

## Eng 121 Student - Music

Thesis: Certain styles of music have a positive effect in the brain that concern anger, self-expression, dementia, seizures, and overall brain performance.

- I. Heavy Metal is able to calm anger in individuals.
  - A. Research suggests that listeners who participated in a study where anger was induced, became more calm after listening to Metal.
    1. Listening to Metal resulted in regulated sadness and enhanced positive emotions.
      - a. Levels of hostility, irritability, and stress all decreased.
  - B. Fans of Extreme music seek out the type of music to match anger they are already feeling.
    1. Listeners often choose the type of music based on how they are feeling in that particular moment.
  - C. Levels of inspiration went up after listening.
    1. Inspiration produces a feeling of self-worth.
      - a. Depression is often linked to low self-esteem.
- II. Particularly when played by musicians, Jazz music is capable of producing self-expression while curbing inhibition.
  - A. A study concluded that jazz musicians often improvise without constraint.
    1. While improvising the musician's dorsolateral prefrontal cortex, the area of the brain linked to self-censoring, showed less activity.
      - a. Less activity in this region of the brain leads to less self-restriction.
  - B. Researchers saw increased activity in the musician's medial prefrontal cortex, the area responsible for self-expressions.
    1. This area of the brain shows increased activity when telling a story about yourself.
- III. The "Mozart Effect" shows that listening to Classical Music is beneficial to brain performance.
  - A. A study shows that teenagers who listened to Mozart as infants performed better on reasoning tests.
    1. College students who listened to Mozart before taking a test had better spatial relationship skills.
      - a. Adults who listen to Mozart were able to solve a jigsaw puzzle quicker.
  - B. Research suggests that the increased performance by the brain is due to Classical Music's more complex structure.
    1. Babies as young as 3 months are able to decipher these sections.
      - a. Infants can remember sections of music they have heard before.
  - C. Classical Music has been shown reduce seizures.
    1. A study shows that listening to classical music reduced epileptic activity in the brain.
- IV. Studies have shown that people suffering from Alzheimer's, or dementia, recall memories and emotion thanks to musical therapy involving Classical and Jazz music.
  - A. Music has been shown to evoke emotions in individuals.
    1. Once an emotion is evoked, memories of when that emotion was felt may arise.
      - a. Studies revealed patients recalling memories that were sad or happy.
  - B. Musical appreciation and aptitude are two of the last remaining abilities that dementia patients hold on to.

1. Once patients combine music with daily activity they can develop a rhythm which will lead to improved cognitive function.
  - a. Recalling past memories is one of the best way to combat dementia.
- C. Certain patients with even the most advanced stages of Alzheimer's are able to reached by music.
  1. There have been instances where patients with advanced stages of Alzheimer's remember lyrics or the rhythm to a song.
    - a. Rhythm incorporates physical movement which helps memory.
- V. Music therapy, particularly involving Jazz and Classical, has shown promise in treating epilepsy.
  - A. The research has shown that patients' brain waves in the temporal lobe, where most seizures begin, match up to the melodies of Jazz and Classical music.
    1. Eighty percent of people with epilepsy have temporal lobe seizures.
      - a. The auditory cortex is located in the temporal lobe.
    2. Music with a high degree of long-term periodicity resonates with the brain to decrease seizure activity.
      - a. Jazz and Classical both have long-term cycles.
  - B. Music is very efficient in relieving stress, one of the main triggers for a seizure.
    1. Stress releases certain hormones related to the nervous system that can impact the brain.
      - a. Any unnecessary impact on the brain makes it harder to combat seizures.

