

Harnessing Aspects of Mental Imagery to Reduce Music Performance Anxiety,
with Special Attention to Neuroplasticity, Growth Mindset, and Flow Theory.

by

Kah Yan Lee

A Research Paper Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Musical Arts

Approved September 2022 by the
Graduate Supervisory Committee:

Katherine McLin, Chair
Kay Norton
Jeffery Meyer

ARIZONA STATE UNIVERSITY

December 2022

ABSTRACT

The aim of this paper is to empower musicians with the knowledge and tools to address the challenges of music performance anxiety (MPA) with confidence and efficacy. Three evidence-based concepts will be examined, beginning with neuroplasticity, which is the brain's capacity to change both structurally and functionally. It is thus in a constant state of evolution. On the functional side, evidence demonstrates that it is possible for individuals to change the way they think in order to provide more positive outcomes in music performance. Secondly, existing literature on the cognitive side of learning and optimal performance will be examined; particularly, flow theory of Mihaly Csikszentmihalyi (1975) and Carol Dweck's mindset theory (2006). Finally, a review of sports psychology research on mental imagery will be provided. For each area of research, I will suggest strategies with which musicians may incorporate these theories in their own practice and performance in order to develop a growth mindset, alter their negative thought patterns, and overcome MPA, achieving their optimal performance level.

ACKNOWLEDGMENTS

I would like to express my deepest gratitude to my committee chair, Dr. Katherine McLin, for her encouragement, patience, and guidance throughout my doctoral degree. I would also like to thank Dr. Kay Norton and Dr. Jeffery Meyer for their feedback, wisdom, and support.

I am especially grateful to my family for their unwavering support and love throughout my life. A special thank you to my fiancée Jessica for her unyielding love, kindness, humor, and support.

TABLE OF CONTENTS

	Page
CHAPTER	
1 INSIGHTS INTO THE MIND.....	1
The Mind-Body Connection.....	1
Music Performance Anxiety.....	4
Neuroplasticity.....	10
2 MINDSET AND FLOW THEORY	14
Growth vs Fixed Mindset.....	14
Flow theory	23
3 MENTAL IMAGERY	28
Introduction.....	28
Five Functions of Imagery	30
Reappraising Anxiety.....	35
Benefits of Using Mental Imagery	37
The Bonny Method	43
4 CONCLUSION	47
REFERENCES	50

CHAPTER 1

INSIGHTS INTO THE MIND

The Mind-Body Connection

Performance anxiety is a common challenge for people who perform in front of an audience and often originates in the performer's negative thought patterns in their preparation. However, performers who are aware of these thought patterns and learn to manage them ultimately have better control over their performance anxiety, resulting in more successful and satisfying performance experiences. Psychiatrist Regina Pally explains that "schematically, emotions can be considered as a constellation of stimulus appraisals... brain and body changes that result from those appraisals, and feedback to the brain itself of those brain and body changes."¹ This shows us that the mind-body connection is an intimate one: every thought causes the body to produce chemicals that allow us to feel and/or experience what our mind was just thinking. The way we feel then triggers the mind to further develop thoughts that correspond to those feelings. Thus begins the cycle that generates what we perceive as our state of being.² Negative inner dialogue pre-performance causes the brain to perceive performing as a stressful experience, which then causes the body to respond by releasing chemicals that usually correspond to the fight-or-flight response. The fight-or-flight response is when the sympathetic nervous system³ prepares the body to deal with or escape from a perceived

¹ Regina Pally, "Emotional Processing: The Mind-Body Connection," *International Journal of Psychoanalysis* 79, no.2 (1998): 350.

² Joe Dispenza, *Evolve Your Brain: The Science of Changing Your Mind* (Deerfield Beach: Health Communications Incorporated, 2007), 43.

³ The sympathetic nervous system is part of the autonomic nervous system, which oversees regulating the involuntary functions of the body such as rate of breathing.

threat and causes the individual to experience symptoms such as an increased heart rate and respiration, dilated blood vessels in the muscles, as well as a loss of peripheral vision and auditory exclusion.⁴ These symptoms can prevent a musician from performing at their optimal level. Negative inner dialogue can mean many things, such as thoughts that diminish ability, the preoccupation with how others will perceive your performance, and/or many other thoughts that may sabotage your performance. These thoughts can also be referred to as self-handicapping.⁵ Repetition of negative thought patterns ingrain destructive physical responses from the body, making this toxic cycle feel automatic and uncontrollable and causing more stress physically and mentally.

Self-handicapping thoughts should be intercepted as soon as possible through awareness and counteracted by recentering one's mind on the present. Shifting our perspective on the ways we approach performing will greatly help with the journey of effectively combating music performance anxiety. For example, instead of focusing on how others will judge our performance, what if we tried to see ourselves from the audience's perspective? Think about why people attend concerts and what they value in a performance. Do these principles guide how you approach performing? It is helpful to remember that the people in the audience are there to enjoy the music and share in a communal experience with the performer as well as other audience members. Reminding ourselves that performing is the way in which we can share the joy and love of music with people can help break the cycle of apprehension tied in with performing.

⁴ Dianna Kenny, *The Psychology of Music Performance Anxiety*, (New York: Oxford University Press Inc., 2011), 19; Dispenza, *Evolve Your Brain: The Science of Changing Your Mind*, 98.

⁵ Katie Zhukov, "Current Approaches for Management of Music Performance Anxiety: An Introductory Overview," *Medical Problems of Performing Artists* 34, no.1 (March 2019): 56, <https://doi.org/10.21091/mppa.2019.1008>

Neurological researcher Joe Dispenza explains that “your body is your unconscious mind. It does not know the difference between the actual experience in reality that produces the emotion and the emotion that you fabricate by thought alone.”⁶ This is further supported by neuroscientists Nadine Dijkstra, Matan Mazora, Peter Kok, and Stephen Fleming, who write that “imagery and perception activate similar neural codes in sensory areas, suggesting that they might sometimes be confused.”⁷ Essentially, the body cannot differentiate between fear that is perceived on stage, and fear when being confronted with true threat. The body goes into fight-or-flight mode and we experience physiological symptoms such as shaky hands, stiff fingers, and increased heart rate. What once was beneficial and necessary for survival (preparing to confront danger) is now a response that is no longer appropriate for the situation. Repeated negative self-talk in practicing and performing eventually trains our bodies to automatically respond to performing with fear, creating a destructive and continuous cycle.

Reducing music performance anxiety, henceforth referred to as MPA, requires a rewiring of thought patterns that have been ingrained in our minds over many years. Although it may take months or even longer to change our thought patterns, the evidence is clear that it is a feasible and effective way to counter MPA. If we can better control the way our mind conceptualizes performing, we have more control over the way our body responds. It should be noted and emphasized that being mentally ready for a performance is only one part of the story. A musician’s response to cognitive anxiety depends on the

⁶ Joe Dispenza, “Three Brains: Thinking to Doing to Being,” filmed April 2012 at TEDx Tacoma, Tacoma, WA. Video, 08:54, https://www.youtube.com/watch?v=8l2nvTv9_Xw

⁷ Nadine Dijkstra, Matan Mazora, Peter Kok, and Stephen Fleming, “Mistaking Imagination for Reality: Congruent Mental Imagery Leads to More Liberal Perceptual Detection,” *Cognition* 212, (2021), <https://doi.org/10.1016/j.cognition.2021.104719>

musician's perception of their skill level as well as the probability of succeeding in the performance.⁸ Thus, it can be said that MPA can be successfully reduced only if there is enough physical and mental preparation leading up to the performance. Though thorough preparation of both kinds is crucial, only the tools to assist with mental preparation for performances will be discussed in this paper.

Music Performance Anxiety

To better deal with MPA, the first step is to gain a clearer understanding of what it is, how it arises, and the role our minds play in the generation of MPA. According to sport psychologist Lew Hardy, the two components of performance anxiety are cognitive anxiety and somatic anxiety.⁹ Cognitive anxiety arises when one thinks negative thoughts about oneself and/or the consequences of the outcome of the performance (such as judgment from the audience if the musician plays poorly). Somatic anxiety is the physiological response (such as sweaty hands, cold feet, tense back) that arises from psychological stress. Dianna Kenny, a psychologist and psychotherapist, agrees with Hardy and further describes anxiety as a “cognitive process in which the danger of a situation is misinterpreted or exaggerated,” which in turn triggers an inappropriate motor, physiological or affective response.¹⁰ This is supported by several theories purporting that anxiety is based on emotional responses, which are examined in her research.

⁸ Lew Hardy, “Stress, Anxiety and Performance,” *Journal of Science and Medicine in Sport* 2, no.3 (1999): 230, [https://doi.org/10.1016/S1440-2440\(99\)80175-3](https://doi.org/10.1016/S1440-2440(99)80175-3)

⁹ *Ibid*, 227.

¹⁰ Dianna Kenny, “The Role of Negative Emotions in Performance Anxiety,” in *Handbook of Music and Emotion: Theory, Research, Applications*, ed. Patrik N. Juslin and John A. Sloboda, (Oxford University Press, New York, 2010), 426.

One of these theories is neuroscientist Elizabeth Phelps's concept of emotional learning, whereby a "stimulus acquires emotional properties."¹¹ For musicians, this is when the idea of music performance evokes fear responses. There are three ways in which a neutral stimulus can get paired with a certain emotion (in this case, fear): classical fear conditioning, instructed fear, and observational fear. Classical fear conditioning is when a neutral stimulus is introduced with an aversive event. Over time, one starts to associate the neutral stimuli with the expectation of something unpleasant, causing the neutral stimulus to elicit a fear response in the body.¹² David Barlow, a psychologist known for his research on anxiety disorders, labels situations that elicit fear responses with an absence of real danger as "false alarms."¹³ Classical fear conditioning can be developed with "false alarms." Barlow explains:

Clinicians are familiar with one of the most common types of specific phobias, 'fear' of flying. It is the rare individual who reports developing a 'fear' of flying after crashing in an airplane...The more common situation is that an individual who may have flown successfully for years suddenly develops an incapacitating 'fear' of flying. Often such people will report, when pressed, that they are afraid some catastrophe will occur or that the plane will crash. What they really seem to 'fear' is the possibility of having another panic attack...The majority of these individuals with specific phobias, social phobia, and agoraphobia, reported

¹¹ Elizabeth Phelps, "Emotion and Cognition: Insights from Studies of the Human Amygdala," *Annual Review of Psychology* 57, (2006): 29, <https://doi.org/10.1146/annurev.psych.56.091103.070234>

¹² Ibid, 29.

