The Significance of Music in Child Development

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While conducting field work for his Harvard doctoral degree in anthropology, Jim Ferguson spent time with an African tribe in Lesotho, an area in South Africa. A sign of gaining the locals' trust was being invited to sing with them. Upon receiving such invitation from the local tribe, he told them he could not sing. The villagers did not understand his objection for they "considered singing an ordinary, everyday activity performed by everyone, young and old, men and women, not an activity reserved for special few."[1] Unlike this African tribe, American society emphasizes musical abilities and talent seen in pop culture, as opposed to emphasizing a basic musical knowledge in every person. In response, this has shaped a society that is timid to engage with the arts, specifically music. What would society look like if this belief was disbanded and music was brought to the forefront of child development and education?

Music educator Estelle Jorgensen advocates for a basic understanding of music as part of every child's education. She emphasizes musical involvement in each person instead of limiting music to those who show specific musical interested. She believes that "music making is a characteristically human activity."[2] Historically, music has been the epicenter of culture across the world. From singing, dancing, playing instruments, concerts, theatre, film, religious functions, parades, festivals, and a multitude of other social activities, music has and continues to play a significant role in cultures across the globe. Music is both a career and a hobby. Music crosses generations, culture, race, gender, and ethnicity. Music speaks when words will not, expressing the depth of a human soul. Music unites people. Historically, music has been a foundational layer in Western society. Not until recently has Western cultural begun to reserve

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[1] Daniel Levity, *This is Your Brain on Music* (London, England: Penguin Books, 2006), 6.
[2] Estelle Jorgensen, *In Search of Music Education* (Illinois: Board of Trustees of the University of Illinois, 1997), 1.

music for those that show particular interest and skill. This should not be the case. Music should continue to be an intricate part of Western society.

Well-known 19th century music educator Jaques-Dalcroze knew there was a quality deeper to music than just instruction or consumption. After observing his music students to find a better method of music instruction he noted that there was "something deep and mysterious about the musical process, something to unify vibrations and sensations, feeling and thought, temperament and spontaneity, imagination and willpower."[3] Music seems to be a powerful, innate part of each person. Such power can be a vital tool in child development, used to educate the young minds of the upcoming generations. If music is so powerful, where does this power come from and why does it seem to be a natural part of each human?

God made humankind in His image, composed of both flesh and spirit, with the capacity to create and reason. Music is inherent in humans because it engages the very foundation of humanity. Therefore, it can be argued that music is indispensable to the development of a healthy, well-rounded child.

This paper will examine the significance and role of music in child development by investigating theological and neurological arguments. These findings will then be applied to a child's academic, social, and emotional development in real life situations.

The Theology of the Power of Music

Music is powerful. Ancient civilizations like the Egyptians, Greeks, and Chinese believed in music's power and considered "musical harmony as a metaphor of cosmic order."[4] Some cultures even describe their gods singing creation into being. Musical influences in the creation

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[3] Choksy Abramson Gillespie Woods and Frank York, *Teaching Music in the Twenty-First Century* (Englewood Cliff, NJ: Prentice-Hall, 1986), 30.

[4] Jeremy Begbie, *Resounding Truth* (Grand Rapids, Michigan: Baker Academic, 2007), 78.

story are also found in J.R.R. Tolkien's *The Silmarillion* and in C.S. Lewis' *Chronicles of Narnia: The Magician's Nephew.* According to Plato, music can restore order to the soul and bring about harmony. Ancient Greek and Chinese cultures believed "musical sounds to improve our individual and social behavior."[5] These ideas suggest that music has a deeper meaning, whereas the purpose of music in America today has often been reduced to merely personal taste and pleasure. Augustine, in his work, *De Musica,* describes a numerical connection between God and music.[6] He concludes that "God *is* music in this sense; he is supreme measure, number, relation, harmony, unity, and equality, and all manifestation and embodiments of music in the world are from him."[7] Augustine describes God as the source of all music and its power. If God holds such musical power, do humans?

Genesis 1:26-28 says, "Then God said, 'Let Us make man in Our image, according to Our likeness; and let them rule over the fish of the sea and over the birds of the sky and over the cattle and over all the earth, and over every creeping thing that creeps on the earth.' God created man in His own image, in the image of God He created him; male and female He created them."[8] Not only is this the first account in the Bible of human beings but also the first account that gives a glimpse into how humans were made. There are three main points that can be extracted from this text to better relate the *imago dei,* or image of God, to music's power and the effect it has on child development. First, humankind, although made with flesh, also is made of spirit which reflects a divine Creator. Second, humans are creative and imaginative. Third, human beings have the mental capacity to reason, think, and gain knowledge.

