

Music can move us to tears, help us to learn, call us to battle, and inspire us to dance with joy. These are things that I've known about music for quite some time, but as I did further reading on the subject in preparation for this talk, I was fascinated at what I learned about the deeper connection between music and being human, and I'd like to share some of this with you this morning.

### \*\*\* Music and the human brain

Researchers tell us that music is first processed in ancient parts of the brain that evolved in primitive times of our history. These parts of the brain are strongly involved in emotion, which may be why music can elicit such powerful feelings in us. The beat or rhythm of music is processed first through the cerebellum and amygdala, very old parts of the brain, rather than through the frontal lobes, which evolved more recently.

Music processing by the brain also results in the mysterious phenomenon called synesthesia [3], or the production of one sense impression or stimulation leading to a different sense impression or stimulation. A perfect example is how listening to Andy play Chopin's "Raindrop Prelude" can make us visualize raindrops peacefully falling down onto a windowsill or pond and feel the cool of evening.

One interesting note is that a reason that we enjoy music is that music often has notes or beats that violate an underlying pattern. Yet because these notes or beats that occur against the rules are not a threat to our safety, the frontal lobes of the brain perceive them as pleasurable. An expectation of the "rule breakers" builds anticipation, and when the rule breakers are encountered, a pleasurable reward reaction occurs, as we experienced in our Percussion Orchestra. [3]

Music also just generally makes us feel good. Recent studies have pinpointed the release of the neurotransmitter dopamine as responsible for the intense pleasure that can be felt in response to music. [12]

By using brain scanning technology, researchers found that activities such as reading or doing math problems each caused activity in a corresponding part of the brain. However, when participants listened to music, multiple parts of the brain lit

up like little fireworks going off at once. And when people playing instruments were scanned, their brains had fireworks going off like a Fourth of July jubilee. Playing music engages almost every part of the brain at once, especially the motor, visual and auditory cortices. Disciplined, regular practice of music that involves fine motor skills, in addition to visual and auditory processing, strengthens these brain functions, which can then be transferred to help in doing other activities and learning. Playing music involves both the left hemisphere of the brain, which dominates in linguistic and mathematical skills, and the right hemisphere that is used in creativity. Music makes us practice coordinating both hemispheres, making our brains become better and more efficient at communicating between the two halves through the bridge called the corpus callosum and can allow musicians to become better problem solvers. This all leads us to the next topic of: [5]

### \*\*\* Learning and Music

There is significant evidence that musical training helps us learn.

One study found that, regardless of socioeconomic differences among schools, students in schools with superior music education programs scored 22% higher in English and 20% higher in math on standardized tests when compared with schools that had low quality music programs.[7]

Nina Kraus, a neurobiologist at Northwestern University, explains how music helps in language development. She says that speech and music have three big commonalities: pitch, timing, and timbre (or tone quality). The brain processes both in very similar ways. Children who come from poverty often are actually unable to hear as many words by age 5 compared with other kids. The difference between “ba” and “ga,” for example, requires incredibly fast and precise processing by the brain. One thing that can help dramatically is music. Music trains and exercises children’s brains to enable them to discern the subtle differences between words.[8] Imagine hearing a “fuzzy” version of the radio playing, and this is what hearing might be like for a child from poverty. What we can give to children with early music opportunity and training is a gift of greatly increased clarity of perception.

An important point here is that playing music alone does not make folks smarter. Just because you can play the Pathétique Sonata by Beethoven on the piano does not automatically give you knowledge of the chemical composition of DNA. You still have to study to gain knowledge. What music training does is to help the brain reach its full capacity to perceive, learn, and solve problems when it is called upon in study.

But kids who are equipped by music training with increased ability in language and learning do appear to use this ability to achieve more academically. The Harmony Project in Los Angeles brought an after-school music program to children in low-income communities. While nearby schools have dropout rates of 50 percent or more, in schools with the Harmony Project music classes, 93% of their high school seniors graduate and go on to college. [8]

It saddens me deeply when I hear of music programs being cut from schools. What is a more powerful equalizing factor when it comes to income inequality than a good education and ability to think? How much does it set up children for failure when they can't discern as many words at the age of 5 as their wealthier classmates? And why would we deprive from children this basic human pleasure? I would ask us all to consider what a disservice it is to this country when we decide that music has little importance in children's development as human beings. And in contrast, what a gift would we give them if we worked to ensure that music has a respected place in education. To start with, perhaps we could sit down and talk about if there is money in our \$4,000 religious education budget for hiring a part-time RE instructor who knows how to play and teach music. Oh, and don't look at me—I can't be in two places at the same time! I'm just bringing up the suggestion.