¹³ David Barlow, "True Alarms, False Alarms, and Learned (Conditioned) Anxiety: The Origins of Panic and Phobia," in *Anxiety and Its Disorders*, ed. David H. Barlow (New York: Guilford Publications, 2002), 220.

experiencing an intense, overwhelming false alarm in situations or contexts that subsequently became “phobic” for these individuals. It was the false alarm, rather than a realistic traumatic event, that seemed implicated in their ‘conditioning.’¹⁴

False alarms become strongly associated with the situation that first caused the fear. Future anxiety arises with the fear of the situation possibly causing the provocation of another false alarm. The fear of having another false alarm in a similar situation further exacerbates the feeling of fear and anxiety and the associated situation becomes paired with false alarms, resulting in learned (conditioned) anxiety.¹⁵

For musicians, the first instance of a false alarm can occur in any number of situations. For example, when walking on stage for a performance, a thought may flicker through a performer’s mind reminding them that their family members are in the audience. The performer might then think about how their family members will view their performance, with pride if it goes well and with disappointment if it doesn’t. The musician then thinks about the embarrassment that would ensue should the musician perform poorly on stage. What would their friends think? What would their professor think? How will their parents react? The fear of the performance going horribly wrong completely paralyzes the musician, rendering them unable to perform at an optimal level. If the musician doesn’t try to stop the cycle of these intrusive and unhelpful thoughts before performances, these thoughts will continue to arise and hinder every performance. Likewise, the longer a musician continues to perform in this negative environment, the stronger the false alarm reaction to performing will become.

¹⁴ Barlow, “True Alarms, False Alarms, and Learned (Conditioned) Anxiety: The Origins of Panic and Phobia,” 241.

¹⁵ Ibid, 244.

It is important for musicians to notice when negative thought cycles happen in order to redirect these thoughts to more beneficial ones and rewire the brain. Don Greene, a peak performance psychologist, talks about ways to improve self-talk in his book *Performance Success* (2002). One of the methods Dr. Greene mentions is by thinking of positive statements that indicate the outcome you want.¹⁶ For example, instead of thinking to yourself “don’t mess up that shift in the 2nd bar of *Don Juan*,” think “slightly release the finger before that shift in the 2nd bar of *Don Juan* so that you are able to shift quickly and efficiently.” Greene explains that positive commands work better than negative ones because the subconscious does not hear the word “don’t.”¹⁷ We can test out this theory by saying to ourselves “don’t think of a pink elephant running on a blue ball.” What popped into your mind as you read that sentence? Thinking in positive statements reduces the likelihood of getting caught in negative thought cycles because you are no longer thinking of the worst-case scenarios.

A technique I often use to help notice negative thoughts is by labeling my thoughts, which helps create space between me and my thoughts. By creating this space, I can better notice the thoughts, take note of them, and let the thoughts drift away. Labeling a thought helps diffuse the emotions tied to it,¹⁸ which allows me to be aware of the thought and release it, as opposed to being emotionally swept away by them. For example: When I find myself feeling overwhelmed by the amount of work I must do, and thoughts about giving up start to arise, I say to myself “Right now, I am feeling

¹⁶ Don Greene, “The Seven Essential Skills for Optimal Performance,” in *Performance Success*, (New York: Routledge, 2002), 49.

¹⁷ Ibid, 49.

¹⁸ Lea Winerman, “Talking the Pain Away,” *Monitor on Psychology* 37, no.9 (2006), <https://www.apa.org/monitor/oct06/talking.html>

overwhelmed because I have five more tasks to do, and the deadline is tomorrow.” After saying this to myself, I follow up by proposing a way to handle the situation – usually by writing down all the tasks I *will* do and allot the necessary time for each task. Doing this helps me focus on the tasks at hand as opposed to the stress of missing the deadline.

Instructed fear is done through listening to the ways people talk about an aversive emotion that is associated with the stimulus. Even if one did not directly experience the aversive event, overhearing other people talk about the experience is enough to start pairing the stimulus with the emotion.¹⁹ Observational fear is when the fear of a stimulus is learned through observing the reaction of others.²⁰ Both observational and instructed fear develop through social rather than experiential means, and develops MPA through external influences. It is possible we inherit this fear when we see the way other people act before they go on stage for a performance or talk about their own performance anxieties. When we perform for an audience, our lives are never truly in danger, nothing in our surroundings poses a threat, and yet we approach performance with fear due to the aversive effects we predict might occur from a bad performance.

Psychologist Jim Lazarus’s cognitive-motivational theory that anxiety arises from one’s perception of their situation is similar to both Barlow and Kenny’s in that the stimulus alone is not sufficient to create the fear that we feel, but rather it is the way in which we process that stimulus that creates fear.²¹ However, Lazarus’s theory posits two parts to the appraisal of the situation: the primary appraisal, in which the situation is appraised based on importance, and the secondary appraisal, wherein the performer

¹⁹ Phelps, “Emotion and Cognition: Insights from Studies of the Human Amygdala,” 31.

²⁰ Ibid, 32.

²¹ Kenny, “The Role of Negative Emotions in Performance Anxiety,” 434.

assesses their capacity to cope with the situation. Performances and auditions are usually of high importance to every musician, but the belief in their ability to cope with the situation determines if they perceive it as a challenge or a threat. High importance and high coping skills lead to approaching the situation as a challenge, but high importance and low coping skills leads to approaching it as a threat.²²

Performing as an action does not elicit the state of anxiety, but our perception of being judged by the audience about performing poorly, combined with low coping skills often causes our body to react to this perceived threat. This is known as anxious apprehension, a core component of anxiety, and it arises when a person perceives a future situation with a feeling of helplessness accompanied by the perception of their inability to cope with that situation.²³ This apprehension then initiates physiological arousal which can manifest in various ways, such as stiff fingers or sweaty hands, which profoundly affect a musician's success in executing technical passages. Kenny explains that a large contributor to the experience of MPA is the inability to separate self-efficacy from self-esteem.²⁴ In other words, the thought that failure in one's musical career directly translates to failure as a person troubles the performer.

Anxious apprehension not only manifests as emotions felt in the body but can also influence the cognitive processes of the mind. This could mean a narrowing or focusing of attentiveness to mood-congruent cues such as fixating on the elevated rate of breathing when you are under stress or having interpretive bias that causes one to view vague

²² Claudia Spahn, Franziska Krampe, and Manfred Nusseck, "Classifying Different Types of Music Performance Anxiety," *Frontiers in Psychology* 12, no. 538535 (April 2021): 2, <https://doi.org/10.3389/fpsyg.2021.538535>

²³ Kenny, "The Role of Negative Emotions in Performance Anxiety," 427.

²⁴ *Ibid*, 433.

situations as threatening.²⁵ Such a response is evident when a person looks out into the neutral faces of the audience and assumes that everyone is silently judging. For most performers, the fear of being judged is usually greatly exacerbated in their minds. Negative self-evaluation and the feeling of uncontrollability further perpetuates this vicious cycle of having negative thoughts that cause negative feelings, which in turn causes more negative thoughts.

As discussed earlier in this chapter, one strategy to help separate self-efficacy from self-esteem in music making and combat negative self-evaluation is to focus on what the musician wants the audience to experience and gain from their performance. Performing is an act of sharing with the listeners and should be remembered first and foremost as a way of spreading the love and joy of music. Through framing performance in this way, the musician can practice gratitude for having the opportunity to create such a meaningful environment. Through repetition of this gratitude practice, the musician will no longer view performances through a self-centered lens.

Neuroplasticity

Habits of the mind become structures of the brain.

- Noreen Herzfeld, *Your Cell Will Teach You Everything*

What begins as a neutral stimulus will become, when repeatedly paired with negative emotions over time, a negative stimulus as a result of neuroplasticity. Neuroplasticity refers to the flexibility of the brain to adapt and learn from experiences

²⁵ Kenny, "The Role of Negative Emotions in Performance Anxiety," 427.

through the reorganization of its synaptic wiring for the most optimal behavior.²⁶ Neuroplasticity serves a clear evolutionary purpose: by mapping appropriate responses, the body is primed to face life-threatening events. However, in the case of MPA, we have trained our minds to associate performance with threat, causing our bodies to have suboptimal reactions. When we encounter new information, the cells in our brains (neurons) fire signals to other neurons, forming new connections and pathways. Repeated exposure to the new information creates stronger and more efficient connections through the building up of the myelin sheath. Myelin is the protective coating and conductor of signals for a neuron, and the thicker the sheath, the more efficiently neurons are transmitted.²⁷ With repetition, the myelin structure thickens, and a learning pattern is thus transformed into a habitual behavior.²⁸

For example, when we first learn a new passage on a stringed instrument, the movements in our left hand might feel clumsy and the bow changes with our right arm are choppy. As we further practice and map out the movements in our left and right hands, neuronal connections start to strengthen. After a while, playing the passage no longer takes as much conscious effort and can almost feel automatic.

In neuroscience, this theory of learning is known as Hebbian learning and was introduced by psychologist Donald Hebb, who famously said “Neurons that fire together,

²⁶ Frederico Lourenco, and B. J. Casey, “Adjusting Behavior to Changing Environmental Demands with Development,” *Neuroscience and Biobehavioral Reviews* 37, no. 9 (November 2013): 2233. <https://doi.org/10.1016/j.neubiorev.2013.03.003>

²⁷ Jill Williamson and David Lyons, “Myelin Dynamics Throughout Life: An Ever-Changing Landscape?” *Frontiers in Cellular Neuroscience* 12 (2018), <https://www.frontiersin.org/articles/10.3389/fncel.2018.00424>

²⁸ Ibid.

wire together.”²⁹ Our thoughts shape who we are;³⁰ if we repeat a thought enough times, it is eventually so ingrained in our minds that it becomes second nature. Because of this, musicians should be aware of their inner dialogue about matters relating to playing the instrument, whether it be about auditions, performances, or practicing. It should come as no surprise that having an anxious mind in the practice room translates to an anxious mind on stage, which is why the saying “practice makes permanence,” is more accurate than “practice makes perfect.” The good news is that if we can map out new thought patterns into our brain, we also have the ability to undo negative thought patterns and form new, healthier patterns. Repeating a debilitating thought parallels repeating a bad habit in the practice room (such as practicing a passage with a wrong note). Neither situation improves the overall level of the musician’s performance; rather, the negative aspect becomes more ingrained in the mind with each repetition, making it much more difficult to unlearn later on.

When we stop using a thought pattern, the connection between neurons in the neural pathway that form that thought pattern start to deteriorate over time in a process called “synaptic pruning.”³¹ Conversely, the connection between neurons in an active thought pattern get stronger the more we use it. Over the years, many negative thought patterns may have been instilled in our minds, making it is easy to give into them and allowing them to dominate our mind. However, being disciplined and adamant about

²⁹ Dispenza, *Evolve Your Brain: The Science of Changing Your Mind*, 49.

³⁰ Noreen Herzfeld, “Your Cell Will Teach You Everything: Old Wisdom, Modern Science, and the Art of Attention,” *Buddhist-Christian Studies* 29 (2009): 86, <http://www.jstor.org/stable/40864807>

³¹ Anil Bajnah, “Neuronal Plasticity: How Your Thoughts Literally Shape Your Brain,” *Institute for Human Optimization*, September 21, 2020, <https://ifho.org/neuronal-plasticity-how-your-thoughts-literally-shape-your-brain/>

noticing these negative thought patterns and actively replacing them with more beneficial ones causes the neuronal connections associated with the negative thought pattern to weaken while strengthening the neural connections of the beneficial thought patterns. Synaptic pruning and myelination provide physiological evidence that musicians can change the way they approach music performance and form thought patterns that are beneficial rather than detrimental to their well-being.

