AN INVESTIGATION OF MUSICAL INTELLIGENCE FOR A POSITIVE PEDAGOGICAL APPROACH

by

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DEDICATION

To my beloved husband, Rodolfo.

To my mother.

To Brian, Martina, Katherine, and Sydney.

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I wish to show my gratitude to the Wayne State University Graduate School and to my Professors. I am indebted to Dr. Robert Rann for his editing and proofreading.

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INTRODUCTION AND THESIS

My dream career, teaching vocal music, turned out to be much more rewarding and exciting than I ever expected. Many times, I found myself being more like a life counselor than "just" a music teacher. The profound link of our voice with our soul often offers opportunities for teaching music psychology to students rather than just vocal techniques. Some of the skills of a good musician are also good to have in life. For example, the discipline required by a piano student during practicing offers the opportunity to discuss values such as commitment, determination, and patience. My daily role of music coach comes to life when I instill passion, inspiration, dedication, and strength in my students to study better and live better. My goal is for them to leave my studio with a happier mood than the one they arrived with.

During my teaching practice, I observed that my intentions were not just abstract, but could become concrete. My students did leave the studio happier, and my desire for them to feel better and satisfied became a reality. It led me to think about the power of music to transform lives. Of course, there is nothing new about this: a lot of research confirms the positive and therapeutic impact of music, but I became curious about how it happens and why. At first, I was fascinated by some principles of music psychology in education. Then, I found research on positive psychology, and I fell in love with the concept of uplifting music pedagogy and its relevance for the learning and wellness of students. I formulated the conviction that education could be the most beautiful and inspiring experience of life when happening under the most favorable approach and conditions.

The purpose of my work is to suggest a positive pedagogical approach because learning music in a constructive environment contributes to the growth of musical intelligence. The primary data comes from interviews with music students, supported by secondary scholarly research. My

work adds to existing neurological research by bringing examples of how musical intelligence interacts with other types of intelligence. Such interactions serve as proof of brain plasticity and the importance of musical training as a method of empowerment for human intelligence. After all, it is all about electrical connections in the brain, and intelligence cannot be separated or compartmentalized.

Intelligence is independent and dependent at the same time, and sometimes, opposites can merge together. In synthesis, intelligence can be seen as a whole made by different subcategories. Specifically, it is independent in the sense that its unique features are associated with pure intuition and creative power. However, it is also dependent because it feeds on psychological and environmental interactions, in a nature and nurture sense. Since musical intelligence connects to general intelligence, any improvement in musical intelligence is an improvement in general intelligence as well.

In my investigation, I provide some missing links between disciplinary fields. Even though it cites research in psychology, neuroscience, and education, it does not provide any new scientific element to any of these fields. Also, my work omits relations between music and language, music therapy and unhealthy individuals, and learning processes in children or other age groups. This work is intended to be addressed mainly to music educators and pedagogues, although some beneficial aspects of music can impact music students or the general public (for example, binaural beats). The paper has been developed with intrinsic assumptions about western music and society (tonal music mainly, mentally healthy and hearing-able people, common culture, etc.), and it is meant for an academic and musically educated audience.

Interviews with music students, music teachers, and music professionals are used to investigate their perceptions of the meaning of music and musical intelligence in their lives and

for their overall satisfaction. Multidisciplinary research and interviews with music students and music professionals confirm that musical intelligence is perceived as an interactive portion of general human intelligence and an asset for a positive musical pedagogical approach.

PART 1: DEFINITION OF MUSICAL INTELLIGENCE

CHAPTER 1. INTRODUCING MULTIPLE INTELLIGENCES

The definition of musical intelligence is not at all clear. Even the definition of general intelligence is more complicated than it may at first seem from a simple dictionary entry ("the ability to acquire and apply knowledge and skills," according to the *Oxford English Dictionary*). Authors from Switzerland and Australia put together "A Collection of Definition of Intelligences," listing eighteen common definitions, plus thirty-five psychological definitions, and another eighteen definitions from AI researchers.[1]

In 1983, American psychologist Howard Gardner proposed a theory of multiple intelligences in his book, *Frames of Mind: The Theory of Multiple Intelligences.*[2] A 2006 update, *Multiple Intelligences: New Horizons*, includes eight types of intelligence, summarized here:

- Musical Intelligence: Empirical observation proves that musical skills are a universal faculty embedded in raw form since early childhood. In Gardner's theory, musical skills are made equal with other intelligences. Understanding relationships between rhythms and pitches with text and feeling takes a special kind of appreciation and awareness of sound and its patterns. Composers and musicians can influence their respective cultures with their contributions. For instance, Bach's, Mozart's, and Haydn's musical accomplishments inspired Gardner as an example of extraordinary musical intelligence.[3]

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[1] Shane Legg and Marcus Hutter, *A Collection of Definitions of Intelligence*, PDF, (Manno-Lugano CH-6928, Switzerland: IDSIA, Galleria 2, October 4, 2006).

[2] Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (New York: Basic Books, 1983), ProQuest Ebook Central.

[3] Gardner, *Frames of Mind*, 119.

- Bodily-Kinesthetic Intelligence: Functional body movements are proof of the evolution of intelligence in human beings. Movement appears to be a less intuitive form of problem-solving, but there is evidence of the cognitive features of body usage. Being physically capable of handling tasks with dexterity and excellent motor control can be the difference between life and death in certain situations, such as in law enforcement and when performing surgery.
- Logical-Mathematical Intelligence: Along with language (see below), this intelligence involves the capacity to analyze problems logically, solve mathematical operations, and approach issues scientifically. This intelligence has historically provided the principal basis for IQ tests. For this reason, the value of being able to compute and solve complex problems related to math and science has been taken into consideration. Also, developing our technology and understanding of the universe holds very relevant industrial and commercial value.
- Linguistic Intelligence: This intelligence is observed to be present since early childhood across cultures. Coming from the area of the brain called "Broca," it includes sign language even in the deaf population when the standards are not taught. In other words, developing communication in any form is an instinct for survival.
- Spatial-Visual Intelligence: This form of intelligence embraces spatial problem-solving required for mapping and navigation, and other abilities typical of visual artists. The use of space, from the middle region of the cerebral cortex, allows us to observe nature from different points of view and to recognize faces, places, and scenery. In blind populations, spatial intelligence and visual perception are divided skills. Artists and

architects can see the beauty in detail as well as the bigger picture and can help those of us less knowledgeable in that area to see the world in a more accurate light.

- Naturalistic Intelligence: The newest addition to Gardner's theory posits an affinity to nature as an intelligence. Naturalists are conscious of the changes in the environment and can identify flora, fauna, and foliage with confidence. Forest rangers and farmers are not the only occupations where this intelligence would be beneficial. Environmental science identifies how humans affect the natural world. Those with this type of intelligence make us aware of pollution so that we can enact a conscious change that would help us conserve our planet.
- Interpersonal Intelligence: Understanding others' behaviors, moods, and motivations, and being able to react with empathy and comprehension is proof of this type of intelligence. In sophisticated forms, these skills belong to religious or political leaders, salespersons, marketers, educators, and other social professionals able to interpret the tendencies of specific demographics as well as the broader population.
- Intrapersonal Intelligence: The knowledge of internal aspects of a person raises humans above any other creature. Being able to understand emotions, label them, and analyze models of intimacy are examples of this skill. While providing a clearer sense of self, this intelligence gives individuals the capacity to recognize their strengths and weaknesses and thus work to better themselves.[4]

[4] Howard Gardner, *Multiple Intelligences: New Horizons* (New York, NY: Basic Books, 2006), 8-18.

Gardner redefines intelligence by pluralizing the concept, placing skills other than linguistic and logical-mathematical on equal footing. Linguistic and logical-mathematical intelligences were overemphasized in traditional models of human intelligence because of the cultural artifact influenced by the IQ test, which favored the logical-mathematical intelligence.[5] Gardner's theory of multiple intelligences has received considerable attention from the educational community as artistic, musical, and sport disciplines have achieved new prominence through differentiation in teaching practices.[6]

Misreadings of Gardner's work and the lack of corroborating research have led to some misunderstandings, for example, the confusion between multiple intelligences and learning styles.[7] Although over ninety percent of teachers believe that students learn better when they receive information tailored to their preferred learning styles, this is a myth because of the brain's interconnected nature. While it is good to give students multiple ways to access information and individualized lessons, it is not recommended to label students with a particular type of intelligence. As educators incorporate the arts in the curriculum, they should not confuse multiple intelligences with learning styles; neither should they lean on one single style.[8]

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[5] Jonathan Plucker, "Howard Gardner: American Psychologist and Educator," *Human Intelligence: Howard Gardner,* April 29, 2018, https://www.intelltheory.com/gardner.shtml.

[6] Cathy Kassell, "Music and the Theory of Multiple Intelligences," *Music Educators Journal* 84, no, 5 (1998): 29-60; Mark K. Smith, "Howard Gardner, Multiple Intelligences and Education," *infedorg*, 2008, http://infed.org/mobi/howard-gardner-multiple-intelligences-and-education/; George Lucas, "Multiple Intelligences: What Does the Research Say?" Edutopia, July 20, 2016, https://www.edutopia.org/multiple-intelligences-research; Thomas Armstrong, "Multiple Intelligences," The American Institute for Learning and Human Development, https://www.institute4learning.com/resources/articles/multiple-intelligences/.

[7] Youki Terada, "Multiple Intelligences Theory: Widely Used, Yet Misunderstood." Edutopia, October 15, 2018, https://www.edutopia.org/article/multiple-intelligences-theory-widely-used-yet-misunderstood.

[8] Terada, "Multiple Intelligences Theory."

Having grown up playing piano, Gardner wondered why the arts were not included in discussions about intelligence. During his graduate studies in psychology, he felt "struck by the virtual absence of any mention of the arts in the key textbooks."[9] His hypotheses were confirmed by studies from the fields of neuroscience, which demonstrated that intelligence "involves all of the regions of the brain, because it involves all cognitive functioning of humans." Although it is challenging to establish a specific definition of musical intelligence, Gardner attempted by quoting Polish philosopher, mathematician, physicist, inventor, lawyer, and economist Hoene Wronsky: "music is the corporealization of the intelligence that is in sound."[10]

This chapter suggests that musical intelligence is the ability to perform (play and sing), compose, and appreciate musical patterns, including recognition of pitch, tone, harmony, timbre, and rhythm. By borrowing the definition from a technological and operational management point of view, a process is the transformation of an input into an output.[11] Inspired by the definition of process in the business model, I define musical intelligence as *the transformation of a musical input into any output through a process that happens in the brain with either conscious or unconscious cognitive or creative elaboration*. This definition includes both instrumental and vocal music, passive vs. active music activity, physical vs. conceptual output, skills vs. ideas, and elaborations. It regards any type of music, from any genre and provenience, and it excludes mere noise.

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[9] Terada, "Multiple Intelligences Theory."

[10] Gardner, *Frames of Mind*, 454.

[11] "The Input Transformation Output Process Information Technology Essay," UKEssays.com, https://www.ukessays.com/essays/information-technology/the-input-transformation-output-process-information-technology-essay.php.

CHAPTER 2. INTERACTION AND PERCEPTION

Gardner defines musical intelligence as a "separate intellectual competence," intended as independent from other intelligences and assuming the connotation of intelligence standing by itself.[12] Barbara J. Crowe writes that "music is the quintessential cultural tool that mirrors the complex relationship and interactions of our world," and it is only through interaction that music may affect intelligence.[13] Likewise, without feeding on music, human intelligence would not have developed as the complex, social, and interactive form we all know.[14] Music provides neuronal arousal as sensory input, which stimulates the brain areas needed for memory and brain functioning.[15] In other words, as we hear any sound, our brain interprets, memorizes, and stores information. This is musical intelligence in action, independent from our will or consciousness.

The interaction between musical intelligence and general intelligence is evident through examples that can be attributed to each of Gardner's categories:

- Musical Intelligence interacts with general intelligence in many ways. Among these, research has proven that listening to music activates the brain structure implicated in reward and experience of pleasure (the *ventral striatum* and *nucleus cucumbens*).[16] People hear a simple melody, such as the NBC chimes, and the immediate association with its representative meaning demonstrates not only the connection between music

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[12] Barbara J, Crowe, *Music and Soulmaking: Toward a New Theory of Music Therapy* (Lanham, MD: Scarecrow Press, 2004), 25.

[13] Crowe, *Music and Soulmaking*, 25.

[14] Jay Schulkin and Greta B. Raglan, "The Evolution of Music and Human Social Capability," *Frontiers in Neuroscience* 8 (2014), https://www.frontiersin.org/articles/10.3389/fnins.2014.00292/full.

[15] Crowe, *Music and Soulmaking*.

[16] Stefan Koelsch, *Brain and Music* (Hoboken, NJ: Wiley-Blackwell, 2013).

and memory but also the abstraction from the physical stimulus.[17] Furthermore, complex vocalisms are possible due to anatomical modification of the *basal ganglia*, which appears to have been developed through natural selection, since beautiful singing has no strict connection with survival or reproduction (as is the case for birds and some other mammals).[18] The brain, central organ of general intelligence, is shaped for creative musical abilities.

- Bodily-Kinesthetic Intelligence interacts with musical intelligence as individuals move to music. The brain extracts periodicities from complex auditory stimuli at different hierarchical levels in music. These periodic expectancies are the basis of motor synchronization to the beat.[19] The relation between rhythm and movement is obvious, but music also influences the body physiologically. Music therapy research confirms the calming effect of music on heart rate, blood pressure, and respiration.[20]
- Logical-Mathematical Intelligence has been connected with musical intelligence since Pythagoras (ca. 500 BC), who discovered the theory of strings vibrating, demonstrating that music intervals correspond to mathematical frequency ratios (i.e., a perfect fifth corresponds to a 3/2 rate and a perfect fourth to a 4/3).[21] Another example of interactions between mathematical and musical intelligences is the well-tempered

[17] John A. Sloboda, *The Musical Mind the Cognitive Psychology of Music* (Oxford: Clarendon Press, 1994).

[18] Aniruddh D. Patel, *Music, Language, and the Brain* (Oxford: Oxford University Press, 2010).

