Changing ADHD Brains Through Music

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Recent advances in audio neurofeedback therapy offer a promising solution for individuals with ADHD by training them to self-regulate brain activity, by reducing excess theta waves and enhancing beta wave production, thereby improving concentration with minimal side effects. Unfortunately, not much is known about the specific audio components that help produce optimal results. This project aims to find which specific rhythmic patterns, harmonic structures, dynamic ranges, and tempi are most effective in audio neurofeedback. To investigate this, participants underwent sessions where these various auditory components were presented. Throughout the sessions, brain activity was monitored using an EEG to measure changes in beta wave and theta wave band-power, a key indicator of improved concentration. This systematic exploration allowed for the comparison of different auditory elements and their direct impact on neurofeedback outcomes. The findings indicate the most effective auditory stimulus for increasing focus may involve a moderate tempo (130-210 bpm), moderate dissonance and syncopated rhythm. Some components increase or decrease both beta and theta waves, making finding a compromise difficult. Rhythm and harmony components tend to offer more balanced solutions without the direct effects observed in dynamics and tempo extremes. The tempo component did not display a direct relationship between increasing tempos and increasing beta wave band-power, which challenges current assumptions. When these new insights are applied to the audio used in neurofeedback treatment, this could enhance treatment continuity and offer a good alternative to the traditional medication, while displaying minimal to no side effects.

Awards Won: