as I tried to hide it, I became frustrated when students did not understand the concepts that I tried to teach them.

After deciding to work towards a more growth-oriented approach, I gradually re-framed my mindset using intervention strategies on myself. I found these strategies to be effective in helping

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"Motivational Processes Affecting Learning," *American Psychologist* 41, no. 10 (1986): 1040-1048, doi: 10.1037/0003-066X.41.10.1040.; Heidi Grant and Carol S. Dweck, "Clarifying Achievement Goals and Their Impact," *Journal of Personality and Social Psychology* 85, no. 3 (2003): 541-53, doi: 10.1016/S0022-3514(03)02 907-8.; Carol S. Dweck and Ellen L. Leggett, "A Social-Cognitive Approach to Motivation and Personality," *Psychological Review* 95, no. 2 (1988): 256-73, doi: 10.1037/0033-295X.95.2.256.; Claudia M. Mueller and Carol S. Dweck, "Praise for Intelligence Can Undermine Children's Motivation and Performance," *Journal of Personality and Social Psychology* 75, no. 1 (1998): 33-52, doi: 10.1037/0022-3514.75.1.33.

[3] Khan, "The Learning Myth."

me focus solely on learning goals, as well as helping to alleviate negative feelings after frustrating experiences such as unsuccessful performances. This involved a lot of self-talk and required me to recognize negative self-cognitions in the moment, attempt to understand why they were happening, and then try to think in more positive and useful ways. For example, after recitals during which I felt that I performed poorly, I gave myself a five-minute time limit to ruminate on negative emotions before trying to force myself to let them go. Then, I thought about positive aspects of the performance and made a list of actionable goals to maximize preparedness for subsequent concerts. I found that the re-orientation of learning priorities away from concerns about intelligence or ability helped me progress as a musician, primarily by allowing me to be fully immersed in the learning process. I began to think of obstacles in a positive light, which enabled me to work on problems until I could solve them. With regards to performing, I started to perceive the stage as a place of experimentation rather than as a platform that required me to display my competence. Ultimately, I gained a deeper sense of satisfaction in many learning endeavours and began to ambitiously seek out opportunities for continued growth. I became compelled to revisit the very topics that I actively eschewed in high school in order to better understand my struggles. Through this experience, I discovered that I actually enjoyed a wide variety of subjects, but I had pre-emptively sabotaged my learning for fear of failure.

As a student, I found that this body of knowledge[4] helped me understand feedback from my applied music professor much more deeply as I worked to minimize my default sense of defensiveness. By trying to understand her critiques in a more objective and rational way, my productivity and learning increased because I could better focus my energy on improving instead of dwelling on my insufficiencies. Additionally, I began to recognize that she implemented her own intervention strategies in order to spark student motivation. For example, the weight of her critiques would often be inversely proportional to the level of preparedness of the student. For students who were performing refined repertoire, she was insistent and demanding about the smallest details, but for students in the early stages of learning, she was extremely encouraging with positive and forward-thinking comments (e.g. “A good start—you will play this very

[4] Blackwell, Trzesniewski, and Dweck, "Implicit Theories of Intelligence."; Dweck, "Motivational Processes Affecting Learning."; Grant and Dweck, "Clarifying Achievement Goals."; Dweck and Leggett, "A Social-Cognitive Approach."; Mueller and Dweck, "Praise for Intelligence Can Undermine Children's Motivation and Performance."

well.”). I realized that she was always intentional about how she framed her comments; learning about the psychological research enabled me to appreciate her teaching on a new level.

Finally, as a teacher, I found that I became much more empathetic to my students. Instead of getting frustrated about their learning barriers, I began to focus on refining my methods of communication. Through this process, I developed a greater sense of flexibility in teaching and was more readily able to adapt to a diverse set of personalities and styles of learning.

In the second year of my MMus degree, I decided to embark on a small case study in which I incorporated mindset intervention strategies into the lessons of two of my students (one adolescent and one adult amateur) over the course of a semester. Afterwards, both participants remarked that learning about this literature had positive effects on their experiences, both in the practice room and on stage. As a result, I was inspired to tackle a more intensive investigation of mindsets in the form of a doctoral dissertation.

1.2 Research questions

My research study explores how differing learning perspectives may affect the many facets of a student’s music-making process, primarily in the ways that a student consolidates the instruction of their teacher, as well as how they deal with personal challenges throughout the learning and performance of new repertoire. This study was guided by two primary questions. Several sub-questions seek to organize the two primary questions into specific components derived from the psychological literature, which will be explained in Chapter 2.

1. How can the educational psychology literature (mainly, the body of knowledge in growth and fixed mindsets) be used as a structure with which to observe and understand the student learning within the context of private music lessons at the post-secondary level?

   Developmental Stage:

   i. In what ways does the shift from high school to post-secondary studies affect the learning mindsets of instrumental music students? How does each student cope

with the multitude of new environmental and academic challenges that must be met?

Goal Types:

ii. What effect does an instrumental music student's framing of their goals have on the effectiveness of their performance process?

Responses to Challenges:

iii. How does each student respond to difficult learning obstacles within the music lesson? In the practice room? On stage?

iv. How does each student react to critical feedback from their respective studio teacher?

Praise:

v. How does the studio teacher frame praise, and what effect does this have on the student's self-conception and motivation?

2. In what ways can fostering growth mindsets affect the quality of the performance process (practice efficacy, overall approach to music learning, and performance outcomes)?

Growth Mindset Interventions:

i. What effect does a growth mindset perspective have on a student's success (e.g. productivity and efficiency) in the practice room?

ii. How can a growth mindset perspective help a student deal with performance outcomes and post-performance critiques?

1.3 Caveats

As a preface, I wanted to acknowledge some of the caveats of my study, mainly with regards to its parameters as well as potential investigator bias. The methodology in Chapter 3 will provide proper context to these statements.

1.3.1 Delimitations of the study

The primary constraint was the fact that I was the sole researcher, which made it difficult to analyze a larger set of data. If it were feasible to have had more than two participants involved in this project, then it would have been possible to investigate behavioural patterns among a larger demographic or explore each aspect of the data in greater detail. It would have also been valuable to develop strategies to incentivize student participation in the studies themselves, as I ran into some obstacles during the recruitment phase. The initial lack of preliminary survey responses delayed the research period, so addressing potential issues here would be necessary to ensure the likelihood that more students might feel compelled to participate in the research. Much of this has to do with connecting with a larger network of professors at the selected universities and figuring out how to have the surveys administered in class, as well as building relationships with the potential participants in the form of in-person lectures or information sessions, rather than operating exclusively anonymously and online.

Secondly, I ran into difficulties by choosing participants only out of my pool of preliminary survey respondents. This pool was significantly smaller than anticipated, and it may have been easier to find a more markedly fixed-oriented individual from a larger subset of the undergraduate music student population, given that the two initial prospective fixed mindset participants both declined to be a part of the study.

Thirdly, I entered this study knowing that I am not a trained psychologist, but rather a pianist and pedagogue with an interest in exploring ways to maximize my students' abilities to grow. I attempted to formulate conclusions based on triangulating the psychological literature with the students' verbalizations and my own interpretations in order to develop arguments with reasonably substantive backings.

1.3.2 Potential investigator bias

Because of my personal history with the research, I was aware that my implicit bias about growth mindsets might manifest throughout the investigation. I was initially compelled to embark on this study because the growth mindset literature had such a profound and positive effect on my own learning perspectives, so I acknowledge that my partiality was difficult to mitigate. While Dweck's own research argues for the nurturing of a growth mindset—and I have experienced firsthand the tremendous benefits of adopting this mindset—I endeavoured to maintain objectivity as best as possible. As will be highlighted in my analysis of Kim (one of the participants), I developed hypotheses about her learning beliefs informed by her survey response, as well as my understanding of the literature. I realized throughout the study, however, that these hypotheses were not always accurate, and that mindsets were much less of a dichotomy than they were a varied spectrum. This speaks to the dynamic nature of individuals and the inherent difficulty of trying to place them in clearly defined categories.

As mentioned, learning about this research has been personally influential, so my rationale for examining it further is to contribute to the psychological literature, help disseminate this knowledge in the hope that it also helps others, and encourage discussion about how mindset work can be integrated into a music education context. As described in the next chapter, there is considerable literature about mindsets, and a deep knowledge of this work frames the methodology I pursued.

Chapter 2
Literature Review

2.1 Introduction

Among the recent research in the realm of educational psychology, American psychologist Carol Dweck's work on implicit theories of intelligence[5] has been significant and, as a result, highly popularized. Dweck coined terms for two dichotomous theories of intelligence—entity and incremental theories—which depict the general trends of learners. Fixed mindset learners internalize entity theories and view their intelligence or ability as a fixed, stable unit that is incapable of growth past the individual's own genetic limitations. Growth mindset learners believe in incremental theories and see their intelligence as dynamic, such that their abilities are a direct product of their effort. Dweck argues that possessing an incremental theory of intelligence (a growth mindset) is vital to developing the long-term resilience necessary to eventual success (proficiency or mastery) at a particular task or area, because sustained effort, focus, and motivation are key ingredients to overcoming challenging learning obstacles. Furthermore, she suggests that growth mindset interventions, a type of attributional retraining (i.e. changing the type of encouragement to focus on the learning rather than the outcome), can be a highly effective tool to curb fixed mindsets and help learners think in an incremental way. In fact, Dweck and Yeager's article, "Mindsets: A View from Two Eras" outlines a number of studies which concluded that implementations of real-world growth-mindset programs correlated with an increase of 3–8% of lower-achieving students being on track to graduate from high school or university.[6] This is a significant statistic when considering the total number of students

[5] Blackwell, Trzesniewski, and Dweck, "Implicit Theories of Intelligence."; Dweck, "Motivational Processes Affecting Learning."; Grant and Dweck, "Clarifying Achievement Goals."; Dweck and Leggett, "A Social-Cognitive Approach."; Mueller and Dweck, "Praise for Intelligence Can Undermine Children's Motivation and Performance."

[6] Carol S. Dweck and David S. Yeager, "Mindsets: A View from Two Eras," *Perspectives on Psychological Science* 14, no. 3 (2019): 488. doi: 10.1177/1745691618804166.

across a nation, as it could amount to thousands more being on track to graduate who otherwise may not have been without participating in said programs.

The majority of the existing research centralizes many of the varied factors which affect how an individual may lean towards one side of the mindset spectrum. These include elements such as developmental stage, goal types, responses to challenges, and praise; however, the discourse has been lacking on two fronts. Firstly, while these concepts are recognized in the general educational system, this specific niche of educational psychology has not been heavily studied within a music learning context. My research to observe instrumental performance majors through their performance process (e.g. practice sessions, studio performances, and private lessons) can be valuable for music students, because most of our learning happens in an independent setting, therefore making it integral for us to be aware of the ways in which different facets of learning present themselves on a psychological level. These include emotional manifestations such as frustrations to difficult challenges or obstacles, satisfaction from achievements or successes (e.g. contentedness arising from a positive performance), and everything in between. Because performers spend so much time learning independently (e.g. long daily practice regimens), we must endure extended periods of social isolation. Therefore, this research is also important in providing a sense of relatedness. For example, other music students may read these studies and find parallels to their own experiences, which can ultimately provide comfort, inspiration, and motivation. It can also impart beneficial insights for music educators, as most of the literature discusses the importance of nurturing growth mindsets in students; thus, understanding the emotional manifestations during learning challenges can help teachers assess and strategize optimal methods to help their students navigate these issues. Additionally, the setting of private music lessons enables teachers to interact with students one-on-one, removed from any classroom management demands that grade school teachers must address. Hence, music educators can have a greater influence in nurturing healthier learning mindsets in students. Furthermore, the endeavour of learning a musical instrument is inherently incremental—musical skills can be perpetually acquired and refined over entire lifetimes—which makes it an ideal medium for understanding self-improvement through effort.

Secondly, the existing studies are performed in controlled scientific settings in order to produce quantitative results on intervention efficacy. The methodologies have been devised and the data

analyzed by trained psychologists, which imbues the research with a strong sense of legitimacy and authority through an exhaustive peer-review process. A gap in the literature exists, however, in the absence of studies examining the real-world implications of the research. The observations and analyses of students and their teachers in more organic settings may help propel the psychological body of knowledge simply by contributing data from a grassroots perspective.

2.2 Developmental stage

As described in the foregoing section, the current literature deals with the many considerations affecting learning perspectives. Developmental stage is one such consideration that has a profound impact on the divergence between growth and fixed mindsets. A study by Blackwell, Trzesniewski and Dweck[7] discusses the importance of the adolescent stages of a child's life as a determinant for the development of their learning mindset. The article documents two studies that targeted adolescent students and sought to discover how their respective theories of intelligence correlated to success in mathematics. Students at this life stage were chosen because "recent research has specifically targeted the early adolescent years as a critical point in development. That is, relatively few problems are found during late childhood; in general, these younger children are well behaved, feel good about themselves and do well in school during those years."[8] Conversely, "early adolescent years are marked by normative increases in antisocial behaviour and normative declines in self-esteem, school engagement and grades."[9] The first study assessed the students' implicit intelligence theories at the onset of junior high school and compared this to their eventual achievement through this transition. The second study, which used a smaller sample size of lower-achieving students, aimed to understand whether or not these theories of intelligence could be taught. The research team "performed an intervention to teach an incremental theory to half of the students, and then assessed the effects on classroom motivation and achievement."[10] In this intervention, "students were told that they had the opportunity to participate in an 8-week workshop in which they would learn about the

[7] Blackwell, Trzesniewski, and Dweck, "Implicit Theories of Intelligence."
[8] Ibid., 246.
[9] Ibid.
[10] Ibid., 253.

brain and be given instruction that could help them with their study skills after which they would receive a certificate of completion."[11] The result was that in the experimental group, "teaching a malleable theory of intelligence was successful in enhancing students' motivation in their mathematics class, according to teacher reports,"[12] and the students' "belief that intelligence is malleable predicted an upward trajectory in grades over the two years of junior high school."[13] During this transition from child to adolescent, because of "social comparison, and at a time of heightened self-focus,"[14] individuals exhibit "declines in self-esteem, school engagement and grades,"[15] which also carries over to other activities including music. This is very often the stage in which a student who undergoes a marked decline in engagement will choose to quit private instrument lessons. Therefore, understanding the process of intervention to teach incremental theory may be a feasible means for combating this issue. Additionally, by extrapolating this idea, one can also conjecture that the progression from secondary to post-secondary education can also have similar effects on individuals, which makes the high school to undergraduate transitional stage a possible avenue for further research.

2.3 Goal types

The correlation between goal types and learning perspectives is an additional factor to be considered. Dweck's article, "Motivational Processes Affecting Learning," was one of the first forays into the research of adaptive (incremental theory) and maladaptive (entity theory) behaviours by Carol Dweck. In this article, she presents a research-based model of motivational processes, which "shows how the particular goals children pursue on cognitive tasks shape their reactions to success and failure and influence the quality of their cognitive performance."[16] Again, this research shows that children who had learning goals over performance goals had

[11] Ibid., 254.
[12] Ibid., 258.
[13] Ibid., 246.
[14] Ibid.
[15] Ibid.
[16] Dweck, "Motivational Processes Affecting Learning," 1040.

> (a) attained significantly higher scores on the transfer test (and this was true for children who had high and low pretest scores); (b) produced about 50% more work on their transfer tests, suggesting that they were more active in the transfer process; and (c) produced more rule-generated answers on the test even when they failed to reach the transfer criterion, again suggesting more active attempts to apply what they had learned to the solution of novel problems.[17]

This article also re-affirms that "measures of children's actual competence do not strongly predict their confidence of future attainment"[18] and that high-confidence fixed mindset children still faltered under challenging obstacles and achieved much less than low-confidence growth mindset individuals. Dweck hypothesizes possible long-term effects of maladaptive tendencies, such as "when children with these patterns may elect to avoid challenging courses of study, drop out of courses that pose a threat to failure, or show impairment of performance under real difficulty."[19] Subsequently, she co-authored a more developed study with Heidi Grant, "Clarifying Achievement Goals and Their Impact." It sought to challenge the common notions of motivational processes, and attempted to more clearly define the concepts of both performance and learning goals. Grant and Dweck describe performance goals as those "where the purpose is to validate one's ability or avoid demonstrating a lack of ability," while they describe learning goals as those "where the aim is to acquire new knowledge or skills."[20] It cites a wealth of other sources, which indicate that

> when the goal is to validate ability and individuals do not believe they can accomplish this, motivation and performance tend to suffer. Learning goals, with their emphasis on understanding and growth, were shown to facilitate persistence and mastery-oriented behaviours in the face of obstacles, even when perceptions of current ability might be low.[21]

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[17] Ibid., 1043.
[18] Ibid.
[19] Ibid., 1044.
[20] Grant and Dweck, "Clarifying Achievement Goals," 541.
[21] Ibid.

Early agreement then deduced that "performance and learning goals have been shown to predict real-world performance," which means that "induced goals can have a causal role in producing achievement patterns."[22] More recent research, however, has challenged this notion, debating whether or not "learning goals affect performance at all, suggesting that they chiefly influence intrinsic motivation."[23] The problem here is that although performance goals (i.e. wanting to get a good grade) may not help develop intrinsic motivation, they may still play a role in affecting performance. Grant and Dweck further speculate that performance goals manifest in three different forms: "goals that are linked to validating an aspect of self, goals that are explicitly normative in nature, and goals that are simply focused on obtaining positive outcomes."[24] For individuals with normative goals (e.g. wanting to perform better in relation to others, or for personal achievement), the notion that "negative outcomes do not necessarily indicate a lack of ability"[25] is of particular interest. The researchers then proceed to document five different studies which attempt to quantify the correlations between performance and learning goals with outcomes. In this article, the more refined sub-categorizing of both learning and performance goals helps to clarify that only ability-linked performance goals correlated with a withdrawal and decrease in performance, while other types of performance goals, such as normative goals, did not display any causality to motivation or performance. This knowledge is useful in that it provides an enlightening counter argument by showing that intrinsic motivation developed through adaptive behaviours may not be a pre-requisite to long-term success and sustained accomplishment. Perhaps extrinsic motivation through performance goals can lead to increased levels of achievement without any relationship to an individual's perceptions on their own ability. If the most direct means of fostering a growth mindset proves to be unsuccessful, then normative goals can be a potential alternative.

[22] Ibid.
[23] Ibid., 542.
[24] Ibid.
[25] Ibid.

2.4 Responses to challenges

Learners' responses to challenging learning obstacles are a critical aspect in the creation and execution of learning goals. "A Social-Cognitive Approach to Motivation and Personality," by Carol Dweck and Ellen Leggett, presents a model wherein "individuals' goals set up their pattern of responding, and these goals, in turn, are fostered by individuals' self-conception."[26] The article cites a series of studies conducted by Dweck in 1980, in which young students "who were likely to display the helpless or mastery-oriented patterns were identified by their responses to an attributional measure."[27] The researcher hypothesized that "a response pattern that deters individuals from confronting obstacles or that prevents them from functioning effectively in the face of difficulty must ultimately limit their attainments, [however,] individuals need to be able to gauge when tasks should be avoided or abandoned."[28] Subjects in this research were given a series of twelve problems to solve, of which only eight were solvable, and each individual was asked to verbalize their thoughts aloud during the process. The results were that "all children attained effective problem-solving strategies on the success problems,"[29] and there was no discrepancy in responses between the helpless or mastery-oriented individuals; however, the pattern diverged into two paths once the children faced the unsolvable problems. The

> helpless children quickly began to report negative self-cognitions . . . accompanied by a striking absence of any positive prognosis and occurred despite the fact that only moments before, their ability had yielded consistent success . . . Specifically, they reported such things as an aversion to the task, boredom with the problems, or anxiety over their performance [and] more than two thirds of the helpless children engaged in task irrelevant verbalizations, usually of diversionary or self-aggrandizing nature.[30]

The children with the fixed mindset displayed a decreasing trajectory of performance levels when faced with failures. Conversely "mastery-oriented children appeared to maintain an unflagging optimism that their efforts would be fruitful and said such things as 'I did it before, I

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[26] Dweck and Leggett, "A Social-Cognitive Approach," 256-257.
[27] Ibid., 257.
[28] Ibid.
[29] Ibid.
[30] Ibid., 257-258.

can do it again' or even "I'm sure I have it now.'"[31] Many even showed "heightened positive affect with the advent of difficult problems,"[32] and therefore, increased their levels of concentration and performance. Subsequently, "the children actually taught themselves new, more sophisticated hypothesis-testing strategies over the four failure trials."[33] Understanding the wide variety of learner self-cognitions provides both learners and educators with a valuable resource to trends that can help them easily assess moments of adaptive and maladaptive behaviour and subsequently make necessary adjustments.

2.5 Praise

Praise also acts as a significant determinant in the manifestation of entity or incremental theory. In "Praise for Intelligence Can Undermine Children's Motivation and Performance," Mueller and Dweck document six different studies in which the researchers sought to find the correlation between teacher or parental praise and the respective performance levels of children aged nine to eleven. Mueller and Dweck speculate that "having [students'] good performance linked to high intelligence may influence children by changing their goals for achievement and by altering the attributions that they make for their performance."[34] Essentially, praising for intelligence may manifest in the child as perceptions of a stable, fixed ability (i.e. their performance was only successful/unsuccessful because of their capabilities or lack thereof). Furthermore, a shift occurs towards performance-oriented goals rather than learning goals, which is of detriment to the individual because, as stated above, "children who hold performance goals are likely to sacrifice potentially valuable learning opportunities if these opportunities hold the risk of making errors and do not ensure immediate good performance."[35] On the other side of the spectrum, praising for effort allows students to "focus on the process of their work and the possibilities for learning

[31] Ibid., 258.
[32] Ibid.
[33] Ibid.
[34] Mueller and Dweck, "Praise for Intelligence Can Undermine Children's Motivation and Performance," 33.
[35] Ibid., 34.

and improvement."[36] Furthermore, individuals have complete control over their effort, but not necessarily their intelligence/ability (at least from a traditional viewpoint). The results of all six studies confirmed the hypotheses of Mueller and Dweck very early in the experimental process. The students who were praised for intelligence after success "chose problems that allowed them to continue to exhibit good performance, whereas children praised for hard work chose problems that promised increased learning."[37] Interestingly, children "praised for intelligence preferred to find out about the performance of others on the tasks rather than to learn about new strategies for solving the problems, even when these strategies might have improved their future performance."[38] Mueller and Dweck also attempted to understand these patterns with consideration to cultural and gender differences. "Virtually all of the findings were replicated not only across genders, but also across children from several different ethnic groups in both rural and urban communities,"[39] and the results were still consistent among these variables. Research on praise is noteworthy because it is a very common practice for parents to praise for intelligence and ability. Of the parents polled by Mueller and Dweck, "85 percent . . . believed that praising children's ability (i.e. their intelligence) when they perform well on a task is necessary to make them feel that they are smart."[40] It is widely accepted that this will instil the self-confidence necessary for continual achievement; however, Mueller and Dweck's research debunks this social myth. Instead, shifting the praise to focus on learning process and work ethic is a key aspect to long-term success and resiliency in individuals. This provides a healthier framework for educators when dealing with student learning barriers.