[19] Patel, *Music, Language, and the Brain*.

[20] Crowe, *Music and Soulmaking*.

[21] K. Lee Lerner, and Brenda Wilmoth, *Real-life Math*, vol. 2 (Detroit: Thomson Gale, 2006), 343-352.

tuning system. Introduced in 1550, it consisted of dividing an octave into 12 equal semitones, requiring a number that equals 2 when multiplied 12 times, which is 1.0595. Lastly, the entire field of data compression, which is crucial to MP3 files, analog-digital signal conversion, and streaming audio, can be attributed to advances in algebra, statistics, calculus, Fourier analysis, and fractals.[22]

- Linguistic Intelligence obviously manifests in singing and significantly overlaps in certain aspects of musical processing. Neuroimaging has shown the interaction when processing one point of musical grammar, such as harmonic structure, chords, or keys. Another interaction with musical intelligence focuses on the relationship between musical abilities and phonemic abilities. "There is growing evidence," writes Patrick Rebuschat, "that either pitch-related or rhythm-related musical skills are related to phonemic abilities in language, such as segmentation, categorization, or discrimination of phonemes."[23] Moreover, quantitative research on adults has examined the correlation between musical ability and proficiency in a second language. Results confirmed a unique variance in other language skills for individuals with musical talents. This predictive relationship relates to receptive and productive phonology, otherwise known as phonemic skills.[24]
- Spatial-Visual Intelligence and its interaction with musical intelligence was investigated in a longitudinal study under the Witelson's Dichaptic Stimulation test.

[22] Lerner and Wilmoth, *Real-life Math*.

[23] Patrick Rebuschat, *Language and Music as Cognitive Systems* (Oxford: Oxford University Press, 2012), 217.

[24] G. Kristiansen, "Towards a Usage-Based Cognitive Phonology," *International Journal of English Studies* 6, no. 2 (2009): 107-140.

The researchers divided 120 children from nine to fourteen years of age into three groups: (1) children with musical talent and the ability to compose and improvise; (2) children with musical talent without the ability to compose; (3) a control group of children without musical skills. "Results confirmed that creative musical ability was significantly related to spatial orientation in both boys and girls and spatial visualization in boys."[25] Another study connected music and spatial reasoning by asserting that "active music instruction lasting two years or less leads to a dramatic improvement in the performance of spatial-temporal measures."[26] Finally, scientific research confirmed that the so-called "Mozart effect" exists and influences spatial-visual intelligence. "The findings that music enhances spatial-temporal performance supports a view of the mind/brain as modular," writes Lois Hetland, "but it also suggests that the particular modules that process music and space are not entirely independent of one another."[27]

- Naturalistic Intelligence interacts with musical intelligence, for example, under a multidisciplinary approach. The division of blue whale songs into nine regional types allows scientists to identify a worldwide blue whale population structure. Differences in songs also provide genetic and morphological data to help distinguish blue whale groups' characteristics.[28] In another example, researchers studied the effect of music

[25] Hassler, Birbaumer, and Feil, "Musical Talent and Visual-Spatial Abilities: A Longitudinal Study," *Psychology of Music* 13, no. 2 (October 1985): 99–113, doi:10.1177/0305735685132004.

[26] Lois Hetland, "Learning to Make Music Enhances-Spatial Reasoning: Evidence for the 'Mozart Effect,'" *Journal of Aesthetic Education* 34, no. 3/4 (2000): 203, doi:10.2307/3333640.

[27] Hetland, "Listening to Music Enhances Spatial-Temporal Reasoning."

[28] Mark A. McDonald, Sarah L. Mesnik, and John A. Hildebrand, "Biogeographic

exposure on 30 plants (Rosa Chinensis). The results showed that music influences the growth of plants and can either promote or restrict it, depending on the type of music being played.[29]

- Interpersonal Intelligence: Making music together is probably the best example of the interaction between interpersonal and musical intelligences. Social research confirms that making music together "presupposes a mutual tuning-in relationship."[30] Furthermore, music facilitates intimate interactions, creates groups, and sets boundaries that include or exclude individuals. It is a flexible tool for managing relationships between the self and others.[31] Additionally, music is a political tool. Without the interactions of interpersonal and musical intelligence, it would not be possible to assign meaning to music, nor to recognize the relation between organized sound and social structure.[32]
- Intrapersonal Intelligence and musical intelligence are one under the whole inner and emotional sphere of an individual. First, "music is a tool for the discovery,

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Characterization of Blue Whale Song Worldwide: Using Song to Identify Populations," EScholarship, University of California, November 25, 2008. https://escholarship.org/uc/item/5r16c2mz#author.

[29] Vidya Chivukula and Shivaraman Ramaswamy, "Effect of Different Types of Music on Rosa Chinensis Plants," *International Journal of Environmental Science and Development* 5 (2014): 431-34.

[30] Alfred Schütz, "Making Music Together: A Study in Social Relationship," *Social Research* 18, no. 1 (1951): 78.

[31] Susan Hallam, Ian Cross, and Michael Thaut, *The Oxford Handbook of Music Psychology*, (Oxford: Oxford University Press, 2018), 42.

[32] Peter Etzkorn, "On Music, Social Structure and Sociology," *International Review of the Aesthetics and Sociology of Music* 1 (1974): 43-49. doi:10.2307/836756.

> manipulation, and projection of individual identity."[33] Second, emotion is a quality of neurological functioning with a biological expression of states that music can arouse, stimulate, and enhance. Third, "music can and does alter our mood." The power of music to shift mood states from negative to positive contributes to treating mental health, confirming the therapeutic value at the intersection between musical and intrapersonal intelligence.[34]

The interaction of musical intelligence with other types of intelligence reinforces the connection with general intelligence. However, given the difficulty of even finding an accepted definition of intelligence and the complexity of interactions between musical and other types of intelligence, this study focuses on the *perception* of musical intelligence only. The term perception in this context can have three meanings: neurological/auditory perception, psychological perception, and perception as a synthesis of meaning.

The connection between the concepts of pitch, perception, and psychology starts in the auditory system. The human ear receives sound waves, amplifying some and attenuating others. Auditory perception occurs when "the brain decodes the spatio-temporal pattern consisting of the individual firing rates of all activated auditory nerve fibers into information about intensity and frequency of a stimulus."[35] Another perception occurs with the phenomenon of "beat frequency." For example, tones of 1000 and 1004 Hz are perceived at a frequency of 1002 Hz. The same principle applies to the perception of *sensory consonance/dissonance* and *harmony.* Western

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[33] Hallam, Cross, and Thaut, *The Oxford Handbook of Music Psychology*, 42.

[34] Crowe, *Music and Soulmaking*, 237-245.

[35] Koelsch, *Brain and Music*, 23-25.

listeners tend to define consonance when the separation between the frequencies of two tones does not exceed 11%-17% of the central wavelength.

The perception of pitch is not a simple auditory phenomenon, but a psychological one.[36] Since melodies and harmonies can be transposed and still be perceived as the same music, the psychological perception of pitches in the ratio of their physical frequencies overcomes their arithmetical differences. A similar pattern happens when "two sinusoidal tones separated by an octave are perceived as somewhat identical." Research confirms that music listeners perceive pitch in an intricate pattern of interrelationships among individual tones, correlated to the function of sounds for an established tonal center. In this context, pitches are psychologically perceived within a tonal hierarchy.[37] However, there are different types of audiences, and the ability to listen has long been linked with social class.[38] Perception also depends upon the establishment of musical expectancies. Within the hierarchy of harmonic stability, the brain's ability to expect musical events is a "reflection of a psychological reality of musical syntax."[39]

The psychological definition of perception is: "the process or result of becoming aware of objects, relationships, and events by means of the senses, which includes such activities as recognizing, observing, and discriminating. These activities enable organisms to organize and interpret the stimuli received into meaningful knowledge and to act in a coordinated manner."[40] In this definition, perception and meaning are closely related. On the one hand, becoming aware of

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[36] Koelsch, *Brain and Music*, 23-25.

[37] Koelsch, *Brain and Music*, 25.

[38] Judith Adler, and Theodor W. Adorno, "Introduction to the Sociology of Music," *Contemporary Sociology* 6, no. 3 (1977): 301. https://doi.org/10.2307/2064780.

[39] Koelsch, *Brain and Music*, 25.

[40] "APA Dictionary of Psychology," American Psychological Association, https://dictionary.apa.org/perception.

musical intelligence is something intertwined with the perception of it, from receiving the musical stimuli to transforming it into meaning. On the other hand, becoming aware of musical meaning and being able to recognize, observe, and discriminate through it confirms the presence of musical intelligence in action. In other words, when hearing a sound, our brain transforms the auditory experience into perceptual stimuli. Our interpretation of it creates new (and merges with pre-existing) knowledge, enabling our musical intelligence to assign a perceived meaning that may lead to potential action.

PART 2: INTERVIEWS AND PEDAGOGICAL CONTRIBUTION

CHAPTER 3. INTERVIEWS

Coming from different musical experiences, my students have always shown me they deeply value the music education that they receive during our lessons. Most of the time, our discussions are not only technical or related directly to music, but also about personal and professional life, and wellness. I interviewed several to find out more about their perception of musical intelligence and its meaning in life. This chapter includes a presentation of the students' background, comments on their perception of musical intelligence, comments on their perception of the ramifications of musical intelligence, and special notes (when applicable).

Participants were asked the following questions:

- What is the role of music in your life?
- Why did you start taking music lessons? What exactly do you want to achieve in music?
- What would you like to achieve in your life? How do your life goals and music goals go together?
- How do you assess your musical intelligence before and after taking music lessons? Which particular musical skills do you think you have improved?
- Do you think your musical intelligence relates to your overall general intelligence? Do you think your musical improvement has impacted your general intelligence improvement?
- Do you think your intelligence contributes to make your life better? Would you say that taking music lessons has positively impacted the quality of your life?
- Do you think everyone should study music or only musically talented/gifted people? Do you think you are musically talented/gifted or not, and why?

- Do you think music makes your life meaningful? Do you think a life with music is a better life than one without it?
- How do you value the general quality of your life and level of happiness? How do you value the general quality of your music life?
- Do you feel more intelligent and/or are you happier because of your music studies? Why yes, or why not?

They were also invited to comment freely and expand on their thoughts, feelings, ideas, opinions about music and intelligence.

Artun Kircali is a young man in his thirties. He started taking singing lessons because he wanted to be competitive as an equity actor when auditioning for musicals. "My musical goals revolve around bettering myself and achieving the potential that I believe lives within me, which is essentially the same as my life goals - to reach my own potential as a professional in something I am passionate about."[41] Kircali perceives a connection between his musical and general life purpose, and the interaction between the two. "I also have experienced some stagnation in my professional career as an actor and wanted to give myself additional tools to strengthen my performer's ability and possibly open up new opportunities for myself."

Kircali never thought about his musical ability before he was told explicitly by some of his friends that he could not sing. He asked for further opinions from closer friends and family, and they confirmed his own belief in his lack of ability. "I assess my musical intelligence by judging my ability to reproduce the notes that I hear in songs," and after taking voice lessons for almost a year, "I have greatly improved my intonation as well as my ability to identify what notes are being

[41] Artun Kircali, personal interview, July 7, 2019. Due to the number of times Kircali is quoted, the quotes are not cited individually.

played or sung. I have also developed a much better understanding of musical pieces I hear, so that I can now identify what instruments are being played in the song and have a better appreciation of the detail contained in a piece of music." Furthermore, "after this past year or work, I feel very confident in my ability to progress further in my singing and musical skills. So much progress has been made during these lessons that I never even thought possible for myself, that I am open to believing much greater heights and progress are achievable."

Kircali's perception of how music education has shaped for him a better quality of life is strong:

> I feel that music lessons have absolutely impacted my quality of life in a very positive way. I have always wanted to be able to express the strong feelings and emotions that I carry around with me because they are exhausting to hold inside, and I find music and singing to be a therapeutic way to release this tension. However, because I could not sing a year ago, I only became more stressed if I attempted to sing my frustrations out. Now because it finally sounds like the song when I sing it, I feel comfortable to express myself, and I also get great pride out of my vast improvement to my singing abilities.

Kircali also has a profound understanding of how musical intelligence is meaningful to him:

> I think that music makes my life more meaningful by being able to help me reflect on complex emotions I am having. Music is like a compass that helps me find my emotional center whenever I am upset, scared, angry, or confused. I believe that my intelligence does make my life better. I think a life with music is better than a life without it because music is a nourishing thing. When I am tired, and I listen to a song, it can fill me with so much energy and emotion that it feels like magic I absolutely think music is vital to a happy and successful life.

Kircali defines his general quality of life as good, and his musical experience as excellent. He perceives his musical intelligence as an asset for a better quality of life and adds:

> I do feel more intelligent in that I feel more skilled now, with the ability to sing much better than before. I also feel much happier due to my music studies because I feel like I have achieved the previously impossible. I felt like I would never be able to sing, and although I took these lessons, I was not certain that I would see results from them. I am very happy to say that I can sing well enough now, and I am looking forward to improving further and becoming happier.

Randall Cobb has been a music student for about fifteen years. He focused on guitar and voice and took lessons whenever he felt he had run into some sort of roadblock or plateau, preventing him from making progress on his own. He would never consider music as a career because playing songs to pay the bills would take away the fun factor. But he is willing to work hard at music, having in mind the goal of performing with his friends.[42] "Music fills a variety of roles, but primarily is an escape of some kind. Also, I like the community aspect of playing in a band, where people from a variety of backgrounds get together for a single purpose, even for just a moment." For Cobb, life goals and music goals go together because music is "the primary activity where I seek out other people to participate. Music is really my preferred way to become an extrovert because a performer gets to take on a persona that can be far different from their daily life." Since he perceives music as an escape, in this sense, his musical intelligence has a liberating function.