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[5] Ibid, 81.
[6] Ibid, 78-84.
[7] Ibid, 84-85.
[8] Gen. 1:26-27 NASB

Genesis 1 explains the characteristics present in every human, one of them being that humans are made of flesh and spirit. The Hebraic grammar in this section points to humankind being set apart, different from any other creation. A divine Creator chose to create beings with flesh *and* spirit—to have capacity for the divine and earthly.[9] Commentator Matthew Henry says, "Flesh and spirit, heaven and earth, must be put together in him, and he must be allied to both worlds."[10] Humans are the only creation that have this blending of flesh and spirit. God puts detail and care into each human being that He forms. Parents, guardians, and teachers are stewards of the children God creates and have the responsibility to put forth as much detail and care into a child's life as possible. A child's growth and education should reflect the God we serve, lavished in creativity and given the best tools to learn and grow as a part of God's unique creation.

Humans are creative and have the capacity to imagine because we are made in our Creator's image. His creativity is seen in the various species of plants and animals, the sunsets, the order of the cosmos, and most uniquely, human beings themselves. No two humans are exactly alike; each child is uniquely crafted. Since each child is uniquely crafted, and music encompasses both creative and logical aspects of the human makeup, child development should reflect the creative process utilizing music's power. Author Harold Best defines creativity as "the ability to imagine something—think it up—and then execute it."[11] Human beings manifest this creative aspect in all they do, whether in regard to problem solving, school projects, work assignments, or through art. Best says, "Creativity is not just for artists and music makers, it is a

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[9] Matthew Henry. *Genesis.* Matthew Henry Commentary on the Whole Bible (Complete). N.p., 1706. www.biblestudytools.com/commentaries/matthew-henry-complete/genesis/.

[10] Ibid.

[11] Harold M. Best, *Music: Through the Eyes of Faith* (New York, NY: HarperCollins Publishers, 1993), 11.

part of humanity."[12] Imagination is the first part of creativity. If humans are creative, then individuals can also be imaginative.

A better understanding of the word "image" is needed to understand a human's capacity to imagine. The root of "image" can first be traced to the Latin word *imaginari* meaning "to picture oneself."[13] A deeper look into the word image comes from the Hebrew word *selem.*[14] According to author and Old Testament scholar Sandra Richter, the word *selem* is also the "ancient Near Eastern word for 'idol.' When a polytheist from the ancient world set out to make an earthly representation of their deity, that polytheist fashioned a 'selem.'"[15] In this context, an image, or idol "was believed in some ways to carry the essence of that which it represented."[16] Thus, when an image of a god or deity was made into an idol, it was worshiped because of the belief that it held the deity's very essence. People are made in God's image. Therefore, individuals contain His essence. Commentator John Walton remarks, "This does not suggest that the image could do what the deity did or that it looked the same as the deity (even though the idol was a physical object). Rather, the deity's work was thought to be accomplished through the idol. The Hebrew word *ṣelem* is a representative in physical form, not a representation of the physical appearance."[17] Here a distinction is made between representative and representation. Representative means "serving to represent; standing or acting for another especially through delegated authority."[18] Whereas, representation means "one that represents; an artistic likeness or

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[12] Ibid.
[13] Katharine Perdue, "Imagination," *The University of Chicago Keywords Glossary*, 2003, http://csmt.uchicago.edu/glossary2004/imagination.htm.
[14] Sandra Richter, *The Epic of Eden*, (Downers Grove, Illinois: InterVarsity Press, 2008), 107.
[15] Ibid.
[16] John H. Walton. *Genesis.* NIV Application Commentary. 2001. https://www.biblegateway.com/passage/?search=Genesis+1&version=NASB.
[17] Ibid.
[18] *Merriam-Webster Dictionary.* October 22, 2014. http://www.merriam-webster.com/.

image."[19] The key word here is "serving," indicating that a person is willing to serve another as their *representative*—as opposed to one that presents an image or likeness to someone or something else. This distinction is important. Humans are God's representatives on earth, made in His image with similar character traits, to serve as an image-bearer and spokesperson to others. The God of the universe, the ultimate Creator and Imaginer, chose to give humanity the ability to create and imagine. Each child is an image-bearer of God, on Earth to be a spokesperson for the Lord Almighty. Music can act as an incredible vehicle to display the power that is within each person because music engages the foundation of humanity. Allowing a child to tap into the creative power of music is allowing a child to tap into their potential as an image-bearer and child of the most high God.

As strong as the creative ability is within humans, people are also made with the ability to think, reason, process, and gain knowledge. A person is not born with complete knowledge. Learning is a process with different avenues in which to gain knowledge. This is lived out through years of school, and work place, as well as through parents, mentors, friends, and even adversaries. Learning is always happening. Author and song writer Michael Card brings up an interesting point in his book, *Scribbling in the Sand,* that when Noah built the ark, Moses constructed the tabernacle, and King Solomon erected the temple, they combined their creativity with their knowledge and divine revelations from God.[20] God gave instructions, then the people carried out the plans with their God-given ingenuity. Creativity and knowledge are not separate entities; they thrive together. Considering Begbie's earlier definition of creativity as the execution of something imagined, it stands to reason that imagination is the mental picture and it takes creativity and knowledge to execute the idea. Thus, creativity, imagination, and knowledge

[19] Ibid.
[20] Michael Card, *Scribbling in the Sand* (England: InterVarsity Press, 2002), 37-42.

are closely woven together. Music is an excellent combination of these elements, and a dynamic tool to use in shaping a child's academic, social, and emotional wellbeing.