Awareness is the key to successful synaptic pruning and myelination. By noticing when a debilitating thought arises, you can take steps that take advantage of these principles in order to replace negative thought patterns with more beneficial ones. Instead of worrying about debilitating nerves sabotaging your next performance, try naming that thought as intrusive, taking a deep breath, bringing yourself back to the present moment, and imagining yourself walking on stage feeling completely relaxed and confident. Every time you notice negative thought patterns instilling worry into your mind, and replace them with deep breaths, you take a step toward eliminating MPA, creating positivity in your performance, and achieving your desired outcome. Following these simple steps have helped me turn a practice session from one filled with fear and dread to one filled with motivation. Initially, being able to pause and notice these hindering thoughts will be difficult, but with practice and persistence, the neurons connecting performance and fear start to deteriorate.

CHAPTER 2

MINDSET AND FLOW THEORY

Growth vs Fixed Mindset

Background

Carol Dweck's concept of fixed vs. growth mindset, presented in *Mindset: The New Psychology of Success*, explains that the individual's conception of ability, whether ability is something that is a fixed capacity versus one that can change and improve with practice, affects the rate of learning as well as motivation to practice.³² Dweck poses a few statements to help readers assess if they have a growth or fixed mindset.³³ (It should be noted that the word "intelligence" used by Dweck in the statements below refer to one's ability):

1. Your intelligence is something very basic about you that you can't change very much
2. You can learn new things, but you can't really change how intelligent you are
3. No matter how much intelligence you have you can always change it quite a bit
4. You can always substantially change how intelligent you are

Take a moment to look over these statements, decide which ones you agree with, and find out which mindset you lean toward! Statements one and two reflect a fixed mindset ideology and statements three and four reflect a growth mindset ideology; musicians can adapt these questions to describe artistic ability and talent.

³² Gabriele Wulf and Rebecca Lewthwaite, "Optimizing Performance Through Intrinsic Motivation and Attention for Learning: The OPTIMAL Theory of Motor Learning," *Psychonomic Bulletin & Review* 23, (2016): 1388, <https://doi.org/10.3758/s13423-015-0999-9>

³³ Carol Dweck, *Mindset: The New Psychology of Success* (New York: Random House, 2006), 12.

An individual's belief about the malleability of their intelligence and ability affects their behavior, from the kind of goals they pursue, to the way they interpret feedback.³⁴ Musicians with a fixed mindset might be more concerned with proving their abilities and feel threatened by negative feedback as it reveals a lack of ability.³⁵ Fixed-mindset musicians tend to pursue performance goals that showcase their ability but are more hesitant to pursue challenging goals that reveal low ability. These musicians may also view effort as a negative trait,³⁶ connecting effort with low ability and having thoughts such as "If I were a good musician, I wouldn't have to practice much." However, people with a growth mindset – who believe that abilities are improved and changeable over time and practice – are usually more concerned with learning and improving with each task. Musicians with growth mindsets also see failures as important experiences from which to learn.

In the eyes of growth-mindset musicians, setbacks provide a learning opportunity to reflect on what can be improved on for the future, which encourages persistence to improve in the face of failure. However, fixed-mindset musicians believe that challenges merely showcase their lack of ability and weaknesses and curtail persistence.³⁷ In the section on neuroplasticity, I discussed the brain's ability to continuously adapt and change as we grow older. In this chapter, we will examine research on the way musicians can develop and cultivate a growth mindset.

³⁴ Carol Dweck, *Mindset: The New Psychology of Success*, 245.

³⁵ Wulf, and Lewthwaite, "Optimizing Performance Through Intrinsic Motivation and Attention for Learning: The OPTIMAL Theory of Motor Learning," 1389.

³⁶ Carol Dweck, and David S Yeager, "Mindsets: A View From Two Eras," *Perspectives on Psychological Science* 14, no. 3 (February 2019): 484, <https://doi.org/10.1177/1745691618804166>

³⁷ Dweck, and Yeager, "Mindsets: A View From Two Eras," 484.

Interventions used to promote growth-mindset in individuals highly utilize the brain's neuroplasticity with its consistent use of the metaphor that "the brain is like a muscle" – it makes new connections and gets stronger when one shows resilience in the face of difficulty and overcomes challenges.³⁸

Brief History of Mindset Theory

The inception of mindset theory stemmed from two other hypotheses published in research studies: attribution theory (1958) and achievement goal theory (1988). Attribution theory proposed that the way people explained the causes for their setbacks and successes highly influenced their response to the situation.³⁹ If the setback was viewed as something that could not be controlled by the individual, there would be less motivation to work towards overcoming that setback. However, if the individual felt as though they had more control over the successes or failures in their life and believed they possess the capability to do better next time, they would be more determined to work towards overcoming the setback. For example, after a disappointing performance on stage, Musician A blames lack of innate ability to play the piece as a reason for the mistakes made on stage. By believing in the static nature of their ability, Musician A does not take responsibility for the events that transpired and responds by playing pieces that are not as challenging in the future, explaining that the disappointing performance was due to the piece being too difficult. On the other hand, Musician B believes that

³⁸ Cameron Hecht, David Yeager, Carol Dweck, and Mary Murphy, "Beliefs, Affordances, and Adolescent Development: Lessons from a Decade of Growth Mindset Interventions," in *Advances in Child Development and Behavior* 61, (2021): 178, <https://doi.org/10.1016/bs.acdb.2021.04.004>

³⁹ David Yeager and Carol Dweck, "What Can be Learned from Growth Mindset Controversies?" *American Psychologist* 75, no. 9 (12, 2020): 1271, <https://doi.org/10.1037/amp0000794>

persistent practicing will help them perform this piece better in the future. Musician B acknowledges the setback on stage but identifies problematic passages to work on and strategizes a practice routine to help minimize the chances of making the same mistakes in the future.

Both of these musicians are responding to the event in very different ways: Musician A walks away with the mentality that the piece is just too challenging to play, and Musician B walks away with ideas and plans on how to improve their ability in order to meet the technical requirements for the piece. These two mentalities showcase the belief the musicians have about their self-efficacy and ability to overcome obstacles, as well as affect how they will respond to future performances. Musician B is determined to improve their ability by continuing to push the boundaries of their technical capability and Musician A is more determined to find a piece better suited to their current ability.

Achievement goal theory was developed mainly to answer the question of why individuals with similar abilities respond and interpret events differently, causing them to display different responses to setbacks.⁴⁰ Achievement goal theory proposes that individuals who aspire to advance their ability (known as *learning goals*) are more relentless in overcoming setbacks compared to individuals who have goals of proving their abilities (known as *performance goals*). Individuals with performance goals tend to develop challenge-avoidant behaviors due to the fear of revealing incompetence and respond to setbacks with a feeling of helplessness.⁴¹ In light of attribution and

⁴⁰ Yeager and Dweck, "What Can be Learned from Growth Mindset Controversies?" 1271.

⁴¹ Ibid, 1271.

achievement theories, the concept of mindset theory may be viewed as the way in which individuals respond to setbacks and challenges. This in turn affects their behavior, in particular the kind of challenges and risks they are willing to undertake.

How Are Mindsets Developed?

There are four distinct categories that can determine the development of a fixed or growth mindset in adolescents and toddlers: Value placed on student learning and development; explicit messaging about progress and success; opportunities for practice and feedback; and response to student challenge, struggle, and poor performance.⁴²

These categories contribute to creating an environment in which the individual learns, and are critical in the development of their learning mindset. An environment is an *affording* environment if it provides support for a growth mindset and an *undermining* environment if it does not.⁴³

Musicians looking to reduce MPA should adapt these concepts to their practice and performance in order to create an *affording* environment for learning. When a musician practices, they serve as both teacher and student. With only one hour a week of lessons with a professor (or none, if not in school), the great majority of improvement and growth takes place in the practice room by oneself. The things we say to ourselves in the practice room can deeply affect the way we feel about playing our instruments. By being aware of the kinds of feedback we are providing ourselves, we can ensure we

⁴² Hecht, Yeager, Dweck, and Murphy, "Beliefs, Affordances, and Adolescent Development: Lessons from a Decade of Growth Mindset Interventions," 186.

⁴³ Ibid, 186.

are giving our student-selves the space and time to develop a growth mindset. Let us take a closer look at the categories that promote a growth mindset:

1. Value placed on student learning and development

The crux of a growth mindset is the belief that everyone has the potential to learn and get better over time, regardless of where they start out. During practice sessions, if you find yourself becoming frustrated over a challenging section, take a moment to put your instrument down and say to yourself: “I might not be able to play this *yet*, but I will be able to play this eventually.” Saying the word “yet” is crucial when promoting a growth mindset because it alludes to the eventual acquisition of something. In contrast, the words “cannot” and “can” place a limit on the potential of the student.

2. Explicit messaging about progress and success

If the individual is praised on improvement over time, there is a higher chance of developing a growth mindset due to recognition of the benefits of the process, i.e., incremental improvements over time on what they’ve learned. If an individual measures their success by the outcome of a performance however, the focus narrows to the one event, which determines if the individual was successful at learning and presenting all the material. Therefore, promoting progress over outcome helps to create an affording environment which in turn supports the development of a growth mindset.

3. Opportunities for practice and feedback

The feedback that we provide ourselves is shown to be an effective tool in promoting a growth mindset.⁴⁴ There are two ways to provide feedback: summative and formative feedback.⁴⁵ Summative feedback provides feedback at the end of a unit or at the culmination of a section, an example being feedback on a final performance, or a grade provided for music juries. Formative feedback is provided more frequently throughout the practice process and discusses responses to the progress made and what can be improved, as well as provides strategies to help achieve their goal. There are three main parts to formative feedback; help the individual identify where they are, talk about where they want to be, and provide ways to bridge the gap. During practice sessions, the feedback a musician provides themselves should both acknowledge the improvements made in addition to what they would like to improve upon.

4. Response to student challenge, struggle, and poor performance

We can use formative feedback to help aid the development of a growth mindset toward challenges, struggles, and poor performance. To be more successful in performing, each performance should be viewed not as a culminating experience but as a learning opportunity about what can be done better in future performances. After each performance, you can watch the recording of your performance and provide feedback using the three parts of formative feedback we discussed earlier. Identify the areas you would like to improve upon and take

⁴⁴ More resources for promoting student engagement, learning, and agency can be found on <https://www.perts.net/resources>

⁴⁵ “Assessments for Learning Encourage a Growth Mindset,” MindsetKit, accessed 26 May, 2022, <https://www.mindsetkit.org/topics/assessments-growth-mindset-math/assessments-for-learning-encourage-growth-mindset>

note of it for future practice sessions and performances. Always remember that “mistakes give us a chance to improve our understanding.”⁴⁶

In developing a growth mindset, the key is to view practice sessions and performances on an equal level. With the large accessibility of recording devices, I would highly recommend musicians to record their practice sessions. If it brings up uneasy feelings in the musician, all the more reason to do it! Recording practice sessions can bring up feelings similar to those caused by performing in front of an audience due to the increase in arousal levels; the musician wants to get a good recording, mirroring how they would want to give a good performance. There are multiple benefits to recording a practice session, such as the ability for the musician to get used to an elevated arousal level and figure out ways to deal with it. But more importantly, it provides the musician the opportunity to listen back to the recording and provide formative feedback from their teaching-selves to their student-selves.