Music has been referred to as a universal language for the world. No matter where in the world one is, people can come together and appreciate a piece of music. This is because melody and rhythm have no language barrier. That is why we see musical acts sell out shows across the globe, not just within their home countries. People have favorite types of music for many reasons, but particularly as Sacks says "We turn to music, we need it, because of its ability to move us, to induce feelings and moods, states of mind. "(Sacks, "The Power of Music") But how often do people examine what actually happens to the brain once music is heard? There are fascinating things that can occur within the brain when one puts on a piece of music. Certain types of music have a positive effect in the brain that concern anger, self-expression, dementia, seizures, and overall brain performance. When one is working out at the gym, a particular song may induce an extra bolt of energy. If one is angry, a certain piece of music can bring about a sense of calm. Playing a particular type of music can produce a feeling of self-expression and thus lower inhibition. People suffering from dementia may recall a memory based on a emotion that is elicited from a piece of music they once heard. Certain patients suffering from epilepsy may find relief from musical therapy. These are all interesting occurrences. But why do they happen? As Levitin poses "Did particular regions and pathways evolve in our brains specifically for making and listening to music?" (Levitin, 8).

First it is important to understand why and how the brain reacts to music. There are several areas of the brain affected by music, but the most important would be the auditory cortex which is responsible for the perception and analysis of tones. This part of the brain is located right above the ears. Once music is played, the sound travels to the ear which contains spiral sheets which the sound plucks. The sound is then converted to electrical signals. (Strike a Chord for Health). This results in the release of brain cells in the auditory cortex.. Cromie illustrates that "Different patterns of firing excite other ensembles of cells, and these associate the sound of

music with feelings, thoughts, and past experiences.” (Cromie). This is essentially what creates the conscious music listening experience. There is more to it than that still. Scientists like to refer to music as “Organized Sound”. They do this to distinguish music from other sounds such as a train passing by or noisy construction. Music is referred to as organized sound by scientists because it is more significant to our brains than just any other sound. It’s melodious, repetitive, and organized thus making it more memorable for the brain to recognize. This is why one might see someone tapping their foot or snapping their fingers to music as opposed to other sounds they might hear throughout the day. There are several types of music that have a positive impact on the brain.

Heavy Metal music is able to calm anger in individuals. This type of music is characterized by loud and powerful sounds often with lyrical content regarding social isolation and depression. According to a study conducted by the University of Queensland, thirty nine extreme music listeners aged eighteen to thirty four years old were subjected to an anger induction followed by a random assignment to ten minutes of listening to extreme music. Results showed that hostility, irritability, and stress went up after the anger induction and decreased after listening to the Heavy Metal music. As Sharman and Dingle put it “The findings indicate that extreme music appeared to match their physiological arousal and result in an increase in positive emotions.” (Sharman,Dingle,). This study was measured by examining the heartbeat and respiration as well as asking the participants to describe how they felt afterwards. Furthermore, listeners experienced a heightened level of inspiration which contributes in battling depression. Feeling angry is often linked to feeling depressed. So the next time one is feeling enraged or annoyed, maybe some Heavy Metal will do the trick.

Particularly when played by musicians, Jazz music is capable of producing self-expression while curbing inhibition. According to an article published by the John Hopkins University of Medicine, “When jazz musicians improvise, their brains turn off areas linked to self-censoring and inhibition, and turn on those that let self-expression flow.”(This is Your Brain on Jazz: Researchers Use MRI to Study Spontaneity, Creativity). To improvise on an instrument means to make up notes that fit within a musical arrangement on the spot. In order to accomplish this certain Jazz musicians turn off their reticence thus allowing for their creative sides to shine more organically. Scientists conducted a study by placing Jazz pianists into a MRI machine and scanned their brains while they improvised over a piece of music. The MRI machine scans the brain and highlights areas that are responding to stimuli when one is performing a mental task, such as playing an instrument. The pianists first performed a memorized piece of music so that the scientists would be able to distinguish this brain activity from the activity while improvising later on. According the the article, “The scientists found that a region of the brain known as the dorsolateral prefrontal cortex,showed a slowdown in activity during improvisation..”(This is Your Brain on Jazz: Researchers Use MRI to Study Spontaneity, Creativity). The dorsolateral prefrontal cortex is an area of the brain that is linked to pre-conceived actions and self-censoring. For example, if one feels what their about to say is inappropriate, the decision to not say it originates from the dorsolateral prefrontal cortex. Shutting down this area of the brain is naturally linked to lower inhibition. Furthermore, the area of the brain known as medial prefrontal cortex showed increased activity. This area of the brain is often linked to activities that convey individuality, such as telling someone a story about themselves. This sort of brain activity is not limited to playing a musical instrument. People often improvise when talking in a conversation. For example, actors without a script on a film shoot will often make up their lines. The same brain activity is present in actions such as that as well.

