

# Music and the brain psychology essay



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According to the essayist Thomas Carlyle, music can be known as the speech of the angels. Rhythm also can be known as music, it is a measured pattern of our time and it is also the glue that sticks our life together. Music has the ability to ease a savage beast, it is been discovered, by researchers that these charms work through the brain. Music is a widely known language and people are hard-wired to value and need music in their lives.

“ Music seems to find re-routed paths and that is why it is such a useful tool in terms of helping people with different kinds of brain damage because it can help to find new pathways in terms of brain functioning” (Wendy Magee, London’s Institute of Neuropalliative Rehabilitation)

The reward system of the brain is highly associated with music. One specific brain formation, known as the striatum, discharges a substance called Dopamine in reaction to pleasure-related stimulating elements. The processing of music in the brain is done differently, than any other stimulating elements, making it important for researchers to understand the “ effects of music on the brain.”

In this research paper, I’m going to provide information on how music affects the brain; benefits and issues of music on the brain and what sort of research is being done in the present, to prove these theories brought forward by various researchers.

## **How Music affects the Brain**

What seems obvious is that the capability to experience and respond to music is greatly included in the chemistry of the neurological system, while music tend to administer mostly in the brain’s right hemisphere, no

individual set of cells are dedicated to this task. Different systems of nerves are triggered based on whether the person is paying attention to the music or using an instrument, and whether or not the music includes lyrics. (Music on the Brain)

As for music's psychological effect, there is some sign that music can affect various hormone levels like cortisol which is discharged during excitement and stress, androgenic hormone and oxytocin, as well as induce the production of the natural opiate known as endorphins. Robert Zatorre, a neuroscientist at McGill University, Montreal, has proven that the regions of the brain engaged in handling emotions seem to perk up with motion, when someone hears music. (Music on the Brain). The right region of the auditory cortex handles messages and some aspects of beat, tune and balance. The left region of the cortex handles the rapid variations of the intensity and frequency in the music. Both regions of the brain understand rhythm. Awareness of rhythm also includes the front cortex of the brain.

In 1993, specialists at the University of Florida, Irvine, held a research to define the effects of classical music on intellectual thinking and memory. During this research, college students were made to listen to music or stay in silence, for 10 minutes. The participants who listened to music were made to a relaxation record or to the Mozart's sonata. After listening or staying in silence, the students were made to take a spatial thinking test in which the students who heard the Mozart's sonata performed better than those who heard the relaxation record or stayed in silence. This affect was knows as the Mozart Effect. (Music effects on the human brain)

According to a study of a brain scan in the May issue of Nature Neuroscience, people's brains are perfectly tuned to acknowledge "musical syntax", just like it is for verbal grammar. They also discovered that some of this musical processing continues in the Broca's region, which is generally linked with language. (How the brain understands music)

Music impacts the brain in highly effective way; it not only encourages passion, fear or comfort, but so even in inexperienced people. For example, while watch a horror film, the moment the music changes, we immediately know that the killer is about to come out from somewhere in the movie.

(Music on the mind)

Children learning an instrument confirmed changes in three areas in the brain:

The motor area, which manages the arms, revealed more action.

The corpus callosum, the link between the brain's two hemispheres, was bigger.

The right primary auditory area, where tunes are heard and deciphered, was decreased.

Kids who were musically trained did better on a motor sequencing test and they were able to figure out simple variations in two identical tunes and tempos, when they were given the task of moving their hands over a keyboard in a particular pattern. This research did not find any performing differences in selected educational areas between the two categories of

musically trained children and musically unskilled children. (Music training causes changes in the brain)

According to Wendy Magee, when sensory routes are damaged of one specific function like language, musical sensory routes are more complicated and extensive within the brain; music is able to discover re-routed paths which make it such a beneficial tool with regards to assisting people with different kinds of brain conditions because it can help discover new routes with regards to proper brain functioning. (Music a 'mega-vitamin' for the brain)