By recording practice sessions, the musician has an opportunity to create an affording environment in all four categories that help promote a growth mindset. The act of recording provides *opportunities for practice and feedback* because the musician will be able to immediately hear what they sound like. The musician is able to place *value on learning and development* by keeping track of their improvements every day as well as keeping track of the sections that they would like to improve upon. Through the practice of reflecting every day on the things they did, and what they would like to do better, they are *explicitly sending a message about progress and success*. Listening to

⁴⁶ Hecht, Yeager, Dweck, and Murphy, “Beliefs, Affordances, and Adolescent Development: Lessons from a Decade of Growth Mindset Interventions,” 187.

recordings also provides an affording environment for *responding to challenges and setbacks* because the musician will be able to take note of this challenge and work on it in the next practice session, as well as look back on past challenges that they've overcome in their practice sessions.

These recordings should be considered invaluable learning tools, as they provide ways for the individual to track progress as well as place value on learning and development. Providing formative feedback to oneself also promotes active engagement as the individual needs to identify problematic areas, think about how they would like to sound, and pursue solutions in practicing to overcome the technical difficulty. It is helpful to write down the feedback in as clear and concise a manner as possible to avoid ambiguity and clarify their thoughts.

When I record my practice sessions, I find it easier to provide formative feedback for the recordings when I pretend that the recording was made by someone else. That way, I don't take the mistakes as personally and can provide more honest feedback. Being able to honestly listen to mistakes and not take it personally also helps detach self-esteem from self-efficacy, which can lead to a reduction of anxiety felt in relation to music performance.⁴⁷ The ability to provide critical feedback to oneself and see progress during practice sessions will also increase self-efficacy levels, which reduces the feeling of MPA. If you are new to recording your practice sessions, or even if you are recording a practice session of a new piece, I would recommend recording a shorter snippet of a challenging section: no more than thirty seconds. There is a high chance that you will jot down plenty of comments on problematic areas that you would

⁴⁷ Kenny, "The Role of Negative Emotions in Performance Anxiety," 433.

like to focus your attention on, and the longer the recording, the more notes you will have. If there are too many notes, the possibility of getting overwhelmed and discouraged is high. Therefore, I would recommend starting off small and making longer recordings as you get more familiar with the piece.

In all four categories, it is important to note that affording environments promote active engagement and critical thinking from the student, as well as the ability to develop strategies on how to improve in the future.⁴⁸ Over time, the musician will see the benefits of tracking the day-to-day progress made in the practice room and reframe the performance as *part* of the process as opposed to a culminating experience. This in turn can help mitigate the arousal level experienced with music performance. Post-performance perceptions greatly affect the way we view future performances: negative perceptions post-performance causes low self-esteem as well as low self-efficacy and can greatly increase MPA in subsequent performances.⁴⁹ Viewing performances as a part of the process of growth and improvement can shift the musician's view of performances as an opportunity rather than a threat, and shift post-performance evaluations to constructive, as opposed to purely negative, feedback.

Flow Theory

Mihaly Csikszentmihalyi's "flow state" is an optimal state of consciousness wherein a person is unperturbed by distractions and completely immersed and mentally

⁴⁸ Yeager, and Dweck, "What Can be Learned from Growth Mindset Controversies?" 1277.

⁴⁹ Claudia Spahn, Franziska Krampe, and Manfred Nusseck, "Live Music Performance: The Relationship Between Flow and Music Performance Anxiety," *Frontiers in Psychology* 12, no. 725569 (November 2021): 3, <https://doi.org/10.3389/fpsyg.2021.725569>

absorbed in the task at hand. Flow state usually arises when the person possesses the appropriate skill level to face the challenge presented.⁵⁰

If a musician's skill level has surpassed the challenge presented in a piece, boredom can prevail. To re-enter the flow state, a musician may choose to work on a piece that better challenges their skill level in order to keep themselves engaged; however, if the player does not possess the necessary skills to play the piece, anxiety may result.⁵¹ When this is experienced, there are two avenues to get the musician back into the flow channel: increase their skill level or decrease the challenge level.⁵² When applied to music, this can mean breaking down a challenging piece into smaller chunks, making it easier to tackle. After identifying the technical difficulties required by each section, the musician can find other etudes or pieces that incorporate the same technical demands to help strengthen the skills to play the passage.

The experience of flow is universal, and can be experienced regardless of the activity, whether it be playing an instrument, rock climbing, dancing, singing, or playing chess. People who have experienced flow describe it as simultaneously feeling a sense of timelessness, heightened sense of control, complete concentration on the task at hand, and the merging of action and awareness, which then creates a loss of self-awareness and an autotelic, i.e., an intrinsically rewarding, experience.⁵³ The word autotelic, derived from the Greek words 'auto', meaning self, and 'telic', meaning goal, refers to

⁵⁰ Mihaly Csikszentmihalyi, In *Flow: The Psychology of Optimal Experience* (New York: Harper & Row, 1990), 50.

⁵¹ Mihaly Csikszentmihalyi, In *Flow: The Psychology of Optimal Experience* (New York: Harper & Row, 1990), 74.

⁵² Ibid, 75.

⁵³ Dwight C. K. Tse, Jeanne Nakamura, and Mihaly Csikszentmihalyi, "Living Well by 'Flowing' Well: The Indirect Effect of Autotelic Personality on Well-Being Through Flow Experience," *Journal of Positive Psychology* 16, no.3 (2021): 310, <https://doi.org/10.1080/17439760.2020.1716055>

a self-contained goal where the activity is done not for the possibility of future benefit but rather because doing the activity in itself is the reward.⁵⁴ When a person is in a flow state, the mind is fully in the current moment, as opposed to worrying about the future or what had happened in the past.

By looking into the conditions that facilitate flow, musicians can incorporate this information into everyday practice sessions to fully maximize the probability of achieving a flow state. There are three conditions that help aid the achievement of flow:⁵⁵

1. A balance between the demands of the challenge and skill, whereby the musician must believe they have the skillset to successfully perform and play the piece.
2. A clear and proximal goal, allowing for the musician to see progress and be able to map out the needed steps to take in order to achieve the goal.
3. Immediate and constructive feedback to reflect on what can be improved on in the future and move forward with a better understanding on the specific areas that need improvement.

If the musician feels there isn't a balance between the perceived technical demand of a piece and their skillset, approaching the piece can cause the musician to feel more anxious. If a piece presents 10 different technical challenges, a potential way to deal with this situation is to break the piece into smaller sections until each section contains

⁵⁴ Csikszentmihalyi, *Flow: The Psychology of Optimal Experience*, 79.

⁵⁵ Dwight Tse, Jeanne Nakamura, and Mihaly Csikszentmihalyi, "Beyond Challenge-Seeking and Skill-Building: Toward the Lifespan Developmental Perspective on Flow Theory," *Journal of Positive Psychology* 15, no.2 (2020): 171, <https://doi.org/10.1080/17439760.2019.1579362>

only one technical challenge. Isolating each technical challenge presents a more digestible goal, allowing the musician to better map out the necessary steps toward their goal. Recording little snippets of each section is helpful for providing immediate feedback as it allows the musician to compare the differences between what they think they sound like versus what they actually sound like.

By providing feedback to their own recording, a musician will develop the skill to listen more carefully as well as *actively* participate during practice sessions. I emphasize on the word “actively” because there are times in which practicing an instrument can turn into a mindless repetition of motion, lacking any sort of reflection on what was just played. The act of recording a practice session, listening back to the recording while taking notes on places in which to improve, and brainstorming potential ways of approaching the problem creates a more active learning environment, minimizing the chance of mindless repetition. If the musician feels like they are getting bored during a practice session, it is a strong indicator that their skill level is too high for the challenge presented, and a way to get around it is to make things more challenging. Suppose that the musician is playing against a drone to practice intonation. Instead of playing one note at a time, they can play double stops with subsequent notes in the passage to make sure they are also practicing the hand frame, and if that is too easy, they can make up rhythms and practice the passage with different variations of rhythm to ensure fast transitions between each finger.

One of my favorite tricks to make any practice session more challenging is by using a metronome’s pulse as the off-beats of a passage. Not only will this reveal if the musician has been playing at a steady tempo, having the metronome pulse on off-beats

also requires the musician to have a strong internal rhythm of the down beats. Let's take the violin excerpt of the Scherzo from Schumann's Symphony No.2 as an example: The excerpt consists of constantly moving 16th notes in 4/4, requiring the violinist to have impeccable left-hand agility and precision as well as right-hand fluid bow crossings while maintaining a steady tempo. The violinist will need to decide if they would like the metronome to beat on the second, third or fourth sixteenth note of each grouping. Avoiding placing the metronome beat on the down beat will require the violinist to internally maintain the downbeat pulse.

Being able to find a good balance between challenge and skill during every moment in the practice room allows for the transformation of boredom to attention, promotes persistence, and can ignite curiosity and creativity in the musician. These attributes, along with being intrinsically motivated, make up an autotelic personality, which is positively associated with the facilitation of flow.⁵⁶ By being aware of conditions that facilitate flow, musicians can better structure their practice sessions and develop the attributes to promote a flow state. Entering a state of flow while playing an instrument allows for the reduction of MPA because of the pure ecstatic feeling of being in flow, which results in approaching performances with eagerness as opposed to dread.

⁵⁶ Dwight, Nakamura and Csikszentmihalyi, "Living Well by 'Flowing' Well: The Indirect Effect of Autotelic Personality on Well-Being Through Flow Experience," 311.

