

POWERFUL EFFECT OF MUSIC ON HUMAN BRAIN

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Abstract

The influence of music on people is not only emotional and sentimental; it has a positive effect on brain development and cognitive development also. Different states of the brain understand music in many different ways, stimulating specific areas of the brain, causing corresponding physiological effects. This paper will discuss, in short, how music influences our brain, as well as some behavioural and physiological effects as a result. It has been found that music helps to facilitate all of these cognitive processes, regardless of its emotional balance or whether the music is active or passive, such as singing or listening to it, respectively. It was discovered that music influences our ability to learn novel concepts related to mathematics, reading, and even language acquisition. These findings implicate that music has rehabilitative ability and therapeutic benefits, supporting the notion that music therapy can be an effective form of therapy for cognitive, behavioural, and psychological disturbances.

Keywords: Music, music therapy, brain, cognition, behaviour, emotion, dementia, neuroscience

INTRODUCTION

“Music and the Brain” explores how music impacts brain functions and human behaviour, including by reducing stress, pain and symptoms of depression as well as improving cognitive and motor skills,spatialtemporal learning and neurogenesis, which is the brain’s ability to produce neurons. It has also seen and experimented that how people with neurodegenerative diseases such as Alzheimer’s and Parkinson’s also respond positively to different music.

“Usually in the late stages, Alzheimer’s patients are unresponsive, “but once you put in the headphones that play their favourite music, their eyes light up. They start moving and sometimes singing too. The effect lasts maybe 10 minutes or so even after you turn off the music.”This can be seen on an MRI, where “lots of different parts of the brain lights up differently.

AN EFFECT OF MUSIC ON DIFFERENT PARTS OF BRAIN :

To being a human, it is the most important to have a frontal lobe in the brain. We have a big frontal lobe compared to other animals and by listening to specific music, we can enhance its functions (brain) properly.

The temporal lobe of the brain (the part of the brain) uses the language center to appreciate music, which spans both sides of the human brain, though the language and words are interpreted in the left hemisphere of the brain while music and sounds are interpreted in the right hemisphere of brain.

Broca’s area of the brain uses to express music. “Playing an instrument may improve your ability to communicate better.”

Wernicke's area, to analyse and enjoy music we use this particular part of our brain.

Occipital lobe, "Professional musicians use the occipital cortex, which is the visual cortex, when they listen to music, while laypersons, like me, use the temporal lobe — the auditory and language centre. This suggests that musicians might visualize a music score when they are listening to music.

Cerebellum, "An Alzheimer's patient, who doesn't remember his children can play flute, if he learned at his young age because playing has become a muscle memory to him. Those memories which are stored in the cerebellum never fade out.

Nucleus accumbens, "Music can be a drug —because it acts like a drug, an illegal drug which controls the parts of human being. "Music increases dopamine in the nucleus accumbens, which is very similar to cocaine."

Amygdala, a part of the brain performs as "Music is the one which control your fear, and makes you ready to fight against and can give some increase in pleasure. "Whenever you feel shivers go down towards your spine, the amygdala is activated."

Hippocampus the part of human brain, produces and retrieves human memories, and it also regulates the emotional responses and helps human to navigate. If we are considering the central processing unit of the brain, it will be the first regions of the brain that will be affected by Alzheimer's disease, which will lead to the confusion and memory loss.

"Music may increase neurogenesis in the hippocampus, allowing production of new neurons and improving memory'.

Hypothalamus of the brain part, maintains the body's status quo, links the endocrine and nervous systems, and produces and releases essential hormones and chemicals that regulate thirst, appetite, sleep, mood, heart rate, body temperature, metabolism, growth and sex drive. As for effect of music, if you play Mozart, the heart rate and body pressure reduces.

Corpus callosum, the part of the human brain which connects the left and right hemispheres to communicate, to each other. Left part provides the logic and right side provide the intuition for the coordinated body to have their thought movement. As, a musician a person you want the both right side and left side to have the coordination of the brain. For example, this allows a pianist, to translate their notes on a sheet to the keys their fingers hit to produce music.

Putamen, this part of the brain, processes rhythm and regulates body movement and coordination to human being. "Music is the source that can increase dopamine in this area, and hence music increases our response to rhythm". "By performing this, music temporarily stops the symptoms of Parkinson's disease.

A form of rhythmic music helps in movement of Parkinson's patients, because they actually need an assistant to help them in movement, but by listening to this source of music helps them in body movement in any way.

Source of music is like a boon to their body movement.

Since 2006, two UCF professors — neuroscientist Kiminobu Sugaya and world-renowned violinist Ayako Yonetani — have been teaching one of the most popular courses in The Burnett Honors College. “Music and the Brain” explores how music impacts brain function and human behaviour, including by reducing stress, pain and symptoms of depression as well as improving cognitive and motor skills, spatial-temporal learning and neurogenesis, which is the brain's ability to produce neurons.

Turns out, whether it's rock 'n' roll, jazz, hip-hop or classical, your gray matter prefers the same music you do. “It depends on your personal background,”. For a while, researchers believed that classical music increased brain activity and made its listeners smarter, a phenomenon called the Mozart effect. In recent studies, they've found that people with dementia respond better to the music that they grew up listening to. “If you play someone's favourite music, different parts of the brain light up,” “that means memories associated with music are emotional memories, which never fade out — even in Alzheimer's patients.”