Before taking music lessons, Cobb was missing some of the fundamentals. He would self-assess when he felt stuck by challenging himself to play some of the songs from his repertoire book. "At this point in time, I feel my musical intelligence is strong in fundamentals," he says, "and I am continuing to expand knowledge into more complex chord structures and ways to use them. I am 100% confident I will continue to progress in the future." Cobb perceives musical intelligence and general intelligence as somewhat related. "My musical intelligence has helped me develop some soft skills, particularly from communication and mental flexibility. Learning to communicate expressively and keep the attention of an audience is not something typically taught

[42] Randall Cobb, personal interview, July 3, 2019. Due to the number of times Cobb is quoted, the quotes are not cited individually.

in schools. Besides, the exercise of analyzing songs is like solving puzzles, and I am often amazed at what variety can be created with the same twelve notes!"

Cobb has a clear understanding of how musical intelligence has positively contributed to make his life better through fun and intellectual growth. "I think the periods of time where I have taken music lessons have certainly had a positive impact on the quality of my life. I play music primarily for fun, and lessons are really supportive of that fun. While I am able to learn a great deal of music on my own, taking lessons is faster and helps me get to the fun part with less effort." Additionally, "improving intelligence and gaining other knowledge opens more opportunities in people's lives. The more options a person has, the better they are able to handle adversity and pursue their goals in life." Cobb not only believes that musical intelligence can make his own life better, but he seems to confirm that cultivating intelligence could be good for everyone else's life satisfaction.

Cobb perceives his musical intelligence as personal:

> Music certainly adds meaning to my life. When I was growing up in school, most of my friends were with me in the band, and it was fun working together and building our music for concert time. When I play in a band now, I feel like I am getting back to a piece of that friendship, and it also helps keep me motivated and moving forward. Life is certainly better with music! I am certainly happier when I am building on my music skills and playing songs with my friends. Intelligence is trickier, but I do think music and the stories in songs have colored my thoughts and viewpoints with a richness that might not have been present otherwise.

Cobb considers his overall life satisfaction to be between "good" and "great." He recognizes the social importance and the fun aspect of music. He also perceives that we can grow open-minded because of musical inspiration.

Katherine McNamara is a professional musician. She has taken violin lessons for over fourteen years and earned a master's degree in violin performance from Bowling Green State University, Ohio. She has been a violin teacher for about ten years. Ambitious and highly

dedicated, Katherine remembers her choice when she was a child. "My mom said violin was one of the hardest instruments, so that made me want to take it."[43] McNamara wants to achieve "a uniqueness that I can add to the music world." She finds that "when a subject all of a sudden is more complex, one can appreciate it and appreciate those who have dedicated their life to it."

Despite her successful career, McNamara is modest about her talent. "I would not consider myself very gifted in music. My areas of strengths were mathematics and sciences. Those came easier for me and were more natural. Had music been like mathematics and science for me, then I would say I was musically gifted." In her view, there is much work to be done for musicians' self-esteem. They need to see their musical intelligence objectively. The truly great musician, who always knows the gap between present ability and perfection, may underestimate his or her actual abilities. "Music is a constant test of your confidence since it is so personal," she says. "I have worked very hard to get where I am at musically." Music lessons have positively impacted McNamara's life because studying violin "pushed me beyond my limitations. Studying music creates discipline and forces you to step out of your comfort zone."

McNamara is, indeed, convinced that her musical improvement had improved her general intelligence:

> Achieving perfection in music is an audio version of achieving perfection in life. The bad sounds and bad pitches mirror imperfections in life, whether it be another skill or character flaw. Going about removing the bad sounds and bad pitches to achieve perfection can be analogs to removing imperfections in life and the ever-constant strive for perfection. Sometimes one will find achieving perfection in music easier than those of different life skills, and you can use how you went about it in music and apply it to the life skill. Other times accomplishing a life skill comes easier than accomplishing a musical passage, thus one can apply the tactics used in the life skill to the musical passage. In this way, my musical intelligence has impacted my general intelligence and vice versa. The process of music-making is a

[43] Katherine McNamara, personal interview, August 2, 2019. Due to the number of times McNamara is quoted, the quotes are not cited individually.

> constant reminder of the imperfections in this life and the never-ending goal of perfection.

Thus, McNamara shows a significant understanding of the interconnection between types of intelligence and their relation to life goals.

She also specifies that musical intelligence relates to overall general intelligence in the problem-solving process. “In anything new you try to do, the brain will inevitably be put to use, thus furthering your experiences. As long as the experiences stay positive, it should make your life better. It also makes you a multi-dimensional person, […] and helps people make connections in many areas of life that they may have not made if not studying an instrument.”

When asked how she considered her musical intelligence meaningful for her life satisfaction, McNamara answered, “life without music is black and white. Music is the color in the audio world. Music is an abstract language, […] and it is a reminder that there are things in this world that exist but cannot be explained. Being a part of music, I am able to participate in the unexplainable. I can reach human beings and communicate with them on a different level than that of words. That, to me, is very meaningful.” And finally, she concluded, “I would say that music does make me feel more intelligent and has made my life richer.” McNamara has exceptional sensitivity and intuition about the concepts of musical intelligence and its interactions. She values education, hard work, striving for perfection, and the meaning of all of this in her life. She has an inner perception of her musical intelligence as an asset in her life.

Rocky Saxena is studying for a master’s degree in biomedical engineering at Wayne State University. He is an example of someone with a scientific mind who is attracted to music. “I want to be a successful artist and an amazing scientist. My passion for science is there to allow me help unlock the mysteries of the universe while becoming an artist (actor or singer) will be there to

express myself in creative ways."[44] Saxena thinks that his musical and life goals blend because music helps him release the stress of his work pursuing treatments for diseases.

Before taking music lessons, he says, "I never knew I was off pitch, tune, or that I was using mouth voice. I had no idea that any of these things even existed. I believe that my musical intelligence has increased significantly from when I started out. […] Now, I am able to stay on pitch. I feel much more confident, I understand the progress I have made, and I know if I devote more time to practicing, I will achieve my goals." Saxena not only appreciates the improvement in his skills, but he can also perceive the relation of musical intelligence with his general intelligence. "I am a college student, and I noticed that my critical thinking and creative skills have improved since I have been taking music lessons. Whenever I am programming, we have to come up with creative ideas to solve problems, and I believe there is a direct correlation between general intelligence and music intelligence."

Saxena describes how musical intelligence is an asset in his life:

> Music lessons improved my quality of life. I have seen improvements in all the hard work I have done. Sometimes I will be singing random songs, and people would say things like - oh wow, I did not know you had a good voice – and getting those compliments make me feel good about all the work I have put into this. I would say music does make my life more meaningful. […] It allows me to express myself and gives me hope that one day I can become an amazing artist.

According to Saxena, a life with music is better than one without.

As a scientist, Saxena fully understands the neuro-plastic effect of music on the brain, and as an individual, he evaluates his musical intelligence as an asset for his life satisfaction. "I feel more intelligent because learning new skills always changes the structure of our neurons in the brain; this allows us to expand our knowledge and our creativity level. As I mentioned before,

[44] Rocky Saxena, personal interview, June 30, 2019. Due to the number of times Saxena is quoted, the quotes are not cited individually.

being a computer programmer requires an individual to be creative, and I have been writing efficient, interesting codes ever since I embarked on taking music lessons." He concludes:

> Taking music lessons has greatly increased my intelligence. I am much more creative, and this directly allows me to become an excellent problem solver. In addition to me becoming more intelligent, music has been a great way to decrease my stress level because of the sheer amount of enjoyment I experience. Furthermore, it allows me to express myself in ways that words could not, and overall, it has improved my quality of life.

Greg Brown has been a music student for about three years, with lessons divided between voice and guitar. "Playing guitar and singing helps me relax after a stressful day at work. I just like the way I feel when I am playing and singing. It feels good and rewarding to pursue this hobby."[45] In his opinion, one of the main goals in life is the pursuit of knowledge. "I truly enjoy studying music and music theory, and then putting that into practice." He adds, "I want to be confident enough to play in front of other people. That is a big milestone for me." Learning how to gain self-confidence through the preparation for stage performance is one of the interconnections where musical intelligence transforms into the potential for happiness.

Brown understands that his musical intelligence "helps to round me out as a person." He also believes that "music helps many areas of the brain. At times, I'll be stumped about a problem at work, and I'll take a break and play some songs on the guitar. As if by magic, a solution will pop into my head. I think music can help connect different areas of the brain and help process non-musical thinking." His perception of the interconnection of musical intelligence and general intelligence is clear; he also understands the role of musical intelligence in life satisfaction: It "makes the world a much more interesting place and enhances wellbeing. The sense of accomplishment is intrinsically rewarding," and "it is important to cultivate high-quality hobbies."

[45] Greg Brown, personal interview, July 17, 2019. Due to the number of times Brown is quoted, the quotes are not cited individually.

According to Brown, not only is making music a quality leisure pursuit, but it is also an antidote to shallow activities like checking social media and enhances the sense of flow in life.

Finally, like Saxena, Brown perceives that a life with music is better than a life without it. "It leads to a more well-rounded life. Music is a true form of art that touches something that is often beyond words. It can also create an emotional valence nearly on demand. It is amazing how music can change one's mood so easily. Overall, music is a high-quality leisure pursuit that can truly increase wellbeing." With his guitar and his passion for theory, Greg considers his quality of life "good" and sees his musical intelligence as an asset for better life satisfaction.

S. is a professional musician with whom I have performed multiple times.[46] She studied violin for over twenty-five years, opera singing for over twenty years, and conducting for a little over a year. Her mother started her on the violin when she was four-and-a-half years old because she said she was quite musical. Despite being modest about her musical intelligence— "there is so much I can learn, and I really feel humbled and stupid in front of my voice professor!" —S. is an extraordinary musician with perfect pitch. She describes herself this way: "I can hear a piece in my head. I can figure things out on the piano for which I have never seen the score. I can play things by ear; I can harmonize when I sing or play the violin; I can remember things that I have heard and play them out on my violin and sing them. Sometimes I have even come up with little melodies or songs, but I chose not to do anything with them."

S. is well aware of the importance of musical intelligence in her life:

> I realize how much it has impacted my life in a positive way. As a child, music teaches you discipline, it trains you in an art, teaches you mathematics (just think about how you have to understand rhythm, or even how to divide the bow into six

[46] Anonymous personal interview, July 21, 2019. She decided to participate into the interview research as an anonymous contributor. She did consent to the publication of her contents but not of her name. Due to the number of times S. is quoted, the quotes are not cited individually.

> notes), it relates to history, and it really creates a particular outlook on life that people who are not musically inclined just cannot understand.

Her grasp of the interactions between musical intelligence and other types of intelligence is clear. "I think I am very musically intelligent, but I don't know how closely related that is to my other forms of intelligence." The interconnections she listed bring evidence to the fact that she understands it, but there is a missing logical step to connect the consciousness to the concept itself.

However, S. does not miss the close interconnection between musical intelligence and education, especially the contribution of

> understanding theory, chord progressions, and harmony. I think I am much better with my musical intelligence as an adult than when I was a kid. When I had to study music formally as an adult, it was very hard because I had to put in words and formulas things that I intuitively understood. It felt like a big block to me, a big block between myself and the music. It took a long time to close that gap, but now the intuition and the concrete analysis are integrated.

The intuition and understanding she had as a kid were the seeds of her musical intelligence. The integration that she earned as an adult through music education is the result of the plastic brain building connections among different functional areas. For example, she can express musical perception through language. S. perceives her musical intelligence as an asset for better life satisfaction. As she states, "music is both my profession as well as my deepest love. […] I think, as a musician, one is always truly happy inside, and no one can take the music away from you. My life would have no meaning without my music. I can't even imagine a life without music. That would be like a life without breathing air."

Ryan Christman has been taking music lessons for about eleven years. Throughout his adolescence and young adulthood, he was a vocalist performing in numerous shows. Music was his source of confidence and inspiration. After serving as an officer in the United States Air Force, he has become a disabled veteran diagnosed with bipolar disorder. Christman confirmed that when

he first got sick, singing helped him channel turbulent emotions.[47] Currently, he is taking songwriting lessons, and he dreams of using music as a way to be more connected with the community.

Christman explains that before taking music lessons:

> I was lost in my thoughts and emotions, always sensitive but too self-absorbed to put it to effective use. Music lessons have taught me about the amazing and humbling complexity and subtlety to making art, and I have carried that philosophy over to my other beliefs as well. I am less likely to insist on a rigid belief structure than ever before, based in large part on the growth that music has brought me.

Christman understands the interactions between musical intelligence and his other interactions in life. His perception of his musical intelligence and its meaning is honest and thoughtful:

> Music is a perfect vehicle to share my story and perspective. Now that I am a disabled veteran, intellectual, and creative activities help to structure my day and make me feel like I am still actively contributing to my world. I finished a book in 2012 that told the story of the onset of my illness and my attempts at recovery, and songwriting has become an extension of that instinct to describe, understand, and find meaning.

Christman believes that through music and philosophy, he has learned to embrace structure and is using it to achieve his goals. He feels more intelligent and happier because of his musical studies, saying:

> I listen to music differently now. Creating my own music has made me more patient about the fact that the tiniest details change things in substantial ways that make a difference, and I am humbler as a result. Philosophy, writing, and general appreciation for art contribute to my overall problem-solving ability. Trying to make music humbles you to the fact that there is always another way to look at life because you don't realize what details are salient to your awareness and what you haven't been noticing.

[47] Ryan Christman, personal interview, July 15, 2019. Due to the number of times Christman is quoted, the quotes are not cited individually.

Christman has an in-depth connection with his inner feelings and an awareness of his own wellness. He consciously and voluntarily uses his musical intelligence while songwriting to contribute to his overall wellbeing. He confirms that music makes his life meaningful:

> Expressing what music means to me is the most important thing that I do. Everyone can benefit from slowing down, paying attention, and describing what it is to experience this life. Music is a wonderful gift, and life is definitely better with it. I particularly enjoy the cerebral aspects of theory and playing an instrument and trying to find places where that connects with my general philosophy of life. Music is enriching my life.

Christman declared that his level of life satisfaction is "good," although it could be "great" if he could find more opportunities to interact with others through music and perfect his composition process.