CHAPTER 3

MENTAL IMAGERY

Introduction

Mental imagery is the “representation and the accompanying experience of sensory information without a direct external stimulus.”⁵⁷ Mental imagery can be seen as a capacity to experience events “with the mind’s eye” only, and has proven effective in helping to reduce performance anxiety.⁵⁸ In Chapter 1, we discussed that the body cannot differentiate between emotions that rise from experiences in real life versus emotions that are fabricated from thought alone.⁵⁹ When we use mental imagery, we can practice with thought-images of future events, eliciting emotional and motivational responses similar to those we would feel if the event were experienced in real life,⁶⁰ and therefore, be able to strategically map out potential actions to different scenarios before they happen. Mental imagery employs the same neurological basis as perceiving experiences in real life, hence, “visualizing an object has much the same effect on the body as actually seeing the object.”⁶¹ Because it allows us to experience the future in the mind vicariously before it happens in real life, mental imagery allows individuals to preemptively decide how to

⁵⁷ Joey Pearson, Thomas Naselaris, Emily Holmes, and Stephen Kosslyn, “Mental Imagery: Functional Mechanisms and Clinical Applications,” *Trends in Cognitive Sciences* 19, no.10 (2015): 590, <https://doi.org/10.1016/j.tics.2015.08.003>

⁵⁸ Landkroon, Elze, Eva van Dis, Katharina Meyerbröker, Elske Salemink, Muriel A. Hagenaars, and Iris M. Engelhard, “Future-Oriented Positive Mental Imagery Reduces Anxiety for Exposure to Public Speaking,” *Behavior Therapy* 53, no. 1 (01, 2022): 81 <https://doi.org/10.1016/j.beth.2021.06.005>

⁵⁹ Joe Dispenza, “Three Brains: Thinking to Doing to Being,” filmed April 2012 at TEDxTacoma, Tacoma, WA. Video, 08:54, https://www.youtube.com/watch?v=8l2nvTv9_Xw

⁶⁰ Richard Crisp, and Rhiannon N. Turner, “Can Imagined Interactions Produce Positive Perceptions?: Reducing Prejudice through Simulated Social Contact,” *American Psychologist* 64, no. 4 (May, 2009): 233, <https://doi.org/10.1037/a0014718>

⁶¹ Stephen Kosslyn, Giorgio Ganis, and William L Thompson, “Neural Foundations of Imagery,” *Nature reviews. Neuroscience* 2, no. 9 (2001): 641, <https://doi.org/10.1038/35090055>

respond to a certain situation without fear of any real danger and can be incorporated at any time or place. Results from a study done by social psychology researchers Blair, Ma, and Lenton (2001) showed the success of reducing implicit stereotypes in thought patterns with mental imagery,⁶² proving that mental imagery has the ability to alter judgments and bring about behavioral changes in these individuals. These results were supported by another study done by Crisp and Turner (2009), who concluded that mentally simulating a positive encounter with individuals from an out-group promotes a more positive outlook toward that individual,⁶³ showing the ability for mental imagery to alter judgment. Likewise, musicians can utilize mental imagery to re-program reactions to stimuli associated with MPA, and allow them to develop a more facilitative response toward performance anxiety.

In this chapter, I will discuss the five functions of imagery as discovered by sport psychologist Craig Hall, kinesiologist Diane Mack, psychologist Allan Paivio, and health psychologist Heather Hausenblas (1998) as well as research done on utilizing mental imagery to reappraise anxiety, increase self-confidence and self-efficacy, improve self-talk, help with appropriate goal setting, as well as introduce the Bonny Method. By understanding the different functions of imagery, a musician can pick and choose the optimal imagery type for a given situation and be equipped to build an optimal pre-performance routine to reduce the effects of music performance anxiety.

⁶² Irene Blair, Jennifer E. Ma, and Alison P. Lenton, "Imagining Stereotypes Away: The Moderation of Implicit Stereotypes through Mental Imagery," *Journal of Personality and Social Psychology* 81, no. 5 (November 2001): 829.

⁶³ Crisp and Turner, "Can Imagined Interactions Produce Positive Perceptions?: Reducing Prejudice through Simulated Social Contact," 238.

Five Functions of Imagery

Paivio's Analytic Framework of Imagery Effects (1985) states that imagery is used for both cognitive and motivational functions, each targeting either a specific or general behavioral goal.⁶⁴ Paivio's framework served as the basis for Hall, Mack, Paivio and Hausenblas's research and development of the Sport Imagery Questionnaire in 1998, which assessed the cognitive and motivational use of imagery in athletes.⁶⁵ Cognitive imagery functions encompass mental rehearsal of a specific skill, while motivation functions encompass visualizations that motivate you to achieve the level of playing you desire. Cognitive and motivational functions are further divided into specific or general levels, each of which describe the scope of the visualization.⁶⁶ Hall et al. discovered that motivational general imagery could be further divided into two sections - motivational general- arousal imagery and motivational general-mastery imagery.

A description of the five imagery functions are as follows:

1. Cognitive Specific Imagery – CS

CS imagery consists of mental rehearsal of a specific skill to improve skill acquisition.⁶⁷ An example of this is imagining the way the right arm should look to perform a bow stroke that produces a certain sound, or envisioning the movements made with the fingers of the left hand on the fingerboard of a violin for a particular passage. CS imagery can also incorporate kinesthetic imagery,

⁶⁴ Krista Munroe, Peter R. Giacobbi Jr, Craig Hall, and Robert Weinberg, "The Four Ws of Imagery Use: Where, When, Why, and What," *The Sport Psychologist* 14, no. 2 (06, 2000): 130.

⁶⁵ Craig Hall, Diane E. Mack, Allan Paivio, and Heather A. Hausenblas, "Imagery Use by Athletes: Development of the Sport Imagery Questionnaire," *International Journal of Sport Psychology* 29, no. 1 (Jan, 1998): 73.

⁶⁶ Munroe, Giacobbi, Hall, and Weinberg, "The Four Ws of Imagery Use: Where, When, Why, and What," 120.

⁶⁷ *Ibid*, 126.

which is imagining what a movement would feel like.⁶⁸ Kinesthetic imagery is beneficial for learning motor movements because it provides the individual with a clearer picture and goal of what the movement should feel like and allows the individual to make adjustments to achieve that feeling.

I often use mental imagery to help aid with the memorization of long pieces. By visualizing what the page looks like in addition to using auditory imagery to hear what it sounds like, I am usually able to pinpoint areas that will need more attention in the future. CS imagery allows for the musician to continue practicing in the mind while giving their body a rest to prevent overuse and injury.

2. Cognitive General Imagery - CG

Cognitive General imagery mainly pertains to the imagery of strategies and strategic execution in completing a task.⁶⁹ CG imagery is mainly used by an individual participating in a team sport to visualize the strategic movements in games as well as mentally practice how they would respond to multiple opponent strategies.

3. Motivational Specific Imagery- (MS)

MS imagery consists of imagining the desired outcome and performance of an activity.⁷⁰ For musicians, this is not limited to a visual imagery of what a successful performance looks like but can also incorporate auditory imagery of how a successful performance would sound. Prior to walking on stage, the

⁶⁸ Munroe, Giacobbi, Hall, and Weinberg, "The Four Ws of Imagery Use: Where, When, Why, and What," 131.

⁶⁹ Ibid, 128.

⁷⁰ Ibid, 128.

musician could combine visual and auditory imagery by visualizing themselves walking on stage, mentally hearing the way they would like to perform the piece, and envisioning how they will look while performing. Having the ability to clearly visualize a MS imagery pre-performance can create an increase in self-confidence because it provides the opportunity for the musician to mentally see themselves performing the opening exactly as they want.

4. Motivational General-Arousal - MG-A

MG-A imagery has to do with imagining the arousal and stress levels related to the activity. This encompasses imagining the level of excitement one might feel, the amount of control while performing, and/or how relaxed one might want to feel.⁷¹ As an example, if a musician wanted to employ MG-A imagery during pre-performance to increase arousal levels and get excited for a performance, they could imagine the feeling of the bright lights on stage, the sound of the audience shuffling, the whir of the air conditioner in the hall, the smell of the cleaner used on the floor, what it would look like when they look out from the stage and face an enthusiastic audience and the feeling they will get after a successful performance.

The deeper the musician can imagine the experience, the more effective the imagery will be. Visualizations of this sort can create excitement in the musician and cause them to look forward to the performance. However, if the musician wanted to achieve a sense of control with MG-A imagery and reach a low arousal

⁷¹ Munroe, Giacobbi, Hall, and Weinberg, "The Four Ws of Imagery Use: Where, When, Why, and What," 129.

level to feel mentally stable and collected, the musician can imagine a serene setting while taking deep breaths.

5. Motivational General- Mastery - MG-M

MG-M imagery is used to help with the persistence of mental toughness, focus, confidence, and positivism.⁷² During the days leading up to a big performance, the musician could take some time to visualize an empowering scenario, such as walking on stage feeling confident and giving 100% of their focus and energy to the performance. Positive imagery like this is a powerful tool to combat negative self-talk and helps the individual present a more optimistic vision of how the performance could go, increasing self-confidence and determination in working hard toward the performance.

Musicians can employ and tailor a combination of any of these imagery functions in their pre-performance routine according to their needs. Musicians could also use a combination of imagery functions to recreate a flow state. This could mean imagining the feeling of the last time they performed in a flow state, what that visually looked like as well as what they were thinking about. By taking the time to prime the mind before practice sessions, mental imagery can be used as a great way to get the musician into the most productive mindset and be able to have a clearer goal of how they would like the practice session to unfold.

⁷² Munroe, Giacobbi, Hall, and Weinberg, “The Four Ws of Imagery Use: Where, When, Why, and What,” 129.

Before every performance, I make sure to carve out at least ten minutes to get my mind and body ready for the performance. I usually perform the following actions while standing with my eyes shut; however, you may find them easier to perform while seated. I start off by inhaling for three seconds and exhaling for five seconds – longer exhales activate our parasympathetic nervous system, which is responsible for calming down our body.⁷³ I repeat this conscious breathing cycle around eight to ten times. As I take my deep breaths, I try to feel my feet on the ground, being sure to distribute my weight evenly and release any tension in the body. After I complete my deep breathing exercise, I remind myself that elevated arousal levels and an adrenaline rush are good things; they indicate that this performance is important to me, which is great! It is during this time when I recall the reasons I enjoy performing. Once I feel like I have successfully framed performing through an optimistic lens, I imagine myself backstage right before walking on stage and remember to feel the weight of my feet on the ground. I envision walking out, with a confident posture and remember to keep slow and steady breaths. I remind myself to take as much time as I need to ground myself before beginning the performance; there is no reason to rush. By taking time to mentally prepare, I feel better equipped to cope with the emotions faced while walking on stage because I have already provided myself a mental script of what to do when I walk on stage.

To decide on the kind of imagery function to employ in your pre-performance routine, the main question you should ask yourself is what you would like to achieve with

⁷³ Nicole Mahabir, “From Fight or Flight to Rest and Digest: How to Reset Your Nervous System with Breath,” *Canadian Broadcasting Corporation*, January 12, 2018, <https://www.cbc.ca/life/wellness/from-fight-or-flight-to-rest-and-digest-how-to-reset-your-nervous-system-with-the-breath-1.4485695>

the imagery. Studies have shown that motivational functions of imagery were primarily used by elite athletes, whereas cognitive functions of imagery were primarily used by athletes competing in lower-level competitions, potentially indicating that elite athletes (who have already acquired the necessary skills to be successful) mainly used imagery as a way to motivate themselves.⁷⁴ For musicians, this could mean that CS imagery is best utilized when learning a new piece and figuring out the technical elements of the piece, whereas MS, MG-A, MG-M is best used after the motor movements for the piece have become more automatic and imagery can be used mainly to help the musician get into the optimal mindset for performance.

Reappraising Anxiety

Mental imagery has been used as a tool to re-define pre-performance anxiety as excitement, thus turning a perceived debilitating emotion to one that is facilitative, leading to better performances.⁷⁵ Reappraising anxiety as excitement is effective and requires less intervention than reappraising anxiety as calmness because it involves arousal-congruent emotions. It would be more challenging to reappraise anxiety as calmness as it involves reappraising high arousal emotion (anxiety) as a low arousal emotion (being calm).⁷⁶

Brooks (2014) conducted a study where participants were randomly assigned to make one of three self-statements: “I am anxious,” “I am excited,” and no statement,

⁷⁴ Hall, Mack, Paivio, and Hausenblas, “Imagery Use by Athletes: Development of the Sport Imagery Questionnaire,” 74.

