Beyond Musical Hobbies

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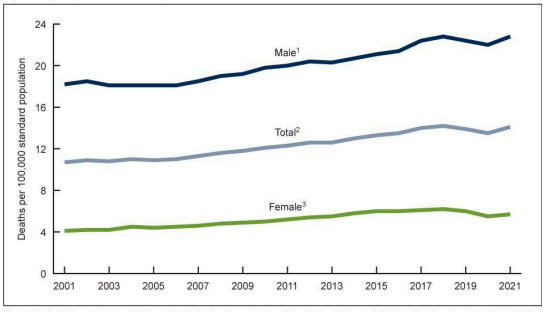
Pull Quote: “By engaging both the emotional and intellectual sides of the brain, music serves as a unique and effective connection for mental health recovery, while simultaneously promoting brain plasticity and cognitive growth.”

Music has long been recognized as a powerful tool for improving mental well-being and cognitive development. Its therapeutic benefits extend far beyond just emotional expression, offering incredible support for those with mental health conditions. Additionally, music’s rhythmic structures have been linked to enhanced cognitive functions, such as memory, attention, and problem-solving skills; specifically, slower tempos of music have been attributed to a more calming state of mind and calmer heart rate. By engaging both the emotional and intellectual sides of the brain, music serves as a unique and effective connection for mental health recovery, while simultaneously promoting brain plasticity and cognitive growth. Research has shown that music can help reduce feelings of depression, anxiety, and neurological diseases such as dementia by stimulating the release of dopamine and other neurological chemical reactions that help the body heal itself.

The relationship between music and emotional health is deeply intertwined, with research consistently demonstrating its ability to relieve symptoms of depression and anxiety. Often marked by persistent feelings of hopelessness, depression has led to a countless number of deaths with signs of exponential growth based on data collected from the Center for Disease Control and Prevention (CDC) over the last few decades. Fortunately, many researchers and

Figure 1. Age-adjusted suicide rates, by sex: United States, 2001–2021



[1]No statistically significant trend from 2001 through 2006; significant increasing trend from 2006 to 2018; no statistically significant trend from 2018 through 2021, $p < 0.05$. The rate in 2021 was significantly higher than the rate in 2020, $p < 0.05$.
[2]No statistically significant trend from 2001 through 2006; significant increasing trend from 2006 to 2018, with different rates of change over time; no statistically significant trend from 2018 through 2021, $p < 0.05$. The rate in 2021 was significantly higher than the rate in 2020, $p < 0.05$.
[3]Significant increasing trend from 2001 to 2017; significant decreasing trend from 2017 through 2021, $p < 0.05$. The rate in 2021 was significantly higher than the rate in 2020, $p < 0.05$.
NOTES: Suicide deaths are identified using *International Classification of Diseases, 10th Revision* underlying cause-of-death codes U03, X60–X84, and Y87.0. Age-adjusted death rates are calculated using the direct method and the 2000 U.S. standard population. Access data table for Figure 1 at: https://www.cdc.gov/nchs/data/databriefs/db464-tables.pdf#1.

scientists alike have begun studying the capabilities of music and its ability to reverse certain emotions and feelings caused by depression. Music has been shown to tackle these effects by engaging the brain's reward system, particularly the release of dopamine, a chemical responsible for pleasure and motivation. The book *Your Brain on Art* by Magsamen and Ross elaborates further on "how the frequency or range of tone might provide different levels of comfort for a person, and help them feel more connected ... music played at certain frequency decreases levels of cortisol, while increasing oxytocin, a hormone sometimes used therapeutically to treat depression and anxiety" (Magamen & Ross, 122). Listening to uplifting music or playing an instrument can provide a sense of joy and accomplishment, counteracting the feeling of numbness and emptiness often associated with depression. It all lies on the frequency and tonality that music is created on, which can change a person's entire mood. It helps regulate mood by providing an outlet for emotional expression and most forms of art, including music, serve as a tool through which individuals can articulate those feelings trapped inside them. To have a healthy physical body, one first has to have and maintain strong mental health to keep their motivation from diminishing.

Dementia caused by Alzheimer's disease is a debilitating condition characterized by a progressive decline in cognitive abilities, such as memory and communication skills. Music has become a powerful therapeutic tool for managing symptoms and improving the quality of life for those affected with said neurological diseases. While there isn't a cure, music can be a unique way to help manage the symptoms that has never been looked at before. Sound and frequencies have the ability to tap into parts of the brain connected to memory and emotions, areas that tend to stay active even as other parts of the brain eventually decay and succumb to neural diseases. Collaborative research done by leading doctor Gilson Tanaka Shinzato discusses new research done on the therapeutic use of music in neurological disorders, explaining how, "Transcranial Pulse Stimulation represents a groundbreaking approach in the