Human beings are made in the image of God. As a result, humans contain both physical and spiritual components with the capability to create, imagine, and continually gain knowledge. This is made possible through the human brain. In all the body systems God created to regulate the human body, the nervous system is the most powerful. Although the brain itself is not the largest organ in size, it is the most extensive in its function. Scientists have not reached the depth of the human mind, but researchers are continually making new discoveries. As researchers learn more about the human brain, more is uncovered about the power of music and the brainf. Educators, philosophers, and scientists have only begun to uncover all that music can do in child development.

The Neurology of Music and Child Development

In 1993, what is known as the Mozart Effect became popular after a study was done at the University of California. The conclusions of the study were that college students performed better on tests after they listened to Mozart for a few minutes prior to the test, compared to students that did not listen to Mozart or any kind of music before a test. The conclusions of this experiment were quickly applied to infants and young children saying that listening to Mozart, or classical music in general, would help their mental aptitude.[21] Here an important distinction can be made. While listening to classical music does not guarantee satisfactory grades, engaging in and playing music does improve brain function as neurological research demonstrates.

[21] Jill Stamm, *Bright From the Start* (London, England: Penguin Books, 2008), 256-257.

Researchers at Stanford say, "The brain is a complex organ with many components. These multiple components work together to maintain basic life processes...as well as higher functions like creative thought and emotions."[22] Regarding music, psychology and neurology researchers Isabelle Peretz and Robert Zatorre conclude from their research that "musical activities are numerous, complex, and diverse...[with] a vast network of regions located in both the left and right hemispheres of the brain."[23] Peretz and Zatorre go on to say, "Some of these regions might not only overlap but might also share processing components with other functions, such as those involved in language."[24] Musician, music producer, and neurologist Daniel Levitin says "musical activity involves nearly every region of the brain that we know about, and nearly every neural subsystem. Different aspects of the music are handled by different neural regions."[25] Sincev every region of the brain is relevant to the study of music, knowing each region's basic functions will help to better understand music's interactions with other functions.

The outer part of the brain, the cerebral cortex, is the most complex part of the brain. Moving from outside in and front to back, the brain's functions become less complex, making the outer, frontal part of the brain the high functioning part and giving the inner, back part control over basic life functions. The cerebral cortex is divided in two halves, down the middle from front to back, creating two hemispheres. In between the hemispheres is a thick bundle of

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22 "The HOPES Brain Tutorial," *HOPES: The Huntington's Outreach Program for Education for Education, at Stanford,* 10/8/14, http://web.stanford.edu/group/hopes/cgi-bin/wordpress/2010/07/the-hopes-brain-tutorial-flash-version/.

23 Isabelle Peretz and Robert Zatorre. "Brain Organization For Music Processing," *Annual Review of Psychology*, 56 (2005): 105, http://ezproxy.ccu.edu:2190/docview/195220211?pq-origsite=summon.

24 Ibid.

25 Daniel Levitin, *This is Your Brain on Music* (London, England: Penguin Books, 2006), 85-86.

nerves called the corpus callosum, which passes information between the left and right hemispheres. Further, each hemisphere is divided in half creating four sections known as lobes.[26]

The frontal lobe is responsible for higher level thought and decision-making. This lobe also contains the pre-motor and motor cortices which "process and transmit information regarding body movement."[27] Music performance, which requires planning of behavior, involves the frontal lobe, specifically the motor cortex, and the sensory cortex which is found in the parietal lobe. The parietal lobe is the center of sensory processing. Here senses like touch and pressure are felt, so the involvement of the motor and sensory cortices allows a person to know they pressed or hit the right key on their instrument.[28] This center also plays a large role in information processing and spatial orientation. The third lobe is the temporal lobe and is primarily responsible for the processing and memory of sounds. The fourth lobe is the occipital lobe and is the visual center for the brain. This is where the action of reading music is processed. The temporal and occipital lobes are where language is processed and these areas are engaged for learning or recalling lyrics.[29]

The limbic system, which is located underneath the cerebral cortex and wraps around the brain stem, contains multiple parts, the most vital being the hippocampus and amygdala. This area below the cortex, is where music processing starts, then "moves up to auditory cortices on both sides of the brain."[30] Emotional processing, learning, and memory happen in the limbic system. Further, memory storage is found in the hippocampus which "is also involved in

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[26] "The HOPES Brain Tutorial," *HOPES: The Huntington's Outreach Program for Education for Education, at Stanford,* 10/8/14, http://web.stanford.edu/group/hopes/cgi-bin/wordpress/2010/07/the-hopes-brain-tutorial-flash-version/.