## **Current Research on Music and the Brain**

Tests done years ago revealed that stimulating certain places of the temporal lobe on each side of the brain brought up "musical memories." (music on the brain). The brain is like a sponge for music. The left and right hemispheres of the brain are linked by a large line known as the corpus callosum. When compared, the corpus callosum of 30 non-musicians and the corpus callosum of 30 qualified string and grand piano players, a team of investigators led by Dr. Gottfried Schlaug of Beth Israel Deaconess Medical Center, Boston. The thick cable of neurons was larger in the front part of the corpus callosum links the two sides of the prefrontal cortex, the area of planning and intellectual thinking. It also links the two parts of the premotor cortex, where any action is planned out before they're put into action. "These connections are critical for coordinating fast, bi-manual movements, such as those of a pianist's hands execute in an allegro movement," says Schlaug. The sensory nerve connected to the right side of the brain is emotions and left side is connected to cognition. Perhaps this is why the

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biggest performers are not only experts of strategy but is also skilled at performing with emotion. (Music on the mind)

When a part of a song is played, people experiences peak pleasure and a portion of the brain known as the ventral striatum discharged dopamine; however, this substance is discharged from a different region of the brain known as the dorsal striatum, about 10-15 seconds before they reach the moment of peak pleasure. (music: it's in your head, changing you brain)

For instrumentalists, music can surprisingly induce physical variations in the brain's wiring. By calculating indistinct magnetic fields produced by the brains of qualified performers, a team led by Christo Pantev of the University of Muenster's Institution of Experimental Audiology, Germany, has proven that extensive exercise of a music instrument, results in a visible enlargement in the areas of the cerebral cortex which is mostly related with the higher brain functions. As opposed to many other activities, there is no specific core of the mind responsible for recognizing and decoding that the right hemisphere manages music, William. J. Cromie of the Harvard Gazette describes that the studies of individuals who have damaged to either hemisphere, perceive music differently. This proves that both hemispheres of brain are needed when listening to music. Researchers of the University of Washington reports that other researchers have tried to study the Mozart Effect, but failed because it did not show similar results with the researchers at the University of California. (music effect on the human brain)

At the Max Planck Institution of Intellectual Neuroscience in Leipzig, Germany, Physicist Burkhard Maess and his co-workers examined the

reactions of six right-handed people who are unskilled in music, using MEG, a technique that uses very sensitive magnetic field detectors to collect electrical motion happening in the brain. They calculated these reactions to three sets of five music notes concocted by a group member, who is also a musician, Stefan Koelsch. Each series created a different MEG pattern, with the biggest distinction seen between the in-key series and the one finishing with the Neapolitan note. The in-key were mainly collected in the main auditory cortex, situated in the temporal lobes, however, the incongruous set lightens up regions above and at the front side of the temporal lobes, the speech region known as Broca's which is situated on the left and its corresponding area on the right. The information recommends that, the auditory cortex receives noises, just like with speech and it is Broca's region. Its right hemisphere handles the most difficult job creating a sense of them. Koelsch also adds that they discovered that musical syntax is not only processed in the same region as speech but also with the same time-course of neural motion. Since the effects happened in participants who were unskilled in music, the research confirms current proof that the brain has an "implicit" capability to implement harmonic concepts to music, the writers create. Overall, the effects of the music were more noticeable in the right hemisphere than in the left, where most of the speech functions are handled. Maess says, "Currently, we cannot prove that the process underlying language and music processing are the same. However, there is still more overlap than we thought." (how the brain understands music)

Researchers in Massachusetts, has proven that children who are musically trained, show noteworthy variations in brain activity that children who didn't

learn any sort of music. Ellen Winner, one of the researches, a lecturer in Psychology at the Boston College, found that there variations did not have any connection with enhanced performance in arithmetic, spatial skills or phonological ability. (music training causes changes in the brain)

Brain areas which are involved with spatial thinking are stimulated when listening to music. Studies have shown that, once the music is stopped, this effect does not last for more than 15 minutes. However, the participants revealed a noticeable increase in spatial thinking while listening to music. (how music affects the brain: the power of music)

Practicing music frequently and effectively boost self-optimization of certain brain activities, as two studies confirmed. In the first research, investigators requested 12 musically unskilled people to complete ten 35 minute exercise classes on a digital piano for a two week period. The results showed that all the participants obtained an extraordinary increase in their motor abilities through training; yet, the most amazing result was the coordination in which both arms were able to execute.

The second analysis was led by Professor Massimo Filippo at the Neuroimaging Research Unit at Milan's San Raffaele Hospital and got 45 musically unskilled participants who were divided into 3 categories. An assignment of using the right hand for playing a specific series of notes on a computer based console, were given to all the participants. This had to be done while following the beat of a metronome for half an hour per workout period (ten sessions during two-weeks). The results showed improvements in all three categories, even though there was no effect noticed on the “ white



matter” structure of the brain, the team did notice significant variations in grey matter in brain areas, which are vital for managing actions. (How music benefits the brain)

Music Therapy has provided social, mental, and physical benefits for people: there is a growing body of scientific proof indicating that music plays a major role in helping people recover or to deal with brain disorders.