2.6 Mindsets in high-achieving students

In addition to these factors, there are a few other notable and relevant sub-areas of the research, such as the susceptibility of high-achieving students towards entity theory, the existing music-related literature, incremental and entity theory in social perception, and effective growth

36 Ibid.
37 Ibid., 48.
38 Ibid.
39 Ibid., 49.
40 Ibid., 33.

mindset intervention strategies. Fegley's 2010 dissertation, "Cultivating a Growth Mindset in Students at a High-Achieving High School," deals with Haddonfield Memorial High School, a renowned high-achieving school in New Jersey. To summarize the statistics, 100 percent of students graduate, and 96 percent proceed to two-to-four year colleges and universities. Although the school can be proud of its academic achievements, issues of fixed mindsets plague many students and place limitations on their learning potentials. The plan of this dissertation was to implement a program to intervene with students and help shift their perspective to a growth mindset. The various qualities that an individual must eventually demonstrate to show this mindset were "having a willingness to tackle challenging tasks, the belief that greater effort leads to greater success, the desire to improve skills, the belief that the type of effort may need to be changed if improvement is not happening, the confidence to bounce back from challenges or adversity, the understanding that setbacks are information which help future growth, the belief that personal success is about growth and learning, and the belief that personal confidence grows as challenges are faced."[41] These interventions occurred during segments of parent/teacher meetings, and with student/counsellor meetings as well. According to this research, "parental involvement is related to high school students' achievement, engagement and attitude towards school and [the authors] find that when early adolescent students perceive that their parents place a high value on effort and academic success, students will place a high priority on their own academic success, their effort and their grades."[42] It is incredibly valuable to note that when dealing with students, perhaps the most important individual to educate is the parent. If a student is consistently surrounded by an environment which places high values on effort and work ethic, then they will simply understand that this is a necessary step for success in all future endeavours. This research is also noteworthy because it indicates that, although students may be high-achieving and can be perceived as having quite a high level of ability, they are no less vulnerable than low-performing students to feelings of doubt, anxiety, and low levels of resilience when given challenging tasks. Thus, teachers cannot presume that growth mindset interventions are unnecessary for high-achieving, or high-performing students.

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[41] Alan D. Fegley, "Cultivating a Growth Mindset in Students at a High-Achieving High School" (PhD diss., University of Delaware, 2010), 38.
[42] Ibid., 43.

2.7 Mindset research in music

One of the only studies which directly relates to music education is Susan Cogdill's 2013 PhD dissertation, "The Identification of Factors Contributing to First-Year College Students' Mindset of Singing Ability, and the Relationship of that Mindset to Intent to Participate in Singing Activities." Cogdill sets out, as the title states, to better grasp the factors which contribute to freshmen's participation in singing activities. She makes the points that each individual has a voice and the ability to sing, and that the act of singing has been proven to be incredibly beneficial in terms of the regulation of emotional and mental health. Considering these factors, she is concerned with why more people do not partake in these endeavours. In her collection of data from adults about this issue, there were three primary reasons for this lack of participation in singing activities: "they had negative singing experiences in their homes when they were children, negative singing experiences in their schools as children, or had a limited perception of what singing was."[43] These negative experiences ultimately manifested in "heightened feelings of anxiety."[44] The results of this study show that those who had an environment which fostered growth mindsets (e.g. when individuals received encouragement from parents or teachers) were the individuals who continued to sing and participate in singing activities. This research provides tangible strategies for mediating growth mindsets in the classroom and the possible complications arising from implementing these strategies. For example, in choir rehearsal, "consistently calling on students with the best voices to model singing for others, sing solos, and participate in choral festivals may reinforce a fixed mindset for the singers who are never chosen."[45] Another example talks about the programming at student recitals, which very often allow the best individuals to end the concert. Therefore, it is very important to consistently make considerations on developing a growth mindset not only within the private lesson, but also in other settings of student-teacher interaction, such as studio recitals or in conversations with parents.

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[43] Susan H. Cogdill, "The Identification of Factors Contributing to First-Year College Students' Mindset of Singing Ability, and the Relationship of that Mindset to Intent to Participate in Singing Activities" (PhD diss., University of Nebraska, 2013), 2.
[44] Ibid.
[45] Ibid., 146.

2.8 Social perceptions

Individuals' social perceptions can also be categorized in growth and fixed mindsets, and these perceptions can serve as an additional indicator for assessing learning theories. Chiu and Hong's article, "Lay Dispositionism and Implicit Theories of Personality," introduces the idea of lay dispositionism, which is a term used to describe "lay people's tendency to use traits as the basic unit of analysis in social perception."[46] These perceptions are "influenced by the implicit theories the individual has about the self and other people."[47] The researchers discuss the notion that those who use traits as a predictor of an individual's behaviours more often held entity theories than those who believed that personalities were dynamic and adaptable. To reiterate, the issue of possessing a fixed mindset is that "[individuals] are concerned with how much of this fixed commodity they possess [and] they tend to see academic failures as indications of their intellectual ability, ascribing to themselves global, stable, negative ability traits on the basis of a limited number of failure experiences."[48] Believing in these fixed commodities subsequently paints future behavioural patterns in very black and white terms, in that a fixed character trait is deemed to be indicative of all future behaviour consistently, even in different circumstances. The results showed that "entity theorists were significantly more likely to make global trait inferences ('bad,' 'mean,' and 'nasty') from these behaviours than were incremental theorists."[49] Additionally, because entity theorists believe character traits to be fixed, they possess greater confidence in their judgments of others in comparison to incremental theorists.

In another study, students were given a hypothetical situation where a boy named Alexis stole bread from a bakery shop. Entity theorists were again more likely to make trait responses such as "Alexis stole the bread from the bakery shop probably because he was a thief or a dishonest person,"[50] while incremental theorists "had a greater tendency to explain the behaviours by referring to the actor's internal psychological states (e.g. 'Alexis stole the bread from the bakery shop probably because he was hungry or desperate')."[51] The studies pursued by Chiu and Hong

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[46] Chi-yue Chiu and Ying-yi Hong, "Lay Dispositionism and Implicit Theories of Personality," *Journal of Personality and Social Psychology* 73, no. 1 (1997): 19, doi: 10.1037/0022-3514. 73.1.19.
[47] Ibid.
[48] Ibid., 20.
[49] Ibid.
[50] Ibid., 28.
[51] Ibid.

are important because social perception can act as a discreet and indirect method for assessing a learner's theory of intelligence if there is, in fact, some sort of correlation between the two.

2.9 Mindset communication strategies

It is important not simply to research the numerous factors contributing to the development of either growth or fixed mindsets, but also to understand what types of strategies can be effectively implemented to foster growth-oriented thinking (growth mindset interventions). In his dissertation, "Rethinking Intelligence: The Role of Mindset in Promoting Success for Academically High-Risk College Students," Rishi Sriram successfully employed strategies that helped aid in the growth of incremental theory. Sriram began with a discussion on how to ensure student success in post-secondary institutions: "to admit only well-prepared academically talented students."[52] However, the obvious fault in this logic is that "limiting admission to only the best and brightest students hinders other values that colleges espouse such as diversity and accessibility. Moreover, such an approach fails to convey how the college experience itself can change students in cognitive and psychosocial ways."[53] He then discussed the role of remedial classes and whether or not they are impactful to high-risk students. On one side of the argument, remedial classes are necessary to consolidate foundational knowledge, but on the other hand, "participating in activities perceived as remedial could induce a counterproductive attitude in which the student performs at a lower level because the student feels labeled as less intelligent."[54] This often resulted in high-risk students "[feeling] a lack of control over their academic achievement."[55] Sriram used methodology to "understand the effect mindset [had] upon achievement (operationalized as academic effort and GPA) in high-risk, first year students at a private, research university in the Southwest."[56] Sriram engaged many different media in order to implement a shift to a growth mindset. For example,

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[52] Rishi Sriram, "Rethinking Intelligence: The Role of Mindset in Promoting Success for Academically High-Risk College Students" (PhD diss., Azusa Pacific University, 2010), 1.
[53] Ibid.
[54] Ibid., 8.
[55] Ibid., 9.
[56] Ibid., 65.

> four sessions were comprised of these basic components: (a) a quote that illustrated a growth mindset of intelligence from a famous person in history; (b) questions posed to prepare students for engaging with a particular movie clip; (c) a movie clip that portrayed an issue related to either a fixed or growth mindset; (d) questions posed to help students reflect upon the movie clip they just watched; (e) a short video of a lecture about intelligence, the brain, and its malleability; (f) a summary of research pertaining to mindset; and (g) teaser questions that introduced the topic for the next section the following week.[57]

He used all of these methods because he had discovered that "effective teachers create diverse learning environments through written words, films, and various media."[58] The results at the end of this study were that "students in the mindset intervention significantly increased their growth mindset, while students in the study skills control group did not have a change in mindset,"[59] which supports the effectiveness of the growth mindset interventions. Of particular interest in Sriram's dissertation was the use of mixed and varied media to communicate a unified message: that the brain is a malleable instrument that can grow with continual effort and desire for improvement. Sriram's dissertation signifies that the consolidation of an idea through a variety of stimuli is generally more effective than simply explaining these concepts to students. Additionally, students may be more receptive if they receive this central tenet of growth mindset thinking from multiple sources rather than solely from their teacher.

2.10 Self-determination theory

Research in self-determination theory (SDT) helps to define the requisites that need to be fulfilled in order to catalyze motivational processes. Similar to other skill-based endeavours, motivation is an essential factor in developing instrumental and musical fluency. This area of research also dissects these motivational processes into different subgroups in order to explore their respective efficacies in honing motivation. Evans' article, "Self-determination Theory: An

[57] Ibid., 76.
[58] Ibid., 77.
[59] Ibid., 102.

Approach to Motivation in Music Education," discusses and elaborates on the basic psychological needs required to develop true intrinsic motivation: competence, relatedness, and autonomy. Researchers argue that all three needs should be fulfilled in order to develop true intrinsic motivation.

2.10.1 Self-determination theory: Competence

The first need is competence, which is the "desire to be effective in one's skills, abilities and interactions in the social environment"[60] and is necessary for individuals to have a sense of confidence in their proficiency at a particular task. Excessive difficulties tend to undermine this feeling, and as a result, can have a tremendous negative impact on individual levels of motivation. The data in Evans' article steers towards the fact that conceptions about musical abilities matter when dealing with the fulfillment of competence. Individuals who believe in predisposed limitations will also find it difficult to believe in their own level of competence because they may feel that they cannot achieve more than their capabilities will allow. Essentially, it becomes a self-fulfilling prophecy; if an individual does not think that they are sufficiently adept at a given endeavour, the absence of self-perceived competence can negatively affect motivation (i.e. questioning the purpose of tackling a task that they believe will end in failure). Conversely, those who embrace the value of their work ethic in skill attainment and refinement can develop confidence in their own competence, since they can trust that their commitment will lead to consistent improvement.

2.10.2 Self-determination theory: Relatedness

The second need is relatedness, which is the human dependence of "close bonds with others in complex social networks."[61] Relatedness is created through a strong social fabric that leads individuals to "feel close and connected with feelings of belongingness and acceptance by

[60] Paul Evans, "Self-determination Theory: An Approach to Motivation in Music Education," *Musicae Scientiae* 19, no. 1 (2015): 68, doi: 10.1177/1029864914568044.
[61] Ibid.

others."[62] For example, in the realm of music learning, it has been deduced that parental involvement has a tremendous influence on a child's musical development and desire to continue with lessons. Studies have revealed, within their sample populations, strong correlations between high-achieving students and high levels of parental involvement and support.[63] In these scenarios, children who felt understood by their parents (i.e. the parents integrated a balanced approach where they were involved without being overbearing) ended up accomplishing more than the children of parents who gave constant practice reminders—the latter group "had children who practiced less and were more likely to cease learning within one year."[64] In examining a school marching band program, it was discovered that "students felt pressure from their friends for participating in a school band program, which was perceived as being less 'cool' than other activities."[65] The marching band students exhibited self-consciousness regarding their perceived lack of social status, and as a result, this threatened their ability to feel relatedness, as they navigated anxieties that the perceived judgments of their peers would lead to social consequences.

2.10.3 Self-determination theory: Autonomy

The third and final psychological need for self-determination is autonomy, defined as "behaviour [that] is congruent with the sense of self, and arises with feelings of volition, choice and being the cause of one's behaviour."[66] Individuals possess autonomy when they feel that they are largely in control of their choices and decisions within a learning context. To highlight the power of autonomy, Evans cites a case study that centred around a twelve-year-old clarinetist named

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[62] Ibid.
[63] Jane W. Davidson, et al., "The Role of Parental Influences in the Development of Musical Performance," *British Journal of Developmental Psychology* 14, no. 4 (1996): 399-412, doi: 10.1111/j.2044-835X.1996.tb00714.x.; Gary E. McPherson and Jane W. Davidson, "Musical Practice: Mother and Child Interactions During the First Year of Learning an Instrument," *Music Education Research* 4, no. 1 (2002): 141-156, doi: 10.1080/14613800220119822.
[64] Paul Evans, "Self-determination Theory," 69.
[65] Ibid.
[66] Ibid., 70.

Clarissa.[67] She had begun learning the clarinet as part of her school band program a few years prior to the research and was asked to learn *La Cinquantaine* by Jean-Gabriel Marie. In one of her lessons, "her teacher mentioned Woody Herman's swing arrangement of the piece, 'Golden Wedding,' during a lesson, and Clarissa asked if she could play it. In Clarissa's subsequent practice sessions, she spent more than twelve times longer per note practising 'Golden Wedding'"[68] in addition to devising more efficient practice strategies to accomplish her task, such as "humming, repeating bars to correct and contextualize passages, and practicing slowly then increasing tempo."[69] By having the freedom to work on a variation of the initial assigned piece—one which resonated much more strongly with her—Clarissa was able to approach her music learning with increased efficiency and effectiveness.

2.10.4 Self-determination theory: Motivation

In "Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development and Well-Being," Ryan and Deci postulate the origins and types of motivation: "Motivation concerns energy, direction, persistence, and equifinality—all aspects of activation and intention."[70] They believe that motivation is heavily explored within the psychological body of literature for the simple reason that it acts as a powerful moving force that enables individuals to produce. The authors also differentiate between intrinsic and extrinsic motivators. Intrinsic motivation is defined as "the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn,"[71] while extrinsic motivation "refers to the performance of an activity in order to attain some separable outcome."[72] From their data, a motivational spectrum can be diagrammed. On one end exists amotivation, which is the complete absence of any semblance of a motivational process. On the other extreme is complete intrinsic

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[67] James M. Renwick and Gary E. McPherson, "Interest and Choice: Student-Selected Repertoire and its Effect on Practising Behaviour," *British Journal of Music Education* 19, no. 2 (2002): 173-188, doi: 10.1017/S0265051702000256.
[68] Evans, "Self-Determination Theory," 70.
[69] Ibid., 71.
[70] Richard M. Ryan and Edward L. Deci, "Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being," *American Psychologist* 55, no. 1 (2000): 69, doi: 10.1037/0003-066X.55.1.68.
[71] Ibid., 70.
[72] Ibid., 71.

motivation. In between lie the four subgroups of extrinsic motivation: external regulation, introjected regulation, identified regulation, and integrated regulation. Externally regulated behaviours "are performed to satisfy an external demand or reward contingency,"[73] and individuals feel that their compliance is necessary to avoid consequence or to receive some type of reward. Introjected regulation "involves taking in a regulation but not fully accepting it as one's own." This usually centres around the ego in matters such as guilt avoidance, pridefulness, or even demonstrating a certain level of ability to others. Identified regulation "reflects a conscious valuing of a behavioural goal or regulation, such that the action is accepted or owned as personally important."[74] Finally, integrated regulation "occurs when identified regulations are fully assimilated to the self, which means they have been evaluated and brought into congruence with one's other values and needs."[75] This final degree of extrinsic motivation overlaps somewhat with the intrinsic. The main difference lies in the fact that the driving motivator is still an external outcome rather than endeavouring for the sake of the task itself.

Understanding self-determination theory can be beneficial for dealing with the performance process of instrumental performance majors because it provides a taxonomic breakdown of motivational types. Studying these five different motivations in depth has been useful in my data interpretation, specifically in analyzing the interviews and the recorded student verbalizations during their practice sessions. Correlations between incremental theory and self-conceptions of competence, internalization of SDT principles and resilience among other parallels between these related bodies of literature strengthen my rationale for pursuing this particular research topic.

2.11 Positive psychology

Research in positive psychology can also aid in the comprehension of growth and fixed mindsets. The basic tenet of positive psychology is "to begin to catalyze a change in the focus of psychology from preoccupation only with repairing the worst things in life to also building

[73] Ibid., 72.
[74] Ibid., 73.
[75] Ibid.

positive qualities."[76] This topic of research emerged as a response to traditional ways of treating psychological questions as a pathology with a specific "wrong" that needed to be righted. Instead, positive psychology aims to highlight and solely emphasize positive human traits. An article, titled "Positive Psychology: An Introduction," written by esteemed psychologists, Martin Seligman and Mihaly Csikszentmihalyi, outlines anecdotal stories by both authors to establish a legitimacy for positive psychological research. Seligman recounts a memory with his daughter, Nikki (then around five years old) during which he regretfully yelled at her. She replied with "Daddy, do you remember before my fifth birthday? From the time I was three to the time I was five, I was a whiner . . . When I turned five, I decided not to whine anymore. That was the hardest thing I've ever done. And if I can stop whining, you can stop being such a grouch."[77] Seligman reflects that this was a pivotal moment in his role as both a father and psychologist because he realized that his daughter corrected her own behaviours by herself and "that raising Nikki is about taking this marvelous strength she has—'seeing into the soul'—amplifying it, nurturing it, helping her to lead her life around it to buffer against her weaknesses and the storms of life."[78] Because of this event, he fully believed that strengthening the qualities which were already strong was a much more fruitful endeavour than his traditional approach to fatherhood and psychology.

Csikszentmihalyi recalls his experience being a captive child during World War II. He discusses how the morale of the prisoners was extremely low, "yet there were a few who kept their integrity and purpose despite the surrounding chaos."[79] His curiosity regarding the resilience of these high-character individuals sparked his initial interest in psychology, specifically in understanding "not the average, but the improbable. Very few people kept their decency during the onslaught of World War II; yet it was those few who held the key to what humans could be like at their best."[80] Csikszentmihalyi goes on to state that "what psychologists have learned over 50 years is that the disease model does not move psychology closer to the prevention of these

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[76] Martin E. P. Seligman and Mihaly Csikszentmihalyi, "Positive Psychology: An Introduction," *American Psychologist* 55, no. 1 (2000): 5, doi: 10.1037//0003-066X.55.1.5.
[77] Ibid., 6.
[78] Ibid.
[79] Ibid.
[80] Ibid., 7.

serious problems. Indeed, the major strides in prevention have come largely from a perspective focused on systematically building competency, not on correcting weakness."[81]

Over the years, the research on positive psychology expanded into other facets of well-being. Ascenso, Williamon, and Perkins note that research on well-being "has been derived from two general perspectives: the hedonic and eudaimonic."[82] The former "focuses on happiness and positive affect"[83] while the latter is "centred on meaning, virtuous action and self-realization."[84] They attempted to reconcile this divergence of literature by consolidating it into a single five-point construct with which to analyze future data on well-being. This construct includes positive emotion, engagement, relationships, meaning, and accomplishment. Positive emotions have been the most heavily studied and are an integral marker to feelings of well-being. They involve "not only feelings but also an appraisal of the situation"[85] and have been shown to correlate with "an increase in problem-solving skills, greater satisfaction and success at work, improved immune function, better social connections and resilience."[86] Engagement describes the process of an individual to feel involved and absorbed into the task at hand, with the highest form of engagement being flow, a concept studied by Csikszentmihalyi. Relationships can be defined as the feelings of affection, care, and value between individuals, and they "have emerged as the only factor that [hold] constant in predicting wellbeing across nations."[87] Meaning is described as an intrinsic sense of purpose and direction. The authors argue that the belief that one's own actions can have a deep impact on the world around them can be linked to positive feelings because one experiences their contributions as being worthwhile. Finally, accomplishment is an aspect that can either be external or internal and "does not have to appear significant to the outside world as long as it is intrinsically meaningful to the individual."[88]

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81 Ibid.
82 Sara Ascenso, Aaron Williamon, and Rosie Perkins, "Understanding the Wellbeing of Professional Musicians through the Lens of Positive Psychology," *Psychology of Music* 45, no. 1 (2017): 67, doi: 10.1177/0305735616646864.
83 Ibid..
84 Ibid.
85 Ibid.
86 Ibid.
87 Ibid., 68.
88 Ibid.

The ideas present in positive psychology are vital to my research in that they are able to complement the growth and fixed mindset literature. In music, the notion of focusing exclusively on highlighting qualities that are positive have been shown to be beneficial, specifically in self-talk as well as in teacher-student interactions. Patston and Waters noted in "Positive Instruction in Music Studios: Introducing a New Model for Teaching Studio Music in Schools Based upon Positive Psychology" that a group of subjects undergoing a positive psychological intervention which "involved a pre-performance routine of breathing and silent repetition of the words 'bold,' 'confident,' and 'free,'"[89] outperformed the group which did not incorporate this technique into their routine. Similarly, this type of well-being training can be translated to the teacher-student dynamic: if the teacher can successfully pinpoint and reinforce the qualities which are valuable and inherent within the student, and the student possesses a level of trust in the teacher's instruction, then the power of this relationship can elevate the learning experience for both parties. All of this has been helpful in analyzing the nuances in student verbalizations as well as within the private music lesson interactions.

2.12 Intervention strategies

Finally, understanding the methods of delivering psychological interventions is a paramount element to their potential success or failure. Yeager and Walton's article, "Social-Psychological Interventions in Education: They're Not Magic," sheds light on said approaches. They discovered that the duration of growth mindset interventions on students had an immense influence on whether the student ultimately adopted or rejected the perspective. Yeager and Walton argued that in order for psychological interventions to be effective, the messages have to be brief and catered specifically to the student. The insistent regurgitation of growth mindset theory to students in long-term workshop sessions resulted in student desensitization and apathy to the idea. This is because indirect and brief interventions "do not feel controlling and so they minimize resistance and reactance to the message. They also allow students to take credit for

[89] Tim Patston and Lea Waters, "Positive Instruction in Music Studios: Introducing a New Model for Teaching Studio Music in Schools Based upon Positive Psychology," *Psychology of Well-Being* 5, no. 10 (2015): 2, doi: 10.1186/s13612-015-0036-9.

their success rather than risking the possibility that students attribute positive outcomes to a heavy-handed intervention."[90] Additionally, a potential drawback of reiterating growth mindset principles to a student may emerge if students "perceive a teacher's reinforcement of a psychological idea as conveying that they are seen as in need of help, teacher training or an extended workshop could undo the effects of the intervention, not increase its benefits."[91] The influence of psychological interventions on students then becomes quite enigmatic, as one may argue that it would be very difficult to correlate the psychological intervention with the improvement in student learning if the intervention itself is so subtle that it is only communicated to the individual in an indirect manner. However, Yeager and Walton believe that these interventions can lead to long-term benefits because they set "into motion recursive social, psychological and intellectual processes in school."[92]

Essentially, the understanding of growth mindsets provides students with the opportunity to be psychologically prepared for and open to building their academic knowledge base, which affects the preparation that can result in increased performance. As students begin to feel confident in their schoolwork, they "achieve success beyond what they thought possible,"[93] which helps them value their work as it becomes a part of their self-conception. By valuing their work, students then invest more of themselves into school, which ultimately creates more opportunities for academic growth, and the momentum of this phenomenon propels the students forward in a self-reinforcing cycle. Yeager and Walton concluded that "a well-timed, well-targeted psychological intervention taps into these recursive processes and thus changes the trajectory of students' experiences and outcomes in school."[94] The authors also conjecture that timings of intervention delivery can be integral to their effectiveness, as "it may be essential to deliver psychological interventions at key educational junctures, such as at the beginning of an academic year, during an important transition such as when students enter a new school, or before an academic gateway, such as before students are tracked into algebra versus lower level math classes or

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[90] David S. Yeager and Gregory M. Walton, "Social-Psychological Interventions in Education: They're Not Magic," *Review of Educational Research* 81, no. 2 (2011): 284. doi: 10.3102/0034654311 405999.
[91] Ibid., 285.
[92] Ibid., 286.
[93] Ibid.
[94] Ibid.

before a high-stakes exam."[95] The significance of this article lies in its analysis of psychological interventions from both a communicative and temporal perspective. It is necessary to consider these details alongside the understanding of mindset divergence and strategy implementation.