Daniel Jones is a music professional and educator with a career of more than thirty years. He studied jazz and theory and went to the Atlanta Institute of Music. Jones generally defines himself as "always a student," saying that "music study never ends." He desires to continue to learn and grow.[48] His life goals and musical goals go together because he fundamentally sees himself as a "student really in any and all arenas. It applies to both my life in general and my musical life specifically." Jones says of himself, "it was only after I started studying music theory that I really started developing musical intelligence." Clearly, he understands the importance of education, and he perceives intelligence through the intellectual patterns of theory.

Jones defines his intelligence as acquiring a deeper understanding of intricate patterns. "My skills on guitar and bass were simply technical really before I started studying music more seriously." As we have observed from the neuroscience field, there is nothing simple about our plastic brain learning specialized movements and technical skills. However, our culture still

[48] Daniel Jones, personal interview, June 24, 2019. Due to the number of times Jones is quoted, the quotes are not cited individually.

conditions people to see intelligence from a particular perspective. In his compositions, he certainly does theoretical work, but his mind, ear, and pitch perception were there before he studied theory.

According to Jones, musical intelligence and overall intelligence reflect each other. "I have seen a correlation between general intelligence and musical intelligence in other musicians I have played with over the years. Those that take studying music seriously and have developed skill in general musicality seem to have this approach in other areas of their lives as well." Jones was able to see musical intelligence's effects not only in himself but also in other people. He also can perceive the interconnection between musical intelligence, education, and meaning for better life satisfaction. "Musical intelligence has definitely had a positive impact. I would characterize periods in my life when I am studying music consistently and in-depth as much better qualitatively than periods when I am not. I also get more joy in general from music. It makes my life meaningful. It is something I constantly return to. I enjoy listening, writing, and playing, and cannot imagine my life without it." His assessment of his life satisfaction is "good to great depending on the day. I am not gigging much anymore, […] but I am writing a lot more of my own material, and I do find that very satisfying." There is no doubt that Jones' musical intelligence is an asset for his overall satisfaction, and he perceives it as meaningful for his life.

Colin Wetmore is a sixty-eight-year-old student for whom "voice lessons are a source of great excitement and anticipation."[49] He always loved music and started lessons because he would like to achieve a good understanding of music theory and work on his singing ability. In his life, he also would like to return to competitive swimming. He feels that life goals and music goals go

[49] Colin Wetmore, personal interview, July 28, 2019. Due to the number of times Wetmore is quoted, the quotes are not cited individually.

together because his singing voice has improved with better breath control coming from swimming activity. Wetmore considers himself "still a neophyte," but his musical intelligence "has really improved" in fifteen months of music lessons, and he feels "very confident about the future."

Wetmore believes that before taking music lessons, his musical intelligence was average. Now, he explains, "I think my musical improvement has made me feel sharper. It has given me a new appreciation of many different pursuits (i.e., voice, opera, choral groups, etc.). It has definitely, positively impacted my life." As he considers his quality of life acceptable and his happiness fair, he finds his musical life great, and he states, "Personally, my life is much better with music, happier!" and "I do feel more intelligent plus happier when I am involved with music."

Even with different experiences and backgrounds, all my interviewed students show a robust perception of the positive impact of musical intelligence on their overall life satisfaction. I am particularly proud of Wetmore because when he first came to voice lessons, he could not find his pitch register. As a bass, he had always attempted to sing songs that were out of his natural range. Once he found his correct setting, he redefined himself as a good singer. In the process, he healed some childhood trauma, his mother's criticism over his wrong singing. Wetmore has found a new identity, fulfillment, and reconciliation in his music education.

Cindy Gabriel, a dance school manager, believes that by learning a new, challenging skill, she is using her brain in a new way. "I believe that I am physically creating new pathways in my brain. By doing so, I do think I am strengthening my brain simply by using it. As a result, I think that is helping my overall intelligence."[50] Gabriel's generally positive attitude in life is palpable. "My life goals are to be fulfilled and joyful. I like to be productive and positive. I want to be a

[50] Cindy Gabriel, personal interview, July 21, 2019. Due to the number of times Gabriel is quoted, the quotes are not cited individually.

positive impact on others. I want to try new things and experience different things. I want to be open to opportunities that come my way. I don't want to waste a minute of time!"

As a dance professional, perhaps surprisingly, Gabriel was not initially aware of her musical intelligence. "Before taking lessons, I would say I was a music novice – no musical intelligence. I enjoy listening to music, but I could not read it or play it or sing it really. I did not know one note from the other. I could hear the beats of music and count them because that is my job. I have to understand the timing, so I can put that into steps, but besides that, I would say, no real music intelligence." Her perception of musical intelligence appears foggy. Counting the music and dancing to the rhythm is not only a distinct sign of musical intelligence but also an interaction with the kinesthetic. Clearly, in some forms, musical intelligence is commonly associated with knowledge or skills acquisition, but not with innate talent nor with the typically human ability of the brain to transform information into meaningful action. Bringing to the public a well-rounded understanding of musical intelligence by spreading the message about it may improve individuals' perception of it and the potential use for wellbeing.

Somehow, Gabriel perceives the significant impact that musical intelligence can have in her life, and she values this contribution. "My music goals help me to learn not just a new craft but also to grow as a human being. It opens my mind to new ways of thinking. I think it makes me appreciate the work that goes into it to make it sound so good." Other fundamental aspects that musical intelligence commonly raise include respect for hard work, constant practice, and the pursuit of the challenge. "I am a person who likes new challenges and to do things right, so by learning the piano, I am challenged, and I can push myself to do it well."

Being involved contributes to the flow, the sense of achievement, and constitutes an asset for a better quality of life:

> I think that the more I learn, the more experience I have, the more open-minded I will be as a human being. I think it helps me appreciate others (i.e., musicians, people who have worked really hard on a challenging goal) and helps me see what they had to go through. I think that just connects us as people. And I believe that meaningful, understanding relationships with people is the highlight of life and makes life better!

Gabriel values the social aspect of music and considers it crucial for her satisfaction. "Life is significantly better with music, primarily because music is so powerful. So often, music stirs up emotions inside of us. I do think that I am happier, simply because I tried it! I do not want to look back on my life and say I did not at least try!" With her positive attitude, she is the only interviewed candidate stating that her quality of both musical and general life is excellent.

Finally, I would like to recollect some short but effective statements from my student Richard Daley, who would like to "use music as medicine,"[51] and "use music to change or enhance my emotions, to stand on stage without fear." He feels extremely confident about his future progress in music because his musical improvement has impacted "the way I talk and how I see others." Not only does singing remind him to stay healthy so he can sing better, but his life is also "more meaningful with music by helping others and myself. Music makes life better, funnier, and more relaxing." As he evaluates his overall satisfaction as good, he also recognizes that during music lessons, he is "happier to add more meaning to my life."

[51] Richard Daley, personal interview, July 16, 2019. Due to the number of times Daley is quoted, the quotes are not cited individually.

CHAPTER 4. MUSIC PSYCHOLOGY AND PEDAGOGY

Undoubtedly, people with musical intelligence are drawn to various music disciplines and careers. And studying musical subjects can promote the growth of musical intelligence. Thanks to the plasticity of the brain, musical intelligence and musical disciplines feed into each other. This chapter presents concrete examples to support this statement, especially by breaking down some of the most common musical disciplines and detailing the way this synergy happens.

The psychology of music is the discipline responsible for examining musical intelligence. By definition, the psychology of music is "a field of scientific inquiry studying the mental operations underlying music listening, music-making, dancing (moving to music), and composing."[52] An intersection between music and psychology, this discipline relies on cognitive science and neurological studies to examine how humans perceive, interpret, and remember music.

Diana Deutsch writes: "Psychology contributes to the understanding of music by characterizing the processing mechanisms of the listener," which means, for example, that cultural and environmental conditioning influences the listener's perception and judgment of the musical input.[53] In other words, it is not possible to understand music, or even define it, without the psychological processes through which we perceive it. Thus, musical intelligence enables the physical act of hearing, filters the sound input and transforms it into a psychological perception, and shapes our perception of musical meaning through socio-cultural-historical perspectives. For example, the development of Western music has historically represented a struggle between innovative composers and the conventional expectations of listeners, such as the negative audience

[52] "Music, Psychology of," in *International Encyclopedia of the Social Sciences*, edited by William A, Darity, Jr., 2nd ed., vol. 5 (Detroit: Macmillan Reference USA, 2008), 345-346.

[53] Diana Deutsch, *The Psychology of Music* (Amsterdam: Elsevier, 2013), 26.

reaction to first atonal music, or the Nazi suppression of 12-tone music, or the ghettoization of black music in the United States of America.[54] Over time, history has shown that new audiences have accepted the previously unacceptable.[55]

Attempting to sing the pitch "A" at 440 Hz is different from possessing this information as a given fact and being able to reproduce it without hesitation. Neurological research confirms that "musicians with perfect pitch revealed stronger leftward planum temporale asymmetry than non-musicians or musicians without perfect pitch."[56] In this case, in vivo magnetic resonance morphometry measured musical intelligence, which was concretely visible in the dimensions of a specific part of the brain.

In 2015, researchers declared that the ability to identify a note without a pitch of reference is a teachable skill because it depends on a "general cognitive ability of holding sounds in one's mind." Finding the "perfect" pitch is the ability to recall a sound through auditory working memory. This ability can be trained in genetically predisposed individuals.[57] Thus, not only does learning contribute to musical intelligence, but because memory is improved, general intelligence also grows through musical training.

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[54] See, for example, Joseph Auner, *Music in the Twentieth and Twenty-First Centuries*, (New York: W.W. Norton, 2013): 35-55; Erik Levi, "Atonality, 12-Tone Music and the Third Reich," *Tempo* 178 (1991): 17-21; and Charles Hiroshi Garrett, *Struggling to Define a Nation: American Music and the Twentieth Century*, Ch. 3, Louis Armstrong and the Great Migration, (University of California Press, 2008): 83-120.

[55] Deutsch, *The Psychology of Music*, 26.

[56] Schlaug, Jäncke, Huang, and Steinmetz, "In Vivo Evidence of Structural Brain Asymmetry in Musicians," *Science* 267, no. 5198 (1995): 699-701. doi:10.1126/science.7839149.

[57] Jacqueline Howard, "Yes! Acquiring 'Perfect' Pitch Is Possible For Some Adults, Scientists Say," *HuffPost*, May 29, 2015, https://www.huffpost.com/entry/perfect-pitch.

Perfect pitch is an example of rare musical ability, but of course, each prodigy is different.[58] However, each possesses distinct brain abilities to make astounding performances possible. Researchers compared music and math prodigies' IQs and, surprisingly, discovered that they are statistically tied, ranging from 134-177 for math, and 108-142 for music.[59] These data challenge the traditional association between intelligence and mathematical abilities while supporting Gardner's theory. These and similar cases should be considered during the creation and revision of pedagogical "best practices."

Positive music psychology may point to new pedagogical strategies to address the traditional credit-for-professional purposes, and also personal development, psychological empowerment, and soul-nourishing. One option could be to have, as part of the regular music department faculty, a music psychology representative trained in both therapy and positive psychology to assist all types of students, from those who struggle to the overachievers.

Knowledge and learning are also considered fundamental components of intelligence because they actively contribute to the acquisition of new information and skills, and consequentially shape brain development. From the perspective of music education, the *scaffolding* principle describes a learning process that builds knowledge, layer by layer, up to higher, more abstract concepts.[60]

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[58] Garth Sundem, "Inside the Brains of Child Prodigies," *Psychology Today*, March 5, 2014, https://www.psychologytoday.com/us/blog/brain-trust/201403/inside-the-brains-child-prodigies.

[59] Mona Park, Evgeny Gutyrchik, Yan Bao, Yuliya Zaytseva, Petra Carl, Lorenz Welker, Ernst Pöppel, Maximilian Reiser, Janusch Blautzik, and Thomas Meindl, "Differences between Musicians and Non-Musicians in Neuro-Affective Processing of Sadness and Fear Expressed in Music," *Neuroscience Letters* 566 (2014): 120–24. https://doi.org/10.1016/j.neulet.2014.02.041.

[60] Brian R. Belland, "Scaffolding: Definition, Current Debates, and Future Directions," in *Handbook of Research on Educational Communications and Technology* (New York, NY: Springer, 2013), 505–18. https://doi.org/10.1007/978-1-4614-3185-5_39.

Each individual's musical intelligence is different and valuable. Therefore, there is a need for differentiated instruction. Finding an appropriate pedagogy is particularly important in the case of talented, gifted, and experienced students in search of meaning beyond training. The very nature of the performing arts requires a high level of insight and feeling to be expressed to the audience. As scientific research confirms, a creative personality contains layers of depth, complexity, and contradictions.[61] By interviewing twenty-one musicians on three major metal rock tours, psychologist Mihaly Csikszentmihalyi explained the paradox of performers' personalities: bold and charismatic on the one hand and emotionally fragile on the other. Creative people show openness and sensitivity that expose them to a lot of pain as well as a great deal of enjoyment. Despite seeming loud and extroverted, musical artists are exposed and vulnerable. They have the strength to show their intimate side to a large number of people, making art out of their feelings. They constantly dig deep into their *emotional baggage* for inspiration.[62] Sensitivity is a fundamental dimension of human personality. Highly sensitive people tend to process sensory input with a higher level of perception of both their internal and external environment.[63]

When we think of learning as a gratifying experience, educators should develop pedagogy to respect the high sensitivity of music students and their artistic-psychological profile. As

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61 Mihaly Csikszentmihalyi, "Society, culture, and person: A systems view of creativity," in *The Nature of Creativity: Contemporary Psychological Perspectives*, ed. R. J. Sternberg (Cambridge: Cambridge University Press, 1988), 325–339.

62 This term represents feelings about the past and things that happened, which often have a negative impact on attitude and behavior, but they can also be a source for change and positive developments. (Ingrid S. Folling and Marit Solbjor, "Previous Experiences and Emotional Baggage as Barriers to Lifestyle Change - a Qualitative Study of Norwegian Healthy Life Centre Participants," BMC Family Practice, *BioMed Central*, June 23, 2015, https://bmcfampract.biomedcentral.com/articles/10.1186/s12875-015-0292-z).