[27] Ibid.

[28] Daniel Levitin, *This is Your Brain on Music* (London, England: Penguin Books, 2006), 86.

[29] "The HOPES Brain Tutorial," *HOPES: The Huntington's Outreach Program for Education for Education, at Stanford,* 10/8/14, http://web.stanford.edu/group/hopes/cgi-bin/wordpress/2010/07/the-hopes-brain-tutorial-flash-version/.

[30] Daniel Levitin, *This is Your Brain on Music* (London, England: Penguin Books, 2006), 86.

complex cognitive processing."[31] Therefore, it would make sense then, that the hippocampus is involved in following along with already familiar music. This musical function also engages the lowest part of the frontal lobe. More complex emotional responses happen in the amygdala, where, along with the cerebellum and the brain stem, emotional response to music is felt.[32] Ironically, this region, the amygdala, cerebellum, and brain stem, is located deeper within the brain. Thus, emotional responses to music are relative to life's basic functions. The deeper and farther back into the brain, the more basic the life functions become. Music is not just a higher level process but is part of the very essence of who individuals are as human beings.

Moving to the back of the brain, near the brain stem and spinal cord is the cerebellum which "receives input from many parts of the brain...and controls balance and coordination and is where learned movements are stored."[33] The fine and gross motor skills that develop slowly in children are comprised of a connection between the limbic system and other parts of the brain such as the basal ganglia, cerebral cortex, and thalamus. These motor movements developed in the front of the brain are refined in the cerebellum which is also responsible for limb orientation and movement and coordinates skilled movements.[34] This is also where music processing happens for keeping rhythm to a piece of music such as foot tapping, mentally or physically.[35]

The human brain is an extraordinary part of the human body. One element that makes it so exceptional is that there is no one center for a function. Although certain processes happen in particular areas, the process is not limited to that one area. Levitin comments, "There are regions

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[31] "The HOPES Brain Tutorial," *HOPES: The Huntington's Outreach Program for Education for Education, at Stanford,* 10/8/14, http://web.stanford.edu/group/hopes/cgi-bin/wordpress/2010/07/the-hopes-brain-tutorial-flash-version/.

[32] Daniel Levitin, *This is Your Brain on Music* (London, England: Penguin Books, 2006), 86.

[33] "The HOPES Brain Tutorial," *HOPES: The Huntington's Outreach Program for Education for Education, at Stanford,* 10/8/14, http://web.stanford.edu/group/hopes/cgi-bin/wordpress/2010/07/the-hopes-brain-tutorial-flash-version/.

[34] Ibid.

[35] Daniel Levitin, *This is Your Brain on Music* (London, England: Penguin Books, 2006), 86.

that perform component operations and other regions that coordinate the bringing together of this information."[36] Another component that makes the brain so remarkable is the neurons that compose and make possible the knowledge people have. Every neuron has the possibility to connect to another neuron and "as the number of neurons increase, the number of possible connections grows exponentially." The numerical calculations are beyond what scientists believe they can calculate. This means the plethora of possible thoughts, ideas, or states of being "exceed the number of known particles in the entire known universe."[37] Levitin states that this is also due to the brain being a parallel processor versus a serial processor. In other words, the brain is not a computer or assembly line processing one thing at a time, then moving on to the next. The brain is capable of continually taking in new information and changing conclusions based on newly arriving information.[38] That fact alone is more than a brain can compute! The brain is an immense organ of exceedingly endless opinions, ideas, creations, and actions. This, coupled with the way music affects so many areas of the brain, makes music an excellent tool to be utilized in the classroom. The creative process in which humans were created to function need to be a significant part of education because it is part of the fabric of humanity.

If the human brain is capable of computing and holding such large amounts of information and ideas, then a person has the capacity to be intelligent in multiple areas and for these intelligences to overlap each other. The research of Dr. Howard Gardner suggests that children learn in various ways, and is known as the theory of multiple intelligences. Dr. Kathy Koch looks at Dr. Gardner's theory of multiple intelligences, or as she labels them 'smarts' in her book *How am I Smart*? There are eight smarts: word, logic, picture, music, body, nature,

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[36] Ibid, 87.
[37] Ibid, 88.
[38] Daniel Levitin, *This is Your Brain on Music* (London, England: Penguin Books, 2006), 88-89.

people, and self-smart. The basis of this theory is that these intelligences are not isolated but overlap each other and each person is born with all eight. Music is listed as one of the eight smarts, and although a person can have an inclination towards music more than others, it does not work alone, nor does someone lack music smarts. As Levitin pointed out, music processing happens in multiple areas of the brain. This research combined with Dr. Gardner's multiple intelligences suggests that music is an essential part of a child's development. Dr. Koch upholds Dr. Gardner's opinion that the nature versus nurture debate is irrelevant.[39] Instead they advocate that it is a combined effort. Dr. Gardner says, "I reject the 'inherited versus learned' dichotomy and instead stress the interaction, from the moment of conception, between genetic and environmental factors."[40] Therefore, music can and does touch every part of a person's life and should be instrumental in child development, especially from birth to early elementary age.