2.13 Conclusion and implications

The concept of growth and fixed mindsets as implicit theories of intelligence has been researched over the past four decades and is still being expanded upon in many different disciplines, evident by the magnitude with which Dweck's core articles are cited in other papers (for reference, just on the Google Scholar database, Dweck and Leggett's 1988 article, "A Social-Cognitive Approach to Motivation and Personality," has been cited over 11000 times). As such, there exists a huge potential for further experimentation and analysis on many paths. There are even large gaps in the research for significant factors affecting learning mindsets such as the ones discussed above (developmental stage, goal types, praise, and so forth), since one or two studies pertaining to each sub-area does not yet provide a sufficient sample size for drawing any definitive conclusions about a general population. However, the relatively small amount of existing journal articles pertaining to mindsets provides a rare opportunity to look in-depth at the entire body of literature and develop a comprehensive picture of the field. As mentioned briefly in this chapter's introduction, instrumental performance and private music lessons provide an ideal ground for studying implicit theories of intelligence for two reasons: 1) the prolonged hours of independent practice coupled with one-on-one teacher-student interaction creates an environment whereby learning mindsets can be extensively analyzed through self-reflection and nurtured with the full attention of a single educator, and 2) instrument learning is an inherently incremental skill that can only improve through sustained effort and long-term dedication. My research can reveal valuable insights on learning mindsets through the experiential accounts of instrumental performance students, which may ultimately lead to fresh perspectives on managing psychological struggles throughout the entire process of skill acquisition. As such, this topic has many potential pedagogical implications for performers, educators, and researchers alike.

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[95] Ibid., 287.

For performers, the mindset and related research can help them navigate a host of obstacles, such as practice frustration, disappointing performances, competition losses, harsh critiques from peers or teachers, or overall career discouragement. With an understanding of the literature, performers can gain a greater awareness of default internal responses to their respective struggles. Comparing these responses to the manifestations outlined in the body of knowledge may provide a valuable impetus to help performers nurture growth-oriented models of thinking and by extension, positively affect their respective levels of optimism and motivation, which can lead to a deeper enjoyment of the many facets of instrument learning.

For educators, the literature may be valuable in improving their abilities to help students mediate challenges, for instance, by enabling them to recognize opportune moments to implement mindset interventions. It may also inspire teachers to introspect more deeply about their methods of communication and refine the delivery of their instruction, with the aim of optimizing a supportive and compassionate learning environment for the student. Additionally, an understanding of this literature may shift teachers' judgements and perceptions of students towards the use of more dynamic and malleable traits, which can allow the educators to focus more on the process and be similarly less discouraged by student setbacks. In post-secondary institutions, the mindset research provides a valuable framework to re-think curricula and greater university structures. For example, courses could consider both process and performance goals, with the aim of encouraging students to take learning risks while minimizing academic consequences. The information within the literature may also be beneficial to the overall university culture by serving as vital pedagogical training for faculty members, equipping them with a teaching philosophy and teaching techniques that are grounded in empirical data, potentially helping them connect more effectively with students.

For researchers, the unique environment of a music school at a post-secondary institution is appealing because it provides research diversity. The one-on-one lesson setting, as opposed to the standard classroom, serves as an advantageous model for mindset analyses simply because there are fewer variables at play. Furthermore, the students likely have had a significant amount of musical training prior to their university studies. As a result, they already have had to deal with musical learning obstacles in the past and perhaps have devised unique strategies for overcoming them. A wide range of individual approaches to challenges may also be observable

because music practice is an inherently independent activity. This can be worthwhile to examine, compile, and document.

Based on the literature, I have embarked on a research study to examine the mindsets of two second-year instrumental music majors attending Canadian universities. As outlined in the following chapter, I partition the body of knowledge into its individual components (developmental stage, goal types, responses to challenges, praise, intervention strategies) in order to better understand the effects that each element has on the students' respective approaches to learning throughout a six-week period of preparing repertoire for an end-of-year jury performance. I analyze three different forms of video data (lessons, practice sessions, and interviews) to answer the research questions, which may be grouped into three main categories: 1) how the psychological literature can be implemented in a music performance domain 2) how the student navigates challenges throughout the music performance process and 3) how teachers can impact a student's self-cognitions. In the next chapter, I discuss the logistics of the research design.

Chapter 3
Methodology

In order to tackle the research questions and sub-questions, I made some initial decisions about the study, such as choosing appropriate research methods, data collection, and analysis. I decided on three different research means in order to provide a balanced picture of the implications of the research: preliminary surveys, case studies, and the personal portrait found in Chapter 1. I began my study in detail once I received permission from the University of Toronto's Human Research Ethics Unit (HREU). The study comprised three stages: the pre-research, research, and post-research period. I elaborate on each one below.

3.1 Pre-research period

3.1.1 Research design

Since my aim was to investigate individual learning perspectives, a qualitative approach to research seemed to most effectively portray the lived experiences of said individuals. Qualitative research provided the participants with a platform to express their own perspectives, thoughts, and feelings throughout the study rather than employing a quantitative experimental design; statistical and numerical data cannot reflect these views. After weighing several options, I ultimately decided on case study research.

Case studies are the careful examination of the functioning and activities of a case, which can simply be defined as "a noun, a thing, an entity; it is seldom a verb [or] a participle."[96] For example, Stake states that managers may be considered a case, but managing would be

[96] Robert E. Stake, *Multiple Case Study Analysis* (New York: The Guilford Press, 2006), 1.

considered a function. Similarly, labour and delivery rooms could represent a case, while giving birth highlights a type of functioning which occurs within this case.[97] Yin states that "the more that your questions seek to explain some contemporary circumstance (i.e. 'how' or 'why' some social phenomenon works), the more that case study research will be relevant."[98] As such, case studies seemed to be the best fit for my study because I was dealing specifically with mindset phenomena within the context of music performance. Harrison et al.'s "Case Study Research: Foundations and Methodological Orientations" provides a list of fundamental elements inherent in case study research:

- the case (object of the study),
- a bounded system (boundaries of time, space, and activity),
- context (studied in real life settings or natural environment),
- an in-depth approach (intensive analysis of an issue),
- case selection (making decisions about people, settings, events, phenomena and/or social processes),
- multiple sources of evidence (multiple participants, methods of data collection and/or methods of collection in order to triangulate a particular argument), and
- a choice of case study design (descriptive, exploratory, explanatory, illustrative, evaluative, etc.).[99]

The cases comprised two second-year undergraduate instrumental music students who self-identified on opposite ends of the mindset spectrum; the bounded system was a specific time frame; the context included observations of lessons and practice sessions in their naturally-occurring settings. The approach used all of the existing psychological literature as a detailed

[97] Ibid., 1-2.
[98] Robert K. Yin, *Case Study Research and Applications: Design and Methods* (California: SAGE Publications, Inc., 2018), 33.
[99] Helena Harrison, Melanie Birks, Richard Franklin and Jane Mills, "Case Study Research: Foundations and Methodological Orientations," *Forum Qualitative Sozialforschung* 18, no. 1 (2017): 10-11, doi: http://dx.doi.org/10.17169/fqs-18.1.2655.

framework; the participant selection and forms of data were carefully planned. Many sources of evidence were collected and analyzed, and finally, the design was exploratory.

The formal research was slated to launch in November-December of 2018, but due to some setbacks which are discussed in subsection 3.8, the research instead ran from February 24 to April 6, 2019. I chose a six-week period as the research window and collected data on the participants in three different contexts. I observed biweekly lessons (three lessons per student) through video recordings; conducted three in-person interviews—a pre-interview, mid-interview, and post-interview—and asked each participant to record three practice sessions at their discretion over the course of the study. Each lesson was sixty minutes; each interview was a maximum of thirty minutes, and each practice session was thirty minutes.

In addition to the six-week research period involving the students, I also decided to incorporate a personal account of how this research has affected my own musical thinking and development (Chapter 1). Understanding this body of knowledge has been paramount in re-framing my perspectives with regard to learning pursuits and has led to a much healthier self-conception and higher levels of motivation. It has shifted my perceptions of learning challenges away from negative and defeating thoughts. As a result, it has been vital to my personal development and has been beneficial to many different avenues in my life, such as the relationship that I have with music as a profession, the way that I respond to critiques from my own studio teacher, and the way that I approach teaching my own students. My personal account serves as a foundation to my argument that this research is valuable to the musical field. Furthermore, I also believe that having personally experienced the struggles and stresses that the potential participants were likely to encounter throughout the study period provided me with a sufficient foundation with which to analyze the data.

3.2 Preliminary steps

I began with a list of six possible universities at which to conduct my research: University of Toronto, Glenn Gould School (of the Royal Conservatory of Music), Wilfred Laurier University, McGill University, Western University, and Memorial University of Newfoundland. I selected

these institutions due to their reputations as leading music schools within Canada, as well as for their geographic convenience. Five of the six are in close proximity to my current residence in Toronto, an important consideration because of their commuting proximity for conducting research in-person if needed. The sixth university, Memorial University of Newfoundland, is the largest faculty of music in Atlantic Canada and diversified my sample size outside of Ontario. It is also my alma mater and located in my hometown, which meant that I benefitted from pre-existing faculty contacts, a strong sense of each professor's respective teaching approach, and a working knowledge of the institution itself. One problem that might have arisen at Memorial University was my own potential familiarity bias, but I had long since graduated from this university, and believed that I was in a good position to maintain objectivity in my analyses.

Next, I made a list of individual contacts at each institution (based upon the collective professional networks of my advisor and myself). I sent each person an email to introduce myself (see Appendix A) and attached a PDF document (Appendix B) which briefly explained my research and its goals. I asked if it was possible for the instructors to disseminate the information contained within the brochures to their students and sought their respective interest to participate in the study themselves. To the professors who agreed to be involved, I sent a link to the mindset survey created using Google Forms (Appendix C), which they circulated to their students either in-class or via email. I sought a minimum of fifty total respondents for the preliminary surveys (approximately eight to ten students from each of the six universities), and out of this pool, I intended to select two subjects to be the foci of the intensive case studies, based on an assessment of their survey scores, upon which I elaborate in subsection 3.5.

3.3 Documents

During these preliminary stages, I prepared a number of documents for the research study, along with their purposes, for reference:

- Template emails: I sent these to professors for participant recruitment (Appendix A) with an attached PDF information sheet (Appendix B) to provide a one-page summation of the mindset research.

- Google Forms of the preliminary survey (Appendix C): I sent these to the professors after they responded. I provided a separate form for each institution, and the professors administered the form URLs to their own students.

- Consent forms (Appendix D): I provided these to the two chosen participants. My forms were derived from the United Kingdom Data Archive Consent Form found on the University of Toronto Libraries webpage (https://onesearch.library.utoronto.ca/researchdata/consent-forms).

- Metrics (Appendix E and Figs. 1 & 2 in 3.9): I created two metrics to analyze all of the video data, one representing the growth-oriented individual and one representing the fixed. The process is explained in the Data Analysis subsection (3.9).

3.4 Participant selection

I began participant selection by perusing several sources on collecting qualitative data.[100] My research aligned with a concept sampling method, a "purposeful sampling strategy in which the researcher samples the individuals or sites because they can help the researcher generate or discover a theory or specific concepts within the theory."[101] Creswell elaborates that "to use this method, you need a clear understanding of the concept or larger theory expected to emerge during the research" so I hypothesized that my findings would mostly match with the results in Dweck's research, but I also expected that there might be outlier cases and hoped for new discoveries to emerge throughout the analysis of the data.

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[100] John W. Creswell, *Educational Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research*, 4th ed. (Boston: Pearson Education, Inc., 2012); Uwe Flick, *The SAGE Handbook of Qualitative Data Analysis* (London: SAGE Publications, Ltd., 2014); Sharan B. Merriam and Elizabeth J. Tisdell, *Qualitative Research: A Guide to Design and Implementation*, 4th ed. (California: Jossey-Bass, 2016).
[101] Creswell, *Educational Research*, 208.

In order to determine subject criteria, the psychological literature indicates that students transitioning to new life stages are most susceptible to maladaptive behaviours.[102] Consequently, I extrapolated that second-year instrumental performance students would be the target demographic for my research. These students had already had a year to develop a working rapport with their respective instrumental studio teachers, yet were still in a relatively transitional stage of adjusting to post-secondary life. I chose to exclude voice students from the target group of this study solely because of the wide-ranging discrepancy of vocal development among singers, especially at this formative age.

Next, I planned to select two participants out of the pool of respondents for two main reasons. The first was that Dweck's research clearly defined growth and fixed mindsets as two opposing ends of a mindset spectrum.[103] As such, I endeavoured to find a participant who self-identified most clearly with each side (one who leaned heavily towards growth beliefs and one towards fixed) through an assessment of their preliminary surveys (Appendix A). In other words, I parsed the available respondents with the aim of finding extreme cases "based on [the] unique, atypical, perhaps rare attributes"[104] of identifying strongly towards growth and fixed learning perspectives respectively. The second reason for the choice of two participants was purely pragmatic because, as the sole researcher, it enabled me to focus in-depth on each individual in a way that would not have been possible with a larger sample size.

While the case study sample size of two is small, Michael Patton argues in "Purposeful Sampling" that Piaget, Freud, Bandler and Grinder, and many other researchers made extraordinary breakthroughs in their respective fields by focusing on only a few subjects: "The validity, meaningfulness and insights generated from qualitative inquiry have more to do with the information-richness of the cases selected and the observational/analytical capabilities of the researcher than with the sample size."[105]

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[102] Blackwell, Trzesniewski, and Dweck, "Implicit Theories of Intelligence."
[103] Dweck, "Motivational Processes Affecting Learning."
[104] Merriam and Tisdell, *Qualitative Research*, 97.
[105] Michael Q. Patton, "Purposeful Sampling," in *Qualitative Research & Evaluation Methods, 4th ed.* (California: SAGE Publications, Inc., 2015), 473.

3.5 Preliminary survey assessment

The distributed preliminary surveys were adapted from Mindset Works,[106] the mindset training organization founded by Carol Dweck and colleagues and were composed of fourteen questions of dichotomous word framing (seven growth-oriented and seven fixed-oriented statements). For example, questions one and two state opposing opinions on the topic of talent:

Example 1:

1. No matter how much talent you have, you can always change it a great deal.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

This was a growth-oriented statement since it discusses talent as malleable trait.

2. You can learn new things, but you cannot really change your basic level of talent.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

Conversely, this was a fixed-oriented statement since it describes base talent as a stable entity

Respondents provided an answer to each statement using a seven-point Likert scale, with options ranging from strongly disagree to strongly agree. The scoring of each survey was a simple process. A response in agreement with a growth-oriented statement (either somewhat agree, agree or strongly agree) would receive a +1, while a response in agreement with a fixed-oriented statement would receive a -1. In Example 1, a respondent who agreed with the first statement received +1, while a respondent who agreed with the second statement received -1. The answers with which respondents disagreed or to which they responded neutrally were omitted from their overall score.

[106] "What's My Mindset?", Mindset Works, accessed August 15, 2018, https://blog.mindsetworks.com/what-is-my-mindset.

I then determined net scores to see where each student leaned on the spectrum. For example, if an individual agreed with six growth and four fixed mindset statements, they received a net score of +2. Conversely, if an individual agreed with two growth and seven fixed mindset statements, then they received a net score of -5. I predicted that the majority of individuals would possess some mixture of growth and fixed-oriented beliefs and would subsequently average a net score between -3 and +3. However, my hope was that out of the total pool of respondents, a small percentage would score very clearly on either side of the continuum (-4 < +4). These were the people whom I was interested in contacting to inquire about further participation in the case study segment. The two who eventually agreed to be case study subjects scored the highest and lowest net scores (+6 and +1 respectively). While there were two individuals who scored lower than +1, both declined to participate. Although Kim (pseudonym), the participant who scored +1, ended up with a positive score, she was selected because she agreed to the most fixed-oriented statements out of the remaining respondents.

3.6 Subsequent steps and timeline

After the preliminary stages of selecting the universities, contacting professors at each institution, administering surveys to students and assessing their responses, the next step involved contacting potential participants to determine their interest in being involved with the research. Once I received their respective confirmations to be a part of the study, I scheduled orientation meetings with each of them to explain an overview of the study format, as well as to provide consent forms to sign. These forms verified in writing that the subjects acknowledged that they had been briefed about all pertinent details surrounding the project and understood their rights as research participants. The students were also provided with a withdrawal form, which they could submit at any point during the research period should they decide to opt out of the study. Additionally, as was noted in the information brochure (Appendix B) as well as relayed to each student during the in-person orientation meetings, I planned to use pseudonyms to refer to both participants and their respective teachers to ensure anonymity. I also obtained permission from their studio teachers to record the subjects' lessons. Subsequently, the participants and I established a basic itinerary during the research period for data collection. The lessons were

predetermined by the participants and their studio professors. In order to accommodate the students' schedules, I recommended date ranges for the interviews and practice sessions and left specific times to their discretion. Table 1 outlines the timeline of these events:

Table 1: Timeline of events

Date	Events
Mid-October 2018	I sent initial emails to professors, who subsequently gave the surveys to students.
Early February 2019	Because total respondent targets were not met (discussed in 3.8), I distributed a second round of surveys.
Mid-February 2019	I emailed prospective participants.
Late February 2019	I scheduled in-person orientations with both participants in order to summarize my research study, sign consent forms, and set data collection dates.
February 24-April 6, 2019	I launched the 6-week research study.

Table 2: Research period itinerary

Date	Events
February 24-March 2, 2019	Pre-Interview
March 3-9, 2019	Recording of Practice Session #1
March 5, 2019	Recording of Lesson #1
March 17-23, 2019	Mid-Interview and Recording of Practice Session #2
March 19, 2019	Recording of Lesson #2
March 31-April 6, 2019	Recording of Practice Session #3
April 2, 2019	Recording of Lesson #3
After April 6, 2019	Post-Interview (scheduled after the end-of-semester jury at the convenience of each participant)

3.7 Research period

3.7.1 Data collection

In the preliminary stage, the only data gathered were the preliminary surveys administered to the second-year undergraduate students. During the research period, I collected video documentation of interviews, lessons and practice sessions. The interviews and lessons were recorded with a Zoom Q4N handheld recorder, while the practice sessions were recorded by each participant using their smartphones. To protect the confidentiality of all of this data, I subsequently archived it onto two password-encrypted external hard drives, which were only accessible by me, the sole researcher. The second of these served as a backup in case of a possible hard drive failure. I also transcribed all of these video recordings to text for data analysis purposes.

The semi-structured interviews each lasted for a maximum of thirty minutes. All of the interviews were completed in-person and were scheduled at different stages of the research period (refer to Tables 1 and 2 for the list of dates). In the pre-interviews, I discussed the design of the project with both participants so that they could assess and decide whether to participate further. I also wanted to gather information about each participant's respective upbringing and musical education in order to provide necessary context to their stories. Prior to meeting with each individual, I created a short list of questions to serve as a basic template for the interview (Appendices F and G), but I made a conscious choice to remain flexible in my interviewing style so that each individual had the autonomy to guide the trajectory of discussion and perhaps to elaborate on anything they felt was important. The template was needed simply to ensure that I could still maneuver flexibly around my research questions and sub-questions, as well as to provide a consistent basis of comparison between subjects.

I began the mid-interviews (the interviews scheduled for week 4 of the study period) by providing each student with a briefing of the research using a combination of a graphic and verbal explanations. I first showed each participant an infographic taken from the Mindset Works website,[107] which summarized the major findings of the research and clearly defined each of the mindsets. I gave the students a few minutes to look over the visual, and using a script that I had

[107] "Why Mindsets Matter," Mindset Works, accessed August 15, 2018, https://www.mindsetworks.com/science/impact.

pre-written, subsequently discussed Carol Dweck, defined growth and fixed mindsets, and divided the research components into their respective subcategories (developmental stage, goal types, responses to challenges, praise, and intervention strategies). The purpose of having prepared dialogue was to ensure that there was consistency between the presentations given to both participants. This briefing lasted roughly ten minutes, and afterwards, I asked the students to reflect on which mindset they used to describe themselves based on this information. I then explained the intent of my research and fielded any questions that they had. For the final segment of the mid-interview, I had prepared various clips of the students' respective practice sessions and lessons to review with them. I excerpted segments of the practice sessions that represented observably challenging moments, for example, when the student struggled with a passage and either commented on their frustrations or were visibly dejected (e.g. sighing, shifting towards a slumped posture, and so forth). In the lesson data, I searched for ways in which the studio teachers framed goals, provided notable words of praise, or were particularly insistent about a passage of music and noted subsequent student responses. My aim for bringing these moments to the attention of the participants in the mid-interview was to verify whether my interpretation of the clips accurately matched their thoughts regarding these moments, as well as to provide the students a platform to further elaborate on their thoughts and feelings at each of these points.

The final interviews provided the participants with an opportunity to make closing comments. Since I gave each individual a briefing about the psychological research in the mid-interview, I used the final interview to ask them to verbalize how their learning perspectives might have been affected after consolidating this knowledge. I also encouraged the students to discuss their thoughts about the process of repertoire learning and preparation for performance (end-of-year juries) throughout the research period, in relation to the growth and fixed mindset research.

In the three thirty-minute practice sessions, I asked students to verbalize both their critical thoughts and emotional responses on video recordings as they practiced. This was modelled after Dweck and Leggett's experimental process in "A Social-Cognitive Approach to Motivation and Personality."[108] Participants in their study were given a set of math problems that became progressively more difficult until completely unsolvable. The researchers analyzed the student

[108] Dweck and Leggett, "A Social-Cognitive Approach."

response patterns (e.g. positive versus negative self-cognitions, motivation versus aversion) as a means for effectively studying each subject's learning mindset. I used the existing psychological literature as a point of reference to analyze how the respective mindsets of this study's participants manifested within the practice domain, observing their nonverbal responses to challenges and their verbal commentary.

Finally, I recorded three sixty-minute lessons between each participant and their respective applied piano professor. Observing interactions between the student and professor was imperative to studying each student's response to challenging situations, and each professor's approach to praise, framing goals and other factors that may affect student learning mindset. I made a deliberate choice to record instead of attending the lessons because I felt that it was important for me to minimize any effects my presence may have had on the natural dynamics of the setting. Prior to the start of each lesson, I placed the camera in an inconspicuous corner of the room and at the end, returned to retrieve it.

3.8 Challenges

A number of obstacles arose at different phases of the research process. My initial goal was to have a minimum of fifty survey respondents across all six universities. While the professors at each institution gave the surveys to their respective studios, it was difficult to incentivize the students to complete them. From their perspective, I was an anonymous researcher who was contacting them through the digital space, and because these surveys were not distributed in-class or in-person, students may not have felt that it was a particularly high priority, as it was outside of the scope of their respective degree programs. As a result, after the first attempt at email correspondence, I only received nineteen returned surveys. Despite not reaching my initial target, I assessed the scores of all of the respondents to see if there were any individuals who fit my potential participant criteria. Out of these nineteen, the results of four looked very promising, with two leaning quite markedly towards each side of the mindset spectrum. I proceeded to contact each of these individuals to ask if they would be interested to be a part of this study. Unfortunately, due to the perceived time investment as well as their busy schedules, they all declined to participate.

As a possible solution, I also created packets with physical copies of all of the documents outlined above: a letter introducing myself, a brochure about mindset information, and the preliminary surveys. I had planned to mail these to the professors so that they could be handed out in classes and promptly returned to me, increasing the likelihood that they would be completed and that I would have a sufficient respondent pool with which to choose additional potential participants. I held onto these as a last resort but opted to send a second wave of email correspondence to my contacts at each university instead. In the end, I did not need the packets as I found two participants through the second round of emails.

Another issue pertained to criteria for subjects. Searching specifically for second-year instrumental performance majors was problematic due to the respective structures of each university's undergraduate music degree. For example, my alma mater, Memorial University of Newfoundland, considers all undergraduate music majors as general degree students who can declare for a specialization (e.g. performance, theory, or history) at the end of their second year or continue on a general track. On the other hand, at the University of Toronto, students tend to apply to performance in their initial undergraduate auditions for admission into the program. When I contacted the professors at MUN, I made sure to ask them to distribute the surveys to aspiring performance majors. Unfortunately, during the year of my research study, only two students were planning to audition for performance. As such, I was unable to reach my target of finding eight to ten respondents at each institution.