The “Mozart Effect” shows that listening to Classical Music is beneficial to brain performance. It is important to note that these studies concluded that adults who listened to Mozart experienced only temporary improvement in brain performance while those who started during infancy showed more permanent results. Several researchers have stated that listening to Mozart for at least ten minutes will improve spatial reasoning performance. Spatial reasoning is regarded as one of the most basic reasoning abilities along with numerical reasoning and logical reasoning. This is why mothers will often play classical music while pregnant. The “Mozart Effect” became a phenomenon when a 1993 study concluded that teenagers who listened to Mozart as adolescents performed better on reasoning tests than those who didn’t listen to anything. The “Mozart Effect” was such a popular idea that in 1998 a governor from Georgia asked for money to be set aside in the state budget so that newborns could receive a CD of classical music. This is built upon further if children study an instrument and play classical music. As Jenkins asserts “The enhancement of spatial-temporal reasoning in children after piano training has resulted in significantly greater scores in higher mathematics” (Jenkins). Studies have also shown that classical music is responsible for the enhanced activity of genes involved in dopamine secretion. Dopamine is often referred to as the feel good hormone. This would result in an overall better mood. It’s worth a shot to listen to some classical music while studying for an exam.

Studies have shown that people suffering from Alzheimer's, or dementia, recall memories and emotions thanks to musical therapy involving Classical and Jazz music. This is attributed to the fact that music evokes emotion, and with emotion memory. A piece of music may evoke sadness in one patient thus prompting a memory filled with sadness. This is very helpful for people having a difficult time remembering even the most basic things. As Sacks states in his book “Music of the right kind can serve to orient and anchor a patient when almost nothing else can” (Sacks, 337). Musical appreciation and aptitude are two of the last remaining abilities that dementia patients hold on to. Moreover, once patients combine music with daily activity they can develop a rhythm which will lead to improved cognitive function. Music can reach patients even with the most advanced stages of dementia. There have been patients that have an extreme case of Alzheimer's but still retain the ability to sing a song or play an instrument. Sacks reinforces this by stating “It is astonishing to see mute, isolated, confused individuals warm to music, recognize it as familiar, and start to sing.” (Sacks 344).

Music therapy, particularly in the style of Jazz and Classical, has shown promise in treating epilepsy. Researchers have concluded that people with epilepsy process music in a different way than regular people. The research has shown that patients’ brain waves in the temporal lobe, where most seizures begin, match up to the melodies of Jazz and Classical music. Jenkins explains “It is suggested that music with a high degree of long-term periodicity would resonate within the brain to decrease seizure activity.”(Jenkins) The way that scientists conducted this study was by recording brain waves of people with and without epilepsy with technology that detects electrical activity within the brain. The results for people without epilepsy showed that their brain waves didn’t match up to the music as opposed those with epilepsy. Another way music is beneficial in preventing seizures is curbing stress. One of the causes of why seizures occur is stress. This happens because stress may lead to lack of sleep and harmful hormones being released within the brain. Listening to music helps people to relax and thus helping in preventing a seizure.

It is clear that through various research and studies that music is more than just a source of entertainment. If one has ever had a family member suffer from dementia or epilepsy, perhaps

music was able to alleviate those disorders. It's possible that if one was learning an instrument at a young age, the benefits could have a lasting effect on intelligence. How about those days where something has one feeling angry? Some Heavy Metal might help in reducing that anger and instead promote some positive emotion. Let's not forget that those who are shy may benefit from improvising some Jazz. These certain types of music are definitely more than just background noise or something on the radio. It's not far fetched to say that music changes lives.

### Work Cited

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