We are all born and gifted with more neurons than we actually need. Technically by the age of 8 human brain dump a neuron in a huge amount, just because this teaching any subject to this year child becomes easy in a way because he adapts the things so easily and effectively. So, by this if you teach music to this year child, they become designed for it for their whole of life.

Research has also been conducted on neurological studies on songbirds. The research has found that “canaries stop singing every autumn when the brain cells responsible for song generation die.” However, it has proven too that the neurons grow back over the winter months, and the bringing back birds learn their songs over again at the time of the spring. Researchers take this that music increases neuron genes via some passing time.

Neurologist Oliver Sacks said, “Music evokes emotion, and emotion can bring with it memory. ... It brings back the feeling of life when nothing else can.”

In 2014, a study was conducted over 89 patients who were suffering from the disease dementia, where the patients and their caretakers were assigned a random task of 10 week music listening or a 10 week singing, or a regular care for their disease. The results showed that they were getting better with the listening or singing music compared to the usual care provided to them.

MUSICAL EFFECT TO AN INDIVIDUAL

- Music Changes Your Ability To Perceive Time
- Music Reduces An Individual's Primal Fear
- Music Reduces Seizures Of An Individual
- Music Makes You A Better Communicator
- Music Makes You Stronger
- Music Enhances And Boosts Your Immune System
- Music Assists In Repairing Brain Damage
- Music Makes You Smarter In A Way
- Music Evoke Memories And Emotions Of An Individual

Music has been scientifically proven that it has a powerful effect on the brain. In recent research followed by many universities shows that music can actually help in many aspects of the brain, including pain reduction, stress relief, memory, and brain injuries to an individual. In the book *The Power of Music*, Elena Mannes says, "Scientists have found that music stimulates more parts of the brain than any other human function."

Here are some of the ways that shows music can aid in the healing and stimulation of the human brain.

PAIN REDUCTION

"I think music in itself is healing. It's an explosive expression of humanity. It's something we are all touched by. No matter what culture we're from, everyone loves music." —Billy Joel.

A study was done in 2014 regarding music and it showed that music was helpful for patients with "fibromyalgia". The study showed that the patients who were listening to a relaxing music of their choice has the result in their "reduced pain and increased functional mobility significantly." Researchers believe that music is the one who eases pain because listening to it triggers opioids—the body's natural pain reliever. In a 2013 study, people given the opioid blocking drug Naltrexone experienced less pleasure while listening to their favourite song, it suggested that music activates the release of pain-relieving opioids.

STRESS RELIEF

Depending on the type of music you listen to, relaxing music can alleviate stress by lowering cortisol levels, which is the hormone released in response to stress.

A 2013 study demonstrates a link between music and decreased stress in pediatric emergency room patients. "They did the trial with 42 children that were ageing to 3 to 12, University of Alberta researchers found that patients who listened to relaxing music while getting an IV

inserted reported significantly had a less pain, and some demonstrated significantly had the less distress, compared with patients who were not listen to any music,” according to the American Psychological Association.

MEMORY

Studies which links music to memory recall have totally increased since the early 20th century. If you are listening to certain music that can automatically take your mind back to decades in an instant manner. Neurologist Oliver Sacks said, “Music evokes emotion, and emotion can bring with it memory. ... It actually brings back the feeling of life in emotion when nothing else can.”

SEIZURE, BRAIN INJURY, OR STROKE

It has been reported in the graphs that the patients who have epilepsy respond differently to amusic exposures than the people who do not have epilepsy. “Persons who have epilepsy synchronize before a seizure. However, in a recent study, it has been found that the patients with epilepsy synchronized to the music without having any seizure,”. “By listening to the music in any forms, many patients did report that they felt relaxed and calm.”

According to a study of 2008, stroke patients who listened to music in the early stages of their stroke showed an improvement in recovery. Author of the study, have explained that patients start listening to music soon after the stroke, as many changes occur during the first week of stroke and the months of recovery. “We found that three months after the stroke, verbal memory improved of the stroke patient from the first week post-stroke by 60 percent in music listeners.”

A music-based treatment called Melodic Intonation Therapy was developed in 1973 to help stroke survivors or people who suffer with aphasia to make them to be able to communicate again. The purpose of the therapy is to convert singing into speech. According to the theory of Research and Hope, these patients weren’t able to speak, “they are often able to sing, sometimes with the same fluency and clarity they had before the onset of illness.”

CONCLUSION

- It has been found in the music listeners, that they had higher scores for mental well-being and they also had a slightly reduced levels of anxiety and depression compared to the other people overall.
- The survey respondsto, who currently go to musical performances, 69% rated their brain health as to the grade of “excellent” or “very good,” compared to the other 58% for those who went in the past concerts and 52% for those who never attended.
- Of those who reported often being exposed to music as a child, 68% rated their ability, to learn new things as “excellent” or “very good,” compared to other 50% of those who were not exposed to music at all.

- 58% of the people were happy and energetic who was taking a part in musical concerts compared to who were not.
- Adults were mentally and physically happy who were taking a part in music exposures compared to the others who were not.

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