To illustrate music's positive effects in a more tangible way, a study was conducted examining three groups of children ranging from five to seven years old who had never received music instruction before. In the study, one group of children received music lessons, another group studied foreign language, and the last group received nothing. Researchers wanted to discover if a person's brain develops and functions differently when given musical instruction and if there is a genetic bias to music in certain children—do some brains look different before musical instruction? Over a period of three to five years, researchers looked for gained musical skills such as notation reading or instrument fingering as well as influences on other non-music related areas such as math and language. Dr. Jill Stamm, co-founder of New Directions Institute for Infant Brain Development and Associate Clinical Professor at Arizona State University in the department of Psychology in Education reports on this study. She concludes, "Kids who take

[39] Kathy Koch, *How Am I Smart?* (Chicago, Illinois: Moody Publishers: 2007), 19.
[40] Ibid.

music lessons do not start out with a brain that is different. After just fifteen months, however, the scientists *did find differences* both in brain structure and in music-related measures."[41] These differences included a notable improvement in math skills and hand-eye coordination in the music group.[42] This study emphasizes the point that music connects multiple brain functions and strengthens the communication between them.

So far, the beneficial effects of music on the brain have only been looked at in light of infants through young children. A study conducted at Harvard further illustrates that music has a lasting impact on the human brain. This Harvard study compared brain scans between adult musicians and non-musicians. The results yielded very different brain scans. First, the corpus callosum, responsible for relaying information between left and right hemispheres, was larger, or more developed in musicians than non-musicians. This shows enhanced communication between the left and right side of the brain in musicians. The second main difference was the development of each hemisphere. In non-musicians the hemispheres were disproportional. The left side, where language is processed, was larger than the right hemisphere where math is processed. In great contrast to this, the musician's brain was symmetrical, having more evenly developed and strengthened hemispheres.[43] It was found that "the areas in the right hemisphere that are larger in musicians are those responsible for planning and executing movement, as well as those for hearing. The cerebellum, which plays a role in the coordination and timing of sequential movements, also shows a higher cerebellar volume in musicians as compared to non-musicians."[44] Although this is an adult study, the results demonstrate that musical activity at any age is favorable to the brain. The study did not specified if the musicians in this study played

[41] Jill Stamm, *Bright From the Start* (London, England: Penguin Books, 2008), 260.
[42] Ibid, 259-260.
[43] Jill Stamm, *Bright From the Start* (London, England: Penguin Books, 2008), 258.
[44] Ibid, 258-259.

music for a living or had other jobs. Regardless, playing music has lasting results into a child's adult years. It takes years of practice to become competent in playing an instrument. That being the case, a child that carries out musical skill into adult life, even if not in the form of a career, has secured lasting neurological results. These neurological results are exemplified in increased communication between hemispheres and stronger developed hemispheres and lobes which support healthy brain function. Not only can exposing a child to various genres of music at a young age be beneficial, but encouraging instrument playing can be significantly influential to a child's motor, sensory, aural, math, and language skills.

Academic Application

As a child develops academically, emotionally, and socially, there is also a natural musical progression as children mature. This natural progression coincides with other developments happening in the brain, and can be used to develop exceptional curriculum to enhance both musical skills and other life skills. From birth to approximately nine months old, babies learn to recognize familiar sounds like a parent's voice and start to imitated sounds they hear. From nine months to two years old children begin to differentiate between sounds to hear small differences and start to respond to pitch change. This age group is also attracted to strong rhythm and may begin to respond with repetitive movements. Children two to three years old may begin to sing fragments of familiar songs or make up their own songs. At this age, children begin to recognize instruments, develop preferences to certain songs over others, and have stronger physical reactions to music. Three and four year olds gain an even stronger enjoyment of physical activity with music, start to gain better control over their voice, begin to learn simple

musical concepts, such as soft versus loud, and enjoy individual and group activities in music.[45] As the brain is advancing in what it can process, naturally, more musical skill is processed. This is detected specifically in the progression of controlled body movement. As the brain develops more of the cerebral cortex, especially the frontal and parietal lobes responsible for decision-making and sensory and body movement processing, a child's physical response to music grows. Many music methodologists use this natural connection of the body to rhythm and repetition to their advantage in teaching music.