At this point, I had to adjust my criteria to be more inclusive so that I could work with a larger pool of subjects. My initial rationale for wanting to select performance majors exclusively was because I felt that they might simply be more information-rich prospects within the context of case studies pertaining to the performance process. One-on-one lessons and performances are generally the primary foci of their university lives, whereas non-performance majors tend to have other academic responsibilities (e.g. conducting and band instrument studies for music education majors), which can make it difficult for them to fully dedicate their time to applied instrumental studies. Ultimately, my advisor and I agreed that it would be best to open up the project to include all second-year instrumental music students. I subsequently sent out a second wave of email correspondence in order to communicate these amendments and managed to obtain five more survey respondents. Of these five individuals, two were viable candidates based on their

survey scores (one leaning heavily towards growth-oriented thinking and the other on the opposite end). Fortunately, both students agreed to take part in the research. As I had discovered after working with the participants, both were as committed to their instrumental studies as any performance major would have been. I could have been more inclusive from the onset, as my initial assumption about commitment was faulty.

As elaborated upon in Chapter 4, while the individual who self-identified in a predominantly fixed-oriented manner leaned the most heavily towards this side of the spectrum compared to all other respondents (disregarding the students who declined to be involved in the study), she still possessed a number of growth-oriented values. Ultimately, she was the best fit in this scenario.

3.9 Post-research period

3.9.1 Data analysis

My analysis of the data was guided by a number of different sources that highlighted similar approaches to organization and interpretation of the material. Writing about case study research, Yin highlights that "much depends on a researcher's own style of rigorous empirical thinking, along with the sufficient presentation of evidence and careful consideration of alternative interpretations."[109]

In Robert S. Weiss' *Learning from Strangers: The Art and Method of Qualitative Interview*, the author highlights four analytic processes: coding, sorting, local integration, and inclusive integration.[110] These aligned strongly with Yin's analytical techniques.

The purpose of coding was "to link what the respondent says in his or her interview to the concepts and categories that will appear in the report,"[111] This may be achieved through pattern matching, which "compares an empirically based pattern—that is, one based on the findings

109 Yin, *Case Study Research and Applications*, 213.
110 Robert S. Weiss, *Learning from Strangers: The Art and Method of Qualitative Interview Studies* (New York: The Free Press, 1994), 169.
111 Ibid.

from your case study—with a predicted one made before you collected the data."[112] In both the growth and fixed-oriented metrics devised to analyze all of the recordings (see Appendix E), the first column was used to predict certain behavioural tendencies based on the conclusions found within the existing psychological literature, and the second was used to record my observations. For example, in the growth mindset metric, one of the expectations was that the student would focus on learning goals in their practice sessions, and these are reinforced by the teacher during the lesson as well. This is opposed to the fixed mindset metric, which predicted that the student and teacher would be more preoccupied with the eventual performance of the repertoire than the progress itself. Another prediction was the fulfilment of the self-determination theory criteria (competence, relatedness, and autonomy) in the growth-mindset individual's data, as they may be compelled to work due to an environment which engaged their intrinsic motivations. In contrast, I predicted that the learning atmosphere surrounding the fixed mindset individual would not satisfy these three key tenets. It is important to note that, as was likely apparent in the literature review (see Chapter 2), the psychological research casts growth and fixed mindsets in positive and negative lights respectively. As such, I recognize that this bias is reflected within these hypotheses. Figures 1 and 2 illustrate the metrics:

Fig. 1. Analysis Metric (Growth-Oriented Participant)

Literature (Questions and Expectations)	Observations
Developmental Stage - Environmental considerations: was a growth mindset instilled in the student from their family, teachers, or peers (both in upbringing and in current day)? - Adjustment to post-secondary life	
Goals - What goals does the teacher outline in lessons / the student outline in practice sessions? - Teacher and student focus on process goals and select performance goals (e.g. normative)	

112 Yin, *Case Study Research and Applications*, 224.

Responses to Challenges - Displays optimism, heightened positive affect, increased levels of concentration, and performance in the face of obstacles	
Praise - Teacher focuses on task rather than placing judgements on student's ability - Teacher praises for effort over ability - Family and friends were encouraging	
Self-Determination Theory (SDT) - Competence - Relatedness - Autonomy	
Lay Dispositionism - Does the participant make any attributional judgements on others? If so, how? - Growth mindset individual chooses adjectives which are dynamic and malleable	
Positive Psychology - Teacher highlights and builds upon strength(s) of student	
Other Comments	

Fig. 2. Analysis Metric (Fixed-Oriented Participant)

Literature (Questions and Expectations)	Observations
Developmental Stage - Environmental considerations: was a fixed mindset instilled in the student from their family, teachers or peers (both in upbringing and in current day)? - Adjustment to post-secondary life	
Goals - What goals does the teacher outline in lessons / the student outline in practice sessions? - Focuses on performance goals (e.g. obtaining positive outcomes like a good mark)	

Responses to Challenges - Has negative self-cognitions, an aversion to the task, boredom with problems, anxiety over performance, task-irrelevant verbalizations	
Praise - Teacher makes judgements on student's level of talent or intelligence - Family and friends were discouraging	
Lay Dispositionism - Does the participant make any attributional judgements on others? If so, how? - Fixed mindset individual chooses adjectives which are static and final	
Self-Determination Theory (SDT) - Competence - Relatedness - Autonomy	
Positive Psychology - Teacher highlights student's flaws	
Other Comments	

Afterwards, I transcribed all of the video recording data (the interviews, lessons, and practice sessions) into a single document, which I archived on the two external hard drives. I sorted excerpts of the transcripts relating to each code (each category listed in the left column of each metric) into separate files. This allowed me to avoid constantly parsing through one large transcript file of amalgamated information.

Subsequently, local integration "summarizes the excerpt file and its codings"[113] in order to find both commonalities and variants within the data. Within the excerpt files, I noted comparisons between participants in order to categorize the many thematic findings. I sought to collect a multitude of supporting evidence for a particular code to ensure its validity and also searched for points in the data which refuted my analysis. The codes were formulated by relying on the

113 Weiss, *Learning from Strangers*, 173.

framework of mindset knowledge that initially inspired the case studies themselves, since said propositions "would have shaped [my] data collection plan and therefore would have yielded analytic priorities."[114] My initial list of codes included self-identification (how participants reflected on their own implicit theories of intelligence), extrinsic versus intrinsic motivators (goals), participation versus deference (responses to challenges), the implications of malleable versus fixed—inferring verb choices (praise), first-person versus third-person subject choices (self-determination theory), and the differences in student responses to open-ended questions versus command-based instruction (self-determination theory). However, as I moved through the analytic and writing stages, my findings ultimately extended beyond these preliminary themes. My additional observations are reflected in Chapters 5 and 6 but were not specifically labelled during local integration. I also considered each "plausible rival explanation,"[115] which might affect my results, namely, possible investigator bias and in the implementation of the study. Finally, while local integration "brings coherence and meaning to excerpt file materials and their codings," inclusive integration "knits the otherwise isolated areas of analysis that result from local integration . . . into a single coherent story."[116]

With the four processes of coding, sorting, local integration, and inclusive integration in mind, I reviewed my research questions prior to each subsequent re-examination of the data (re-watching the videos or re-reading the audio transcripts) in order to ensure that all of my analyses would continue to be grounded by my initial inquiries. In the next three chapters, I use this analytical structure to create a comprehensive report of my research findings. For context, I provide a portrait of each participant in Chapter 4, directly answer my research questions in Chapter 5, and in Chapter 6, I present an in-depth observation of my research data as it pertains to each component of the psychological literature.

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114 Yin, *Case Study Research and Applications*, 216.
115 Ibid., 221.
116 Weiss, *Learning from Strangers*, 175.

Chapter 4
Portraits of the Participants

4.1 Alison

At the time of the study, Alison was a second-year undergraduate student in Music Education, studying with Professor Peters. She had come to Canada from China in order to go to university. She came from a family of non-musicians, but her parents enjoyed classical music and felt that the ability to play an instrument was a good skill to have. Throughout her childhood, she studied with a private teacher, but she highlighted that there were some differences between the Canadian and Chinese musical systems:

> When I did the level exams in China, I just [did] the practical. There's only a practical. And when it gets to Grade 10, there's sightreading as well, and a little bit of ear training but no theory at all. So I didn't learn theory before I came to university and I just studied it on my own for the [university] entrance exam.

When asked about her eventual decision to pursue music at the postsecondary level, she explained:

> When it gets to high school back in China, it's intense. So, most people—many people start playing piano at a young age, like many people will learn it. But not many people will keep on playing. It's also thanks to my mom actually . . . [who wanted] me to continue. So, I guess, when it got to the point when I needed to apply for university, I applied for so many stuff. I applied for music school in China and also regular universities—general universities—and also applied to universities in Canada. I don't know if it was good or not, but [I focused] on 3 different worlds.

She received a lot of encouragement from a number of different parties:

> Well, you know those parents, they always say “oh, you're so talented, you should keep playing” and then . . . there was a teacher that . . . went “oh, it would be such a regret if you didn’t go keep pursuing music because you’ve been playing for all these years, and it would be a pity to not keep pursuing that.

After graduating from high school, she moved to Canada to do a transitional year. This was so that she had a sufficient amount of time to prepare for post-secondary theory entrance exams and the audition. She was subsequently accepted to a university music program.

Since my selection criteria specifically targeted students going through an important transitional phase in their lives, I wanted to see how this might have affected Alison. Given that she not only had to make the transition from secondary to post-secondary life, she also had to learn a new language, live in a new city across the world from her family and friends. I asked her whether she encountered any difficulties with these changes:

> Not really, because I lived on [residence] when I was in high school as well, so I lived on my own, and I just [went back home] every week. So, yeah, I found that living on my own is not a problem. It was just mostly the cultural difference and also [the] language barrier, like at the beginning especially. Yeah, mostly the language: you feel upset when you want to say something, but you don’t know how to say it and you’re afraid you will say it wrong . . . I know people won’t mind, but you just feel kinda scared to speak up sometimes.

On the preliminary survey, Alison scored +6, indicating a strong inclination towards a growth mindset (Appendix C1). She agreed with all seven of the growth-oriented statements and by contrast, she only agreed with one of the fixed: “I like my work best when I can do it really well without too much trouble.” Among the remaining six, she responded neutrally to two: “You can learn new things, but you cannot really change your basic level of talent,” and “I like my work best when I can do it perfectly without any mistakes.” She disagreed with four statements:

- When I work hard, it makes me feel as though I’m not very talented,
- I have been complimented before on being very smart,
- bad performances make me feel like I am not very talented, and
- I feel like I am not very good when my teacher has a lot of criticisms.

Of most importance, she believed that talent was malleable, she enjoyed work when it made her think hard and learn despite the possibility of making a lot of mistakes. She also felt that she could learn a lot about how to improve from bad performances and was motivated when given a lot of critiques in lessons.

In the pre-interview, her perspectives aligned very strongly with the assessment. First and foremost, her optimistic demeanour was apparent upon the first meeting. She spoke with a lighthearted inflection and signified that she understood that many of these obstacles were simply a normal part of the process. For example, when asked to discuss the struggles in learning her repertoire, she mentioned, "I know that it would take time because of my technique. Because you can't rush it right? I also know that, so I just need to be patient."

With regard to teacher interactions, she felt that she had mostly studied with teachers who were very kind and supportive to her. Her recollections of her former teachers portrayed many of them in a positive light: "They [were] all very nice to me. [Good] teachers won't push you to achieve certain things right away, right? Like, they know that it's gonna be a process. And they won't have high expectations of you like 'why can't you play this?'"

She understood the importance that teachers played in an individual's education. She noted that she progressed the best when the teacher outlined clear goals for her in order to provide her with a visible path to success. During primary school, her family chose a piano teacher simply based on proximity. At the time, her non-musical family had no real way of assessing a teacher's level of instruction, but they soon realized what a difference a trained professional could have on her development:

> When I switched teachers . . . in middle school, she was a university teacher, so she was much more professional than a primary school music teacher. And she suggested a lot of new ways to practice and how to learn new pieces. Before when I learned a new piece (when I was in primary [school]), I was just learning from the top to the end. So, it was very hard. And what she suggested was to just learn a few lines each day, and don't go over that amount. [She said to] keep going back and playing these few lines until you're really comfortable, and the next day you can add other lines. Breaking into small chunks, I found that really helpful. And she also offered me new ways to practice as well. She

> also connected a piece to . . . she would talk about the composer and the background and the like, history and the era. Because my primary school teacher didn't talk about any of that kind of stuff. And I actually felt one of my level exams, she just wanted me to take the exam, but I wasn't prepared. And I actually failed it. And then my middle school . . . my teacher afterwards said, "how can she let you go [to the exam] when you're not even prepared?

While she spoke very highly about her own education, she was also cognizant about the fact that teachers can have the opposite impact on student development. I asked her if she could recall a moment of frustration or tension in a lesson with a teacher, but she found it hard to come up with any specific example:

> I feel like it's a really important part of your research, but I don't actually have any . . . I know some teachers would be like that. It's just that luckily, I [didn't] have any teachers like that. Because some teachers would actually judge—I have a friend [and] her teacher is like "why [do] you keep playing like that?

From our first interaction, Alison's disposition and personal qualities seemed to accurately exhibit the growth-oriented thinking that the preliminary survey indicated. She displayed a very grounded viewpoint regarding her transition to post-secondary life in Canada, citing a temporary adjustment period in learning the language and culture, but she was of the perspective that others likely would not judge her negatively for attempting to converse in English as a non-native speaker. Within the pre-interview, she also reiterated on multiple occasions the need for patience and long-term thinking in learning; she was aware that development need not be rushed.

4.2 Kim

Kim was also a second-year undergraduate Music Education major during the research period, studying with Professor Mackie. Unlike Alison, Kim grew up in the same city as the university where she was completing her undergraduate degree. She began piano lessons at age seven, and came from a musical family—both her mom and dad completed RCM exams (her mom finished Grade 10 and her dad finished Grade 8) in their youth, and she stated that they were able to help

her throughout her musical development. Kim eventually ended up receiving her ARCT at age 15 and took a small break from piano:

> I did an RCM saxophone exam for fun the next year and ended up getting a gold medal—I just wanted to broaden my horizons [and] try out other instruments and other genres. So, I started accompanying—I accompanied my school band, I accompanied woodwind recitals—I did a rock band for a year, and that was cool. I did jazz band, and then I did band throughout high school, so I was pretty involved with the saxophone. And then I ended up pursuing Music Education.

When asked about her decision to pursue music at the post-secondary level, Kim mentioned that she had always felt an affinity towards teaching, and that one of her middle school teachers had been the one to plant the idea of music education as a career into her head:

> Ever since I can remember, I always knew I wanted to be a teacher. I would just be in the classroom and [think] "this is what I want to do." And I loved music but I didn't relate the two together. And then in Grade 9, my piano teacher [said] "Kim, you know, there's a program called Music Education and you can study to be a music teacher" and I [thought] "wow, that sounds amazing!" And ever since then, I always worked towards getting to university for Music Education.

Kim spent a great deal of her youth working both with kids and in music, citing a lot of summers teaching at music camps, which helped affirm her post-secondary decision. While Alison remained open to a number of different paths (she applied to several different degree programs), Kim was quite singular in her desires. Kim noted that in her life, however, teaching took precedence over music:

> I'm in Music Ed because I love teaching, and I see music as a fun way to teach, whereas a lot of my peers love music and so, teaching is their way of like expressing their music. So, I do love music, but teaching has always been . . . my first [interest].

Kim remarked that her transition from secondary to post-secondary life was actually quite seamless. Although she was living in university residence at the time of this research, she was still living in the same city in which she had grown up. As such, all of her family and many of

her friends were still geographically close to her. Additionally, she did not have to overcome any cultural or language barriers nor had to do any kind of intermediary training in order to prepare for university.

> If anything, I felt more focused and more driven in university. I'm from a pretty academically driven high school . . . From what I've heard, it has pretty high ratings, so I'm used to the workload. I felt like I already had the studying skills that prepared me for university. And then in university, I was surrounded by a lot of driven people as well, and that was very motivating.

Kim's preliminary assessment results (Appendix C2) reflected seemingly conflicting sentiments. Out of the entire pool of respondents, she agreed to the most fixed mindset statements, but her responses painted a much more enigmatic picture than Alison's did. She scored a +1, and out of the fourteen statements, Kim agreed with five growth-oriented prompts:

- No matter how much talent you have, you can always change it a great deal,
- I like my work best when it makes me think hard,
- I have been praised for being a hard worker,
- bad performances help me figure out different ways I can improve, and
- I am more motivated when my teacher gives me lots of critiques in the lesson.

She disagreed with one statement: "I like work that will help me learn even if I make a lot of mistakes," and responded neutrally to one: "When something is hard, it just makes me want to work more on it, not less." As for the fixed mindset sentences, she agreed with four:

- You can learn new things, but you cannot really change your basic level of talent,
- I have been complimented before on being very smart,
- bad performances make me feel like I am not very talented, and
- I feel like I am not very good when my teacher has a lot of criticisms.

She disagreed with two statements: "I like my work best when I can do it perfectly without any mistakes," and "when I work hard, it makes me feel as though I'm not very talented," and responded neutrally to one: "I like my work best when I can do it really well without too much trouble." Kim simultaneously agreed with questions one and two, which both state somewhat

opposing concepts of talent. She believed that it was possible for one to change their talent, but also believed that their fundamental level of ability was predetermined. She appreciated work that was difficult, though she expressed that she did not enjoy it if there was a possibility of making a lot of mistakes, even if it helped her learn. She had been told in the past that she was very smart but had been praised more frequently for being a hard worker. She noted that she felt untalented after bad performances and in lessons when her teacher gave her a plethora of critiques; however, she also understood both of these experiences as valuable to her development by helping her figure out how to improve.

All of this information might indicate that she believed in a certain threshold when it came to many of these concepts. In the mid-interview, Kim mentioned that "everyone has like a natural talent level, [and] some people might just be better at [specific instruments] naturally," so it is possible that she believed that an individual's fundamental talent ceiling is genetically predisposed. She also talked, however, about success being dependent on "how much . . . you want to put the effort in," so to this point, talent is malleable depending on the degree that someone was willing to invest into a particular endeavour. Although she appreciated difficult work, it could be hypothesized that once a threshold was reached, a lot of mistakes indicated to her that she was actually not very good at the activity and should either pivot or work even harder in an attempt to negate her own limitations. A similar postulation could be made about her perception of bad performances and teacher critiques: these things negatively affected her self-conception even though she acknowledged that they provided her with important insights.

Kim also reflected positively about her former teachers. She mentioned that they were all very encouraging and sought to build upon the good aspects of a student rather than make any disparaging judgements. She found her current piano instructor to be extremely helpful and felt that her own musical abilities had grown tremendously since coming to university:

> I feel like she really worked on how to interpret the music better so [that] you're able to express the musicality that the composer was trying to get you to express, but she also — her pedagogy is very much [in] physiology. Like, make the motion that makes the music. So, she would explain . . . the gesture that would bring out the musicality. That, to me, was very helpful because a lot of times my [former] teacher would [say] "play it this

> way," and I would try to do it and I couldn't get the connection, but then when Professor Mackie would explain that "this is how you do it" . . . I feel that improved my musicianship so much.

With respect to goals, Kim also mentioned in the pre-interview that she was highly externally motivated, and she really valued getting good grades or positive feedback. In the context of the mindset research, one could theorize that Kim prioritized performance goals over learning goals, and that this may have had an impact on how she approached her work. The psychological literature[117] argues for the framing of process goals over performance goals because focusing solely on outcomes can distract an individual from working on the steps necessary to reach the end result.

Since she spoke of feeling quite lost in her first year because she was surrounded by so many like-minded and focused peers, I asked her to reflect on moments during her degree so far that affirmed her choice to pursue a musical career in spite of these thoughts:

> I'm very motivated by extrinsic rewards, like marks. So, when I get back midterms or final marks, I'd [think] "oh, this was good." And my first-year jury mark was way better than I was expecting, so I [thought] "this was very encouraging" because it was showing me that my hard work was paying off. And then, this year, I was playing a piece by a Canadian composer. And I guess I did well in it because Professor Mackie [said] "wow, Kim! You should record this."

Ultimately, Kim's disposition aligned accurately to her responses on the preliminary survey. While she agreed with the most fixed-oriented statements out of any of the initial respondents, her personality is much more dynamic than the survey was able to portray. In her pre-interview, she self-identified as untalented; however, because she felt that a musical career was the correct path for her, she was willing to exert substantial amounts of effort in order to achieve the equivalent of what she perceived "talented" individuals would be able to do in far less time. With resilience and a motivation to receive external rewards, Kim felt that she was able to level the playing field by eventually attaining the same marks as peers whom she viewed as more adept

[117] Dweck, "Motivational Processes Affecting Learning."; Grant and Dweck, "Clarifying Achievement Goals and Their Impact."

than her. She also had concrete evidence of this being possible by her progress in Musicianship Skills class and her first-year jury. Similar to Alison, she came from a very supportive family environment and had teachers who encouraged her to pursue music at the post-secondary level. The difference was that her parents were musically inclined and as a result, were able to help her with her musical progress throughout her childhood in a number of different facets. All of this indicates that Kim was likely much more balanced in her learning perspective than a strictly fixed-oriented individual might be based on the manifestations outlined in the existing psychological data.

Having presented portraits of the individual subjects, in Chapter 5 I answer the specific research questions in detail. Each subsection tackles a research question or sub-question separately, with the exception of subsection 5.2, in which I consolidate my answers to questions 2, 2i and 2ii due to the interrelatedness of the results.

Chapter 5
Results

In this chapter, I review the research questions and sub-questions, giving specific responses to each. Chapter 6 will elaborate further on each of these conclusions, with an in-depth discussion of the data. For convenience of reference, the research questions are re-iterated:

5.1 Re-statement of research questions

1. How can the educational psychology literature (mainly, the body of knowledge in growth and fixed mindsets) be used as a structure with which to observe and understand the student learning within the context of private music lessons at the post-secondary level?

   Developmental Stage:

   i. In what ways does the shift from high school to post-secondary studies affect the learning mindsets of instrumental music students? How does each student cope with the multitude of new environmental and academic challenges that must be met?

   Goal Types:

   ii. What effect does an instrumental music student's framing of their goals have on the effectiveness of their performance process?

   Responses to Challenges:

   iii. How does each student respond to difficult learning obstacles within the music lesson? In the practice room? On stage?

iv. How does each student react to critical feedback from their respective studio teacher?

Praise:

v. How does the studio teacher frame praise, and what effect does this have on the student's self-conception and motivation?

2. In what ways can fostering growth mindsets affect the quality of the performance process (practice efficacy, overall approach to music learning, and performance outcomes)?

Growth Mindset Interventions:

i. What effect does a growth mindset perspective have on a student's success (e.g. productivity and efficiency) in the practice room?

ii. How can a growth mindset perspective help a student deal with performance outcomes and post-performance critiques?

5.2 Educational psychology literature in a musical context

The educational psychology literature on mindsets is inherently intertwined with any and all learning endeavours, and the music performance process is no different. With regard to the main research question, the outlined theoretical framework helped to provide a clear methodological and analytical structure in this study to allow many valuable insights to take shape. The observations of teacher-student interactions, student practice sessions, and the analysis of student interview responses provided tangible examples of mindset manifestations as well as a variety of perspectives on the topic. Both participants felt that the nurturing of a growth mindset could lead to positive effects in the music learning process, as their words indicated. Both remarked that they had experienced increased levels of patience and self-compassion in subsequent practice sessions and their respective jury performances after learning about the mindset research.