⁷⁵ Alison Brooks, “Get Excited: Reappraising Pre-Performance Anxiety as Excitement,” *Journal of Experimental Psychology: General* 143, no. 3 (06, 2014): 1144, <https://doi.org/10.1037/a0035325>

⁷⁶ *Ibid*, 1144.

before being instructed to perform a karaoke song on a Nintendo Wii video game console. Results showed that participants in the “I am excited” statement group had a higher singing accuracy rate, felt more self-efficacy, and were more persuasive, confident, and persistent than those in the other two groups.⁷⁷ Saying “I am excited” out loud and imagining the feeling of excitement in your body can affect so many aspects of performance because self-talk plays a crucial role in an individual’s success.

Reappraising anxiety as excitement and being in a positive affective state causes an individual to perceive threats as opportunities, as opposed to individuals in negative affective states.⁷⁸ Having an opportunity mindset versus a threat mindset can influence an individual’s eagerness to pick up challenging activities and can substantially affect the way they approach challenges. Threat mindset individuals are less likely to engage in challenging activities.

Musicians who reappraise anxiety as excitement can use their high-arousal levels before performances as reminders of how much the performance means to them. By shifting the narrative from the negative self-talk, such as thinking about being judged or making mistakes, to highlighting the reasons why performing is important to them, the musician will be better able to view performance as an opportunity, as opposed to a threat. The increase in positive thoughts about an upcoming performance will also increase self-confidence, causing an increase in positive feelings about the situation and an increase in the perceived ability to cope.⁷⁹ One way to use anxiety reappraisal is to

⁷⁷ Brooks, “Get Excited: Reappraising Pre-Performance Anxiety as Excitement,” 1150.

⁷⁸ Ibid, 1152.

⁷⁹ Sheldon Hanton, Stephen D. Mellalieu, and Ross Hall, “Self-Confidence and Anxiety Interpretation: A Qualitative Investigation,” *Psychology of Sport and Exercise* 5, no. 4 (10, 2004): 487, [https://doi.org/10.1016/S1469-0292\(03\)00040-2](https://doi.org/10.1016/S1469-0292(03)00040-2)

come up with a mantra that expresses your excitement of the performance and integrate this mantra into your pre-performance routine. For example, a mantra you could say is, “you have worked hard for this performance. You are ready and you can do this. You will go out there and everything will be great. Be present.”

The way a musician talks about their feelings regarding performances also dramatically affects future performance.⁸⁰ If post-performance the musician says: “I was really excited about the performance. I went on stage and did my best,” the musician is likely to be persistent in working hard and looking forward to the next performance. On the other hand, if the musician said, “I was so nervous, I felt like I couldn’t control any of my limbs,” the musician will be more worried about how their nerves might derail their next performance. When looking back at a performance, remembering the feeling of excitement and having a positive mental imagery of the performance will attenuate the force of the negative associations with performance over time, causing a reappraisal of performing.⁸¹ This is why we need to be aware of the things we tell ourselves after every performance; it deeply affects the way we view future performances.

Benefits of Using Mental Imagery

Mental imagery has been shown to help with goal-setting and self-talk – which affects self-efficacy and self-confidence – and can be used in a musicians’ pre-performance routine to maintain a facilitative interpretation of music performance anxiety symptoms. Positive mental imagery about a future event reduces stress levels when

⁸⁰ Brooks, “Get Excited: Reappraising Pre-Performance Anxiety as Excitement,” 1154.

⁸¹ Landkroon, van Dis, Meyerbröcker, Salemink, Hagenaars, and Engelhard, “Future-Oriented Positive Mental Imagery Reduces Anxiety for Exposure to Public Speaking,” 89.

experiencing the actual event due to the individual's ability to imagine different constructed behaviors and problem solve in advance,⁸² enhancing control over the situation and reducing perceived difficulty with coping with bad outcomes. Psychologist David Marks, who specializes in research on consciousness, agrees, explaining that mental imagery serves as a way for individuals to construct ideal future actions through "selection, rehearsal, planning and perfecting" of these actions and be able to repeat the cycle of possible actions and their consequences before executing them in real life.⁸³ For example, if the musician visualizes themselves standing on stage right before playing and notices their hands shaking, they can imagine taking steps to reduce the shaking, such as pausing to take a few deep breaths or quietly repeating an empowering mantra in their head. By imagining this scenario ahead of time, the musician is likely to take a moment to compose themselves on stage before starting to play.

If the musician has a specific goal in mind, such as being ready to perform a certain piece of music by a certain time, using mental imagery to map out the process of how they will achieve the goal helps the musician have a clearer idea of the steps needed to achieve the goal. Active mental practice of the steps needed to achieve a goal will lead to changes in behavior that increase the likelihood of achieving the desired outcome, reducing the chance of feeling underprepared for a performance. Imagining the process needed to achieve a goal is more effective in causing behavioral change than merely

⁸² Landkroon, van Dis, Meyerbröcker, Salemink, Hagenaaars, and Engelhard, "Future-Oriented Positive Mental Imagery Reduces Anxiety for Exposure to Public Speaking," 81.

⁸³ David Marks, "Consciousness, Mental Imagery and Action," *British Journal of Psychology* 90, no. 4 (1999): 570.

imagining the desired outcome.⁸⁴ Process simulation also minimizes the chances of the individual falling into *planning fallacy*, which “refers to the fact that people invariably underestimate the resources, such as time and money, that will be required to finish a project and overestimate how easily it can be done.”⁸⁵

By visualizing the process needed to finish a goal, musicians can mentally map out and structure their practice sessions leading up to the performance and have a better mental model of what needs to be done. Psychologists Taylor, Pham, Rivkin, and Armor (1998) performed an experiment where students were separated into three groups: process simulation, outcome simulation, and control. The goal was to complete a school-related project by the end of the subsequent week. The process simulation group was encouraged to envision collecting the materials needed as well as seeing themselves get organized and envisioning themselves working on the project. The outcome simulation group was told to envision being pleased with their final project and taking it to class, feeling confident in their work. Students in the control group simply recorded their progress each day.⁸⁶

The results from the experiment revealed that, although the process simulation results are modest, with 41% completing on time, this is significantly better than both the outcome simulation group and control group, with completion rates of 33% and 14%, respectively. Not only that – students in the process simulation group also reported that

⁸⁴ Shelley Taylor, Lien B. Pham, Inna D. Rivkin, and David A. Armor, “Harnessing the Imagination: Mental Simulation, Self-Regulation, and Coping,” *American Psychologist* 53, no. 4 (04, 1998): 432, <https://doi.org/10.1037/0003-066X.53.4.429>

⁸⁵ Taylor, Pham, Rivkin, and Armor, “Harnessing the Imagination: Mental Simulation, Self-Regulation, and Coping,” 434.

⁸⁶ *Ibid*, 435.

they found the assignment significantly easier compared to their peers in the other groups, who reported that the assignment was harder than they expected.⁸⁷ A potential explanation for this finding is that by imagining the day-to-day activities leading up to the goal, there was a lower chance of underestimating the amount of time and effort needed to achieve the goal.

When applying process simulation to preparing for a performance consisting of more than one piece of music, musicians can visualize the amount of work needed for each piece, and mentally create a practice plan for each piece. By doing so, they will have a better estimate of the timeline for each piece and have a clearer idea of how many practice sessions to dedicate per piece. By mentally going through the process needed to lead to a successful performance, and being diligent about following that process, the musician will stand a better chance of approaching the performance knowing that they have put enough time into practicing each piece of music and avoid the feeling of performing underprepared pieces. With the mentality of having fully prepared each piece, the musician will be able to approach the performance with confidence, reducing the effects of MPA.

To apply process simulation when preparing a piece, begin by having a copy of the music dedicated to the musician's written thoughts. Then listen to the piece while following along with the music, taking notes on sections, and jotting down the potential challenges in each section. This will create more clarity on how to divide your practice session and allot the necessary amount of time needed for each section, making sure to

⁸⁷ Taylor, Pham, Rivkin, and Armor, "Harnessing the Imagination: Mental Simulation, Self-Regulation, and Coping," 435.

dedicate more time to sections that require more attention. With the potential blockers of a section written down beforehand, you are effectively writing out a plan of action on the things to work on during the practice session, leading to more effective practice sessions with a clear goal. With the performance date in mind, you will be able to see how many days you are able to dedicate to the piece and be able to better distribute your time with a clear practice plan. I would encourage repeating this process several times and making any necessary changes to the practice plan and timeline. If some passages take less time to work on than anticipated, redistribute the time you initially dedicated for this section to another section that needs more work.

In addition to reducing MPA through process simulation, musicians can also look at how their self-talk affects their performance. Self-talk can be thought of as the voice we hear in our heads. Negative self-talk can lead to negative thoughts, negative emotions and low performance.⁸⁸ By paying close attention to what we are telling ourselves and how we are acting before, during, and after practice sessions and performances, we can preemptively stop thoughts or behaviors that are detrimental and actively conjure up a mental image that is empowering.

Negative self-talk can be initially challenging to stop or even notice; because we have been so conditioned to thinking a certain way, we don't even realize we are thinking the way we do! A trick to improve awareness of negative self-talk is to perform a physical action right after noticing the occurrence of negative self-talk, such as a vertical

⁸⁸ George Mamassis, and George Doganis, "The Effects of a Mental Training Program on Juniors Pre-Competitive Anxiety, Self-Confidence, and Tennis Performance," *Journal of Applied Sport Psychology* 16, no.2 (2004): 122, <https://doi.org/10.1080/10413200490437903>

jumps.⁸⁹ When encountering negative self-talk such as “I’m really worried about that last page of piece X,” use auditory imagery to imagine how you would like that last page to sound, coupled with what it could feel like to play with ease, and finally saying a positive mantra to yourself. We have the power to transform our mental script, and each time we swap our negative self-talk for an empowering directive, we transform that script from one that puts us down to one that lifts us up. Visualization of what a close friend would say to us in a tough situation or what our heroes would tell themselves is a helpful imagery to conjure if we ever find ourselves having difficulty thinking of empowering things to write in our mental scripts.

Another effective mental imagery technique is performance visualization: a visualization based on modeling someone else. The individual starts off by visualizing themselves carry out the activity, then he/she visualizes the activity being done by a professional, and finally imagines themselves performing the activity as the professional does.⁹⁰ I have used this technique many times in the practice room to gain confidence in playing a challenging passage of music. First, I imagine myself playing the passage with ease. While I’m doing this, I’m also paying attention to what it feels like to play the passage with ease as well as see what my hands and arms look like when they are moving effortlessly. Then, I look up a video of my favorite musician playing the piece and I watch the snippet of the passage I’m working on. After watching it at normal speed, I visualize myself playing the passage again, trying to mirror the video I just watched.

⁸⁹ Mamassis, and Doganis, “The Effects of a Mental Training Program on Juniors Pre-Competitive Anxiety, Self-Confidence, and Tennis Performance,” 122.