63 Csikszentmihalyi, *Society, Culture, and Person*.

psychologists Pastson and Waters stated, "positive pedagogy has the capacity to enhance a student's intellectual, social, and emotional development by building engagement, self-confidence, concentration, and emotional sensitivity."[64] Therefore, a compelling music pedagogy strategy should include adequate conditions to ensure the resilience and the joy of the student musician. Pastson and Waters propose a model for the successful implementation of positive psychology in music education, called Positive Instructions in Music Studios (PIMS), which consists of the following four stages:

1. Positive Priming: reviewing what went well during home practice and selecting repertoire that the student enjoys playing;
2. Strengths Spotting: encouraging the student to use his/her strengths such as creativity, curiosity, perseverance, etc.;
3. Positive Pause: having the student stop and analyze something that went well during practice;
4. Process Praise: providing feedback about the learning process, not just the outcomes, and praising strategies and application, not only the talent or final result.[65]

The PIMS approach not only feeds musical intelligence, but it also allows the student to feel appreciated by the teacher as a complete person and not just as a student or musician. Thus, both the educator-student relationship and the level of trust in the academic institution improve.[66]

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[64] Waters Pastson, "Positive Instruction in Music Studios: Introducing a New Model for Teaching Studio Music in Schools Based upon Positive Psychology," *Psychology of Well-being* 5, no, 1 (2015): 10.

[65] Pastson, "Positive Instruction in Music Studios."

[66] Pastson, "Positive Instruction in Music Studios."

Applying positive pedagogy requires, for example, a recognition that one of a musician's everyday challenges is error management. "Musicians tend to strive for flawless performance and perfection, avoiding errors at all costs. Dealing with errors while practicing or performing is often frustrating and can lead to anger and despair." Training in error management teaches principles such as "errors are a natural part of the learning process"; "the more errors, the more learning"; "an error is an opportunity for improvement"; "everybody makes mistakes, and this is no reason for any punishment," etc. This set of pedagogical values allows students to reflect on the causes of errors and develop an emotionally relaxed attitude toward them, which improves learning.[67]

With the wrong pedagogical approach, studying music becomes a source of anxiety and a risk for mental health damage instead of an opportunity for intellectual development. Recent research on undergraduate students reports alarming statistical data on mental health issues. These can take many forms, including depression, anxiety, suicide, eating disorders, and addiction. While it may be challenging to come to terms with any illness, it is important to be aware and familiar with the resources available whenever they are needed.

[67] Silke Kruse-Weber, and Richard Parncutt, "Error Management for Musicians: An Interdisciplinary Conceptual Framework," *Frontiers of Psychology* 5 (2014): 777.

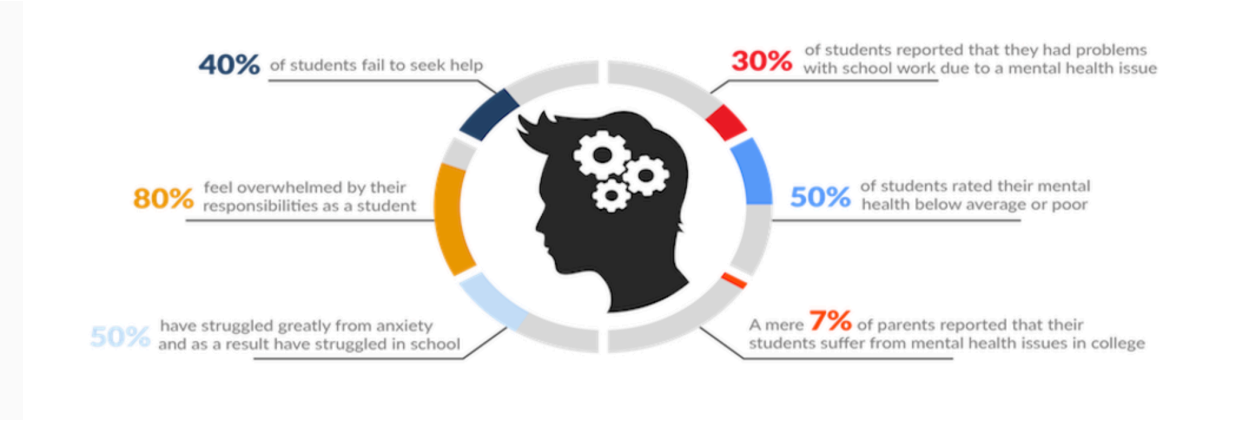

Figure 1. Survey report on college students.[68]

As Figure 1 shows, 80% of college students feel overwhelmed by their academic responsibilities. At least half of the student body has struggled with anxiety and have rated their mental health "below average" or "poor." Moreover, graduate students have strikingly high rates of depression and anxiety, with many reporting little help or support from supervisors. Figure 2 shows that more than half of the students with anxiety and/or depression feel neither valued nor supported by mentors, who fail in providing a positive emotional impact. In Figure 2, chart (a) shows the overall prevalence of anxiety and depression, (b) the prevalence of anxiety and depression by gender, (c) the effect of perceived work-life balance, and (d) the effect of the relationship with a mentor.

[68] Darcy Gruttadaro and Dana Crudo, "College Students Speak: A Survey Report on Mental Health," National Alliance on Mental Illness (Arlington, VA: NAMI, 2012), doi:10.1177/0305735605056144.

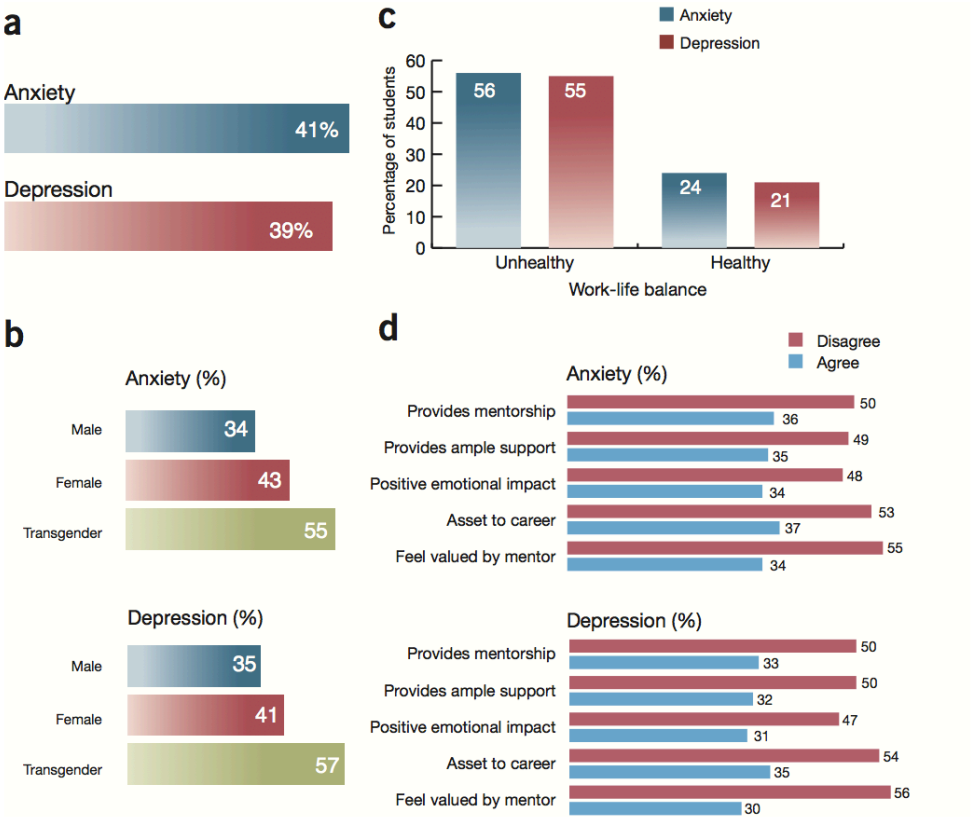

Figure 2. Prevalence of anxiety and depression among graduate students.[69]

In a world where positive psychologists are searching for ways to encourage happiness and satisfaction—and musical training appears to be an effective one—current pedagogical approaches need to be adjusted. Accounting for musical intelligence and music positive psychology, educators should develop a pedagogy that meets students' intellectual and emotional needs. Moreover, music educators should be responsible not only for the quality of musical performance but also for the satisfaction of their students in their growth as artistic human beings.

Those actively pursuing greater life satisfaction and wellbeing can choose to cultivate musical intelligence as an alternative means of personal growth, in addition to yoga, meditation,

[69] Teresa M. Evans, Lindsay Bira, Jazmin Beltran Gastelum, L. Todd Weiss, and Nathan L. Vanderford, "Evidence for a Mental Health Crisis in Graduate Education," *Nature Biotechnology* 36, no. 3 (2018): 282-284. https://doi.org/10.1038/nbt.4089.

and mindfulness. Music lessons do not "just" teach one to play an instrument. They show one how to live better. As Eduard Punset explains:

> Most recent research has revealed that music, by acting on the central nervous system, raises levels of endorphins, the brain's own opiates, as well as other neurotransmitters such as dopamine, acetylcholine, and oxytocin. Endorphins have been found to provide motivation and energy for life, to cause joyfulness and optimism, to decrease pain, to contribute to the feeling of well-being, and to stimulate feelings of gratitude and existential satisfaction.[70]

Consequently, through the study of music psychology and positive psychology, an individual can make informed choices about studying music disciplines with the specific purpose of increasing life satisfaction. Positive music psychology could teach people about their ability to actively improve their life satisfaction through the power of choosing music lessons for wellbeing, not necessarily for performance or career goals. With this approach, both musical intelligence and education can be meaningful for better life satisfaction.

[70] Eduard Punset, *The Happiness Trip: A Scientific Journey* (White River Junction, VT: Chelsea Green, 2007), 124.

PART 3: MUSICAL INTELLIGENCE AND THE BRAIN

CHAPTER 5. MEANING AND EMOTION

To help clarify the relations between music perception, meaning, and emotion, researchers Koelsch and Siebel developed the following neurocognitive model of music perception (see Figure 3):

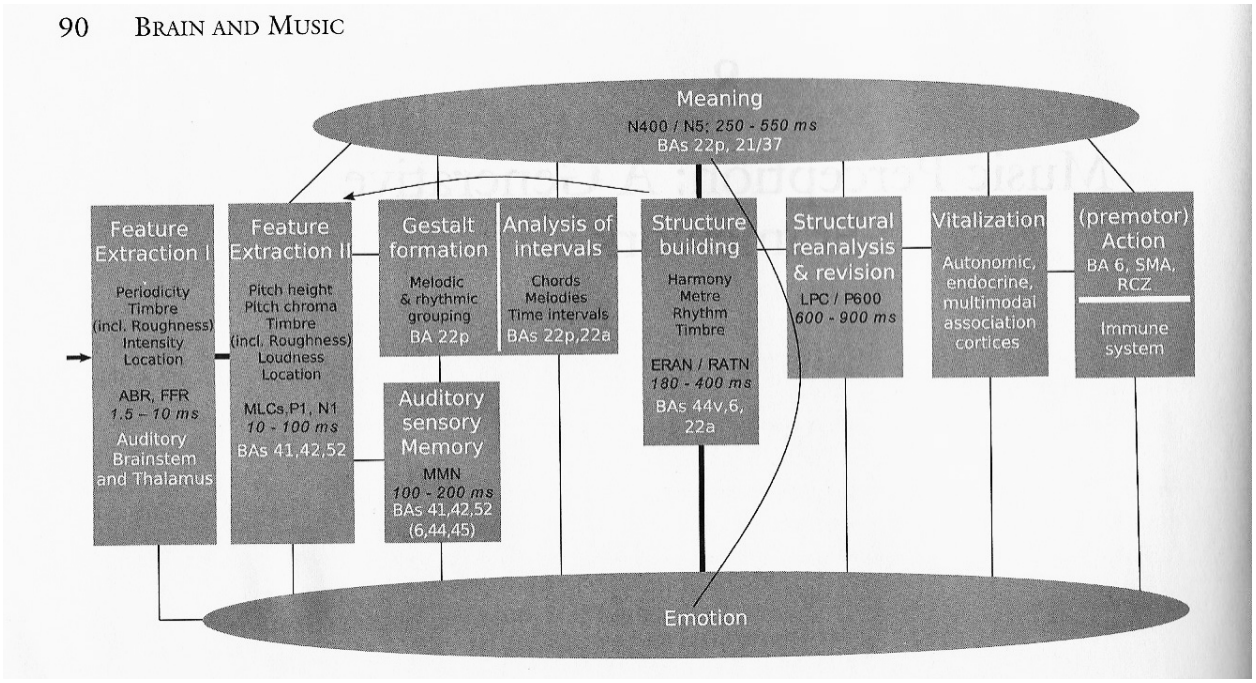

Figure 3. Neurocognitive model of music perception.[71]

This model offers a theoretical framework for different areas of neuroscientific research in the field of music perception. It synthesizes various dimensions of music perception, including information about the time of music processing and the brain area in which these processes happen, some of which are common with spoken language. Importantly, all the different stages of music

[71] Koelsch, *Brain and Music*, 90. ABR: Auditory Brainstem response; BA: Brodmann area; ERAN: Early right anterior negativity; FFR: Frequency Following Response; LPC: Late positive component; MLC: Mid-latency component; MMN: Mismatch Negativity; RATN: Right anterior-temporal negativity; RCZ: Rostral cingulate zone; SMA: Supplementary motor area. Italic font indicates peak latencies of scalp-recorded evoked potentials.

perception contribute to the attribution of *meaning* and the generation of *emotion.*[72] The structures of meaning and emotion are also connected, showing in the model musical intelligence as an interactive portion of general intelligence.