5.2.1 Developmental stage: High school to post-secondary life

In the context of how the secondary to post-secondary transitional stage manifested in the participants, they both seemed mentally and emotionally prepared to meet the challenges of university life. Both had positive upbringings and had a supportive network of family and teachers that encouraged their pursuits of music as a vocation. While Alison took an extra year to bridge any cultural or language gaps, as well as to study for music entrance exams, she had been living independently since the beginning of high school. Kim came from an academically intensive high school and also felt that this transferred well into the rigour of a university setting. The primary difference between the two was that in Kim's first year, she expressed that she struggled a lot more due to feelings of inferiority compared to her music degree peers; however, she was able to overcome this by simply embracing a consistent work routine in order to put herself in the best position to succeed, despite these negative self-cognitions. The external accolades she received (e.g. positive applied teacher feedback, good marks) provided her with tangible indicators that highlighted the efficacy of her approach, and she was able to build momentum through this recursive cycle.

Initially, I hypothesized from the literature on adolescents that individuals may be particularly susceptible to mindset divergences during any transitional stage; however, I did not fully account for the fact that young adult music students would already have had several years of experience dealing with obstacles, frustrations, and setbacks, and would have had to repeatedly make the conscious decision to continue pursuing a musical endeavour. As such, many second-year undergraduate music majors may have already developed a strong mental fortitude and a repertoire of strategies to cope with learning obstacles prior to university studies.

It is important to note, though, that Alison and Kim both came from environments that allowed them to flourish, and both possessed assuredness in their respective choices of a musical career. This may have caused them to be exceptional cases. For students who are less certain about their decisions, entering a university environment of musically high-achieving peers or encountering a less encouraging teacher might have a more palpable impact on their mindsets. For example, a high-achieving small-town musician entering a large music university, who then has to cope with an environment surrounded by a multitude of other highly capable musicians, may have to

wrestle with many different mental and emotional challenges, which could ultimately manifest in a wide spectrum of negative self-cognitions.

5.2.2 Goals and the performance process

With regard to goal types, Alison and Kim were somewhat dissimilar in viewpoint but more similarly aligned in response. Alison was highly motivated by the learning process, and Kim was largely driven by external rewards such as grades; however, both were able to overcome learning hurdles through determined and deliberate effort. While it is difficult to draw conclusions about the magnitude of intrinsic motivation between the two participants or their respective perceived levels of satisfaction while engaging in piano-related activities, Kim explicitly stated that her goal was to become an elementary school music teacher and band director. Her priority was on more immediately relevant training to her future life in the school system and less on pianistic skill acquisition. Because applied music lessons were simply a prerequisite to her envisioned future, she likely embraced that she needed to do well in piano in order to reach her primary goal, which could have compelled her to simply accept the workload.

Goal types were difficult to analyze in this setting, as there was an expected obligation of work inherent in university courses, in addition to the fact that post-secondary studies are financially-binding (tuition costs). Whether a student approaches post-secondary endeavours with intrinsic motivation or not, the coursework still needs to be completed, whereas there are fewer expectations of adolescents in a public-school system. However, as is outlined in the literature, one could argue that tackling work from an intrinsically-motivated perspective might allow an individual to independently seek out opportunities to push one's capacities, and that this may lead to higher levels of satisfaction in the activity itself, as well as a higher likelihood of information consolidation and permanence. Thus, this notion may be valuable for both educators and students. A strong comprehension of the research pertaining to motivation may allow educators to frame tasks and interactions in an ideal way for the student to access this intrinsic impetus, and it may serve as a reminder for students to focus primarily on learning goals, with the understanding that this will provide more fruitful results compared to a fixation on outcomes. The effect of goal types was palpable in the lesson interactions between Professor Peters and

Alison and was explicitly confirmed in Alison's interview responses. Professor Peters provided Alison with small, achievable goals that fed into a larger picture, and this enabled Alison to leave lessons feeling inspired and motivated, with a clear format of what to work on and how to work on it.

5.2.3 Responses to musical obstacles

In responding to challenges, Alison and Kim verbalized their reactions in different ways. For example, in the practice sessions, Alison was optimistic and very kind to herself (e.g. self-verbalizing encouraging comments) while Kim was often disparaging (e.g. constantly saying that things were not good). Both agreed that one needed to view obstacles as moments which provided information for paving the path forward instead of as firm barriers, and while they both successfully completed the pianistic work that was required of them, Kim seemed to have experienced more emotional setbacks (e.g. her negative feelings about her own ability in her first year). Fortunately, through her anecdote about unsuccessfully performing Chopin's Fantasie-Impromptu (to be discussed in subsection 6.3.2) at her high school shortly before her university auditions, she had articulated that she learned new and more effective practice strategies as a result of this incident, which helped her feel more prepared when finally reaching the auditions themselves, and likely helped her with future challenges as well. Because the tracking and measuring of both Alison and Kim's respective levels of achievement over a longer period of time was beyond the scope of my study, it remains to be seen what kind of an effect this difference in behavioural response patterns may have had on their long-term levels of achievement. Both accepted work as a necessary function of success and were extremely composed in both the lessons and practice sessions, but the variations of manifestations highlighted in the psychological body of work might have been more apparent over a longer and more in-depth investigation.

The biggest takeaway regarding responses to challenges in this research study was that the participants' respective professors had a noticeable impact on students' approaches to difficult learning obstacles within the lessons, which could have bled into their thinking and self-efficacy during the practice sessions. Professor Peters empathized with Alison whenever Alison

verbalized difficulty with certain passages of music (e.g. “Well, let’s put it this way. You’re not the only person that struggles with this part,” or “I know it’s hard”), and this was mirrored in Alison’s comments in the other research data of needing to be patient with her struggles. While Professor Mackie frequently encouraged Kim, she also used a plethora of comparatively more negative feedback (e.g. the multitude of “don’t” comments and judgmental statements such as “it gets frustrating to my ear”). In the same vein, when I analyzed Kim’s practice sessions, she used more defeatist commentary and negative self-assessments (noted in 6.2.2). At the very least, this data may be correlative and worth exploring in greater detail in the future.

5.2.4 Responses to teacher critiques

Question 1(iv) was the only question for which I felt that I did not have a sufficient amount of data to determine an answer. The only observable difference in the students’ responses to critical feedback from their respective teachers was that Alison exhibited increased participatory behaviour in the lesson, while Kim reacted with greater deference. However, both participants seemed to trust their teachers’ judgements and accepted their comments without issue.

I conjecture that Alison’s heightened level of participation directly following critical feedback may be explained by two factors. Firstly, as outlined in subsection 2.4, children with growth mindsets in Dweck and Leggett’s 1988 article[118] showed increased levels of optimism, concentration and performance, and ended up learning new strategies to test their hypotheses when faced with unsolvable math problems. Based on Alison’s preliminary assessment score of +6 along with all of the other available data, it would be reasonable to expect her to exhibit similar response behaviours as Dweck and Leggett’s subjects. Secondly, Professor Peters was able to fulfil the competence and autonomy criteria of self-determination theory by her ability to encourage Alison to draw her own conclusions through well-framed, open-ended questions, as well as positive affirmations (to be discussed in subsection 6.6**)**. In this subsection, I note that Alison had also remarked that lessons with Professor Peters were extremely collaborative, and working this way benefitted her level of motivation. Therefore, the manner in which Professor

[118] Dweck and Leggett, “A Social-Cognitive Approach.”

Peters established the lesson dynamic may also in part explain Alison's willingness to take an active role in response to critical feedback.

Kim's increased deference might also be explained by these two reasons, although, as I have already mentioned, she displayed more mixed-minded values than the fixed mindset subjects in the psychological studies. In the same article by Dweck and Leggett, the fixed mindset study subjects essentially reported opposite behaviours from the growth-minded individuals. The fixed-oriented students ended up reporting aversions to the task by citing boredom, and also attempted to divert the researchers to other topics using task-irrelevant verbalizations. Based on Kim's data, it is clear that she has developed the capability to navigate through these negative self-cognitions, so she likely would not exhibit the same types of outward reactions as the adolescents in the psychological study. Her noticeably withdrawn disposition in the face of critiques, however, may be indicative of negative inner self-talk, similar to the disparaging verbalizations that she uttered during the practice sessions. Furthermore, this may have been exacerbated by Professor Mackie's dismissive judgements, such that it is possible that Kim felt unable to participate due to the environment of the lesson. However, these contrasts may also simply be explained by a difference in personality. I would have needed to pose additional follow-up questions to Kim in order to confirm these interpretations. Thus, further research is required to make any definitive claims with regards to this question.

5.2.5 Approach to praise

The studio teachers approached the realm of praise differently from one another, although neither lauded the students for fixed traits such as intelligence or talent. After outlining small process-oriented goals within the lesson and ensuring that Alison could achieve each of them, Professor Peters responded positively and inflected excitedly. This acted as a useful indicator to Alison that she was moving in the right direction. Professor Mackie refrained from praise until shortly before Kim's jury, so that Kim could reflect on all of her hard work throughout the academic year only after she had completed it. As she mentioned in her final interview, Kim appreciated this, and it helped her find comfort and confidence to enjoy the jury performance, knowing that she was amply prepared (refer to 6.2.2).

A notable point is that both approaches proved effective. For teachers, understanding that praise can be a very valuable tool with a wide set of possibilities is paramount. It is, then, up to the discretion of the teacher and their assessment of the student to determine how they might incorporate praise into the lesson; an awareness of the psychological literature may be useful in ensuring that they can best facilitate each individual's training. With a full understanding of its potency, an experienced teacher may be able to use praise to focus an otherwise fixed-oriented student on process goals or a discouraged student on more malleable aspects of their learning journey.

In the final interview, Kim recounted an interaction with a police officer who was discouraged from continuing with lessons by his music teacher (outlined in subsection 6.4.2). In conjunction with the literature on praise, this story highlights that praising or critiquing for fixed attributes such as ability can have long-lasting and often detrimental effects on an individual's self-perception. Both telling a student that they are untalented and should not continue playing an instrument, or telling a student that they are very talented, can lead individuals to perceive obstacles as signals which manifest similarly—these challenges then affirm the self-conception of the supposedly "untalented" former, while undermining the latter.

5.3 Effects of growth mindsets on the performance process

5.3.1 Mindsets in the practice room and mindsets on stage

Because of the strong intercorrelation found in the data, in this section I amalgamate my analysis of the second research question and its sub-questions. Kim and Alison both articulated that the fostering of growth mindsets had a positive impact on their learning perspectives, which subsequently provided them with many practice and performance benefits. Alison said it provided her with affirmation that helped her make sense of how she normally dealt with challenges. She mentioned in her final interview that she was not the type of person who typically gets frustrated, so learning about the mindset research allowed her to more easily collect herself in these moments. An awareness that the research supported her approach allowed her to "stop and think a little bit . . . break [a section] down and then practice it again" in the

second and third practice sessions. She also noted the importance of this knowledge in working with her own piano students: “because every student is so different and you kind of have to cater to everybody’s different needs . . . you just need to be really patient.” With regard to how learning about this research might have helped her with performance outcomes, she reflected that, despite making some errors in her jury, “it went better than [she] thought,” and so she didn’t dwell on the mistakes for very long.

For Kim, who demonstrated a seemingly mixed-minded perspective, she felt that her parents really instilled growth-oriented strategies in her from a very young age, noting that while she may not have been appreciative of it at the time, it helped condition her to think about “the things that [she needed] to do to improve” rather than simply sit and be upset. She found the research to be very interesting and likened it to Dory’s motto of “just keep swimming" from *Finding Nemo* when challenges presented themselves. Kim said that if one was pursuing something that they found worthwhile, a growth mindset approach would be most beneficial: “so, you’d apply that both to a performance and to like, your practice. If things don’t go well, you just keep practicing.” Like Alison, she also thought that the best teachers “could inspire students to have a growth mindset . . . to want to improve and to want to overcome those challenges and to want to have continuous improvement.” With regard to how this research may have impacted her thinking after her jury performance, Kim stated that she was satisfied and simply accepted the outcome because she knew that she had put in the necessary preparation beforehand. She said that “it wasn’t like ‘oh, I wish I did everything different,’ it was more like ‘oh, in this section, I could have been a little bit better,’ but I think overall, I was okay with it.” She also articulated that Professor Mackie’s email (reflecting on her progress throughout the year) sent to her a couple of days before her jury was “very encouraging, and it’s a good mindset to know that your teacher is happy and they believe in you,” which truly reinforces the impact that teachers’ comments can have on the ways that students think about themselves.

5.4 Summary

While I gained deeper perspectives about both of my research questions and the psychological literature after extensive analyses of this data, I discovered that mindset beliefs are much more

dynamic than the growth and fixed-oriented dichotomy might be able to describe. For example, in designing a portrait of Kim, I quickly realized that she did not quite fit the fixed-oriented mold with which I had initially attempted to label her after assessing her preliminary survey. While she identified as an untalented musician, she was highly determined to pursue a career in music education. Ultimately, this ambition spurred an unwavering motivation and level of resilience that superseded any doubts that she may have had about her ability. She discussed her musical aptitude in absolute terms but simultaneously believed that work ethic can be the great equalizer. She also managed to find success in the past (e.g. achieving an ARCT at an early age, good marks) which helped provide her with a point of reference for tackling future challenges. I went into the interviews with many preconceived notions about how Kim might respond to my questions based on how they were outlined in the psychological literature and was constantly surprised at how much her answers differed from my expectations. Overall, within the recorded data there were many more parallels than differences in the ways that both Alison and Kim responded to obstacles. I believe that these similarities indicate the potential for fixed-oriented individuals to nurture growth-oriented behavioural patterns, in spite of their own negative self-perceptions. As a result, I think that it can also show that it is possible to find success through consistent practice and perseverance, regardless of said individuals' beliefs about their limitations. In the next chapter, I elaborate on these findings with a detailed exploration of my research data as it relates to each individual component of the psychological literature.

Chapter 6
Observations and Discussion

The four primary factors outlined in the original psychological literature which affected mindset beliefs were:

- **Developmental Stage**: student adjustments to post-secondary life, other transitional struggles, etc.,
- **Goal Types:** framing of goals as either performance or process-oriented by both the student and teacher,
- **Responses to Challenges**: reactions to obstacles in both the lesson and practice session data,
- **Praise**: how each teacher frames judgements.

I made further analyses with regards to **mindset intervention strategies** and auxiliary research such as **self-determination theory** (whether the fulfillment of the three prerequisites for intrinsic motivation had an effect on each student), and **positive psychology** (how both the teachers and students incorporated this concept into the teaching and learning spaces).

6.1 Developmental stage

The possible effects of the post-secondary transitional period, as well as other age-related struggles, were previously discussed in both participants' respective portraits. As mentioned in the literature, a divergence between growth and fixed mindsets occurs at the adolescent stage for a number of reasons. Primarily, as individuals need to navigate new emotional and social considerations alongside increasingly demanding schoolwork, their self-esteem may be tremendously affected. Teenage students encounter academic challenges as they become

introduced to more abstract concepts and have to develop the necessary discipline and time management skills to study and learn independently. Furthermore, because of the need to develop in social ways, there are many non-school-related priorities, which can take a student away from a focus on their studies. Issues which originate at this stage may be recursive—for example, a student who faces difficulties with a topic in mathematics will likely continue to struggle as the course advances unless they self-mitigate (i.e. studying independently to catch up). Confronting repeated struggles may impact an individual's self-conception; in this scenario, this particular student may end up feeling like they are simply not good at math, even though they may be perfectly competent if they take the proper steps towards filling some of the foundational gaps in their knowledge.

This phenomenon also occurs at the post-secondary level. While music students still need to audition and are required to display some level of competence before admissions, transitioning between secondary and post-secondary school is a difficult rite of passage for many individuals. Students have to decide on a particular concentration of study at a stage when many of them are uncertain about what vocation to pursue, and as a result, a high percentage of this demographic either drop out or change degree paths entirely. A university curriculum requires a much higher level of rigour than that expected of students in high school, and as such, it can also challenge said students' perceived levels of ability.

6.1.1 Alison

To reiterate some of the things which were mentioned in the portraits, Alison stated that she had benefitted from an encouraging environment throughout her upbringing. Music was a highly valued skill in her family ("my mom just likes classical stuff, and she feels like . . . it's a good skill to have"), her music teachers encouraged her to go abroad to continue studying music, and Alison also felt it was important to her: "most people would like, give it up because of school right? . . . Many people start playing piano at a young age . . . but not many will keep on playing . . . but I didn't stop in between and just like [kept] playing." Alison credited this level of support for her mindset beliefs:

> When you asked me whether I'm more of a fixed mindset or a growth mindset, I hesitated for a few seconds because as you were saying how people were a mix of both. I think of myself as being more of a growth mindset, because I feel in my education process, I had a lot of teachers who always encouraged me. They were all so encouraging, and then I remember one said that your potential was unlimited, and I can see you accomplish great things. And that really encouraged me, so I just [kept] motivating myself that way.

Alison had also been fostering a level of independence since high school, as she lived in residence and only returned home on weekends. While this helped dampen some of the growing pains that many students experience in their initial year of university studies, Alison still had to adjust to both a cultural and language barrier, which she mentioned had been the origin of some self-consciousness: "Yeah, mostly the language, like you feel upset when you want to say something, but you don't know how to say it and you're afraid you will say it wrong." Fortunately, she was able to take a gap year to minimize these stresses:

> Before I applied to [university], I needed to prepare myself for the exam. So, I studied with an RCM teacher. I didn't come to [current university] right away—I went to [different university] for a year. And I kind of prepared myself for the exam."

These two factors were integral to allowing Alison to feel mentally and emotionally prepared for the adjustment to university life. She started in a positive mental space due to a nurturing environment of family members and educators and utilized a gap year between secondary and post-secondary life to address any foreseeable difficulties (e.g. language and cultural barriers, and preparing for curriculum requirements such as entrance exams). Alison was set up to succeed.

6.1.2 Kim

By contrast, Kim comes from a musical family (Alison mentioned that neither of her parents played an instrument), and commenced lessons because of her parents:

> I started the piano when I was 7 years old. According to my parents, they asked me if I wanted to play the piano and I told them yes—I don't remember that conversation. So, yeah, I started when I was 7 because both of my parents played piano before, so my mom had her grade 10 [RCM] and my dad got his grade 8 [RCM], um, so, they helped me throughout my levels. I started with one teacher and she was very technical, and I had her for 2 years, and then I ended up switching to another teacher and I had her until I got my ARCT in piano performance in 2015.

Despite these early accolades, Kim felt that she had to work much harder than other students when it came to basic musical skills, and although she consistently achieved academically (e.g. RCM exam grades, university course grades), she felt that she had to put in a disproportionate amount of preparatory time to be able to do things that she thought her peers were having no trouble with, such as pitch-related exercises in her first year Musical Skills classes:

> When I came to university, in Musical Skills class, at first, it went really bad because I couldn't hear anything. So, I got a tuner and I practiced everyday and I ended up doing, like my marks ended up being higher than my friends that could actually hear. But it's not because I'm better, it's just because I learned the material better.

She mentioned, however, that her music teachers as she grew up were very encouraging to her, and her parents were supportive, though pragmatic:

> Growing up, at times when things didn't go well or I didn't have a good lesson or if I didn't do well on something, I mean yeah, my parents wouldn't be happy, but they'd always [say] "you just have to work harder. These are the things that you need to do to improve." And in the moment, you're not appreciative of that advice. You're just like "let me be upset about this." But then, it really makes you think . . . I think it just conditions you to think that way. That there's . . . you just have to get up and keep going and keep

> improving. So, I think it's a combination of my parents [saying] "this is what you have to do" and then me just taking that as I get older and [thinking] "yeah, that's just my natural mindset" so when things don't go well—things don't always go well—my reaction is to always just be like "okay, this test didn't go well. What can I do for next test to make sure that what happened that time doesn't happen again?"

Kim also explicitly credited her parents and educators for her continued musical pursuits:

> I know that, growing up, if I had been told by my piano teacher and by my high school music teacher that "yeah, maybe you shouldn't be in music. Maybe you shouldn't go to university for music," and if my parents had [said] "no, don't go into music." If I hadn't had all of that support, honestly, I don't think I would have ended up in music.

With regard to the post-secondary life transition, Kim mentioned that she went to a high school that was academically highly-ranked, so she felt that she was able to adjust to the demands of university coursework quite smoothly. Additionally, she opted to live at home and commute to the university rather than live in residence, which helped mitigate some of the common obstacles that students who move out of their home sometimes have.

The main source of Kim's transitional struggles was rooted in entering a music-centric environment in which she was able to directly compare her perceived aptitude to that of her peers:

> I feel like first year mentally was the most challenging because I was just surrounded by so many talented or hardworking or high achieving people, and so I kind of had, not an identity crisis, but I—I [never thought] "oh this isn't the program for me," but I was like, "I am not as good as everyone else."

The self-perception of her abilities was a recurring theme in our conversations. Despite all of her efforts to get to this point in her musical development, she viewed herself through an incredibly modest, if not self-deprecating, lens:

> I've always viewed myself as a very untalented musician [laughs]. Because doing the RCM levels, especially with the ear training, a lot of my friends would just naturally hear

> everything, but I always had to work really hard. And I did well—I would always get First Class Honours in my exams—but that was because for months ahead of time, I had to practice every single day for half an hour. So, I felt like I always had to work harder to get the same results as everyone else.

Although Kim stated that she believed very strongly in the existence of talent as a precursor for any kind of achievement, she provided a multitude of counter examples (perhaps unknowingly) in which she outworked and received much better grades than some of her peers whom she deemed to be more talented than she was.

As such, Kim's views about her own level of ability were not wholly discouraging. She had already developed many learning strategies in her youth (e.g. consistent and regular practice/study) in response to these negative self-conceptions, so she was amply prepared to face a multitude of future challenges:

> [In first year,] I [thought] "why did I choose the piano?" because I wanted to be an elementary school teacher. I still loved the piano, but I was [wondering] "how do I translate those skills into the classroom?" And a lot of my friends were much more musical, more musical than I was so I felt like—I felt like I just didn't know where my place was, and it was hard for me to get involved at first. But then in second year, that was totally fixed.

Kim's upbringing was influenced by family members and educators who helped nurture her musical passions. The combination of her self-perceived lack of ability with her desire for a career as a music teacher helped her hone a strong sense of work ethic and resilience, and as a result, she felt she was able to overcome the mental and emotional hurdles that arose during her first year at university.

6.2 Goal types

6.2.1 Alison

With Alison's growth-oriented personality, one can theorize that she would be inclined to frame her goals in a learning and process-oriented manner rather than focusing solely on performance outcomes. The research data heavily supports this assertion. In the pre-interview, Alison reflects on her music teachers throughout her upbringing, and discusses the differences between their respective efficacies, beginning with her first foray into music lessons:

> The teacher in China during my primary school . . . She just asked me to play piano notes mostly and just correct wrong notes and wrong rhythms but never expanded on details in terms of how to play musically and emotionally. She's just a music teacher in my school so she's not very professional. And at that point we [didn't] know . . . I was so young and my mom [didn't] know anything — she couldn't tell if a teacher was good 'cause she didn't study music right, but it was so obvious that when I switched to a teacher in middle school, I improved a lot.

Alison only realized the difference between teachers in retrospect. As mentioned in subsection 4.1, she noticed drastic improvements in her piano-playing abilities after this change of scenery and when asked to articulate how this teacher was so impactful, Alison outlines a process-oriented strategy: her teacher assigned her with small, manageable chunks of repertoire to work on and built upon them on a weekly basis. By providing Alison with highly focused and achievable tasks, it allowed her to experience repeatable success and perpetually build upon her skill base. As a result, Alison could concentrate fully on the steps of progress, rather than be distracted by thinking too far forward to potential instances where she would have to demonstrate this ability (e.g. an exam). Furthermore, this teacher also provided Alison with stylistic and historical contexts surrounding the pieces in her repertoire, in order to help her understand the music on a deeper level and facilitate longer-term learning goals (e.g. building an informed interpretation).