### \*\*\* Healing

Let's talk now about music and healing. Music therapy has been shown in scientific studies to be effective at reducing depression, anxiety, and chronic pain, as well as being used to improve social functioning of people with schizophrenia. It can reduce heart rate, blood pressure, and levels of cortisol, the hormone that is harmful when released in large amounts due to stress. Also, music can heal because often it is a powerful connecting experience. And having good social

connections and social support have been shown to improve both physical and mental health.[6] Blending our voices and singing together to create a larger whole is connecting by its very nature, for example.

Perhaps because music is processed in ancient parts of the brain, and because music and language are so closely related, singing has actually been able to help people who have suffered from a traumatic brain injury to speak again. Patients who cannot talk, amazingly, retain the ability to sing. Music seems to be more deeply rooted in our brains than spoken words. Gabby Giffords, a former U.S. Representative who suffered from a gunshot injury to the brain that destroyed her ability to speak, used music therapy where patients sing and gradually learn to drop the melody. She regained her speech and two years later testified before a Congressional committee. [7]

### \*\*\* Social Change

And now we come to the role that music can play in social change. In different countries, when thinking of war, an image of a trumpet, a drum, or a bagpipe inspiring the troops to battle may come to mind. Music can inspire men and women to fight, and yes, even to give their lives for a cause.

In Ireland in the 17<sup>th</sup> century, musicians were considered so dangerous at fomenting anti-English rebellious spirit among the people that they were heavily persecuted by the English authorities. In the province of Munster, the Lord President issued a proclamation to the military “to exterminate by marshal law all manner of Bards [and] Harpers.” [1]

In 1603, Queen Elizabeth decreed, “hang the harpers wherever found, and destroy their instruments.” [1]

I’m a harp player. Honestly, this seemed a little extreme! Harpers seem so gentle. But then I realized how potentially dangerous is this seemingly gentle ability to touch the soul and inspire.

Earlier in 1596, it seems almost with a note of desperation that an English bishop of several regions of Ireland wrote:

“Some strict order must be taken for idle persons... rhymers, bards, and harpers, which run about the country, eating the labours of the poor, carrying news and intelligence to the rebels, and bruiting [spreading] false tales. Also the rhymers make songs in commendation and praise of the treasons, spoilings, preyings, and thievings made.” [1]

What power must have had these taunting songs about oppressors! Such a troublesome lot are musicians! I think this quote is wonderful in how it encapsulates so well the seemingly contradictory image we often have even today of musicians (and also poets, one might add) as idle, neer-do-well troublemakers who yet can be deadly agents who possess the power to inspire and incite large numbers of people to social movements and rebellion.

And who can forget Pete Seeger? In Pete’s view, where folk music exists, so does community, and where community exists, there also existed a force capable of creating political change. I agree with his statement that “... there’s a lot of good music in this world, and if used right it may help to save the planet.” [9][10]

\*\*\* Spirit

Finally, what about music and the spirit?

The dictionary defines “spirituality” as “Relating to or affecting the human spirit or soul as opposed to material or physical things.” [11]

From the dawn of humanity, from primitive chanting and drumming to elaborate choir and orchestral pieces for church, music has been an integral part of spirituality. Many people describe their deepest spiritual experiences as involving music. There is little scientific evidence today to explain this connection, but here are a few reasons for this: as we have seen, music has the ability to simultaneously engage multiple parts of our brain, evoke multiple sensations, memory, and thought, and transport us to a higher level of experience. Songs allow us to express

beautiful intent, meaning, and joy behind words that are important to us and combining this with music greatly magnifies and uplifts their beauty and effect. It seems worth noting that to combine words with music is, as far as we know, an ability that belongs solely in the realm of being human. I think that it's no wonder that music allows us to be more human and to connect with and express the divine spirit that exists within us.

As evidenced by its place in ancient regions of our brain, and by its integral role in human culture from the beginning of our history, music is a necessary part of what it means to be human. Experiencing and creating music benefits our health, is critical for helping developing young brains fulfill their potential, and calms and nurtures our soul. It also just makes us feel good, and unlike another source of pleasure, food, it won't cause you to gain even an ounce in weight. When we consider the role of music in terms of our congregational social justice goal of addressing income inequality, perhaps we could ask ourselves, "Is there something we can do to help ensure that the children are provided with quality music programs?" I would leave you with this thought this morning: If early music opportunities resulted in the young people of this country becoming calmer, and more perceptive and spiritual human beings, I wonder: how could this change the world?

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