Name(s)
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Project Number
S0412

Project Title
The Effect of Music on the Brain Using Machine Learning

Abstract

Objectives/Goals
Determine the effect of all genres of music on the frontal and temporal lobes.

Methods/Materials
Headphones. Laptop computer with an iOS simulator. Students took the test on the iOS simulator. I wrote the app, and the machine learning algorithm used, was Tensorflow, provided by Google.

Results
The results showed that only the genres of Blues, with an average score of 21.75 greater than the No Music average score of 20.25. Other than country, the other genres scored at least 3 points worse on average than without music. In the last two tests, an uptick in magnitude and tempo saw a decline in scores, while a decrease in magnitude and tempo had an average score that was .65 below the no music score. For the frontal lobe, Blues and Country enhanced brain competency. The other genres hindered the productivity. For the last two tests, a decrease in magnitude was close to no music averages and the increase in magnitude produced a decline. The temporal lobe saw Country and Blues show enhancement in brain competency, by a margin of .875 and 1.25 points respectively. The other genres showed detrimental impact, and a decrease in magnitude was detrimental to the temporal lobe. An increase in magnitude showed results equal to those without music. When the temporal lobe worked together with the frontal lobe, no music helped productivity. Pop, Blues, and Country had results similar to no music, while the remaining genres caused a negative impact. Changes in magnitude and tempo also resulted in a worse result than no music.

Conclusions/Discussion
The frontal lobe benefits highly from Country, Blues, and Jazz music. All of these types of music share the same melodic power with a slow rhythm and a low magnitude. With the frontal lobe, this allows an increase in dopamine, which increases focus, and does not take away from the power of certain synaptic connections. The temporal lobe benefits from Blues, Country and Jazz music. Similar to the frontal lobe, these types of music allow a faster synaptic connection. The music does not take away neurons that are focused on the task, while the rhythm and melodic power helps tone out other distractions. When the frontal and temporal lobe are working together, no music causes benefit as there are so many synaptic connections going on in the brain, that taking away some of these synaptic connections may result in a lack of concentration or a silly mistake.

Summary Statement
I realized that high schoolers' brain productivity is enhanced by music genres similar to Country and Blues, and are hindered by genres similar to Hip-Hop and EDM.

Help Received
None. I designed, implemented, and conducted all the testing for the software in the app I created.