Music perception becomes musical intelligence through the processes of decoding information, storing memory, and creating representations. As music perception begins with the decoding of the acoustic information, the auditory cortex is responsible for the transformation of acoustic inputs into precepts, such as pitch height and sound volume. While auditory features are extracted, the acoustic information enters the *auditory sensory memory*, also called *echoic memory*, and auditory representations of perceptual elements integrated over time are formed (i.e., *Gelstat formation*).[73]

Musical intelligence comes into play as acoustic input yields interactive neural functions. Sound becomes perception, which becomes a representation and transforms into information. Musical information leads to meaning and interpretation. The intrinsic meaning of music differs from the subjective process of interpretation.[74] In the first case, information and communication are meant to be conveyed through music, while in the second case, meaningful and evocative associations enacted by the receiver are not necessarily meant by the music producer. A recent neurobiological theory of musical meaning considers both sides, "music as a system to convey meaning information, and the psychological reality that music information means something for

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[72] Koelsch, *Brain and Music*.

[73] Koelsch, *Brain and Music*.

[74] Leonard Meyer famously explored the basis for the cognitive connection between emotion and meaning in music. He focuses the role of pattern recognition and its impact on emotion and meaning; how, for instance, the withholding of an expected pattern completion heightens our emotional response, and, conversely, how realization might calm it. (Leonard B. Meyer, *Emotion and Meaning in Music* [Chicago: University of Chicago Press, 1961].)

an individual."[75] Our musical intelligence transforms sound input into signs, imagery, and meaning according to our cultural perception, social connotation, and interpretation.[76]

Music evokes real and basic emotions, such as joy, sadness, fear, and anger. It also elicits surprise, and it can have a significant impact on an individual's wellbeing by affecting the regenerative autonomic, endocrine, and immunological systems.[77] Furthermore, music generates a reaction in the three major components of emotion, which include physiological arousal, subjective feelings, and motor expression leading to action tendencies. Music is therapeutic, socially engaging, effectively communicative, and it facilitates group cohesion.[78] Neurological research confirms that musical intelligence actively shapes the brain and contributes to its neuro-plastic development.

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[75] Koelsch, *Brain and Music*, 156.

[76] *Music semiology* or *semiotics* is the study of the process that leads our intelligence to create, interpret, and develop meaning and ideas from and through music. Emotion and meaning can be explained through signs that call to mind something else and create an effect in the observer. The semiotic signs have been described as: (1) *icons*, signs that recall elements to each other by resemblance; (2) *indexes,* when sign and object are experienced together; and (3) *symbols,* when sign and object are connected through linguistic definition. Musically speaking, we have an example of an icon when a composer repeats a motive previously presented and the listener perceives the resemblance. An example of an index is the use of scary music in a movie, where the listener experiences the association between scary music and a prior scary scene. Notation is a clear example of symbols in a musical score. See Thomas Turino, *Music as Social Life: the Politics of Participation*, 5-10, and Thomas Turino, "Signs of Imagination, Identity, and Experience: A Peircian Semiotic Theory for Music," *Ethnomusicology* 43, no. 2 (1999): 221-55. doi:10.2307/852734.

[77] Koelsch, *Brain and Music*.

[78] Koelsch, *Brain and Music*.

CHAPTER 6. MUSIC-INDUCED NEUROPLASTICITY

Scientists have studied musicians' brains in order to examine their ability to grow in structure and function. Early musical training, bimanual motor activity, and innate capacities are critical factors to brain development. Results show that certain regions in the musician's brain, such as the *corpus callosum, motor cortex,* and *cerebellum*, show some adaptations to meet the challenges and requirements of musical performance. Musical training is responsible for functional and structural cerebral changes and an increase in neural connections, due to the brain's plasticity.[79] According to the *Oxford English Dictionary*, neuroplasticity is "the ability of the brain to form and reorganize synaptic connections, especially in response to learning or experience or following an injury." Playing a musical instrument is "an intense, multi-sensory and motor experience" that leads to the acquisition and maintenance of specialized skills over time. The association of motor action with auditory and visual stimuli coming from musical notation and pattern recognition strengthens connections between "multimodal integration regions." Research suggests that long-term dedication to musical activities yields sensorimotor and cognitive enhancement, as well as plastic reorganization.[80]

Neuroscientists have shown increasing interest in studying musical intelligence, especially in the last fifteen years. Musicians have been studied for the "neuroanatomical and neurophysiological underpinnings of their expertise." Receiving "music lessons" has been the

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[79] Gottfried Schlaug, "The Brain of Musicians," *Annals of the New York Academy of Sciences*, January 25, 2006, https://nyaspubs.onlinelibrary.wiley.com/doi/abs/10.1111/j.1749-6632.2001.tb05739.x.

[80] Gottfried Schlaug, "Musicians and Music Making as a Model for the Study of Brain Plasticity," *Progress in Brain Research Music, Neurology, and Neuroscience: Evolution, the Musical Brain, Medical Conditions, and Therapies* (Bethesda, MD: National Center for Biotechnology Information, 2015), 37-55. doi:10.1016/bs.pbr.2014.11.020.

discriminating distinction between professional musicians' and non-musicians' groups. The relationship between musical training and brain changes uses programs lasting from several hours to several months or years. Recent research supports "the idea of brain plasticity driven by musical expertise and musical training."[81] These findings have led to the question of whether the musical experience would positively influence other functions, such as language, or even intelligence in general.

Musical training improves non-musical skills such as reading and linguistic perception through changes in cortical activation patterns, which supports the theory of interactions among different types of intelligence.[82] Compared to the control group, which was not exposed to music, patients recovering from a stroke who regularly listened to their favorite music showed mood improvement and recovery of verbal memory and focused attention, confirming the advantage of using music as a non-invasive neuropsychological and neurological therapeutic tool. Moreover, the positive neuro-plastic effect of music on the brain can be beneficial not just for pathological cases, but also for healthy individuals, as research demonstrates positive results in terms of improved writing, reading, and memory skills.[83] However, the brain's neuroplasticity can be a double-edged sword. Richard Davidson and Bruce Mcewen warn that "experiential factors shape the neural circuits underlying social and emotional behavior from the prenatal period to the end of life." Under severe stress factors, our brain will change negatively.[84]

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[81] Lutz Jäncke, "Music Drives Brain Plasticity," *F1000 Biology Reports* (2009), doi:10.3410/b1-78.

[82] Jäncke, "Music Drives Brain Plasticity."

[83] Jäncke, "Music Drives Brain Plasticity."

[84] Richard J. Davidson and Bruce S. Mcewen, "Social Influences on Neuroplasticity: Stress and Interventions to Promote Well-being," *Nature Neuroscience* 15, no. 5 (2012): 689, doi:10.1038/nn.3093.

Making music is a process that requires the human brain to solve a puzzle made of various information that needs to be addressed correctly to generate a culturally acceptable result. The desire for perfection can be so powerful it initiates a virtuous circle of practice and dedication. It also addresses different emotional impulses, from expressing oneself in new ways to achieving success through competition and fueling ambition. Furthermore, playing in an ensemble can teach about teamwork, including when to lead and when to follow. According to basic ethnomusicological principles, musical education contributes to understanding peoples, their cultures, and their values.[85]

Pattern recognition is a typical method of musical training to transform visual and manual information into practical solutions and quicker processing, as my student Cobb confirmed: "I am continuing to expand knowledge into more complex chord structures and ways to use them."[86] Concert pianist Robert Taub explains how the visualization of the notes and their interrelationship contributes to making "multiple connections in multiple spheres" intellectually.[87] In Western musical culture, musical learning often involves practicing for hours, working on something over and over again while double- and triple-checking, in order to master every detail perfectly. Although it could lead to exhaustion, injury, excessive competitiveness, and elitism, if approached with good sense and uplifting and positive pedagogy, this hard work educates for discipline, determination, consistency, coherence, continuity, and dedication, as my student McNamara

[85] Simone Krueger, "Democratic Pedagogies: Perspectives from Ethnomusicology and World Music Educational Contexts in the United Kingdom," *Ethnomusicology* 55, no. 2 (2011): 280-305, doi:10.5406/ethnomusicology.55.2.0280.

[86] Randall Cobb, personal interview, July 3, 2019.

[87] Joanne Lipman, "Is Music the Key to Success?," *The New York Times,* October 12, 2013.

confirmed, "music pushed me beyond my limitations. Studying music creates discipline and forces you to step out of your comfort zone."[88]

"Music may not make you a genius, or rich, or even a better person," writes Joanne Lipman. "But it helps train you to think differently, to process different points of view—and most importantly, to take pleasure in listening."[89] Instead, I would argue that if music helps us think differently, that is important too. When our brain changes plastically—in its shape, dimension, and neuro-electrical connections—because of musical training, this can have a significant impact on our lives. When musical intelligence grows, and overall intelligence grows with it, we become smarter. Music represents a proven path to take in becoming smarter and trained for success. Certainly, musical training is not the only factor in shaping a person's life. However, it potentially contributes in a significant way when approached positively. Finally, by offering pleasure in listening, by soothing our mood, and reducing our stress level, music may allow us to shift towards more positive attitudes and, perhaps, even to become a better person.

Empathy is one soft quality that not only makes us good people but also empowers us to better interact with other people. Being emphatic contributes to building better social skills and developing both an extensive professional network and a trustful reputation with co-workers and clients. Recent neurophysiological research explores the early stages of models of empathy (both emotional and cognitive) in empirical music research. Empathy is an emotional response that originates from another emotional state or condition and is congruent with it. The music-specific manifestation of this trait comes from a "cognitive style of processing music that privileges

[88] Katherine McNamara, personal interview, August 2, 2019.

[89] Lipman, "Is Music the Key to Success?", *The New York Time,* October 12, 2013.

emotional recognition and experience" over musical structural analysis.[90] My student Brown agreed: "music helps many areas of the brain. At times, I'll be stumped about a problem at work, and I'll take a break and play some songs on the guitar. As if by magic, a solution will pop into my head. I think music can help connect different areas of the brain and help process non-musical thinking."[91]

Musical empathy is evident in musical gestures, signals, and hidden communication by way of reflective, mirroring processes, and body language.[92] Trained musicians show the ability to intuitively pick up on the conductor's intentions, expressions, and (eventually) unpredictable musical changes happening in real-time during live performances. When musical training helps individuals to become better listeners, more collaborative, and more empathetic human beings, the potential for growth is clear.

[90] Zachary Wallmark, Choi Deblieck, and Marco Iacoboni, "Neurophysiological Effects of Trait Empathy in Music Listening," *Frontiers in Behavioral Neuroscience* 12 (2018). https://www.frontiersin.org/articles/10.3389/fnbeh.2018.00066/full.

[91] Greg Brown, personal interview, July 17, 2019.

[92] Wallmark, Deblieck, and Iacoboni "Neurophysiological Effects of Trait Empathy in Music Listening."

PART 4: LIFE SATISFACTION AND WELLBEING

CHAPTER 7. POSITIVE PSYCHOLOGY

Positive psychology is a relatively new field that investigates the beneficial processes contributing to wellbeing, positive functioning, and human flourishing. First developed by American psychologist Martin Seligman at the University of Pennsylvania in the 1960s and 1970s, "positive psychology is the scientific study of the strengths that enable individuals and communities to thrive. The field is founded on the belief that people want to lead meaningful and fulfilling lives, to cultivate what is best within themselves, and to enhance their experiences of love, work, and play."[93]

In the early 2000s, Seligman predicted that positive psychology would become a new focus for the 21st century. In the fifty years since psychology and psychiatry became healing disciplines, psychologists have begun to ask how humanity can achieve what is best in life. Taxonomy and reliable methods for measuring mental illnesses have contributed to creating a valid scientific map for highly transferable knowledge and understanding of the human brain and the treatment of issues like schizophrenia, depression, and anger. Some pharmacological and psychological treatments have helped people to deal with mental disorders and, in some instances, made them curable. With the same methods and laboratories, future scientists can help to understand and measure those characteristics that "make life most worth living." By studying positive human traits, science will provide better answers to preventing some mental and physical illnesses.

[93] Positive Psychology Center, "Positive Psychology Center," accessed June 01, 2019. https://ppc.sas.upenn.edu/.

However, the most important gain as a community and as individuals is to learn not just to endure and survive, but also to flourish.[94]

An established health profession, music therapy is "the clinical and evidence-based use of music interventions" to heal through a personalized program able to address the physical, emotional, cognitive, and social needs of individuals.[95] During the two world wars, music amateurs and professionals went to comfort veterans in hospitals, giving evidence of music's positive impact on both physical and emotional trauma. The notable response from the patients led doctors and nurses to request that musicians be hired, and this demand generated the need for a college curriculum.[96] According to the American Music Therapy Association, today, there are about 5,000 board-certified music therapists in the United States. Through singing, moving, and listening to music, individuals strengthen their abilities and transfer them to other areas of their lives. Music therapy is useful in many endeavors, for example, speech improvement, physical rehabilitation, emotional support for families, dealing with trauma, increasing motivation, and expressing feelings.[97] The discipline of music therapy is evidence of musical intelligence and its transformation into a professional field.

The word "therapy" implies the treatment of a disorder or pathological condition. However, positive psychology, with its purpose of providing tools for humans to thrive and flourish, goes beyond healing sickness because it empowers healthy individuals. From discovering how to find

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[94] Martin E.P. Seligman and Mihaly Csikszentmihalyi, "Positive Psychology: An Introduction," *Flow and the Foundations of Positive Psychology* (Washington, D.C.: American Psychology Association, 2014), 279-98, doi:10.1007/978-94-017-9088-8_18.

[95] American Music Therapy Association, "What Is Music Therapy?" https://www.musictherapy.org/about/musictherapy/.

[96] American Music Therapy Association, "History of Music Therapy" https://www.musictherapy.org/about/history/.

[97] American Music Therapy Association, "What Is Music Therapy?"

the balance to achieving wellbeing and happiness, the discipline of positive psychology aims to define guidelines for a more meaningful way to live our lives. While traditional psychology is not rejected, positive psychology focuses on what makes life worth living, with the understanding that happiness at all times and all costs is unrealistic. For this reason, re-wording the concept of *happiness* into one of *life satisfaction* reflects an approach that takes into consideration grounded values like self-knowledge, moderation, self-control, and wisdom. Happiness is redefined as contentment with the past, positive emotions in the present, and hope for the future.[98] At the core of the research is the study of strengths and virtues, such as the capacity for love and work, courage, compassion, resilience, creativity, curiosity, and integrity. Because musical intelligence enhances creativity, by raising emotions and expressing feelings, teaching discipline, and engaging in positive social behavior, it could be considered an asset for a life worth living.[99]

Self-awareness is the ability to know our internal state, preference, resources, and intuitions with the purpose of non-judgmental evaluation and comparison of our standards and values.[100]

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[98] Positive Psychology Center, "Positive Psychology Center - Learn More," Frequently Asked Questions, https://ppc.sas.upenn.edu/learn-more/frequently-asked-questions.

