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Using Classical Music to Increase Productivity in Elementary School Students with Attention Deficit Hyperactivity Disorder

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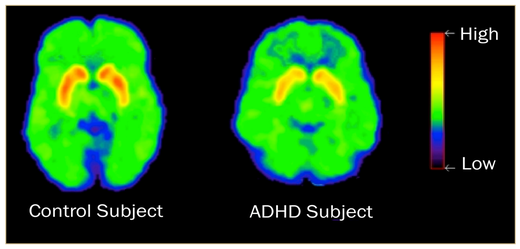
Introduction

Currently, physicians use prescription medications to treat attention deficit hyperactivity disorder (ADHD) in children known to have low levels of the neurotransmitter dopamine.



(Brookhaven National Laboratory, 2006)

However, most treatment plans and prescribed medications often do not go to completion because of low adherence or side effects. Listening to classical music that contains mostly consonant chords may help as partial treatment for children with ADHD. This type of music may stimulate the dopamine reward system in the brain, allowing for a small amount of dopamine to be released. When combined with smaller doses of prescribed ADHD medication, this may be able to produce healthy dopamine levels in children with ADHD. Because all children exhibit some increase in dopamine while listening to consonance-dominated classical music, educators can introduce this music into the classroom to improve overall academic performance and help treat ADHD children simultaneously. This will not only provide a more cost-effective treatment, but will also create a new treatment plan, one in which may benefit other healthy children as well.

Materials and Methods

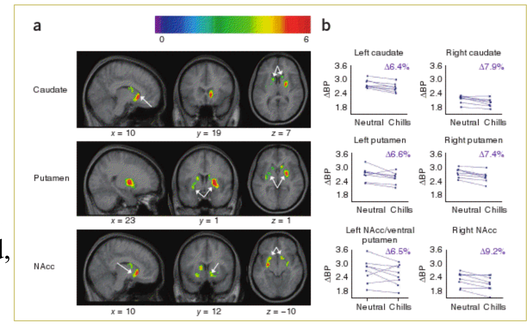
Several studies in the past decade involving children with ADHD and listening to various types of music were analyzed. In addition, soundtracks relating to the types of music used in the studies were listened to and sorted by dominance in consonance sounds. These studies were compiled together to produce a hypothesis of the best ADHD treatment for children under the criteria that it involved listening to music, was cost-effective, and was compatible in the elementary classroom environment.

Results

Auditory stimuli such as music has been shown to elicit activity in all the major areas of the brain. The studies analyzed show that music is a natural reward that stimulates the dopamine "reward system," which is linked to improve cognitive functions such as attention and work production. Children with ADHD require more stimuli to focus, and background music may provide a practical stimulus for the production and release of dopamine.

The structure of music dominated in consonance chords and intervals was the most effective in fostering focus. The brain associates consonant sounds with unity and stability so the listener will often hear that pieces based on consonant chord progressions are simple and lacking in intensity. On the other hand, the brain associates dissonant sounds with unevenness and instability. The brain thereby expects a change in sound progression to a more stable sound. These expectations in variations of dissonant sounds result in greater brain activity focusing on the music.

Instrumental music also does not contain lyrics, so the listener is not distracted by literary meanings. It is more abstract, thereby working well as background music, creating a calm mood, and helping maintain focus.



(Hammond, 2012)

In comparing several studies, data showed that, overall, while healthy children also improved, hyperactive children benefited most from music listening.

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Conclusions

Listening to classical music can result in natural dopamine stimulation, thereby reducing the dose for ADHD medication. Listening to classical music dominant in consonance sounds can also help improve healthy children, although children with ADHD have been shown to have the greatest improvements. This treatment is a cost-effective method that—with extant classroom technology—can be implemented into the elementary school classroom (where ADHD prove most problematic) to increase overall focus and work production, proving a worthwhile investment to benefit all students. Physicians should turn to incorporating music in ADHD treatments rather than solely prescribing medications in order to expand the possibilities of discovering more efficient treatment plans. Though consonance dominated classical music is known to increase dopamine, further research should be conducted in order to better define appropriate ADHD treatment plans in the classroom.

Treatment Guidelines and Music Appendix

Instructors could rotate music playlists weekly to avoid memorization and monotony. Music could be played in quiet environments when focus is key—not during playtimes or group work. Specific genres of classical music and composers have shown increased engagement and focus. The types of instruments played also influences focus (timbre- violin vs. piano).

- ✧ Baroque music (1600s-1800s)
  - -Mozart's minuets
  - -Pachelbel's Cannon
- ✧ Early Classical music
  - -Bach string quartet pieces (ex. Air on G)
- ✧ Romantic music
  - -Chopin (Nocturnes)
  - -Beethoven

Acoustic guitars and other soft strumming or "long-sounding" instruments like the saxophone may also be as successful.

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