CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
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Project Number
38600

Project Title
Finding Calm: Meditation vs. Mobile Games

Abstract

Objectives/Goals
The objective of this study is to determine whether meditation or mobile games are more effective in activating calming brain waves.

Methods/Materials
40 subjects, a Muse meditation application on an ipad, Two Dots game application on an iphone, and a portable electroencephalogram. Subjects were tested in two sessions with a washout period in between. Subjects were randomized to meditate or play the mobile game for 5 minutes, while the electroencephalogram measured the brain waves. After a washout period, the subjects performed the opposite task.

Results
The p-value of the two tailed t-test indicated that negligible carryover effects existed from one treatment to the next. Another two tailed t-test was performed to test for differences within subjects and identify which treatment resulted in more seconds of calm. The p-value revealed that differences in treatment effects were significant. The average duration of calm for meditation was 197 seconds out of 300 and 164 seconds out of 300 for mobile games.

Conclusions/Discussion
The results supported my hypothesis that meditation would be more calming than mobile games. Meditation is more effective in achieving a calmer state of mind than mobile games because it produces more gamma brain waves, which are beneficial in improving memory recall, sensory perception, and focus. Mobile games, however, still activated gamma brain waves, which indicate high levels of calm. Knowing that mobile games also produce a calming effect is useful because one can calm themselves in a noisy and crowded environment by playing a mobile game, when meditation may not be feasible or socially acceptable.

Summary Statement
I showed that both meditation and mobile games produced calm brain waves, but meditation was more calming.

Help Received
I designed and tested the experiment myself. I reviewed excel calculations under the supervision of T. Tong. I got help in understanding the statistical comparison of data from Dr. Jiaxiao X. Shi at Kaiser Permanente in Woodland Hills.