⁹⁰ Joe Ayres, and Tim Hopf, “Visualization: Reducing Speech Anxiety and Enhancing Performance,” *Communication Reports* 5, no. 1 (January 1992): 2, <https://doi.org/10.1080/08934219209367538>

Then I proceed to watch the video at $\frac{3}{4}$ the speed and turn off the volume (to prevent distraction from the distorted sound). Once I feel confident enough about visually playing the passage, I physically pick up the instrument and play the passage. Depending on the difficulty of the passage, I will try to play the passage mimicking the video in either normal speed (not too challenging), $\frac{3}{4}$ speed, or half speed (very challenging). I will repeat this process until I can clearly visualize myself playing the passage effortlessly.

Performance visualization is an effective tool to help build up confidence levels through imitation, largely with the help of mirror neurons, a “type of brain cell that respond equally when we perform an action and when we witness someone else perform the same action.”⁹¹ Mirror neurons were first discovered by neuroscientist Giacomo Rizzolatti, MD. Along with his colleagues at the University of Parma in 1990, he found that neurons fired in the same regions of the brains of macaque monkeys both when they observed another monkey grab an object and when they grabbed the object. It was later discovered that humans not only mirror other people’s actions, but also their emotions and intentions behind those actions.⁹² Performance visualization exploits the power of mirror neurons to help build confidence in performing, and can be used to aid MPA through watching and imitating other confident performers.

The Bonny Method

The Bonny Method of Guided Imagery and Music (GIM, developed by Helen Bonny in 1970) is the use of music and imagery to explore the subconscious by listening

⁹¹ Winerman, Lea, “The Mind's Mirror,” *Monitor on Psychology* 36, no. 9 (2005, October), <https://www.apa.org/monitor/oct05/mirror>

⁹² Ibid.

to music and describing the imagery that naturally arises. A GIM session is facilitated by a GIM- certified therapist.⁹³ Music therapist Debra Burns, PhD, identifies four parts of a GIM session. At the beginning of the session, the client provides context regarding their situation and establishes goals. The second part introduces prompts of relaxation by the facilitator before moving to the third and largest part of the session: music listening.

Carefully selected classical music pieces are played for about 30-40 minutes, while the client tells the facilitator about the mental images that pop up, while the facilitator takes notes. The last part is spent reviewing these notes.⁹⁴ Music therapist Erin Fox and professor of music therapy Cathy McKinney examined the impact of personal therapy in the form of GIM on the personal development and growth of music therapy interns.⁹⁵

After participating in GIM therapy sessions, benefits experienced by the participants include an increase in stress-reduction, self-awareness, self-confidence, and an increase in relaxation.⁹⁶ Music is used as a tool in the therapy sessions as it provides the depth, structure, and movement for the spontaneous emergence of imagery, bringing to light the things that need our attention, allowing for a heightened sense of awareness.⁹⁷ To take steps toward reducing MPA, the musician needs to be aware of their emotions that arise regarding performing, whether it be pre-performance, during the performance,

⁹³ Cathy McKinney, and Denise E. Grocke, "The Bonny Method of Guided Imagery and Music for Medical Populations: Evidence and Vision for the Future," *Music and Medicine* 8, no.2 (2016): 18.

<https://mmd.iamonline.com/index.php/musmed/article/download/485/310/918>

⁹⁴ Debra Burns, "The Effect of the Bonny Method of Guided Imagery and Music on the Mood and Life Quality of Cancer Patients," *Journal of Music Therapy* 38, Issue 1 (Spring 2001): 58, <https://doi.org/10.1093/jmt/38.1.51>

⁹⁵ Erin Fox, and Cathy McKinney, "The Bonny Method of Guided Imagery and Music for Music Therapy Interns: A Survey of Effects on Professional and Personal Growth," *Music Therapy Perspectives* 34, no. 1 (2016): 90.

⁹⁶ Ibid, 93.

⁹⁷ Ibid, 94.

post-performance and/or when they practice. The incremental accumulation of emotions from multiple practice sessions build up over time and inherently affect our performance, which is why being aware of our emotions and actions during practice sessions is of great importance. GIM therapy helps aid the individual in increasing their sense of awareness by allowing the mind to wander, revealing memories they didn't know they had and bringing to the forefront the issues to face.

Using a technique like the Bonny Method could help a musician get to the origins of their performance anxiety. Psychiatric researchers Lora Beebe and Tami Wyatt's (2009) article details a story of a woman who goes through GIM therapy because she felt miserable and cried a considerable amount for no reason. Through her sessions, her free-flow thoughts centered on the theme of the wind, but she could never understand what it meant. During her final session, the imagery of fan blades started to appear, and she remembered it as the fan in a house in which she experienced abuse as a child.⁹⁸ As seen through this example, the root of anxiety can stem from many places and may not be caused by the action where the anxiety is manifesting itself. Because of this, I believe the Bonny Method is another tool in which a musician may explore possible causes of MPA and take steps towards healing.

Since the development of the Bonny Method, there have been adaptations of the method such as Directed Imagery and Music, which was developed by music therapists Roberta Blake and Susan Bishop (1994), to help clients suffering from post-traumatic

⁹⁸ Lora Beebe, and Tami Wyatt, "Guided Imagery & Music: Using the Bonny Method to Evoke Emotion & Access the Unconscious," *Journal of Psychosocial Nursing & Mental Health Services* 47, no. 1 (January 2009): 31, <https://doi.org/10.3928/02793695-20090101-02>

stress disorder (PTSD).⁹⁹ Unlike the traditional GIM method in which the facilitator does not interfere or guide the imagery that is conjured by the client, the imagery in Directed Imagery and Music (as the name suggests) is directed by the facilitator. Musicians can use directed imagery to imagine a scenario in which they are performing with confidence and what that would feel like. Listening to carefully selected music that creates a sense of empowerment can support the creation of this mental image.

As explored in Chapter 1, the neural pathways in our brains get stronger the more we use them. Therefore, regularly practicing our directed imagery toward confident performance will cause our brains to begin associating performance with the feeling of confidence rather than one of fear. Through the Bonny Method, we have seen how music listening is used as a tool and greatly assists the conjuring of mental images. Musicians can use this principle to their advantage by creating a playlist of their own that promotes the evocation of specific mental images and emotions. The musician can then listen to the necessary playlist when trying to get into a specific mindset.

⁹⁹ Cathy McKinney, and Denise E. Grocke, "The Bonny Method of Guided Imagery and Music for Medical Populations: Evidence and Vision for the Future," 20.

CHAPTER 4

CONCLUSION

I first experienced debilitating music performance anxiety when I was in high school. I felt paralyzed as soon as I walked on stage to perform; the lights would shine brighter than usual, my hands would get cold and tense, and I felt like my heart would beat out of my chest. This feeling persisted every time I walked on stage to perform for many years to come. It wasn't until I was in my undergrad when I learned more about the mind's unique connection with the body through a dance/movement class, and this experience provided valuable insight as to how powerful the mind was in both creating as well as combating MPA. Armed with this new knowledge, I resolved to lessen the destructive hold MPA had on me through further exploring how the mind-body connection worked. In the 8 years since I began this journey, I have experienced both successes and setbacks along the way. Through my setbacks, I learned to be patient with myself and persevere through challenges. Overall however, I now have a much better relationship with performing and attribute my successes to the retraining and reframing of my mindset on performing.

The benefits of utilizing mental imagery in pre-performance routines are undeniable. This research paper was designed to empower musicians who are struggling with music performance anxiety and provide strategies and solutions toward reducing MPA and unlocking their full potential in performing. From recent research in understanding the mind and the way we learn through neuroplasticity, we now realize that the brain is constantly evolving and learning, no matter our age, and science has proven the saying "you can't teach an old dog new tricks" is incorrect. With patience and

time, we can rewire the old, debilitating patterns in our brain and carefully carve out new, healthier paths.

If you doubt your ability to make a change and reduce MPA, remind yourself that your mindset affects multiple aspects of your life, from the challenges you decide to pick up to the way you interpret feedback. It is completely possible to develop a growth mindset if you are willing to put in the time and follow the steps to do so.

Mental imagery is like any other skill; practice will not only familiarize the individual with the skill, but help them master it. The application for mental imagery is incredibly versatile: from helping solidify motor movements (visualizing hand motions of a certain passage) to increasing confidence in an individual (imagining playing the piece exactly the way you want) to mapping out a practice plan for each piece (process simulation) and memorizing long works. Preparing for a performance should not be limited to simply the physical act of playing the instrument. Research has shown that the mind is a powerful tool that, when positively directed through mental imagery to desired outcomes, can have a profound effect on our ability to perform at the highest level.

Performances are an essential part of every musician's career, but it is important to remember that it is the things we do in the weeks and months leading up to those performances that determine our success on stage. Positive psychologists have suggested that "happiness in life comes from the frequency not the intensity of positive versus negative emotional experiences."¹⁰⁰ The manner in which we approach our daily practice has profound implications on our mental and physical health and abilities. By harnessing

¹⁰⁰ Alison Brooks, "Get Excited: Reappraising Pre-Performance Anxiety as Excitement," 1155.

the power of mental imagery, we have the ability to unlock and achieve our greatest potential.

REFERENCES

- Ayres, Joe, and Tim Hopf. "Visualization: Reducing Speech Anxiety and Enhancing Performance." *Communication Reports* 5, no. 1 (January 1992): 1-10. <https://doi.org/10.1080/08934219209367538>
- Bajnah, Anil. "Neuronal Plasticity: How Your Thoughts Literally Shape Your Brain." *Institute for Human Optimization*, September 21, 2020. <https://ifho.org/neuronal-plasticity-how-your-thoughts-literally-shape-your-brain/>
- Barlow, David H. "True Alarms, False Alarms, and Learned (Conditioned) Anxiety: The Origins of Panic and Phobia." In *Anxiety and Its Disorders*, edited by David H. Barlow, 219-251. New York: Guilford Publications, 2002.
- Beebe, Lora H., and Tami H. Wyatt. "Guided Imagery & Music: Using the Bonny Method to Evoke Emotion & Access the Unconscious." *Journal of Psychosocial Nursing & Mental Health Services* 47, no. 1 (January 2009): 29-33. <https://doi.org/10.3928/02793695-20090101-02>
- Blair, Irene V., Jennifer E. Ma, and Alison P. Lenton. "Imagining Stereotypes Away: The Moderation of Implicit Stereotypes through Mental Imagery." *Journal of Personality and Social Psychology* 81, no. 5 (November 2001): 828-841.
- Blake, Roberta L., and Susan R. Bishop. "The Bonny Method of Guided Imagery and Music (GIM) in the Treatment of Post-Traumatic Stress Disorder (PTSD) with Adults in the Psychiatric Setting." *Music Therapy Perspectives* 12, no. 2 (1994): 125-129. <https://doi.org/10.1093/mtp/12.2.125>
- Brooks, Alison Wood. "Get Excited: Reappraising Pre-Performance Anxiety as Excitement." *Journal of Experimental Psychology: General* 143, no. 3 (06, 2014): 1144-1158. <https://doi.org/10.1037/a0035325>
- Burns, Debra S. "The Effect of the Bonny Method of Guided Imagery and Music on the Mood and Life Quality of Cancer Patients." *Journal of Music Therapy* 38, Issue 1 (Spring 2001): 51-65. <https://doi.org/10.1093/jmt/38.1.51>
- Crisp, Richard J., and Rhiannon N. Turner. "Can Imagined Interactions Produce Positive Perceptions?: Reducing Prejudice through Simulated Social Contact." *American Psychologist* 64, no. 4 (May, 2009): 231-240. <https://doi.org/10.1037/a0014718>
- Csikszentmihalyi, Mihaly. *In Flow: The Psychology of Optimal Experience*. New York: Harper & Row, 1990.