There have been many teaching theories and methods created over the years that help children gain both musical and life skills from an early age. These ideas have one main theme in common, that music is inherent in humans. Some of the most prominent names in the field have recognized the body's instinctive wiring for music and have used the brain's natural progression to process music as the root of their theories. These teaching methods could be discussed at length, but a compact look at a few of the most prominent names in music methodology will help illustrate music being inherent within each person. Some of these names are Emile Jaques-Dalcroze, Zoltan Kodaly, Carl Orff, and Shinichi Suzuki. Each one of these theorists have a different, but effective approach to teaching music as a basic life skill.

Jaques-Dalcroze's primary focus was on rhythm, connecting the human body to music. He believed "that the source for all musical rhythm may be found in the natural rhythms of the human body"[46] and so his theory became known as *Dalcroze Eurhythmics*. He observed in his students that even if they could not play a rhythm in tempo, they could walk in tempo. Furthermore, he observed students' bodily response to music in small and large ways. He

[45] Jill Stamm, *Bright From the Start* (London, England: Penguin Books, 2008), 264.
[46] Choksy Abramson Gillespie Woods and Frank York, *Teaching Music in the Twenty-First Century* (Englewood Cliff, NJ: Prentice-Hall, 1986), 27.

perceived larger movements in his students such as tapping their foot to the beat and in smaller ways watched them relax at the end of a phrase. He came to conclude that the body is the primary instrument. He believed that the human body was the first instrument to be trained and that one must train not just a single body part such as the ears, but the whole body to envelop the entirety of music. Jaques-Dalcroze's final analysis was the bodily process of what is known today as kinesthetics: the way the brain and body work together to relay sensations into information. Kinesthesia became the foundation of Jaques-Dalcroze's method.[47]

The Kodaly training method focuses on making the language of music accessible to every child through the "innate musicality present in all children"[48] and to foster an appreciation and love for great music. More than anything, the Kodaly method stresses the natural development of a child and how they gain musical awareness. He held the opinion that music was not just for an elite few, but encouraged everyone to sing. Like the African tribe referred earlier, music should be a natural part of human life. Like many of his peers, he also sought to incorporate music education at a young age. Research conducted in his home country of Hungary showed great academic improvement in children that were sung to daily versus children that had a lack of music in their environment. Due to this research, he believed that music should be a key component in all curriculum. He held the firm belief that music contributed to the development of every area in a child's life and therefore should not be pushed aside, but brought to the center of child education.[49]

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[47] Choksy Abramson Gillespie Woods and Frank York, *Teaching Music in the Twenty-First Century* (Englewood Cliff, NJ: Prentice-Hall, 1986), 27-31.
[48] Ibid, 72.
[49] Ibid, 71-73.

Carl Orff's approach to teaching music was to "ignite a fire in the imaginations and fantasies of children, inviting them into the world of music."[50] Out of his love for dance and theatre came his philosophy of an endless cycle of music which would produce movement which, in return, would produce more creative music and movement. Orff stressed the ideology of "doing rather than learning about,"[51] through children physically experiencing elements of music like beat, tempo, and rhythm. In a similar manner to Jaques-Dalcroze's emphasis on kinesthesia, Orff emphasized exploration and experience through bodily awareness. He believed in teaching children about each element starting with the basics, then the depth of each element would grow with understanding and age. Like *Dalcroze Eurythmics*, an integral part of the Orff process is understanding that the body is the most important instrument to a person and the second most important is the voice, being attached to the body. At every level of the Orff process, the child is discovering space through bodily movement, understanding sound through the use of their voice and then other instruments, and using improvisation to understand form.[52]

Like Jaques-Dalcroze, Kodaly, and Orff, Suzuki believed that music is inherent within each person and was influenced by his predecessors in music methodology, including Jaques-Dalcroze. Suzuki firmly believed that in the same way a child learns their native language, a child can become fluent in musical language. This idea is known as the "mother tongue" method.[53] He believed that talent was not innate, but that every child was musical. Another significant part of his method was the importance of the parent-teacher-child bond. He taught that these parties should work together to create a healthy, nurturing environment for the child to

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[50] Ibid, 92.

[51] Choksy Abramson Gillespie Woods and Frank York, *Teaching Music in the Twenty-First Century* (Englewood Cliff, NJ: Prentice-Hall, 1986), 93.

[52] Ibid, 94-97, 103.