[99] Dr. Ed Diener has dedicated his career to the investigation of wellbeing and life satisfaction. Since the 1980s, he has worked toward making happiness measurable and quantifiable. He has articulated the following essential principles: (1) psychological wealth has greater value than money; (2) happiness has a positive impact on relationships, work, and health; (3) happiness needs to be understood and redefined realistically; and (4) having the right thoughts is a key contribution to happiness. "Boosting our cognition can boost our happiness if done appropriately," he writes. Given that in specific ways musical intelligence actively boosts our cognition, in those same ways, and through interaction, it can boost our happiness. In particular, self-awareness and mindfulness are excellent ways to influence human perception from a dissatisfied life into a satisfied one. (Positive Psychology Program, "Life Satisfaction Theory and 4 Contributing Factors (Incl. SWLS Scale)," May 18, 2019, https://positivepsychologyprogram.com/life-satisfaction/.)

[100] Positive Psychology Program, "What Is Self-Awareness and Why Is It Important? 5 Ways to Increase It," May 20, 2019, https://positivepsychologyprogram.com/self-awareness-matters-how-you-can-be-more-self-aware/.

Through the perception of the self, we measure the gap between where we are in life and where we would like to be, creating a feeling of satisfaction or dissatisfaction. However, the perception could be distorted, influenced by external factors, pre-conceptions, not truthful or authentic, like my student Saxena, who listened to his friends' judgment about his singing. Self-awareness is tricky, but perception can be re-adjusted by changing the observation point, for example, with self-compassion and mindfulness. Mindfulness empowers humans by focusing the attention on the here and now, embracing the present moment, and preventing the mind from worrying in adverse scenarios. Mindfulness also has a positive impact on human functioning, quality of attention, intrapersonal and interpersonal behavior, development of empathy, and compassion.[101] Most exercises and practices of mindfulness include "tuning up" with music.

Even though more research is needed to fully understand the main contributing factors to life satisfaction, they have been found to likely fall into the following four categories:

1. *Life chances*: i.e., economic welfare, social status, culture, political freedom, material property, family bonds, and intellectual and physical skills;
2. *Course of events*: i.e., need/affluence, attack/protection, solitude/company, humiliation/honor, routine/challenge, ugliness/beauty;
3. *Flow of experience*: i.e., yearning/satiation, anxiety/safety, loneliness/love, rejection/respect, dullness/excitement, repulsion/rapture;
4. *Evaluation of life*: i.e., the average effect of the interaction between the aspects above, and the comparison with the personal idea of "a good life."[102]

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[101] Positive Psychology Program, "Mindfulness and the Brain: What Does Research and Neuroscience Say?" April 09, 2019, https://positivepsychologyprogram.com/mindfulness-brain-research-neuroscience/.

[102] Positive Psychology Program, "Life Satisfaction Theory."

Life satisfaction is essential not only because a happier life that can be thoroughly enjoyed but also for its strict relation to health and wellbeing. Variables like health, income, and relationship status are important. However, it is not uncommon to find situations where people with low income and poor health may show higher satisfaction than those with wealth and material things. Because of the subjectivity of the matter, an accurate measure must be obtained with conventional measurement techniques like surveys, questionnaires, and interviews. As life satisfaction can be measured, it can also be improved by taking specific actions.[103] Dr. Leslie Becker-Phelps developed a five-question tool as a guideline to achieving more satisfaction in life. By answering the questions, individuals can assess and improve their lives. Specifically, they can try new experiences, commit themselves fully to what they do, create more social interactions, approach people with a genuine desire to get along, and actively set concrete goals for happiness.

Furthermore, when music positively contributes to the improvement of one or more of the domains for life satisfaction, Life Satisfaction Theory suggests it directly impacts the perceived quality of life. For example, studying how to play a musical instrument contributes to the personal growth domain, and by extension, to the personal satisfaction of an individual. As my student, Christman, stated: "Music is a wonderful gift, and life is definitely better with it. I particularly

[103] Among the most popular measurement systems is the Satisfaction with Life Scale (SWLS), created by Ed Diener. It consists of five statements that require evaluation of life as a whole, rating on a scale from 1 to 7 (disagree strongly to agree strongly). The Wheel of Life is another evaluation method consisting of a visual diagram. On it, there are grades up to ten for different life domains, such as physical environment, love and relationships, health and fitness, personal growth and learning, business career and work, money and finance, social relationships, fun and entertainment, and spirituality. Also, the *Life Satisfaction Index* is a 20-item questionnaire that measures the quality of life for adults over fifty years old. Other surveys have been developed to investigate life satisfaction in old age, coming from studies addressing life satisfaction among the elderly. (Positive Psychology Program, "Life Satisfaction Theory.")

enjoy the cerebral aspects of theory and playing an instrument and trying to find places where that connects with my general philosophy of life. Music is enriching my life."[104]

"Wellbeing is the experience of health, happiness, and prosperity," according to *Psychology Today*. "It includes having good mental health, high life satisfaction, and a sense of meaning or purpose."[105] Wellbeing is not only beneficial by itself, but it also spreads to other, broader life endeavors. Those who achieve wellbeing perform better at work, are more cooperative and prosocial and have a stronger immune system. Also, they have fewer sleep problems, greater self-control, lower levels of burnout, and more satisfying relationships. They have better physical health, reduced cardiovascular mortality, and they live longer.[106] Although optimism plays an important role among the contributors to wellbeing—by lessening depression and anxiety, enhancing performance at school or work, and contributing to better physical health—we also need to keep into consideration the following other factors.

Seligman developed the "PERMA: P Theory of Well-being" as an attempt to define five basic building blocks as leading contributors to the achievement of wellbeing. PERMA is an acronym that stands for:

- *Positive emotion:* i.e., the hedonic route to wellbeing, based on cultivating positive emotions about the past, present, and future;

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[104] Ryan Christman, personal interview, July 15, 2019.

[105] "What Is Well-Being? Definition, Types, and Well-Being Skills," *Psychology Today*, https://www.psychologytoday.com/us/blog/click-here-happiness/201901/what-is-well-being-definition-types-and-well-being-skills.

[106] Jessica Kansky and Ed Diener, "Benefits of Well-Being: Health, Social Relationships, Work, and Resilience," *Journal of Positive Psychology and Wellbeing* 1, no, 2 (October 4, 2017): 129-69, https://journalppw.com/index.php/JPPW/article/download/20/pdf.

- *Engagement:* i.e., to fully deploy skills and strength into living the flow. The flow happens when self-awareness disappears while busy in performance (Csikszentmihalyi's theory);[107]
- *Relationships*: i.e., sharing, joy, laughter, connection, and a sense of belonging that is fundamental to wellbeing;
- *Meaning*: i.e., a sense of purpose coming from involvement in something bigger than oneself, for example, religion, science, politics, and community;
- *Accomplishment:* achievement, competence, success, and mastery in a variety of forms.[108]

Any time our musical intelligence contributes to any of these factors, then it helps promote our wellbeing. As my student Kircali confirmed: "I think that music makes my life more meaningful by being able to help me reflect on complex emotions I am having. Music is like a compass that helps me find my emotional center whenever I am upset, scared, angry, or confused. I believe that my intelligence does make my life better. I think a life with music is better than a life without it because music is a nourishing thing. When I am tired, and I listen to a song, it can fill me with so much energy and emotion that it feels like magic I absolutely think music is vital to a happy and successful life."[109]

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[107] Jeanne Nakamura and Mihaly Csikszentmihalyi, "The Concept of Flow," American Psychological Association (2002), https://psycnet.apa.org/record/2002-02382-007.

[108] Positive Psychology Center, "PERMA Theory of Well-Being and PERMA Workshops," https://ppc.sas.upenn.edu/learn-more/perma-theory-well-being-and-perma-workshops.

[109] Artun Kircali, personal interview, July 7, 2019.

CHAPTER 8. APPLICATION EXAMPLES

Listening to and performing music are at the same time expressions of musical intelligence and contributors to its growth. Ultimately, when we listen to music, we do not just hear sound passively, but our musical intelligence processes it through pattern recognition, searching for familiar combinations (drawing on our previous experience and cultural background) and preparing for the perception of meaning. As such, we can anticipate musical passages, based on previously heard, learned, and stored models. The anticipation leads to the prediction of the deep relationships that hold the music together, and we attend to any differences between what we anticipate and what we actually hear.[110]

Imaginative thoughts enhance motivation, increase confidence, improve motor performance, and increase the state of flow. Imagination benefits cognition and personality, and these elements together constitute the concept of emotional intelligence, which is the ability to interpret and handle emotions effectively.[111] Positive thoughts also increase synapses dynamically, improving mental productivity and cognition, and enhance focus, creativity, analysis, and problem-solving. Negative thoughts, on the other hand, slow down brain coordination, decrease activity in the cerebellum, and affect mood and impulse control, generating fear, and memory loss.[112] Therefore, we should mindfully select positive music listening to generate the chemical byproducts that influence feelings of life satisfaction. Indeed, pharmacologists and neurobiologists found that half of the people listening to music experience euphoria. The joy of music listening

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[110] Crowe, *Music and Soulmaking*, 82-83.

[111] Isabella Selega Csikszentmihalyi and Mihaly Csikszentmihalyi, *A Life Worth Living: Contributions to Positive Psychology* (Oxford: Oxford University Press, 2006).

[112] Chai M. Tyng, Hafeez U. Amin, Mohamad N. M. Saad, and Aamir S. Malik, "The Influences of Emotion on Learning and Memory," *Frontiers in Psychology* 8 (2017): 1-22. https://doi.org/10.3389/fpsyg.2017.01454.

enables the body to produce healing chemicals that function as anesthetics and enhance immune activity. Music listening directly impacts musical intelligence, altering chemical and electrical reactions in the brain.

Music therapy research confirms that the endorphins released by musical aural stimulation reduce the need for medicines, distract attention from pain, and relieve anxiety.[113] Another study used positron emission tomography (PET scanning) to find a correlation between areas of the brain responsible for musical pleasure and the motivation-and-reward system.[114] The connection exists between the amygdala, the prefrontal and orbitofrontal cortex, and the euphoria-induced response to stimuli like food, sex, or drugs. These findings demonstrate how musical intelligence connects to survival. This cognitive interconnection, concludes Eduard Punset, "represents a significant benefit for our physical and mental well-being."[115]

Not all music listening is equal, and certain effects or benefits can be linked to specific sounds or musical styles. For this reason, musical intelligence can contribute to music listening by making conscious choices based on a given need. For example, listening to music enhances the secretion of dopamine—the "feel good" hormone—and increases synaptic functions with benefits for learning and memory.[116] Jazz music has shown effective in reducing anxiety in patients

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[113] Carolyn J. Murrock and Patricia A, Higgins, "The Theory of Music, Mood and Movement to Improve Health Outcomes," *Journal of Advanced Nursing* 65, no. 10 (2009): 2249–57, https://doi.org/10.1111/j.1365-2648.2009.05108.x.

[114] A.J. Blood and R. J. Zatorre, "Intensely Pleasurable Responses to Music Correlate with Activity in Brain Regions Implicated in Reward and Emotion," *Proceedings of the National Academy of Sciences* 98, no. 20 (2001): 11818–23, https://doi.org/10.1073/pnas.191355898.

[115] Punset, *The Happiness Trip*, 124-132.

[116] M Victoria Puig, Jonas Rose, Robert Schmidt, and Nadja Freund, "Dopamine Modulation of Learning and Memory in the Prefrontal Cortex: Insights from Studies in Primates, Rodents, and Birds" *Frontiers in Neural Circuits* 8, no. 93 (2014), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4122189/.

undergoing surgery. According to Stephanie Castillo, "hip-hop lyrics offer individuals suffering from cognitive illnesses a fresh way of thinking while creating, singing, moving. Listening to music reduced symptoms in depressed children and adolescents" and helps them address emotions such as anguish and aggression.[117]

One innovative way to obtain the most from conscious music listening is the beneficial effect of the binaural beats. According to Lori Smith, this term refers to "an emerging form of soundwave therapy in which the right and the left ears listen to two slightly different frequency tones yet perceive the tone as one." For example, if two tones are respectively at 200 Hz and 210 Hz, the binaural beat heard is the difference between the two frequencies or 10 Hz.[118] The perceptual phenomenon of binaural auditory beats can influence cognition and mental states, with a significant impact on memory, attention, anxiety, and analgesia (the inability to feel pain). Psychological research provides evidence that "binaural beat exposure is an effective way to affect cognition over and above reducing anxiety levels and the perception of pain without prior training, and that the direction and magnitude of the effect depends upon the frequency used, time under exposure, and the moment in which the exposure takes place."[119]

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[117] Stephanie Castillo, "What Classical Music Does To Your Genes," *Medical Daily*, March 13, 2015, https://www.medicaldaily.com/listening-classical-music-enhances-gene-activity-update-mozart-effect-325680; Leah Sharman, and Genevieve A. Dingle, "Extreme Metal Music and Anger Processing," *Frontiers in Human Neuroscience* 9 (2015), https://www.frontiersin.org/articles/10.3389/fnhum.2015.00272/full.

[118] Lori Smith, "Binaural Beats Therapy: Benefits and How They Work," *Medical News Today*, November 14, 2017, https://www.medicalnewstoday.com/articles/320019.php.

[119] Miguel Garcia-Argibay, Miguel A. Santed, and José M. Reales, "Efficacy of Binaural Auditory Beats in Cognition, Anxiety, and Pain Perception: A Meta-analysis," *Psychological Research* 83, no. 2 (2018): 361. doi:10.1007/s00426-018-1066-8.