This process-oriented approach was apparent in Alison's practice sessions. During the first session that she recorded, she was highly focused throughout the entire period, and when

verbalizing her thoughts aloud, provided herself with straightforward directives and concentrated on controllable elements. For example, when working on a small section of music, she would say short instructions, such as “it should be legato in the RH,” “try to connect the sound more,” and “less after playing the first note, leading to the second one.” If she felt that her attempts were successful, she would also say encouraging things such as “that’s not bad, one more time,” and “I think that’s better.”

Alison remarked about some difficulties at the post-secondary level with her initial piano teacher in her undergraduate degree (she switched to Professor Peters in her second year). She stated that this teacher did not provide enough tangible instruction and instead, spoke in metaphors to help her deal with possible performance anxiety:

> There were a few things that she always said . . . She always said “bump in the chair. Feel there’s like a circle around you and then a spot of light. No one else there—it’s just you in your own little musical bubble.” And when you are about to start, then “smell the flowers.” She used all kinds of analogies, which I didn’t find really helpful. But in a way, she stressed that a lot and then kind of overlooked the technique part. So, she didn’t help me improve in terms of my technique and stuff—that’s why I switched.

Alison explained that for her, the complete absence of a goal structure was detrimental to her progress. By not being provided with a proper format and clear how-to instructions, Alison found that her lessons contained more guesswork than she would have liked. However, Alison lauded Professor Peters for contributing immensely to her musical growth. The quality that she appreciated the most about her is that:

> When I was having a lesson with her, I feel like we were both engaged in the teaching process. She’s not like a teacher, she’s more like coaching me, and we work together to solve this problem. And we will actually have discussions . . . We will think of stuff together and figure things out together. I think that’s pretty good.

Furthermore, Professor Peters provided Alison with a multitude of process-oriented goals in each lesson. Professor Peters’ method of framing issues was palpable in the recorded data. Firstly, Professor Peters tackled a variety of musical and physical matters using incremental process

goals. For example, in the first recorded lesson, she broke down a fundamental problem to its skeleton before incrementally snowballing additional directions to Alison:

> Professor Peters: The RH melody, we've kind of already heard it from before. The LH[119] has a new line. Can we play the LH line? Just the accented notes.
>
> Alison: [plays]
>
> Professor Peters: Good, now can you play those with your RH?
>
> Alison: [plays]
>
> Professor Peters: Right. And then together they finish. Now add in the other notes and see if we can hear those.
>
> Alison: [plays]
>
> Professor Peters: Good. I could hear the LH but the RH is missing the da-dum.
>
> Alison: [laughs] I can't focus on both.
>
> Professor Peters: I know. I'm asking for so much.
>
> Alison: [plays]
>
> Professor Peters: I missed the F#.
>
> Alison: [plays]
>
> Professor Peters: Good. This time I could hear them but these two were not really together. Same idea, I need to hear the A and the F#, which creates what interval?
>
> Alison: Um. 6th.
>
> Professor Peters: The F# to the A.

[119] Throughout the dissertation, the abbreviations LH and RH will be used to designate "left hand" and "right hand." This is a common short form used by music instructors.

Alison: Oh.

Professor Peters: So, we have a 3rd between the two. So, we want to hear the opening of the two hands.

Alison: [plays]

Professor Peters: Mmhmm. And then the LH is the downbeat. And then the RH is the second part of beat 1. So, if you have the eighth notes, then [vocalizes]. So, your LH first note should give you the pulse for when to come in with the RH. LH's almost like your metronome.

Alison: [laughs] It's so hard to . . .

Professor Peters: It's so hard to play those at the same time, yes. And then your RH should always begin on the note. Be careful not to start playing before you get down to the note. Because you're playing from above, so sometimes I feel like you already start to play before you're here. Always think from the key. Sometimes you feel like you've already played, but you haven't actually touched the key yet. So, if you're always from the key, then you shouldn't miss it.

Alison: [plays]

Professor Peters: Good! Yes, from the keys. Now one more time with the LH.

Alison: [plays]

Professor Peters: Good that's it.

In this brief exchange spanning about three minutes of lesson time, Professor Peters addressed a combination of musical and physical concerns and helped Alison target a single section of music and build it competently from a small seed to a full product. She began by isolating the newly introduced material (the LH line), asking Alison to gradually add elements to it (a RH melodic line, then all the voices) while ensuring that she finds success at each step. Then, she took the same concept and extrapolated it to a subsequent portion of music ("Same idea, I need to hear the

A and the F# . . .”). Finally, when Alison expressed that she was having some technical trouble, Professor Peters responded with a concise solution. This provided Alison with an understanding of the logical sequence of mastering a musical segment, so that she had the means to diagnose independently within the practice space. Furthermore, Professor Peters’ enthusiastic demeanour and increasingly excited responses during each of Alison’s successful playing attempts helped enhance these clear learning goals even further. These demonstrations were found all throughout the lesson data. A second example occurred during the second lesson; Professor Peters highlighted a particular measure and asked Alison to first play it simply (as block chords) before asking for more complex demands:

> Professor Peters: Okay, so that’s the first 4 bars. Once you get to the LH G, it stays on G, right? Which makes it a little bit more insisting, so that insisting feel kind of keeps that *forte* more and more. And the ending, because you have more notes. So, that means even the inner notes need to help you build the crescendo. So, all of these things inside need to be much more active than what you had from there. It’s a different type of playing. Can we play just that last bar first?
>
> Alison: [plays]
>
> Professor Peters: Yeah, so the middle one is like, especially the C# and E, so these ones need more sound.
>
> Alison: [plays]
>
> Professor Peters: Play them as block chords for me. Play this one on its own and these two together.
>
> Alison: [plays while Professor Peters coaches]
>
> Professor Peters: Feel the firmness of that fingertip. Now, play it the way that it is.
>
> Alison: [plays]
>
> Professor Peters: Mmhmm. The second one even more than the first. Now add in the pedal.

Alison: [plays]

Professor Peters: Good, and then the last one.

Alison: [plays]

Professor Peters: Good. That's it. Because whatever sound you finish with here, it's the start of the next one. Okay? Now, go from this one first.

Alison: [plays while Professor Peters coaches]

Professor Peters: That's it.

As mentioned, Alison expressed in the interviews that this style worked well for her by giving her concrete things to work on. It was also abundantly clear from the mindset research that learning goals are significantly more advantageous to student growth than performance goals, and the interactions between Professor Peters and Alison undoubtedly support this notion.

6.2.2 Kim

As mentioned in Kim's portrait, she highly valued grades and types of external affirmation such as positive remarks from a teacher. During her first year of university studies, she found it difficult to be surrounded by musically high-achieving peers, so for her, external stimuli was important to show her that she was making progress.

It is necessary to note the distinction between the research literature on goal types and Kim's thoughts about the matter. In the two pioneering studies on goals cited in the literature review, performance goals superseded learning goals during the activity itself.[120] Participants in those experiments sought opportunities to display a level of mastery and validate their own competence while avoiding tasks in which they might have a chance of failing (and subsequently, feeling like they would be showing others that they were actually not competent).

[120] Dweck, "Motivational Processes Affecting Learning."; Grant and Dweck, "Clarifying Achievement Goals and Their Impact."

Kim was able to compartmentalize the process from the outcome. She took her studies very seriously: “Well, I think my approach to just being more serious about music in university, just like overall changed,” and despite her sentiments regarding her lack of ability, she developed a consistent work ethic from an early age to help her equalize against the “natural talent” of others. Kim overrode her feelings of inadequacy by working routinely and diligently towards learning assessments (e.g. tests, exams, juries), and only celebrated her grades in retrospect because she felt that she was making good progress. In this scenario, backed by the research data, Kim focused solely on small learning goals throughout the process, which aligned with her seemingly mixed mindset belief system (i.e. she believed in fixed levels of talent, while simultaneously feeling that she is growth-oriented).

Kim credited Professor Mackie with facets of her learning strategy to this point in her undergraduate music program:

> She did kind of affect that I started taking notes. I would write down every little thing that she’s saying and that was super helpful, because then I’d remember everything that I was supposed to work on for the week. Sometimes she would [say] “in order to be able to play this passage successfully, you can do these particular warmups, because that will help you develop the technical skills to play the passage.” Or sometimes, she would tell me to listen to recordings, so that I would have a better understanding of the musical ideas that the composer was trying to bring out, or just hear different interpretations and choose which one you feel best fits your own musicality. In terms of performing, yeah, she gives tips. Yeah, just the idea of sitting, thinking, breathing before you play. Like, you’re kind of conducting yourself in.

Kim made this comment during the pre-interview, and this methodical approach was a noticeable aspect of Professor Mackie’s teaching throughout the lesson data as well, indicating that a one-on-one student-teacher setting can impact a student’s model of learning. Even though Kim came to university from a supportive environment throughout her youth (supportive parents and encouraging educators), it was crucial for her to continue receiving positive affirmation at this transitional stage, based on her reflections about struggling to feel like she belonged with her musically-successful peers at the post-secondary level.

In the practice sessions, Kim often made disparaging, off-hand comments about her own playing. Words and phrases such as “that was sad,” “yikes,” “dangit,” “oh boy,” and frustrated sighs were scattered throughout the videos. While these self-assessments momentarily took her away from her learning goals, she seemed to have a deeply rooted understanding of the necessary struggles inherent in skill mastery, based on how she spoke about her past experiences, and therefore, she possessed a level of resilience which allowed her to adequately cope with her frustrations and stick to the learning process itself:

> I’ll be working on page twelve first, and this is just because when I performed it live, the rhythm and the feel of it was off, so I’m just working on consistency. Especially, the turn at m. 110 [demonstrates]. Also, as well as the runs on the last line of page twelve.
>
> [2:31] I was talking about in m. 13 how it needs to be pulled out more because it’s going back into like the main idea, so I think I worked on that. And when I go back and work on m. 10, just to make sure that when the nerves hit, the notes will be in my hand.
>
> [4:39] Next, I’ll be working on the next two pages. Making sure that at m. 124-125 the pedal stays down, because I have a tendency not to. And m. 126-131, making sure that it articulates properly, and the pedal is holding down the bass note.
>
> [10:14] The next part that I’m going to work on is the *meno mosso* section and making sure that it’s more consistent in terms of tempo. And I’ll go into that from m. 56.

These clips highlight that she often spoke in forward-thinking terms regardless of the negative thoughts that she might have had about the state of her playing. Thus, she was able to filter out the distractions and simply work towards her goals in an intentional way.

In addition to the quote mentioned about her studio professor ("She did kind of affect that I started taking notes . . . "), Kim also stated in the pre-interview that Professor Mackie helped her mediate emotional and mental struggles:

> She’s very encouraging. Her entire approach is a very positive outlook so, even if I have a bad lesson—because you always have a bad lesson once in a while—her approach is “yes, like maybe you didn’t play the piece as well as you could have or prepared it as

> well as you could have this week, but these are the steps that we need to work on to improve." So, it's constantly looking forward instead of being like "this was bad."

In these moments, Professor Mackie was honest when discussing things that needed improvement, while simultaneously providing Kim with a proper plan, as illustrated in the lesson interactions:

> Professor Mackie: Good, listen to the last note. Listen for that last note. And listen for the drama of that interval. What interval does that represent?
>
> Kim: Um, is that a minor 7th?
>
> Professor Mackie: Yeah. It represents this chord: B7, which takes us to E7, and then finally takes us to A major. So, it's a lot of tension that's built up. So, we need that chord for sure. So, much better. You heard the last octave, and it did not feel dragged at all. Wherever is a good place to start. Maybe just 109 again. Pickup to 110.
>
> Kim: Okay. [plays]
>
> Professor Mackie: Do the second half of bar 113. So now do that bar. Okay? And even after the transition, this next chord can be much softer [demonstrates].
>
> Kim: Okay.
>
> Professor Mackie: One last time.
>
> Kim: [plays]
>
> Professor Mackie: If you can create a little bit more of an arrival at 154. So, you're going to really listen to the end of the bar, make a lot of crescendo and hold back just a little bit. Right going into bar 154. So, it's good. It's stable. This section is now stable. If not for tomorrow, then certainly for your jury. Taking a look at the pedaling at 146, you see how it carries—the whole first half of the bar is pedaled.
>
> Kim: Ohhhh.

Professor Mackie: And you're doing [demonstrates] that kind of pedaling.

Kim: Oh. It goes to the next chord. Should I try that?

Professor Mackie: Try that. If you can, start right there.

Kim: [plays]

Professor Mackie: Yep. And in fact, at bar 148, I would slur—make sure I got the pedal. I would re-pedal that c minor to make sure I get the slur in there. Because you're pedaling the rest of them, and it just seemed a little bit out of place. Well, pick it up at the same place and see if you can get a little bit more arrival at 154.

Kim: [plays]

Professor Mackie: Do it once more. Do it once more.

Kim: From here? From 150?

Professor Mackie: We're going to do it from here. One thing that I was noticing from the side, you use your arm and your wrist to play the first notes (especially the thumb) and some of the first beat of each group, and it's getting a little bit stuck instead of just finger. Let that lean come from the LH but not from your RH.

Kim: [plays while Professor Mackie coaches].

Professor Mackie: Right.

One of the aspects that Kim appreciated most about Professor Mackie was that she withheld her feedback on progress and instead, provided it to Kim as a reflection at the end of the year. When discussing her jury in the final interview, Kim said:

> I was satisfied. I [didn't think] "oh, I wish I did everything different." It was more [of a] "oh, in this section, I could have been a little bit better." But I think overall, I was okay with it. And it was really encouraging because my teacher sent me an email 2 days before my jury being like "yeah, you've worked hard. This is where you started and this is

> where you've come from," so it was a good reflection looking back and [thinking] "oh yeah . . . maybe you're not 100% happy with what you have right now, but you've come so far." And she was saying "yeah, you've done good." And that was very encouraging, and it's a good mindset to know that your teacher is happy and they believe in you.

Thus, Professor Mackie and Kim concentrated solely on learning goals until it was an opportune time to relish in their finished product (e.g. feeling satisfied with performance-ready repertoire at the end of an academic year).

6.3 Responses to challenges

6.3.1 Alison

Throughout the study, Alison embodied all of the qualities of an incremental theorist: she was persistent and exuded high levels of optimism, especially during enduring moments. She described her thoughts about this topic in both the interviews and practice sessions. During the lessons, Professor Peters helped her reinforce this mindset even further.

In both the pre-interview and mid-interview, Alison mentioned the need for patience; she noted that certain things simply took time to be digested fully. In the pre-interview, when asked about whether she could recall being visibly frustrated in a lesson, she said:

> Oh, I actually didn't tell [my teacher] that I'm frustrated about this part [laughs]. I just played in the lesson, and [she] found that I'm struggling at this part, and we just worked on it together. And I know that it would take time because of my technique. Because you can't rush it right? I also know that, so, I just need to be patient [laughs] . . . Teachers won't push you to achieve a certain thing right away, right? They know that it's gonna be a process. And they won't have high expectations of you like "why can't you play this? [laughs]"

In the mid-interview, Alison reiterated a similar sentiment when reflecting on particularly trying points in her first recorded practice session:

> Yeah, I remember those passages [laughs]. It's there every time. I think it's just my skill —I just need to build it over time. But at this point, I couldn't get it so I just kept practicing it, and I got a little frustrated when I couldn't get it to how I wanted it.

This mirrors some of the comments made by the growth-mindset participants in Dweck and Leggett's study,[121] in which, when faced with an unsolvable set of math problems, remarked "I did it before, I can do it again," and "I'm sure I have it now." For Alison, thinking in the long-term rather than being discouraged by the immediate obstacle was a vital strategy on her path towards musical excellence.

These positive responses were observable in the practice sessions as well. As first mentioned when discussing her framing of goals, Alison often made very kind and encouraging off-hand comments to herself after repeated attempts at a particular section of music, saying things such as "that's not bad, one more time," and "I think that's better." She also did this with an upbeat demeanour, as she would often smile and laugh in response to both successes and obstacles. Additionally, at the end of each practice session, she reflected with a realistic assessment of how she felt it went, as well as with some words for moving forward:

> Does that sound good? No [laughs]. LH here is always a challenge for me. Not technically, but it's hard to shape it and also needs to support the RH. The RH has the melody, so the RH needs to be heard. The LH can't be too soft nor can it be too loud . . . Oh, it's already a half an hour. Okay, this past half hour is quite effective. I solved things. I just need to be patient with my struggles.

In the lessons, Professor Peters expressed a tremendous amount of empathy and understanding during moments when Alison struggled. This particular vignette occurred after a number of unsuccessful attempts by Alison to achieve dynamic pacing in a section of her piece. Professor Peters worked with her by framing small, cumulative goals, which culminated in this summation:

> Professor Peters: That moment, you can be big. That . . . what your sound has here is what I want here. Okay? So, you see the reason why this has to be so soft, because that's the first time we're hearing this. The second time is only piano. And then *poco crescendo*

[121] Dweck and Leggett, "A Social-Cognitive Approach," 258.

> —*poco*, only a little bit. Then, the crescendo really goes and then really arrives there. But that's not your biggest. And then it's *sempre*, which is always. Always getting louder and louder, so how long do you have for the crescendo? If I counted from here, it's like almost a page and a little bit more. So, that's a long time. Okay? One, more time same place.
>
> Alison: It's really hard [laughs].
>
> Professor Peters: I know it's hard.
>
> Alison: [plays while Professor Peters coaches]
>
> Professor Peters: Yeah see? That's exciting!
>
> Alison: [sighs] I'm really tired [laughs].
>
> Professor Peters: It is very tiring, I know. But that was good.

Professor Peters acknowledged Alison's frustrations as valid ("I know it's hard," and "it is very tiring") while simultaneously providing her with encouragement and tangible guidance. Another example of an empathetic interaction between Professor Peters and Alison occurred in a different lesson:

> Professor Peters: Now, how about the RH play just the melody? Ignore all the sixteenths.
>
> Alison: Okay. [plays]
>
> Professor Peters: That's the idea. I know I just confused you, and your brain hurts [laughs]. So many things at the same time. You're a conductor, not a pianist. And plus, it just takes less movement too. He also wants less speed and a little bit more tranquility. So, you don't really have to rush. Just not too slow because we have *plus lent* coming after that, so it's going to be even slower.
>
> Alison: [plays]

> Professor Peters: Now the only problem is now beat two is getting an accent. You don't want beat two to become like [demonstrates]. It's still this. It's just the LH has a little bit of the [demonstrates]. Yeah, the RH remains like that.
>
> Alison: [plays]
>
> Professor Peters: It's a little better. Now try just adding in the sixteenths and see what happens.
>
> Alison: [plays]
>
> Professor Peters: That was actually really good. I really liked that. And now you see this is why we have to have it a little slower, because you have so much to do. And he allows you to take the time, so you have to take it.

In this excerpt, Professor Peters encouraged Alison with many remarks that indicated that she was moving in the right direction ("that's the idea," "it's a little better," and "that was actually really good"). She also lightened the pressures of expectation by taking some accountability for the demands that she placed on Alison ("I know I just confused you, and your brain hurts. So many things at the same time."). Professor Peters was empathetic in that she verbalized that she was aware of the difficulties in what she asked Alison to do but continued to be insistent that Alison achieve them.

One final example highlights this point:

> Professor Peters: Let's go from there again.
>
> Alison: [plays]
>
> Professor Peters: Mmhmm. And then go on.
>
> Alison: [plays and then stops] I'm too scared now [laughs]
>
> Professor Peters: Don't be scared. It's okay. Even if it's off, it's off. Just stay very close, your RH is getting less energetic. Stay really close to it. You're the one who controls them together. Focus on finger 2 in the LH.

In each of these instances, Professor Peters recognized that Alison was working through things that tested her ability, and she helped take some of the pressure off of her with supportive and warm remarks. When Alison verbalized difficulties, Professor Peters made her feel heard and fully understood that Alison was going to simply need time in order to find success. With both parties responding optimistically and in line with one another, the environment then became much more conducive to effective learning, as difficulties were framed in a positive light (Professor Peters knew that her instructions were hard, but guided Alison towards solutions so that she knew that they were possible).

Finally, in the concluding interview, Alison noted that learning about the mindset research in the mid-interview helped orient her belief system even further:

> Before, as you told me for your research, [there are] two different kinds of mindsets, and I didn't know that I was like that before. And then when you actually showed me the indicators, I thought "oh yeah, that's how I feel and that's what I'm thinking." I kind of fit myself in that category, and sometimes when I feel like frustrated or not getting the results I want right away, I will maybe step back and think about what I should do in this moment. I'm not the kind of person to get frustrated easily, like why do I feel frustrated now? [laughs]

The research data highlighted strong evidence of Alison's growth-oriented responses to challenges, as they aligned with all of the manifestations outlined in the psychological body of literature. Through the lesson interactions, it became clear that Professor Peters also played an integral role in helping Alison feel this way.

6.3.2 Kim

Kim's disposition also allowed her to effectively deal with learning obstacles. Her feelings of inadequacy did not deter her from studying music because she already possessed an unquestionable conviction in her decision to pursue her passions: "There's never been a doubt that this is what I want to do." This assuredness allowed her to overcome any short-term troubles, as she had conditioned herself to working through barriers in past experiences.

It is important to note that, as mentioned in her portrait, Kim had envisioned pursuing music education and becoming a music teacher from a very young age, rather than pursuing performance studies. In an interview, Kim mentioned that she questioned her decision to study piano as an applied instrument; the development of her pianistic abilities was secondary to honing her skills as a teacher. She mentioned that she contemplated studying another instrument at the applied level that would be much more directly applicable to her chosen career path of an elementary school teacher and band director (e.g. the saxophone, which she also studied seriously in her youth). As a result, this could have had an effect on how she internalized challenges at the piano, considering the instrument itself did not hold as much intrinsic value to her as the education degree. Progress in the applied lessons, therefore, fulfilled a degree requirement instead of representing internal motivation.

These considerations provide context to the research data: Kim verbalized, in the interviews, the necessity to work hard and was able to continue working through difficult moments in both the lessons and practice sessions (as were underscored in subsection 6.2). Her ability to navigate through problems was further highlighted by an anecdote that Kim shared about an unsuccessful public performance, which occurred shortly before her undergraduate auditions:

> In high school we had a recital [where] all the bands and all the choirs will perform but my teacher asked me to play a solo on the piano. I had been playing Chopin's Fantasie Impromptu—and I knew the piece pretty . . . inside out. I had been playing it for over two years so, I knew it really well. And before I had gone to the recital, I had just played it through, memorized it no problems whatsoever. And then I got on that stage—this is in January in Grade 12, so before university auditions started—and I played the A section and I got to the B, played like a line of the B, had a total memory slip and panicked, and I just skipped the entire B section and went right back to A. And afterwards, I felt terrible because that's the worst performance I've ever had. And my piano teacher was in the audience, so I [thought] "oh no, that was so bad." And I went home, and I was so sad. But um, strategies. I think it was . . . It was the first time I was performing in a very public setting, so I guess mentally I was not ready. So, even though I had prepared, I wasn't mentally prepared. And I think that performance really helped me get into the auditioning mindset because I [thought] "okay, that was a public performance. That went really bad.

> What can you do to make sure that doesn't happen for your university audition?" So, I guess I was more conscious. Like, being more aware when you're practicing, having more memory bookmarks throughout the pieces, and I think understanding the piece not just with muscle memory, but, [for example], harmonically, how does it all relate? So, you're understanding why you're playing the note and its relation to everything else in the music—the key and the rest of it."

Kim responded to the experience of failure by searching for better ways to solidify her pieces, similar to Dweck and Leggett's research participants who "actually taught themselves new, more sophisticated hypothesis-testing strategies over the four failure trials."[122] In turn, she felt that this actually helped her to be optimally prepared for her university auditions, so encountering and embracing an obstacle happened at an opportune time for her. When asked about how she coped with the emotions inherent in this seemingly unsuccessful public performance, she said:

> Just a lot of self-reflection. I never . . . It never made me think "oh, music is not for me. This is not what I'm supposed to be doing." But it was a lot of self-reflection in terms of how can I improve from this? How can I take this very not good experience and then make sure it doesn't happen again and turn it better? So, it was more planning for the future [thinking] "I really didn't like that. So, these are all the things that I'm going to do to improve."