treatment of Alzheimer's disease. The potential cognitive benefits of TPS [...] open new avenues for research and offer hope for a condition that has long been challenging to treat." Transcranial Pulse Stimulation is a new type of therapy that has opened the gates for what could potentially change the way doctors view dementia caused by Alzheimer's disease and other recessive conditions. This experimental therapy method was run on people with Alzheimer's disease at stages that were noted as "mild" and had a bittersweet conclusion at the end of testing. Through an MRI scan and other transmitters connected to the head, they were able to capture data of the brain firing off and being stimulated. While the doctors were expecting their work to have a more significant effect that lasted for a longer period of time on the patients, the effects were still visible, and it suggested a possible start to a new view on working for a cure to these recessive neurological diseases by utilizing sound frequencies and music. Familiar music can evoke vivid memories and emotions in individuals with Alzheimer's, helping them reconnect with their sense of identity and past experiences. Using music as a form of stimulation to help patients is a breakthrough and has opened the door in medicine to find a possible cure. Susan Magsamen and Ivy Ross also highlighted how "music allows for more pathways to be aroused and stimulated"(123), delving further into the incredible effects that music has on the brain. Music therapy has demonstrated its benefits for behavioral and psychological symptoms of dementia through musical sessions, where patients listen to familiar music and have been shown to have reduced episodes of distress. The rhythmic structure of music has also been seen to aid in motor coordination, enabling some patients to improve their physical movements through dance or clapping exercises. Beyond its immediate effects, music's ability to stimulate neuroplasticity, the brain's capacity to form and reorganize connections, offers hope for slowing the decline of memory.

Learning to play a musical instrument is one of the most effective ways to strengthen the brain. The act of playing music engages multiple sections of the brain simultaneously,

from fine motor skills and auditory perception to memory and emotional processing. This activity promotes brain plasticity, enabling the brain to form new neural connections and adapt to challenges more effectively. Studies have shown that individuals who learn instruments exhibit enhanced executive functions, such as problem-solving, decision-making, and multitasking. Neuroimaging studies have shown that musicians often have more developed areas in the brain related to motor control, auditory processing, and visual-spatial skills. A collective research article published by PLOS ONE, with lead psychologist Mathilde Groussard, discussed this further and explained how "Gray matter density of the hippocampus was higher in musicians than in nonmusicians." The part of the brain that receives and distributes information resides in that area, and gray matter that is denser has been linked to a higher concentration and comprehension. Intensive musical practice was shown to sharpen abilities of memorization, emotional regulation, and discipline with signs of a different structured brain as well. These structural changes demonstrate the long-term impact of musical training on brain health and functionality. By combining intellectual challenges with creative expression, learning an instrument offers a new approach to personal growth and cognitive enhancement by allowing the learner to express themselves while engaging in a new hobby.

The massive impact of music on mental and cognitive health cannot be belittled or overlooked by the scientific community. Whether reducing the symptoms of dementia, easing depression and anxiety, or fostering brain plasticity through instrumental learning, music offers unique and transformative benefits. Its ability to engage both the emotional and intellectual part of a person makes it an invaluable resource for mental health recovery and cognitive development. As research continues to uncover the unique ways in which music interacts with the brain, its role in healthcare and education will undoubtedly expand and be seen as a staple in the world of medicine. Although humans can survive without art or music,

the will to live would lose much of its appeal. Embracing music as a lifelong practice through listening, performing, or creating should be done for a better quality of life. In a world filled with stress and uncertainty, music remains a tool for aid and relaxation.

Work Cited

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The Reflection:

The purpose of my piece was to enlighten the readers of the incredible uses that music has in the world of medicine, as well as the ability it has to improve cognitive development. I used an informative style to write my paper because I wanted to let the facts talk for themselves, since it was truly fascinating what music was capable of. I also felt slightly biassed because I hold music to a high standard and think that music can heal the world; I also felt like I couldn't justify my feelings towards music, since I lacked the evidence to back up my own experiences and found it hard to articulate them at the same time. The process of writing my piece involved a lot of outside research, and I used information found in *Your Brain on Art* (by Susan Magsamen and Ivy Ross) as a base to structure what I wanted to talk about. Since the book was an amalgamation of different arts, the information about music and its effects weren't really talked about a lot in my opinion. There were only a few key points to make a strong thesis statement but not enough to back up my claims, so I went on a researching journey to find enough information for all of my claims. One quote that did stick out was "Music played at certain frequency decreases levels of cortisol, while increasing oxytocin, a hormone sometimes used therapeutically to treat depression and anxiety," (Magamen & Ross, 122) because it helped paint a picture of the chemical reactions occurring in the brain, while also backing my claim for that paragraph. Doing research online led me to articles talking about new sound wave therapies to keep certain neurological diseases at bay and to more information about how the brain could be fortified by learning a new instrument. The most unique thing I found were videos where doctors ran experiments with patients with severe cases of dementia under an MRI scanner. During these experiments, doctors would play certain music from their childhood memories or other music attached to memories and could see the brain light up in real time. Unfortunately, this was only a temporary solution, and the patient would rapidly fall back into the state from beforehand, yet it was still

fascinating to visually understand how the brain would activate because of music attached to memory. This assignment has helped me learn a lot more about what my own body is capable of and how it can keep itself healthy with a little bit of art here and there. The book was a pleasure to read, and the sixth chapter helped me realize how I could grow as a person and achieve my goals one step at a time. Before this section of this course, I knew of the powers of music, but I've now seen just how potent music can be for a lot of different people and how it can be used in a handful of scenarios. As a writer, this paper has helped me come out of my shell, and I think this is one of my best researched pieces because of how invested I was in the prompt, allowing me to reach a flow state multiple times. This assignment also helped me test out new methods for my writing process, letting me test drive some new styles that I learned about during class.