- Dijkstra, Nadine, Matan Mazora, Peter Kok, and Stephen Fleming. "Mistaking Imagination for Reality: Congruent Mental Imagery Leads to More Liberal Perceptual Detection." *Cognition* 212, (2021). <https://doi.org/10.1016/j.cognition.2021.104719>
- Dispenza, Joe. 2007. *Evolve Your Brain: The Science of Changing Your Mind*. Deerfield Beach: Health Communications, Incorporated.
- Dispenza, Joe. "Three Brains: Thinking to Doing to Being." Filmed April 2012 at TEDxTacoma, Tacoma, WA. Video, 08:54. https://www.youtube.com/watch?v=8l2nvTv9_Xw
- Dweck, Carol S. *Mindset: The New Psychology of Success*. New York: Random House, 2006.
- Dweck, Carol S, and David S Yeager. "Mindsets: A View From Two Eras." *Perspectives on Psychological Science* 14, no. 3 (February 2019): 481-496. <https://doi.org/10.1177/1745691618804166>
- Fox, Erin I., and Cathy H. McKinney. "The Bonny Method of Guided Imagery and Music for Music Therapy Interns: A Survey of Effects on Professional and Personal Growth." *Music Therapy Perspectives* 34, no. 1 (2016): 90-98.
- Gunderson, Elizabeth A., Nicole S. Sorhagen, Sarah J. Gripshover, Carol S. Dweck, Susan Goldin-Meadow, and Susan C. Levine. "Parent Praise to Toddlers Predicts Fourth Grade Academic Achievement Via Children's Incremental Mindsets." *Developmental Psychology* 54, no. 3 (March 2018): 397-409. <https://doi.org/10.1037/dev0000444>
- Greene, Don. "The Seven Essential Skills for Optimal Performance." In *Performance Success*, 22-93. New York: Routledge, 2002.
- Hall, Craig R., Diane E. Mack, Allan Paivio, and Heather A. Hausenblas. "Imagery Use by Athletes: Development of the Sport Imagery Questionnaire." *International Journal of Sport Psychology* 29, no. 1 (Jan, 1998): 73-89.
- Hanton, Sheldon, Stephen D. Mellalieu, and Ross Hall. "Self-Confidence and Anxiety Interpretation: A Qualitative Investigation." *Psychology of Sport and Exercise* 5, no. 4 (10, 2004): 477-495. [https://doi.org/10.1016/S1469-0292\(03\)00040-2](https://doi.org/10.1016/S1469-0292(03)00040-2)
- Hardy, Lew. "Stress, Anxiety and Performance." *Journal of Science and Medicine in Sport* 2, no.3 (1999): 227-233. [https://doi.org/10.1016/S1440-2440\(99\)80175-3](https://doi.org/10.1016/S1440-2440(99)80175-3)

- Hecht, Cameron A., David S. Yeager, Carol S. Dweck, and Mary C. Murphy. "Beliefs, Affordances, and Adolescent Development: Lessons from a Decade of Growth Mindset Interventions." *Advances in Child Development and Behavior* 61, (2021): 169-197. <https://doi.org/10.1016/bs.acdb.2021.04.004>
- Heider, Fritz. *The Psychology of Interpersonal Relations*. New Jersey: John Wiley & Sons Inc, 1958.
- Herzfeld, Noreen. "Your Cell Will Teach You Everything: Old Wisdom, Modern Science, and the Art of Attention." *Buddhist-Christian Studies* 29, (2009): 83-87. <http://www.jstor.org/stable/40864807>
- Kenny, Dianna T. "The Role of Negative Emotions in Performance Anxiety." In *Handbook of Music and Emotion: Theory, Research, Applications*, edited by Juslin, Patrik N. and John A. Sloboda, 425-451: Oxford University Press, New York, NY, 2010.
- Kenny, Dianna T. *The Psychology of Music Performance Anxiety*. New York: Oxford University Press Inc., 2011.
- Kosslyn, Stephen M, Giorgio Ganis, and William L Thompson. "Neural Foundations of Imagery." *Nature Reviews. Neuroscience* 2, no. 9 (2001): 635–642. <https://doi.org/10.1038/35090055>
- Landkroon, Elze, Eva van Dis, Katharina Meyerbröker, Elske Salemink, Muriel A. Hagenars, and Iris M. Engelhard. "Future-Oriented Positive Mental Imagery Reduces Anxiety for Exposure to Public Speaking." *Behavior Therapy* 53, no. 1 (01, 2022): 80-91. <https://doi.org/10.1016/j.beth.2021.06.005>
- Lourenco, Frederico, and B. J. Casey. "Adjusting Behavior to Changing Environmental Demands with Development." *Neuroscience and Biobehavioral Reviews* 37, no. 9 (November 2013): 2233-2242. <https://doi.org/10.1016/j.neubiorev.2013.03.003>
- Mahabir, Nicole. "From Fight or Flight to Rest and Digest: How to Reset Your Nervous System with Breath." *Canadian Broadcasting Corporation*, January 12, 2018. <https://www.cbc.ca/life/wellness/from-fight-or-flight-to-rest-and-digest-how-to-reset-your-nervous-system-with-the-breath-1.4485695>
- Mamassis, George, and George Doganis. "The Effects of a Mental Training Program on Juniors Pre-Competitive Anxiety, Self-Confidence, and Tennis Performance." *Journal of Applied Sport Psychology* 16, no.2 (2004): 118-137. <https://doi.org/10.1080/10413200490437903>
- Marks, David F. "Consciousness, Mental Imagery and Action." *British Journal of Psychology* 90, no. 4 (1999): 567–585.

- McKinney, Cathy H., and Denise E. Grocke. "The Bonny Method of Guided Imagery and Music for Medical Populations: Evidence and Vision for the Future." *Music and Medicine* 8, no.2 (2016): 18-25.
<https://mmd.iammonline.com/index.php/musmed/article/download/485/310/918>
- MindsetKit. "Assessments for Learning Encourage a Growth Mindset." Accessed 26 May, 2022. <https://www.mindsetkit.org/topics/assessments-growth-mindset-math/assessments-for-learning-encourage-growth-mindset>
- Muenks, K., K. Kroeper, E. A. Canning, and M. C. Murphy. "What Cues Do Students Use to Discern Their Professors' Mindset Beliefs? An Exploratory Study of the Beliefs and Behaviors That Communicate Faculty Mindset in College STEM Classrooms." Under Review (2021).
- Munroe, Krista J., Peter R. Giacobbi Jr., Craig Hall, and Robert Weinberg. "The Four Ws of Imagery Use: Where, When, Why, and What." *The Sport Psychologist* 14, no. 2 (06, 2000): 119-137.
- Paivio, A. "Cognitive and Motivational Functions of Imagery in Human Performance." *Canadian Journal of Applied Sport Sciences* 10 (Dec, 1985): 22-28.
- Pally, Regina. "Emotional Processing: The Mind–Body Connection." *International Journal of Psychoanalysis* 79, no. 2 (1998): 349-362.
- Pearson, Joey, Thomas Naselaris, Emily Holmes, and Stephen Kosslyn. "Mental Imagery: Functional Mechanisms and Clinical Applications." *Trends in Cognitive Sciences* 19, no.10 (2015): 590–602. <https://doi.org/10.1016/j.tics.2015.08.003>
- Phelps, Elizabeth A. "Emotion and Cognition: Insights from Studies of the Human Amygdala." *Annual Review of Psychology* 57, (2006): 27-53.
<https://doi.org/10.1146/annurev.psych.56.091103.070234>
- Spahn, Claudia, Franziska Krampe, and Manfred Nusseck. "Classifying Different Types of Music Performance Anxiety." *Frontiers in Psychology* 12, no. 538535 (April 2021): 1-11. <https://doi.org/10.3389/fpsyg.2021.538535>
- Spahn, Claudia, Franziska Krampe, and Manfred Nusseck. "Live Music Performance: The Relationship Between Flow and Music Performance Anxiety." *Frontiers in Psychology* 12, no. 725569 (November 2021).
<https://doi.org/10.3389/fpsyg.2021.725569>
- Taylor, Shelley E., Lien B. Pham, Inna D. Rivkin, and David A. Armor. "Harnessing the Imagination: Mental Simulation, Self-Regulation, and Coping." *American Psychologist* 53, no. 4 (04, 1998): 429-439. <https://doi.org/10.1037/0003-066X.53.4.429>

- Tse, Dwight C. K., Jeanne Nakamura, and Mihaly Csikszentmihalyi. "Beyond Challenge-Seeking and Skill-Building: Toward the Lifespan Developmental Perspective on Flow Theory." *Journal of Positive Psychology* 15, no.2 (2020): 171–182. <https://doi.org/10.1080/17439760.2019.1579362>
- Tse, Dwight C. K., Jeanne Nakamura, and Mihaly Csikszentmihalyi. "Living Well by 'Flowing' Well: The Indirect Effect of Autotelic Personality on Well-Being Through Flow Experience." *Journal of Positive Psychology* 16, no.3 (2021): 310–321. <https://doi.org/10.1080/17439760.2020.1716055>
- Williamson, Jill, and David Lyons. "Myelin Dynamics Throughout Life: An Ever-Changing Landscape?" *Frontiers in Cellular Neuroscience* 12 (2018), <https://www.frontiersin.org/articles/10.3389/fncel.2018.00424>
- Winerman, Lea. "The Mind's Mirror." *Monitor on Psychology* 36, no. 9 (2005, October). <https://www.apa.org/monitor/oct05/mirror>
- Winerman, Lea. "Talking the Pain Away." *Monitor on Psychology* 37, no.9 (2006, October). <https://www.apa.org/monitor/oct06/talking.html>
- Wulf, G., and Rebecca Lewthwaite. "Optimizing Performance Through Intrinsic Motivation and Attention for Learning: The OPTIMAL Theory of Motor Learning." *Psychonomic Bulletin & Review* 23, (2016): 1382- 1414. <https://doi.org/10.3758/s13423-015-0999-9>
- Yeager, David S., and Carol S. Dweck. "What Can be Learned from Growth Mindset Controversies?" *American Psychologist* 75, no. 9 (12, 2020): 1269-1284. <https://doi.org/10.1037/amp0000794>
- Zhukov, Katie. "Current Approaches for Management of Music Performance Anxiety: An Introductory Overview." *Medical Problems of Performing Artists* 34, no.1 (March 2019): 53–60. <https://doi.org/10.21091/mppa.2019.1008>