## **How Music Benefits the Brain**

According to a music educator from Floyd Central High School in Floyd Knob, Indiana, Angela Hampton, music has several benefits on the brain: it improves the number of sensory connection in the mind, motivates the brain and improves learning capacity, and music improves the efficiency of the brain and toughens the brain cells. (music effects on the human brain)

Physician Wendy Madee, International Fellow in Music Therapy at London’s Institute of Neuropalliative Rehabilitation, says that music is a “ mega-vitamin for the brain,” which has the ability to have an impact and improve motor function, interaction and even intellectual thinking. Listening to music every day, for several hours can improve the rate of recovery of stroke patients, as demonstrated by a group of researches in Finland. In another research, stroke patients who were trained to play the grand piano or the drums led to a faster recovery in comparison with patients who received old-fashioned therapy. Melodic Intonation Therapy, in which music workouts are used to improve pronunciation, has proven just right for sufferers with aphasia, a condition caused by damage to areas of the brain which handles language. Psychologists have utilized the power of music to improve moods

and emotions, however, as the founder of a newly recognized course in Music, Music and Brain at the Goldsmiths University of London, Dr. Lauren Stewart, informed, that recent developments in neuroscience and brain scanning are now drastically changing traditional music therapy into a more extensive and research-based practice. (music a 'mega-vitamin' for the brain)

Another interesting fact of research is that music which has a beat seems to benefit individuals with motor abnormalities such as Parkinson's disease, had a speedier recovery in the presence of music; patients coordinated their actions to the beat. Aniruddh Patel at the Neuroscience Institute in San Diego, California, said "That's a very powerful circuit in the brain," he also said, "It can actually help people that have these serious neurological diseases." There's some proof suggesting that music can benefit Alzheimer's sufferers have better memory, and that learning different skills like a musical instrument can possibly even prevent dementia. (Music: it's in your head, changing your brain)

Music motivated various regions of the brain, making it an effective healing or mood-altering tool.

Some more instances where music can benefit the brain are given below,

De-stressing and healing:

The right relaxing music reduces pressure like decreasing the level of the cortisol hormone.

Enhanced exercise:

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Fast moving music acts as a point of concentration, taking your mind off your pain and burning muscles; it encourages you to keep moving, to push yourself further.

Immune Booster:

Dance music causes the brain to discharge endorphins and healing hormones due to the hypnotic beat of the music; this boosts your immune system.

Memory Recall:

A significant improvement in having a better memory.

Anti-anxiety:

Music is very good at helping you to soothe yourself. It distracts you from the stress and gets you pumped up.

Anti-fatigue, anti-boredom:

Music helps to keep you empowered and productive.

Heightened spiritual experience:

It increases the sensation of oneness with greater energy, and many religious methods implement a changed state of awareness.

Improved moods:

Research has revealed that music generally enhances the frame of mind.

## **Harmful effects of Music on the Brain**

Paying attention to music, affects performance in bad ways. Robert. J.

Hjortsberg of Loyola University found that people who did not pay any attention to the songs did considerably better on the memory test than the people who heard classical music or moderate rock; after analyzing the effects of music on 69 people. (music effects on the human brain)

There are three types of impairment that occurs in our system when exposed to loud volume:

Loud volume reduces our ability to remember and perform other brain functions by restricting the circulation of blood to the brain.

It can cause schizophrenia. When someone is subjected to high levels of audio, a chemical substance is created in the brain which is normally found in schizophrenia patients in psychological institutions.

It can cause Abscesses. When susceptible people are subjected to listen to loud music over a time period, certain abdomen functions are disturbed and an escalation of hydrochloric acid is produced, resulting in ulceration of the abdomen.

## **Conclusion**

Songs that get trapped in your head can be frustrating, but it also provides lots of other requirements that are an advantage for you. If you accept it as a language, as Victor Wooten of Béla Fleck and the Fleckstones indicates, you might understand new abilities and obtain some of the advantages neurologists are discovering on brain health. From the information provided

above, it has been proven that music affects the human brain through a dozen researches held regarding this topic.