Proponents of this technique compare it to meditation. Each frequency has a particular therapeutic purpose, and better results can be obtained in conditions of no distractions. Benefits range from reducing stress and anxiety to increasing focus, concentration, motivation, and confidence, to helping psychomotor performance, mood, and deep meditation. Binaural music listening activates specific systems within the brain, which have been recorded through an electroencephalogram (EGG). Electrical brain activity affects a person's body according to the frequency pattern used.[120] Therefore, not all binaural beats are created equal. According to Figure 4, each binaural beat can be created to resonate in alignment with the human brain waves and its frequency, depending on the right type of healing desired.[121] For example, gamma, beta, alpha, theta, and delta binaural beats are to be chosen for the respectively corresponding functions determined explicitly for each frequency range.

[120] Smith, "Binaural Beats Therapy: Benefits and How They Work."

[121] Tam Hunt, "Could Consciousness All Come down to the Way Things Vibrate?" *Medical Xpress - Medical Research Advances and Health News*, November 09, 2018, https://medicalxpress.com/news/2018-11-consciousness-vibrate.html.

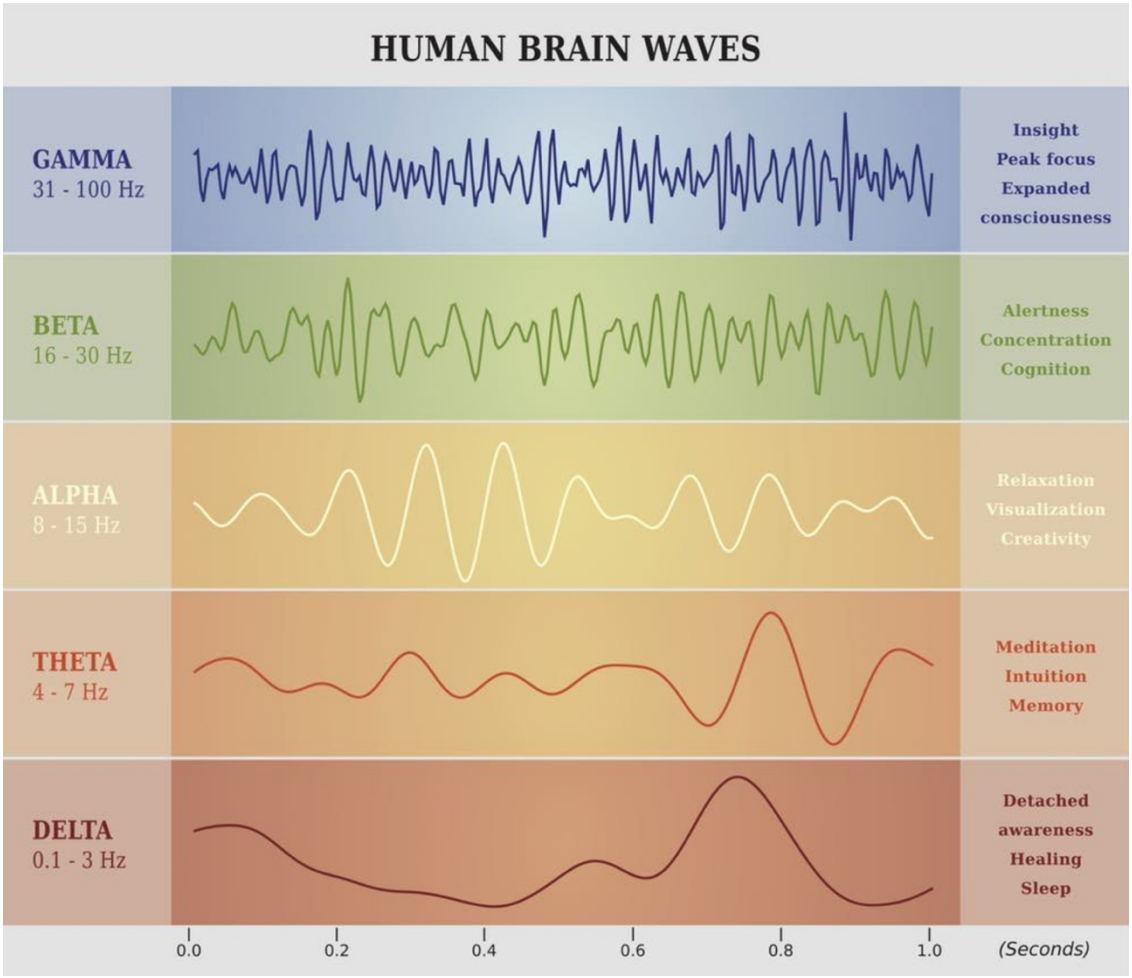

Figure 4. Human brain waves.[122]

Although the research on binaural beats still needs further development, some recent studies have confirmed its effectiveness in reducing pain and promote healing and wellbeing.[123]

[122] Smith, "Binaural Beats Therapy: Benefits and How They Work." Neural oscillations are rhythmic or repetitive patterns of neural activity in the central nervous system.

[123] Helané Wahbeh, Carlo Calabrese, and Heather Zwickey, "Binaural Beat Technology in Humans: A Pilot Study To Assess Psychologic and Physiologic Effects," *The Journal of Alternative and Complementary Medicine* 13, no. 1 (2007): 25–32, https://doi.org/10.1089/acm.2006.6196; M.P. Le Scouarnec, R. M. Poirier, J. E. Owens, J. Gauthier, A. G. Taylor, and P. A. Foresman, "Use of Binaural Beat Tapes for Treatment of Anxiety: A ..." PublMed.gov. Clinique Psyché in Montreal, Quebec, January 7, 2001, https://www.researchgate.net/publication/12140104_Use_of_binaural_beat_tapes_for_treatment_of_anxiety_A_pilot_study_of_tape_preference_and_outcomes.

In my opinion, the most intense form of music listening happens through music performance because the performers enact a highly skilled motor behavior. Specialized motion involves physical movement with precise shapes and patterns. Body memory is employed to create meaningful sound. Physiologists define this skill as "one that requires sensory integration, memory processing, motor integration, and feedback or knowledge of results."[124] Usually, these skills are attributed to athletes because of the deep involvement of the major muscles of their body. Musicians are just like athletes in regard to some muscles of the hands, arms, and mouth. In music performance, musical intelligence interacts to build a great deal of physical coordination. This mechanism of music-making is associated with a large amount of brain control, which means the musical intelligence is working at its highest complexity. Indeed, the brain is called to process many different elements at the same time, and every aspect of the motor skill intertwines with them.[125]

According to Barbara Crowe, reading music notation involves rhythmic movements of the eyes, with starts and stops, following the structure of the music, identifying patterns and repetition, and picking up quickly on musically significant turning points. The engagement of the visual cortex adds another layer of complexity to the performance activity that interacts with the tactile and kinesthetic response. The auditory system receives information from the music produced, and musical intelligence creates a feedback control system, which offers valuable insights to the performer. Musicians can use this information to modify their performance in real time. They not only interact with their perception, imagery, and intention for expressivity but also with the conductor and the ensemble, in the case of group performance. "The complexity of hearing and

[124] Crowe, *Music and Soulmaking*, 85.

[125] Crowe, *Music and Soulmaking*.

perceiving elements of sound alone is immense," Crowe writes. "Yet, clearly, when active listening and all the elements that go into musical performance are added, the brain activity involved in music is greatly increased, adding to the overall complexity of the process."[126]

Successful professional musicians also appear to be advantaged when considering wellbeing. In fact, what my interviewed students have in common is that they hedonically (from hedonism, the pursuit of pleasure) reach *positive emotions* through music. They fully *engage* while busy in a performance. They share a sense of belonging within their group and build strong *relationships* through music. They continuously pursue and achieve *meaning*, by finding a sense of purpose in something higher than themselves, such as creating an artistic rendition of beautiful music. Finally, they feel *accomplished* since they achieve a mastery of music. My student Wetmore stated: "voice lessons are a source of great excitement and anticipation." And my student Gabriel said, "My music goals help me to learn not just a new craft but also to grow as a human being. It opens my mind to new ways of thinking. I think it makes me appreciate the work that goes into it to make it sound so good."[127] In this sense, musical intelligence contributes to music performance and vice-versa, by nurturing a virtuous circle of art, meaning, and perceived satisfaction.

[126] Crowe, *Music and Soulmaking,* 88.

[127] Cindy Gabriel and Colin Wetmore, personal interviews.

CONCLUSIONS

Built on Gardner's premises, this research investigates musical intelligence and its integration with general intelligence and musical pedagogy. Musical intelligence exists both as nature and nurture, as we may be born with it, but we can also cultivate it through training and education. Music psychology and positive psychology have not only been fundamental for this investigation, but they may also offer inspiration for music-positive-psychology as a new, independent discipline. Its multidisciplinarity may offer novel ways of flourishing through music in search of greater life satisfaction.

Most importantly, these ideas offer a new vision of music education, intended not only as a tool for learning how to play a musical instrument, for example, but also an innovative way of accomplishing that learning (and teaching) more effectively, as well as a guide for personal and spiritual growth. The dedication, passion, practice, and perseverance required to learn technically challenging skills offer a healthy way to build up self-discipline, strength of character, and determination. The sense of achievement and the pleasure drawn from the creation of music offer a possible path to life satisfaction by increasing self-esteem. In other words, people could be aware that they have music as an option for feeling better and feeling good.

Additionally, this research contributes to an understanding of how to develop the self through musical discipline while releasing the negativity and frustration of self-judgment. Music training helps students expose and address their weaknesses, while at the same time discover their talent and potential. Like all the opposing forces in life—good and evil, yin and yang, winter and summer—music education works, philosophically, between perfection (sublime art) and imperfection (mistake and trial) to drive humans to achieve balance.

The implications of this investigation apply not only to musicians but to everyone. Non-

musicians can now realize that they may try musical training and grow their intelligence as a result. In my experience and as seen in this study's interviews, many students begin without faith in their musical abilities (and themselves generally), but this perception changes. I would hypothesize that anyone could benefit from music in their lives and see personal, spiritual, and mindful growth.

Therefore, music in the twenty-first century can be seen not only as an essential component of human life that expresses itself mainly in society writ large, but also as a crucial inner quality meant to enhance our psychology, emotional balance, spirit, and soul as individuals. As the scientific community has recognized the validity of music therapy as a healing method, the next step could be to validate music training as a useful tool for cultivating healthy individuals. The definition of musical intelligence allows non-musicians to believe they could be capable of delivering results through music training and gaining improvement for their overall satisfaction.

As the interviews with my students suggested, the impact of musical intelligence in their lives turned out to be significant in their perception of meaning for better life satisfaction. However, further investigation is needed. Additional studies could address how to focus attention on the music-positive-psychology approach with the purpose of better aligning with systems of (music) educational system. For example, further studies might include interviews with professional musicians and scholars to find out what exactly prevents them from thriving in their environment. Analyses of those interviews would try to find the bottlenecks in the larger educational systems, which drive people away from the pursuit of musical studies.

The goal of my research was to investigate musical intelligence and its relevance for a positive pedagogical approach. The outcome shows that it is possible to become more satisfied by training ourselves musically. Once this was clarified, the next steps are to understand how to do it realistically and concretely, with solutions that will impact the fields of music, education, and

psychology.

New questions to ask include, how does the general public perceive positive psychology? How much are people aware of the power of their free choice when they work for their happiness? Why does music seem to be reserved for so few people? Is it for those "born with the gift" only? How and when will music education be able to respond to the demand for wellness benefits derived from musical intelligence? What would be the benefit to the community if a greater number of individuals were more satisfied and/or more musical? What are the economic effects of such musicality? One thing that I would dream of seeing is music and psychology departments sitting together and discussing how to integrate positive-music-psychology into their current curricula. Perhaps it could be an extension of music therapy.

There is much that scientific research and institutions could do to answer these questions. But, to me, results are visible, week after week, when I see my students' lives transformed and improved by positive music pedagogy. When musicians confirm their perception of musical intelligence as an interactive portion of general human intelligence, which can lead to greater life satisfaction, they learn more effectively and can begin a self-development journey through music. While it is true that ups and downs are part of daily life, there is no doubt that, in the long term, an individual can improve his or her perception of life satisfaction when musical intelligence is put to good use.

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ABSTRACT

AN INVESTIGATION OF MUSICAL INTELLIGENCE FOR A POSITIVE PEDAGOGICAL APPROACH

by

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Advisor: Dr. Joshua S. Duchan

Major: Music

Degree: Master of Arts

Inspired by Howard Gardner's theory of multiple intelligences, this work investigates how musical intelligence interacts with the other types of intelligence while aiming to find a better pedagogical approach. Multidisciplinary research and interviews with both music students and professionals confirm that musical intelligence is perceived as an interactive portion of general human intelligence and an asset for a positive musical pedagogical approach. This study shows the connections between how the brain transforms sound perception into meaning and emotion and their impact on music pedagogy. The interviews show how music students and professionals perceive the development of their musical intelligence over time and its contribution to an improved sense of overall wellbeing. Although further research is encouraged to measure such results, this thesis offers a panoramic view of the potential of positive pedagogy for musicians to thrive and flourish.

AUTOBIOGRAPHICAL STATEMENT

Viviana Garabello was born and raised in Italy. After thirteen years as a Quality System Engineer in an international automotive company, she changed her career and decided to pursue music professionally. Garabello moved to Michigan in 2014 and later graduated with a Bachelor of Music in Film Music Scoring with the highest honors from Madonna University (Livonia, MI). While pursuing a Master of Arts in Music at Wayne State University (Detroit), Garabello focused on the topic of musical intelligence because of its connection with the field of positive psychology, which had always interested her. From her mother—Anna Maria Quinterno, psychobiological counselor, craniosacral therapist, teacher of yoga and meditation, and author of the book *Meditate for Living*—Garabello learned a lot about the ability of body and mind to work together for wellness, and she wondered if music could have a role on it. With over twenty-five years of experience as a music educator and vocal coach, after noticing the positive influence and impact of music lessons on her students over the years, Garabello formulated her theory about musical intelligence and its connection to life satisfaction and wellbeing. She applies the method and its principles daily during her classes and confirms the positive overall benefits visible in her students.