Despite her beliefs about her perceived lack of talent, she still displayed a lot of the optimism and growth-oriented values that researchers argue are conducive to self-improvement. Her philosophy on the topic of incremental and entity theory was elaborated upon with an anecdote in the final interview:

> Yeah, I think going back to it, I still believe that there's . . . It's not black and white. No one ever has just a fixed or a growth . . . I think there's always room for growth. I strongly believe, yeah, if anybody works hard enough, they can achieve it.

In her elaboration of this idea, however, she seemed to believe in a baseline of natural talent that she thought should be taken into account when deciding on an eventual career path.

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[122] Dweck and Leggett, "A Social-Cognitive Approach," 258.

> But going back to interest in what someone's naturally better at, I think those also have to be taken into account. When you're trying to choose things both for yourself and for your students, if you're applying it to a music education perspective. Yeah, if . . . I don't remember if I used the math example, but I'm just going to use it again. If you do 10 hours of homework (of math homework) everyday, you will get really good at it. But if it's just not coming, and you have to work so hard for it, and you're just not interested in it, then it's [probably] not worth it to pursue that as a career path. Like, yes you should work hard in school and do well in school, but maybe don't choose that for a career path if that makes sense.

For Kim, it seemed that natural talent and interest were both synonymous concepts. Although it is only conjecture, a possible explanation for this may be that Kim believes that individuals' interests directly correlate with innate ability; however, this is confounding because it contradicts with her self-cognitions of being musically untalented yet deciding to pursue music at the post-secondary level regardless. Additionally, by Kim's other statements, she has excelled academically because of her perseverance and work ethic, so her actions also run counter to this quote. This perhaps highlights the difficulties in placing Kim in either a fixed or growth-oriented camp, although her statements align with her survey responses.

Her final musing about this clarified her initial belief that "if anybody works hard enough, they can achieve it." Because she reiterated this idea, perhaps it provides an ultimately truer depiction of her internalized perspective.

> With the growth, I strongly believe [that] yeah, if anyone really works hard at it, they will get it. But it's important to choose what you're interested in because then, everyone's going to face challenges when you're pursuing things, but if you're interested and you're dedicated towards it, then those challenges . . . you'll take those challenges and [think] "how can I improve it?" instead of taking every challenge as "oh, this is yet another thing that's not working out," and you'll be discouraged.

In sum, Kim believed that if the desire to pursue an endeavour was strong enough, then the failures along the way should help provide information that paves the path forward rather than discourage an individual away from their vocational decisions. She elaborated upon this same

point when talking about the function of educators in helping a student build their mental fortitude:

> In terms of the growth mindset, one of the categories was about obstacles and how you perceive them. Do you think of it as a brick wall that's trying to block you, or do you think of it as a challenge that you need to overcome so you can improve? And I think a good teacher will help you work through that. They'll explain [that] "yeah, maybe your piece isn't where it's at . . . like where you want it to be right now, but these are all the things that you can work on so you can improve on it." And if they phrase it in a way where it's constructive, it will inspire you to want to do better, and I think that's what a good teacher will do.

In Kim's musings, she made a clear distinction between maladaptive (impenetrable brick walls) and adaptive (temporary challenges that can be overcome) behavioural patterns, emphasizing that the perception of competence or ability has to exist in a plastic state to enable an individual the proper mindset to be willing to tackle learning challenges.

6.4 Praise

6.4.1 Alison

Because of the intersections among these four main components of mindset research (developmental stage, goal types, responses to challenges, and praise), praise has been tangentially discussed in the other subsections. Alison received a tremendous amount of support and encouragement from a number of different parties. Many adults praised her for her talent when she was growing up, and her teachers told her that she should continue studying music, as it would be a pity for somebody of her aptitude to stop. The way that Alison framed it in the interviews was to mention how they told her that she had potential. As a concept, possessing potential infers that although she may have been very capable, she would still need to invest a sufficient amount of effort to facilitate achievement. This helps to frame skill acquisition as a dynamic process, rather than as determined by some kind of genetic limitation:

> They were all so encouraging, and then I remember one said that your potential was unlimited, and I can see you accomplishing great things. And that really encouraged me, so I just keep motivating myself that way."

When asked about whether she thought it was important to tell a student that they were smart or talented, Alison responded:

> I think after they've done something well, like they've accomplished something, you definitely need to praise them, but not like out of the blue: "oh you're a smart kid." Maybe before you give them something challenging, and you believe they can do it, but it seems difficult to them. But you know they can do it; it's just to encourage them, so you can also say that I guess.

She believed that she could use these types of comments as a means for celebrating students' improvements over time, but that they should only come after the work had been completed, as a sort of affirmation of their abilities. While the research distinguishes between the effects of praising for fixed attributes (e.g. talent and ability) versus praising for malleable ones (e.g. work ethic, resilience, grit), Alison's rationale functioned in the same vein even if it reached a different conclusion. The literature also states two major considerations, however, when it comes to praise. Firstly, whenever students are praised for intelligence or talent, and they subsequently internalize this point of view, future obstacles will be much more difficult to overcome, for the simple reason that advanced skill acquisition naturally necessitates longer periods of struggle. Therefore, to praise a student in a fixed manner at all can be to their detriment, regardless of the timing of the comment. Secondly—and this somewhat counters the first consideration—Yeager and Walton[123] argued that describing mindset orientation in a heavy-handed way to a student can actually undermine their own beliefs about their level of intelligence, talent, or ability. By repeatedly telling a student that they have a great work ethic and evading a communication of any assessment of natural skill, a student may end up believing that they have to exert more effort simply because they are less able. Thus, the type and method of praise becomes extremely contextual and entirely up to the discretion of the educator.

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[123] Yeager and Walton, "Social-Psychological Interventions in Education."

According to Alison, Professor Peters' praise and affirmation came largely from her non-verbal reactions:

> Yeah, even if she [doesn't] say it straight, but she will say . . . when I manage to play something and correct my mistakes . . . like she wants me to do this and I'm able to do it the right way, I can tell. She'll seem like "oh good. You got this." She [doesn't] say it but . . . .

This was evident in the videos, as Professor Peters always responded with an excited inflection whenever Alison was able to fully execute directives. Additionally, Professor Peters often praised growth while simultaneously providing Alison with a path forward in the same thought:

> Okay good. Excellent. So, the sound is starting to open up more, so that's good. But there are some places where it can still be a little bit more. [For example], the big moments [and] these things [points to score], the sound is really good. What I'm missing now is the buildups. I feel like these parts are still a little weak, and all of a sudden, the chords come in, and you look so much more relieved that there's chords."

Professor Peters found a good balance between critiques and positive feedback, which signalled to Alison that she was making progress, but that it could still be built upon further. Over time, the reinforcement of this type of message may condition an individual towards growth-oriented thinking.

6.4.2 Kim

Kim's experience with praise was similar to Alison's; she had a supportive network that helped her achieve her goals of getting into a music education degree, from her parents who guided her growth throughout the entirety of her formative process, to her 9th grade music teacher who introduced the program to her as a possible future career. By suggesting these avenues to a student or a child, an educator or a parent essentially conveys a vote of confidence; they think the student or child possesses the capability to succeed in a given field. Kim talked about this

importance in the final interview when she noted that she would not have ultimately ended up in music if her parents and teachers discouraged her from the career path (discussed in 6.1.2).

In the same interview, Kim also told a story about a personal interaction with a police officer who experienced treatment at the opposite end of the mindset spectrum—an all-too-ubiquitous anecdote about childhood music lessons:

> I was getting a police report—like a VCS—because I was working for a music job, and you have to get those if you're working with young children. I was talking to the police officer, and he [says] "oh, you play music? I like music but I just was terrible at it, and my teacher kept telling me like not to play." And I think that's terrible. I don't think a music teacher should tell a student not to play because they're not . . . they're not in tune or they're not at the level of the rest of the band. Because what you're telling that kid is "I don't believe in you and I don't think that you're good enough to perform with this class." And so, what that kid's going to do is they're probably just going to be discouraged and not want to keep practicing and just stop [so] there goes their music education. And I think that's terrible—that's really sad. And that's very much kind of enforcing the fixed mindset idea, where if you're just not good at it, then that's it. So, I guess as a music teacher, figuring out a way to create a classroom environment where even though you have varying levels of skill, that everyone feels included in that; you make sure that your students understand that you believe in them and that if they work on it enough, they will be able to achieve the results that they want.

While unrelated to the role of praise in Kim's life, this anecdote signified the potential detriment of a fixed mindset. A possible chain of events began with the police officer's teacher negatively assessing his ability and making all sorts of critical comments. Based on Kim's re-telling of the story, the police officer subsequently internalized these sentiments and as a result, never ended up pursuing something that could have potentially brought him a lot of joy and satisfaction. Therefore, praising for malleable traits not only helps the student believe in incremental growth, but also conditions the teacher or the parent to think this way, which can have all sorts of implications for the interpersonal relationship dynamics at play.

6.5 Intervention strategies

Yeager and Walton[124] wrote that in order for a growth mindset intervention to be successful, it has to be subtle, well-timed, and recursive. An insistence or over-explanation of the mindset literature to a student could actually lead to desensitization and apathy. This strategy may be effectively highlighted by a number of instances in the lesson data. For example, framing things in ways which help the student constantly look forward was a valuable strategy to stimulate their motivation towards further growth:

> Professor Peters: Well, the top 3 systems really. After you start the piano. So, until the G#. Yes, so that's your peak. So, can we do once with the LH and RH, but give me only the quarter notes?
>
> Alison: [plays while Professor Peters coaches]
>
> Professor Peters: There's other notes after that. Yes, until you get there. And then you miss this one. We also need to hear that a little bit too. And then the other thing was that this one doesn't actually go to a *forte* right? It's only a little bit but it's not as much as the first two. And then this one actually starts from a *mezzo forte*. So, then that's even bigger than the —
>
> Alison: Oh, this is like a big crescendo.
>
> Professor Peters: Yeah, a big one. But then there's a little one inside. So, a little bit of provoking but not as much as the first few times. So, if you could just start it a little less.
>
> Alison: Ohhh.
>
> Professor Peters: Okay? One more time. Just the quarter notes.
>
> Alison: [plays]
>
> Professor Peters: Just a touch! That was already *forte*.

[124] Yeager and Walton, "Social Psychological Interventions in Education."

Alison: Oh! Okay um . . . [plays]

Professor Peters: Good. Yes. Now if you were to play just the RH alone, can you listen carefully to the sound quality when you come in with those *fortes*? Because sometimes they don't sound like they're a part of the previous three notes. Because I kind of hear them like [demonstrates while Alison nods in agreement]. So, they're a little bit separated. Try to make them a little more connected. Just the RH.

Alison: [plays]

This moment occurred in a lesson after Alison felt she was struggling with a section of music. It exemplifies the subtlety of incorporating intervention strategies. As mentioned in subsection 6.2.1, Professor Peters first provided Alison with small learning goals to accomplish, which snowballed into a larger product.

Professor Peters: It's a little better. Now try just adding in the sixteenths and see what happens.

Alison: [plays]

Professor Peters: That was actually really good. I really liked that. And now you see this is why we have to have it a little slower, because you have so much to do. And he allows you to take the time, so you have to take it. The ending of this—make sure you also bring out the A, not just the A#.

Alison: [plays]

Professor Peters: Which one is more? The A or the A#?

Alison: Mmm . . . the A#?

Professor Peters: Why?

Alison: Because it's going up. Oh, it's going into the B.

Professor Peters: Right, it's going into the B. But does he say he wants a crescendo?

Alison: Oh, I was just trying to bring out that note.

Professor Peters: Right. But you also have to bring out the A.

Alison: [plays]

Professor Peters: That's good. One last time from here, and then we're going to go on.

Alison: [plays while Professor Peters coaches]

Professor Peters: Be careful not to add the B# into your melody. It's just the E.

Alison: Oh. [plays]

Professor Peters: Yes, that's the idea. So, this whole section—the motif. If you look at the LH, after we start with the [plays], these two-note things. It continues here. And then it flips it over in the RH [demonstrates]. So, you kind of use that two-note decrescendo figure motive to tie in the whole thing.

Alison: [plays]

Professor Peters: I need to hear the G#. Don't let your finger 2 feel too much like you're on the way down. Because on the way down, it's just accompaniment, but on the way up [demonstrates]. It has a different responsibility.

Alison: [plays while Professor Peters coaches]

Professor Peters: Good. That's it.

Then, Professor Peters gave Alison agency by allowing her to explain her rationale for her decisions (e.g. "which one is more . . . and why?"), which may have empowered her to feel capable and confident in her thinking process. Additionally, Professor Peters' judgements served to positively reinforce things that Alison was doing well. She only said affirming things, such as "good" and "that's the idea," so that Alison could focus solely on what direction in which to move. This kept her forward-thinking and goal-oriented and removed her from thoughts about skill deficits.

In the same vein, the frequent choice of verbs that Professor Peters used implied malleability. For example, oftentimes she chose words like “train” and “strengthen” to talk about how Alison might approach her practicing:

> Professor Peters: Well, the main hard thing I find with this one is the evenness. Then, the second thing is to be together. Because they are so different in nature with the type of playing, so as soon as you lose the coordination, it’s gone. And then you can’t stop because it just keeps going. So, you really have to strengthen that finger 2 in the LH because that’s the one . . . you really need to train your hand—both hands—to really feel that they’re together. Um, I think it’s just I’m getting . . . I need more of [demonstrates] this kind of feel, and if you train your hand to be able to feel them together, it should always match.
>
> Alison: It’s more like one hand with ten fingers.
>
> Professor Peters: Yes! But because there’s no time to aim at which one it goes together, so you have to do it by the tactile. So, you have to train it [vocalizes] . . . Maybe train it with finger 2 with an accent.
>
> Professor Peters: It’s not your jury yet. You still have one more month. Just take it slower and really train each one. Okay?

Professor Peters implied a subtext by using these types of words: she communicated to Alison that these obstacles were possible to conquer with practice.

While Professor Mackie was predominantly encouraging, at times, she made judgements which starkly contrasted from Professor Peters’ approach and could have very easily been discouraging to Kim. In the following example, Professor Mackie only tells Kim what not to do, rather than leading her to strategies which can help frame her future practice. This may have the opposite effect of the mindset interventions, because it can place a student’s attention solely on their deficiencies and does not provide them with a clear path forward:

Professor Mackie: Be careful that the crescendo doesn't suddenly surge ahead and make you rush. Okay? It's a crescendo into *agitato*, not a crescendo into *presto*. It's coming later.

Kim: Okay. Is that entire section slightly faster?

Professor Mackie: It will be slightly faster, yeah. But you don't want to suddenly go [demonstrates].

Kim: Okay. From that transition?

Professor Mackie: Yeah. If you can just pick it up from 39, that would be great. Beginning of 39.

Kim: [plays]

Professor Mackie: Let's back up because it's sort of hard to pick up what you're trying to do. Why don't you just go back to the *a tempo*?

Kim: [plays while Professor Mackie coaches]

Professor Mackie: Okay, top of the page. And just accents. Don't overdo the accents.

In other instances, Professor Mackie provided Kim with clear and thoughtful guidance but dismissed her subsequent attempts to play these passages with "no" and "yeah, but" statements.

Professor Mackie: So, how many cadence points do you have in this section? One at bar 4 and then you have one at bar 8. And then what happens?

Kim: Um, it goes on until 16.

Professor Mackie: Yeah. So, you have the classic hip hip hooray. Two phrases of four bars, so give us the arc of those phrases. That'll also encourage you maybe to . . . make you feel like you can put out a little bit more tonal quality in your lines. So, once more and really show me when you get to those cadences [demonstrates].

Kim: [plays while Professor Mackie coaches]

Professor Mackie: No [demonstrates]. Like that kills it right? [demonstrates again] Really breathe. Do bar 3.

Kim: [plays while Professor Mackie coaches]

Professor Mackie: Yeah, but you have to keep it [demonstrates] . . . You have to keep it going because the pull of everything is really to the D in bar 7 in the bass. Why is it the D, why am I picking on the D?

Kim: Um, because it's the dominant.

Professor Mackie: Because it's the dominant. Exactly. Okay? So do the second phrase.

Kim: [plays]

Professor Mackie: No, that's too weak.

While these isolated incidences may not have actually been detrimental to Kim's self-conceptions, it is possible that individuals who receive these types of negative reactions cumulatively may fall into fixed-oriented patterns of thought. Haimovitz and Dweck discussed parents who believed that their child's failures were debilitating (fixed mindset approach) as opposed to enhancing (growth mindset approach) experiences imparted these sentiments to their child "through concerns and behaviours that are visible to children and that, in turn, shape children's own beliefs."[125] For that reason, it is valuable to consider the examples of Professor Peters' interactions with Alison as an appropriate model for eliciting growth mindset thinking.

6.6 Self-determination theory

On a related note, throughout the research data were many moments in which the teachers were successful in honing self-determination within the students. As mentioned in the literature

[125] Kyla Haimovitz and Carol S. Dweck, "What Predicts Children's Fixed and Growth Intelligence Mind-Sets? Not Their Parents' Views of Intelligence but Their Parents' Views of Failure," *Psychological Science* 27, no. 6 (2016): 867, doi: 10.1177/0956797616639727.

review, the three main components of self-determination theory are competence, relatedness, and autonomy.[126]

Competence, the desire for an individual to be effective in one's skills, and autonomy, having feelings of volition and the capacity to act on one's own choices, were both achieved through similar means. These were incorporated into lessons primarily through the teachers adopting a participatory model to learning. When they gave the students agency to respond to their questions and allowed them the opportunity to come up with their own solutions, the students appeared markedly more engaged. For example, as previously discussed, Professor Peters tasked Alison with a number of small, incremental goals, which she snowballed into larger concepts. She communicated these goals in the form of open-ended questions that guided Alison towards a particular idea and then provided Alison with time to conjure up her own answers without responding to said answers with any type of judgement. This provided Alison with a clear breakdown of the elements inherent within a musical problem, the experience of feeling frequent and regular success, and the freedom to experiment via her own hypothesis-testing methods to determine what strategies best fit her manner of thinking. This was highlighted in the first recorded lesson:

> Professor Peters: Good, okay. So, I can hear more than last time, which is great. First thing we're going to do is the *agitato* section. The last note—does it take time to go to the next bar or does it go straight into the next bar if you were to just phrase the melody itself?
>
> [waits for Alison to respond]
>
> Play the RH melody and think about it.
>
> Alison: I think go right in.
>
> Professor Peters: Go right in, right. But then when you played it together, you took some time. Yes, so now try it with the other notes.

[126] Evans, "Self-determination theory."

Alison: [plays]

Professor Peters: Good, that's better. And then this time, you also took a little bit of time right there. Was it intentional?

Alison: Yeah. Because you said to take a little bit of time to bring down the sound.

Professor Peters: Let's try to drop the sound without breaking the flow though. So, start even softer.

Professor Peters began by framing the issue with a question while providing two possible options and waited for Alison to respond. Since Alison did not feel any more certain after some time, Professor Peters asked her to play the section first as a diagnostic tool. When Alison provided an answer, Professor Peters affirmed it and then asked her a chain of related questions to help her clarify her thoughts. This example has significance because of how it alters the teacher-student dynamic—Professor Peters enabled Alison to feel a stronger sense of authority about her actions and decisions. An additional interaction reinforced this idea:

Professor Peters: Okay good. Excellent. So, the sound is starting to open up more, so that's good. But there are some places where it can still be a little bit more. Like, the big moments, like these things [points to score], the sound is really good. What I'm missing now is the buildups. Like, I feel like these parts are still a little weak, and all of a sudden the chords come in, and you look so much more relieved that there's chords. So, when you have sections like this, what are you trying to use to help you build the crescendo? We have a long way to go—we have seven bars.

Alison: Yeah.

Professor Peters: Is there anything that can sort of help you really gradually feel the expansion of sound?

Alison: Like, in terms of technique or . . . ?

Professor Peters: Like, in terms of the context. Like what's written in there.

Alison: Oh. There's a key change.

Professor Peters: Other than that. Try again, just maybe from here to here and we'll just stop right there.

Alison: Okay [plays].

Professor Peters: Okay.

Alison: Is it the top voice?

Professor Peters: Uh, what about the top voice?

Alison: So, it goes from [demonstrates]. It goes up.

Professor Peters: Good, okay. So, that opens up. What about the LH?

Alison: Mmmm.

Professor Peters: Let's say the first four bars, what happens in the LH part?

Alison: So, we have a dotted half note.

Professor Peters: Yeah, and how does the dotted half note change?

Alison: It becomes a part of the sixteenth note.

Professor Peters: How is it moving?

Alison: Oh, it goes down.

Professor Peters: It goes downwards, but then the RH is going upwards. So, you're basically opening the range.

Alison: Right.

In this example, Professor Peters introduced the topic of dynamic pacing in her initial comment. She asked Alison a number of follow-up questions and had her experiment at the piano to let her

figure out possible answers on her own before reaffirming Alison's conclusions at the end. Alison's heightened level of engagement was also confirmed by her interview response when asked about Professor Peters' teaching style and how it might differ from her previous teachers (first mentioned in subsection 6.2.1):

> Alison: She feels like more of a . . . Like when I was having a lesson with her, I feel like we were both engaged in the teaching process. She's not like a teacher, she's more like coaching me, and we work together to solve this problem. And we will actually have discussions . . . We will think of stuff together and figure things out together. I think that's pretty good.
>
> Me: Do you find that affects how motivated you feel at the end of a lesson?
>
> Alison: Yeah. I feel like "oh now I have new ways to practice this."

Relatedness, defined as the feeling of being understood and possessing a strong sense of belongingness within a greater social fabric, was achieved by the teachers through two main strategies: the choice of subject, as well as empathy in the face of obstacle. Alison articulated that Professor Peters acted more like a coach, and she felt that they solved problems collaboratively, operating on a more equal footing than exists within the conventional teacher-student authority/deference dichotomy. A further element that helped Professor Peters create a cooperative environment was her choice of subjects. In place of second-person subjects (e.g. you and me), Professor Peters would instead frame sentences using first-person plural (e.g. we) when directing Alison through an idea. This was outlined in previously quoted excerpts from their lessons, as well as in the following snippets:

> Professor Peters: Let's try to drop the sound without breaking the flow, though. So, start even softer.
>
> Professor Peters: The next thing is the beginning—can we try once much slower?

Furthermore, when discussing details of the pieces themselves, Professor Peters structured sentences by placing the composer as the primary subject:

> Professor Peters: Yeah. So [the composer] does change your context a little bit. Even with this one, the LH starts off the same way, but once we get into here [demonstrates], it does start off a little bit different. So, it's interesting to bring those out because they do change. And then the RH, even though they do ba-da ba-da, some of them have accents, some of them don't, some of them are only *pianissimo*. That's why we're talking about colour changes. Even though the idea of the motive may be the same, very slight symbol differences will give you hints that he heard it in a different way.

Both of these tactics may remove a student from thinking from a purely personal lens—the teacher communicates to the student that the learning process is a combined effort between the two parties, and that one must consider possibilities surrounding the composer's perspective as well. As a result, this may provide students with a sense of interconnectedness as they gain awareness about their role within a larger musical network.

Finally, empathetic teacher responses, which were mentioned in subsection 6.3, also seemed to help convey relatedness to each student. In the papers researching parental influence on a child's musical development,[127] the highest achieving demographic were the children who noted that they had felt most understood by their parents. The parents of these children were encouraging without piling on unnecessary pressure. Educators, by extension, may aim for a similar balance:

> Alison: Yeah, they already are not together [laughs].
>
> Professor Peters: Well, let's put it this way. You're not the only person that struggles with this part. Everyone that plays this piece, it's always about that.
>
> Alison: Is this a hard part about this piece?
>
> Professor Peters: One of them.