[53] John Kendall, "Suzuki's Mother Tongue Method," *Music Educators Journal* 83, no. 1 (1996): 43, accessed November 12, 2014, http://eq4cn7dt4l.search.serialssolutions.com.

thrive in. From within this environment a child could be exposed to musical activity from birth, reduce competition and support self-development, and engage in home learning as well as private and group lessons. Since Suzuki's method was built on the ability of a child to master their native language, the techniques Suzuki employed were largely based on repetition and reinforcement over a large span of time.[54]

Many children can remember using household items to facilitate their musical activities. The most common for children seem to be their mother's kitchen pots and pans. Add some spatulas or spoons and the child is all set up for a drum solo or accompanying themselves as they sing a familiar or made-up song. This can stimulate "cognitive and motor connections in the brain. Rhythm activities stimulate the areas of the brain used for pre-reading skills."[55] In addition, "recent research is connecting the ability to detect rhythm with improved early decoding skills in reading."[56] Singing and using a lot of rhythm and rhyme can help an infant learn language skills as demonstrated by preschool teachers taking well known children songs or nursery rhythms and changing the lyrics to fit the current activity. These games and more show how musical processing overlaps with many other activities in the brain, especially language centers. Rhythm and rhyme continue to be vital tools in child development. Reading nursery rhymes, constantly engaging in singing, and tapping out simple rhythms can all help a child begin to develop their musical ear. They also aid a child in developing other areas such as math and reading, learning about their own bodies, hand-eye coordination, and awareness of their surroundings.[57] Activities like these and many more are suggested and encouraged by Dr. Stamm and the New Directions Institute for Infant Brain Development. New Directions Institute seeks

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[54] Ibid, 43-46.
[55] Jill Stamm, *Bright From the Start* (London, England: Penguin Books, 2008), 281.
[56] Ibid.
[57] Jill Stamm, *Bright From the Start* (London, England: Penguin Books, 2008), 268-281.

"to provide parents and caregivers with training and tools to help every infant, toddler and preschooler develop a healthy brain and enter school ready to learn."[58] They recognize that music is an essential part of healthy development. This institution also acknowledges social and emotional development as a key part to healthy brain development.[59]

Social and Emotional Application

Throughout the centuries, people in various cultures have believed that music is able to express emotions that words are otherwise unable to convey. In contrast to this idea, some people have held the opinion that emotions are inferior to logic.[60] Music educator Bennett Reimer states, "Emotions are often believed to get in the way of reason's proper workings. This belief has largely accounted for the arts being regarded as less important in education than those subjects clearly based on reasoning. These are considered 'the basics' because they entail thinking and intelligence."[61] Reimer goes on to explain that including music as a special or enrichment in a school schedule only feeds this ideology that music is inferior to subjects such as math or reading.[62] This says these logic based subjects are essential to a student's wellbeing, while music is only a positive additive, specifically for students that have a special gifting for the arts. Encouraging music as an additive feeds the notion that music and the arts are predisposed in a person instead of inherent in every person. Theologically, because humans are made in the image of God they are created with emotions that are just as valid as reason and logic. Furthermore, neurological research would suggest that emotions are both a higher function and a basic life

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58 "Welcome to New Directions Institute," *New Directions Institute for Infant Brain Development*, November 19, 2014, http://www.newdirectionsinstitute.org/index.html.
59 Ibid.
60 Bennett Reimer, *A Philosophy of Music Education:Advancing the Vision* (Upper Saddle River, NJ: Pearson Education, 2003), 75.
61 Ibid.
62 Ibid.

function due to emotions being processed in the cerebral cortex and limbic system. Feeling, thinking, and acting are not isolated functions but the brain uses all incoming data to produce the best outgoing data. This is possible due to the brain's capacity to process multiple things at once. Emotional development is just as important to a child's growth as academic development in regards to developing a well-rounded child that is both emotionally stable as well as academically intelligent. Music can be an important part of emotional maturity because music helps to express emotion in a way words cannot at times.

Consciousness is a core part of human life as opposed to an animal. Out of it flows awareness of surroundings and self to produce thought, reason, and creativity among other things. Research neurologist Antonio Damasio says that our consciousness is built on our emotions and more specifically our feelings—self-awareness of what the body is experiencing in its surroundings and inside itself. Music is a vehicle in which humanity can sustain feelings in the form of memories.[63] Reimer explains Damasio's research by saying, "Music is a unique way of extending our emotional lives." Music allows a person to "extend their capacity for felt experience...that way to extend feeling for the sake of the enhancement of consciousness it provides—the depths and breadth of felt meaning it makes available—is called 'music.'"[64] Based on these conclusions, a child's emotional development is just as important to a well-rounded state of being as their academic development. Therefore, music should not be disregarded based on an emotional merit but considered invaluable because of its combination of both emotional and logical merit.

[63] Ibid.

[64] Ibid, 79.

Developing emotional skills then transfer to the success of a child's social development. Awareness of one's emotions aids in navigating social constructs. Learning to cooperate, having self-control, confidence, interpersonal communication, and relating to others are crucial life skills that get a child ready for grade school and continue to assist a person throughout life in the workplace and social functions. Consequently, a child's emotional state affects their social development, making healthy social and emotional growth imperative to early childhood development. Music can aid in this social-emotional maturity. A school-ready child has "the ability to experience, regulate, and express emotions; form close and secure personal relationships; explore the environment; and learn."[65] Musical activities can help form these important social-emotional skills. Social interaction or relating to others can be experienced in musical activities in a plethora of ways. The primary way to nurture relatedness, cooperation, and interpersonal communication through music is with ensemble work. On a more basic level with young children, playing with simple instruments in a group can support the same ensemble feel where children are listening to each other, working together, and having fun.

Professional Culmination

An excellent example of the culmination of neurological and psychological research examining music's positive effects on child development can be seen in the work of Kindermusik International. I plan on enrolling in the certification process to teach for Kindermusik International. I believe Kindermusik opens a window to one way of incorporating music into daily life in a fun and academic way. Kindermusik seeks to do two things: develop a child's love for music while also cultivating music as a primary life skill, and improve academic,

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65 Dumbleton and Heidi Gilian Bennet, "Music and Social-Emotional Skills," *Kindermusik International*, November 17, 2014, http://media.kindermusik.com/docs/PDF/Kindersmusik_Benefits_Music_and_SocEmo_1_to_3_FullResearch.pdf.

emotional, and social skills through music. Through a personalized curriculum based on the philosophies of Kodaly, Suzuki, and Orff, children learn through music and movement activities in group settings. Kindermusik emphasizes the important parent-teacher-child bond so that the child has the optimum environment for learning. In a class period, a child can begin to improve upon such things as their language-literacy skills, gross and fine motor skills, how they relate to others and regulate their responses, and grow their spatial and reasoning skills needed for math, all while learning musical skills. This illustrates a great culmination of the brain's parallel processing, multiple intelligence, and use of various music education theories.[66]

In language and literacy skills Kindermusik classes help build active listening skills through music instruction that are the building blocks of oral and written abilities. Using a song or rhyme with motions helps give words meaning and aid in better memory of vocabulary. When a child listens to music, they become aware of pitch changes. This helps identify pitch changes in speech and thus supports phonological awareness needed for learning to read.[67]

In the area of math, Kindermusik classes help strengthen a child's use of numbers, patterns, and geometry. Familiarizing a child with their body and space around them by playing fun games with simple instruments, like reaching up high, down low, or behind them, can work to shape their spatial awareness. Music is full of numbers and patterns, so matching a steady beat to a steady movement while counting out loud to a samba or waltz song can engage both of these skills.[68]

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[66] "About Kindermusik International," *Kindermusik*, November 19, 2014, http://www.kindermusik.com/about/.

[67] Barchers and Heidi Gilman Bennett, "Music and Reading," *Kindermusik International*, November 19, 2014, http://media.kindermusik.com/docs/PDF/Kindermusik_Benefits_Music_and_Reading_1_to_3_FullResearch.pdf.

[68] Heidi Gilman Bennett, "Music and Math," *Kindermusik International*, November 19, 2014, http://media.kindermusik.com/docs/PDF/ Kindermusik_Benefits_Music_and_Math_1_to_3_Highlights.pdf.

When it comes to a child's social and emotional growth, "children who spend time singing, playing, and moving with other children find themselves better prepared to be confident and self-aware, build positive relationships with peers, and get the best out of the learning environments and opportunities that life will bring them."[69] All of these elements and more are combined in a Kindermusik classroom to provide optimum academic, emotional and social growth. While music does not guarantee a higher IQ, 4.0 GPA, or a high paying job in the future, music enhances the quality of life and shapes important building blocks needed for a healthy, well-rounded human being.

Conclusion

The running theme throughout this research is that music is a part of every person from the time each individual is conceived. This has been discussed from multiple angles including theologically and neurologically. Whether it be the Hebraic grammar of Genesis 1, the philosophies from Plato and Augustine, or the research done by Levitin, Peretz and Zatorre, Gardner and Koch, or Stamm, or the teaching methods of Jaques-Dalcroze, Kodaly, Orff, and Suzuki, they have all come to similar conclusions; music is an inherent quality in every person. Music indwells in each individual from the time of conception because humankind is fashioned in its Creator's image with creativity and knowledge. The God of the Universe is the foundation of music's power. That musical power resides in each person and is an innate part of the human design. Some people may be inclined to pursue music more seriously, as a degree program or career, but the powerful, inherent nature of music remains the same. Every person on planet Earth has the capacity to partake in and enjoy musical activity. Every person has the ability to

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69 Dumbleton and Heidi Gilian Bennet, "Music and Social-Emotional Skills," *Kindermusik International*, November 17, 2014, http://media.kindermusik.com/docs/PDF/Kindersmusik_Benefits_Music_and_SocEmo_1_to_3_FullResearch.pdf.

play, read, sing, dance, and listen to music. Music can be an extraordinary and significant tool in a child's development because it encompasses the foundation of how humans were made; with the ability to reach the soul, captivate human creativity and access humanities ability to gain knowledge. Music is an excellent vehicle to allow each child to walk in their God-given potential as a child of the Most High King.

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