In one section of her étude, Alison had many difficulties making sure that her right and left hand were lined up. Professor Peters' response displayed empathy and understanding of Alison's

[127] Davidson et al., "The Role of Parental Influences."; McPherson and Davidson, "Musical Practice."

troubles and also managed to convey to Alison that she was not alone in her struggle; that this particular section of music has caused great difficulty to many other pianists as well.

Self-determination theory operates hand-in-hand with the mindset research—a growth-oriented mindset provides students with the understanding that persistent, deliberate practice elicits incremental progress, and the fulfillment of self-determination criteria enables said student to develop the intrinsic motivation to carry out long-term goals, overcome failures, and more importantly, find an inherent sense of satisfaction within the endeavour itself.

6.7 Conclusion

6.7.1 Research outcomes

This research acts as a valuable springboard for further work on learning mindsets within the musical realm, and I would like to highlight a few successes post-completion. Firstly, it is clear from the data that the words and actions of educators can have a tremendous effect on students. The connection between Prof. Peters' empathetic approach in lessons and Alison's compassionate self-talk in the practice sessions, or Prof. Mackie's more frequent use of negative feedback and Kim's disparaging self-verbalizations both evidence this notion. Therefore, I was able to provide a strong argument that knowledge about implicit theories of intelligence is pertinent to music educators since we spend a significant portion of our time working with students in a one-on-one environment.

As I had mentioned in 1.1, the mindset literature had a profound impact on my own life and significantly shaped my approach to subsequent learning endeavours. Additionally, Alison and Kim both noted that they benefitted from learning about the literature during the mid-interview. Throughout the writing process, I have shared excerpts of this document with numerous peers and it has ignited insightful discussions where many have articulated how much this research resonated with them personally and helped them make sense of their own musical experiences. Although anecdotal, I feel that this frequent mention of relatability is a highly positive outcome

as it shows that the research contains many takeaways for musicians at any stage of their musical learning.

Furthermore, although the sample size of two was limited, the data is information-rich because it highlights the complexities inherent in fully understanding the wide range of student dispositions. Alison and Kim contrasted greatly in terms of personality and self-conception, but both found academic success through commonalities of work ethic, resilience and determination. I believe that my analyses effectively navigate the intricacies of the participants' respective personalities, and that this paper will serve as a useful reference for teachers in strategizing effective methods of catering to individual needs.

Finally, one of my initial aims was to convey the multitude of ways in which the mindset framework operates in real-world scenarios, and I managed to accomplish this. I was able to translate this psychological body of knowledge to music performance in order to provide musicians with more directly relevant examples of its uses and applications. I hope that subsequent research on mindsets in music can build upon this groundwork.

6.7.2 Future research

Future research should address the challenges of my current study as well as elaborate on many of the insights in a more comprehensive fashion. First, regarding sub-question iv (“how does each student react to critical feedback from their respective studio teacher?”), a future study could contain a larger dataset in order to adequately answer all research questions and sub-questions. This insufficiency was discovered only after the research period ended and could have been resolved simply by asking the participants to further verbalize their thoughts regarding moments of critical feedback in the lessons.

Second, future research should aim to draw information from a larger sample size in order to either strengthen or challenge the interpretations presented within these case studies. It would be beneficial to investigate a much wider demographic of undergraduate music students from different socioeconomic, ethnic, geographic, and cultural backgrounds to explore possible

discrepancies in data. As well, examining the variation of mindset manifestations across genders may also be worthwhile.

Third, it could be interesting to study mindset differences within undergraduate music programs across musical genres, such as in jazz or contemporary music, to investigate possible differences from the classical music conservatory model.

Fourth, with consideration of the studies which highlight that individuals experience the most mindset divergence during adolescence, future research could also target private music students during adolescence as, anecdotally speaking, this seems to be the time when a large percentage of students decide to cease instrument learning altogether. The research within this domain could integrate several mindset intervention strategies with the aim of mitigating the level of attrition at this stage.

Fifth, it would be valuable to investigate each of the mindset elements (e.g. developmental stage, goal types, responses to challenges, and praise) in significantly more detail than was possible in these case studies. Future studies could focus on each element individually, so that experimental controls and boundaries could be more clearly defined. Furthermore, since I launched this study at the end of the academic year, it might be beneficial to explore this research during a different timeframe, for example, at the beginning of the year when repertoire would be much newer.

Sixth, as topics of mental health and well-being have entered popular discourse in recent years, it would be worthwhile to research how individuals' implicit theories of intelligence may affect their overall levels of mental health. Because music conservatories are often highly stressful and competitive environments, it might be valuable to explore how mindset intervention strategies can help students mitigate their respective levels of performance and other school-related anxieties, similar to my personal experiences in learning about this research (subsection 1.1).

Finally, future research should include interdisciplinary work with psychologists and education researchers. The main benefit of this approach would be the ability to analyze the teacher-student dynamic in one-to-one settings as opposed to investigations within a classroom, where the impacts of this relationship are more difficult to observe due to the higher student to teacher ratio. For music pedagogues, the psychologists could help further refine the experimental process

with a greater knowledge of possible psychological practices to implement, and the education researchers could bring a firm understanding of current trends in the literature in order to help shape the study's purpose in a meaningful way.

After completing these case studies, I feel that there are a few paths towards which I would want to direct my future mindset research. This particular study was intended to be exploratory in nature, so I aimed to operate with as minimal a footprint as possible. For example, interviews were open-ended, lessons were recorded with an inconspicuous camera, and the participants recorded their own practice sessions. While I provided the students with a synopsis of the mindset research during the mid-interviews, I intentionally abstained from issuing any directives to them about how to integrate these concepts into their lives. As such, in the future, I would aspire to develop a pedagogical action research study in which I would take on an active role in order to enact change. Through my current experience of analyzing this data and consolidating the psychological literature, I would be interested to explore how mediating the student-teacher dynamic with potential intervention strategies might affect the conceptions and manifestations of mindsets in both parties.

Furthermore, I would also want to operate with more specificity in future studies, such as by incorporating the interdisciplinary examples listed in a previous paragraph (e.g. more developed standardized assessment metrics and psychological research strategies). The main advantage to this approach would be in helping further substantiate my analyses with more supporting information. It would also help me answer each research question with a greater degree of exactitude.

6.7.3 Final reflections

In the aftermath of this study, there is one lesson that I feel is necessary to convey about the mindset research: it is not a substitute for effective pedagogy, nor does the literature make these claims. For instance, teachers cannot simply praise for effort as a standalone exercise and expect it to be impactful to a student. The difficult work of building student competence and eliciting

tangible progress still needs to occur. In recent years, Dweck has responded to the widespread popularization of her research and criticized poorly implemented mindset programs as ineffectual or even potentially damaging to students.[128] For example, it has been reported in the media that some teachers have gone as far as to grade students on attitude, which entirely defeats its purpose.[129] Instead, what the growth mindset research can do is function as a valuable philosophy that can guide the perspectives of the educator and learner alike. The nurturing of a growth mindset simply enables students to develop resiliency through hardship and allows them to understand that failures are necessary, and even beneficial, facets of the learning process. This acceptance can put them in a strong position to realistically assess their respective level and devise mastery-oriented strategies which can help them improve. As witnessed in the many psychological studies,[130] fixed mindset children may display helplessness in the face of obstacles and end up foregoing challenges in lieu of easier tasks that allow them to validate their own competence. As I mentioned in the opening chapter, growth-oriented thinking has enabled me to learn and explore a wide variety of interests in adulthood, many of which I unfortunately avoided in my youth due to my own negative self-conceptions. Therefore, as an educator, I believe that one of our roles is to try to remove the many psychological barriers that students often create for themselves, which ultimately limit their attainment. In the realm of music, it is a tragedy that fixed-minded perceptions of talent pervade, because the multitude of benefits that are inherent to music-making (cognitive, emotional, creative, and so forth) can be experienced independent of notions of talent or ability, and deserve to be widely accessible.

A valuable discovery I made from exploring the mindset research was the realization that it had applications beyond academic pursuits. I believe that the data has many social implications as well, and I feel that I have developed a great deal of empathy, compassion, and understanding

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[128] Tom Chivers, "A Mindset "Revolution" Sweeping Britain's Classrooms May Be Based On Shaky Science," *BuzzFeed News*, April 2, 2020, https://www.buzzfeed.com/tomchivers/what-is-your-mindset.
[129] Susanna Rustin, "New Test for 'Growth Mindset', the Theory that Anyone Who Tries Can Succeed," *The Guardian*, March 24, 2020, https://www.theguardian.com/education/2016/may/10/growth-mindset-research-uk-schools-sats.
[130] Dweck, "Motivational Processes Affecting Learning."; Dweck and Leggett, "A Social-Cognitive Approach."; Mueller and Dweck, "Praise for Intelligence Can Undermine Children's Motivation and Performance."; Grant and Dweck, "Clarifying Achievement Goals and Their Impact."; Carol S. Dweck and Daniel C. Molden, "Mindsets: Their Impact on Competence Motivation and Acquisition," in *Handbook of Competence and Motivation*, ed. Andrew J. Elliot, Carol S. Dweck, and David S. Yeager (New York: The Guilford Press, 2017), 135-54.

through approaching social interactions as learning opportunities. I feel that I have been able to have meaningful and productive conversations with others because of the inherent open-mindedness of a growth philosophy. Although only based on my anecdotal experiences, I have spent a considerable amount of time hypothesizing the most optimistic implications of incremental theory as a cultural tenet. Idealistically, I believe it could be tremendously positive to have individuals engage with one another in a growth-oriented manner and aspire to listen to and learn from other perspectives, as it would promote a collaborative spirit and create less divisiveness in tackling larger societal issues. I have certainly learned to introspect more deeply about my default behavioural patterns and am more readily able to embrace being wrong or recognize my own ignorance as an essential step towards eventual growth rather than as a negative event. It is my hope that undergoing this process of reflection can also encourage otherwise disunited individuals or parties to find common ground. As such, I will continue to implement the knowledge learned through the literature in my own personal life and teaching, and I will also continue to disseminate it with the hope that it can help others.

Appendices

Appendix A: Template Emails to Professors

Email #1 (Introduction):

Hi [Professor's Name],

My name is Michael Lee, and I'm a graduate student at the University of Toronto currently amidst my DMA in Piano Performance. I was given your email address by my doctoral advisor, Dr. Midori Koga, because I am currently in the process of gathering data for my dissertation. My research is centred around a niche of educational psychology, mainly learning mindsets, and I am looking to use these psychological concepts as a means for observing their impacts on the performance process (e.g. learning and practicing new pieces, preparing for recitals, etc.). I've attached an information sheet to this email to help summarize my topic.
Currently, I am simply looking to distribute questionnaires to second year undergraduate instrumental performance majors. The questionnaire is very brief and would only take a few minutes to complete. You can take a look at it here: [Link will be added here - I will host the survey on a server to make it easier for students to complete].

If you have any questions at all or would like to know more about the research topic, then please don't hesitate to ask.

I really appreciate your time and I am looking forward to hearing from you.

All the best,

Michael

Email #2 (Follow-Up):

Hi again,

Thank you so much for agreeing to help with my study!

There are a few things that were in the information sheet that I should reiterate, just so you are aware of all of the details prior to the study:

- There is a chance that one of your students will be selected out of the pool of questionnaire respondents to participate in a case study. No work would be required of you, but you would need to be comfortable with and consent to having six lessons recorded.

- As I am the sole researcher, the lesson data will only be seen by your student and myself.
- Anonymity is of utmost concern. You and the student will be referred to as aliases within the dissertation.

- The video footage will be stored on a password-encrypted external hard drive to ensure security. Additionally, it will be deleted upon completion and successful defense of my thesis.

I would be more than happy to answer any additional questions you might have. If everything seems satisfactory to you, then I would ask that you please distribute the questionnaire link to your second-year undergraduate performance majors, and we can take it from there.

All the best,

Michael

Appendix B: Information Brochure

Student Learning Mindsets and Their Effects on Music Practice and Performance

Introduction:

American psychologist, Carol Dweck, states that learners tend to diverge into two dichotomous theories of intelligence: entity and incremental (Chiu, Hong, and Dweck 1997). **Fixed mindset learners** hold entity theories and view their intelligence or ability as a fixed, stable unit which is incapable of growth past the individual's own genetic limitations, while **growth mindset learners** hold incremental theories and see their intelligence as dynamic objects in which their abilities are a product of effort. Dweck argues that possessing an incremental theory of intelligence is vital to developing the long-term resilience necessary to becoming truly proficient at a particular task or area since sustained effort is a key ingredient to overcoming challenging learning obstacles.

Purpose of the Research:

This study will be guided by these two main questions:

1. How can the educational psychology literature (mainly, the body of knowledge in growth and fixed mindsets) be used to observe and understand student learning within the context of private music lessons at the post-secondary level?

2. In what ways can fostering growth mindsets affect the quality of the performance process (practice efficacy, overall approach to music learning and performance outcomes)?

Participant Involvement:

I am looking for second year instrumental performance majors:

For the majority of participants, it will be as simple as filling out a preliminary survey which can be completed in a few minutes

Out of the respondents, I am hoping to select two individuals to be the focus of the case studies

For the two individuals:

I am looking to follow them through a process of preparing a piece for eventual performance.

Over the course of 6 weeks, this will include:

- Video recordings of three 30-minute practice sessions, weekly lessons, and one studio performance
- A series of interviews

Benefits of Participation:

- Learn about mindset psychology
- Opportunity to analyze and reflect upon your performance process

- All identities will be anonymized, and data will be protected and only used by me, the sole researcher in this study
- Data will be used in the publications as text transcripts of the video recordings and interviews
    - All participants will be given pseudonyms to maintain confidentiality
- All participants have the right to withdraw from the study at any point

Appendix C: Sample Growth Mindset Preliminary Survey*

Circle the response which resonates most strongly with you:

1. No matter how much talent you have, you can always change it a great deal.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

2. You can learn new things, but you cannot really change your basic level of talent.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

3. I like my work best when it makes me think hard.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

4. I like my work best when I can do it really well without too much trouble.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

5. I like work that will help me learn even if I make a lot of mistakes.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

6. I like my work best when I can do it perfectly without any mistakes.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

7. When something is hard, it just makes me want to work more on it, not less.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

8. When I work hard, it makes me feel as though I'm not very talented.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

9. I have been complimented before on being very smart.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

10. I have been praised for being a hard worker.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

11. Bad performances make me feel like I am not very talented.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

12. Bad performances help me figure out different ways that I can improve.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

13. I am more motivated when my teacher gives me lots of critiques in the lesson.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

14. I feel like I am not very good when my teacher has a lot to say.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

*adapted from Mindset Works, the mindset training organization led by Carol Dweck and Lisa Blackwell

Appendix C1: Alison's preliminary survey responses

1. No matter how much talent you have, you can always change it a great deal.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / **Somewhat Agree** / Agree / Strongly Agree

2. You can learn new things, but you cannot really change your basic level of talent.

Strongly Disagree / Disagree / Somewhat Disagree / **Neutral** / Somewhat Agree / Agree / Strongly Agree

3. I like my work best when it makes me think hard.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / **Somewhat Agree** / Agree / Strongly Agree

4. I like my work best when I can do it really well without too much trouble.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / **Agree** / Strongly Agree

5. I like work that will help me learn even if I make a lot of mistakes.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / **Agree** / Strongly Agree

6. I like my work best when I can do it perfectly without any mistakes.

Strongly Disagree / Disagree / Somewhat Disagree / **Neutral** / Somewhat Agree / Agree / Strongly Agree

7. When something is hard, it just makes me want to work more on it, not less.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / **Somewhat Agree** / Agree / Strongly Agree

8. When I work hard, it makes me feel as though I'm not very talented.

Strongly Disagree / Disagree / **Somewhat Disagree** / Neutral / Somewhat Agree / Agree / Strongly Agree

9. I have been complimented before on being very smart.

Strongly Disagree / Disagree / **Somewhat Disagree** / Neutral / Somewhat Agree / Agree / Strongly Agree

10. I have been praised for being a hard worker.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / **Somewhat Agree** / Agree / Strongly Agree

11. Bad performances make me feel like I am not very talented.

Strongly Disagree / Disagree / **Somewhat Disagree** / Neutral / Somewhat Agree / Agree / Strongly Agree

12. Bad performances help me figure out different ways that I can improve.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / **Agree** / Strongly Agree

13. I am more motivated when my teacher gives me lots of critiques in the lesson.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / **Agree** / Strongly Agree

14. I feel like I am not very good when my teacher has a lot to say.

Strongly Disagree / Disagree / **Somewhat Disagree** / Neutral / Somewhat Agree / Agree / Strongly Agree

Appendix C2: Kim's preliminary survey responses

1. No matter how much talent you have, you can always change it a great deal.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / **Somewhat Agree** / Agree / Strongly Agree

2. You can learn new things, but you cannot really change your basic level of talent.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / **Agree** / Strongly Agree

3. I like my work best when it makes me think hard.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / **Somewhat Agree** / Agree / Strongly Agree

4. I like my work best when I can do it really well without too much trouble.

Strongly Disagree / Disagree / Somewhat Disagree / **Neutral** / Somewhat Agree / Agree / Strongly Agree

5. I like work that will help me learn even if I make a lot of mistakes.

Strongly Disagree / Disagree / **Somewhat Disagree** / Neutral / Somewhat Agree / Agree / Strongly Agree

6. I like my work best when I can do it perfectly without any mistakes.

Strongly Disagree / **Disagree** / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

7. When something is hard, it just makes me want to work more on it, not less.

Strongly Disagree / Disagree / Somewhat Disagree / **Neutral** / Somewhat Agree / Agree / Strongly Agree

8. When I work hard, it makes me feel as though I'm not very talented.

Strongly Disagree / **Disagree** / Somewhat Disagree / Neutral / Somewhat Agree / Agree / Strongly Agree

9. I have been complimented before on being very smart.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / **Somewhat Agree** / Agree / Strongly Agree

10. I have been praised for being a hard worker.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / **Agree** / Strongly Agree

11. Bad performances make me feel like I am not very talented.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / **Agree** / Strongly Agree

12. Bad performances help me figure out different ways that I can improve.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / **Somewhat Agree** / Agree / Strongly Agree

13. I am more motivated when my teacher gives me lots of critiques in the lesson.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / **Somewhat Agree** / Agree / Strongly Agree

14. I feel like I am not very good when my teacher has a lot to say.

Strongly Disagree / Disagree / Somewhat Disagree / Neutral / Somewhat Agree / **Agree** / Strongly Agree

Appendix D: Consent Forms

Informed Consent for Student Learning Mindsets and Their Effects on Music Practice and Performance

Please tick the appropriate boxes	Yes	No
1. Taking part in the study		
I have read and understood the study information dated [DD/MM/YYYY], or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.	☐	☐
I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.	☐	☐
I understand that taking part in the study involves a survey questionnaire. If selected for further research, the study involves video-recorded practice sessions, private lessons, studio performances and interviews.* ***All video recordings will be transcribed as text and destroyed after the completion of the dissertation.**	☐	☐
2. Use of the information in the study		
I understand that information I provide will be used for a doctoral dissertation.	☐	☐
I understand that personal information collected about me that can identify me, such as my name or where I live, will be restricted only to the sole researcher, Michael Lee.	☐	☐
I agree that my information can be quoted in research outputs.	☐	☐
3. Future use and reuse of the information by others		
I give permission for the survey questionnaires and de-identified transcripts that I provide to be included in the doctoral thesis and deposited in ProQuest so it can be used for future research and learning.	☐	☐

4. Signatures

_____	_____	_____
Name of participant [in Capitals]	Signature	Date

I have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

_____	_____	_____
Name of researcher [in Capitals]	Signature	Date

Study contact details for further information
Principal Investigator:
Michael Lee, University of Toronto
DMA (Candidate), MMus, BMus (Hons.)
(709) 765-2818
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Doctoral Advisor:
Dr. Midori Koga
Associate Dean, Graduate Education
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If you have questions about your rights as research participants, please contact:

Research Oversight and Compliance Office - Human Research Ethics Program
416-946-3273
ethics.review@utoronto.ca

Request to Withdraw from Research Study

(*Please fill out all sections of the letter*)

Name of Principal Investigator: Michael Lee

Title of Study: Student Learning Mindsets and Their Effects on Music Practice and Performance

I, _____ want to end my participation in this study.

Name of Participant

Ending my participation means:

- I will no longer be contacted about this research study.
- Information about me, including my health information, will no longer be collected.

All data collected as part of my participation in the study will be removed from all records.

_____ _____

Signature of Participant *Date*

Appendix E: Analyses Metrics

Appendix E1: Analysis metric (growth-oriented participant)

Literature (Questions and Expectations)	Observations
Developmental Stage - Environmental considerations: was a growth mindset instilled in the student from their family, teachers or peers (both in upbringing and in current day)? - Adjustment to post-secondary life	
Goals - What goals does the teacher outline in lessons / the student outline in practice sessions? - Teacher and student focus on process goals and select performance goals (e.g. normative)	
Responses to Challenges - Displays optimism, heightened positive affect, increased levels of concentration and performance in the face of obstacles	
Praise - Teacher focuses on task rather than placing judgements on student's ability - Teacher praises for effort over ability - Family and friends were encouraging	
Self-Determination Theory (SDT) - Competence - Relatedness - Autonomy	
Lay Dispositionism - Does the participant make any attributional judgements on others? If so, how? - Growth mindset individual chooses adjectives which are dynamic and malleable	
Positive Psychology - Teacher highlights and builds upon strength(s) of student	
Other Comments	

Appendix E2: Analysis metric (fixed-oriented participant)

Literature (Questions and Expectations)	Observations
Developmental Stage - Environmental considerations: was a fixed mindset instilled in the student from their family, teachers or peers (both in upbringing and in current day)? - Adjustment to post-secondary life	
Goals - What goals does the teacher outline in lessons / the student outline in practice sessions? - Focuses on performance goals (e.g. obtaining positive outcomes like a good mark)	
Responses to Challenges - Has negative self-cognitions, an aversion to the task, boredom with problems, anxiety over performance, task-irrelevant verbalizations	
Praise - Teacher makes judgements on student's level of talent or intelligence - Family and friends were discouraging	
Lay Dispositionism - Does the participant make any attributional judgements on others? If so, how? - Fixed mindset individual chooses adjectives which are static and final	
Self-Determination Theory (SDT) - Competence - Relatedness - Autonomy	
Positive Psychology - Teacher highlights student's flaws	
Other Comments	

Appendix F: Sample Pre-Interview Questions

1. Briefly tell me about your musical background.
2. What led you to want to pursue music at the post-secondary level?
3. How have you found the adjustment from high school to post-secondary life so far? Has anything changed in how you approach the study of your instrument?
4. In relation to your instrumental study in particular, have there been any notable challenges so far in your university experience, and how have you found you've been able to manage or overcome them?
5. Did you have to switch to a new teacher at the start of your undergraduate degree?
6. How was that adjustment? Were there any challenges or difficulties in your initial interactions with this teacher? If not, what do you think helped create a smooth transition? How do you find the relationship currently?
7. Staying on the topic of teacher-student interactions, were there any particularly memorable ways that this teacher has been able to help you overcome learning obstacles? What were those obstacles?
8. Were there ever any critical comments made by this teacher which discouraged you? How did you respond? Conversely, in what ways was this teacher able to encourage you?
9. Were there ever any affirming moments with your teacher that made you realize that you want to continue down this musical path in the future?
10. Has your teacher had any effect on how you approach your practice sessions? How about on your performances? Please elaborate.

Appendix G: Sample Weekly Interview Questions

1. Reflecting on your practice sessions and lesson this week, could you elaborate on any obstacles, frustrations, and successes that you may have encountered?

2. Reviewing your video footage from this week, were there any discrepancies between what you remember feeling or thinking in a particular moment, and what you saw on camera? If so, please explain further.

3. In reflecting and reviewing this footage, has anything changed in how you think of your practice sessions or your general approach to music learning? If so, please elaborate.

4. Any additional comments, thoughts or observations that you might like to make?

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