CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

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Project Number

36129

Project Title

How Can You Improve Your Cognitive Performance? It Depends. Are You Male or Female?

Abstract

Objectives/Goals

The objective of this study is to determine which of four different ten minute activities will enhance cognitive performance.

Methods/Materials

Set up 4 cognitive performance assessments with Lumosity.com so that level and type of text is the same each time but each assessment itself is unique to control for learning bias. Complete consent forms. Each day, have subjects perform one activity in random order to control for learning bias. (sit quietly, listen to music, aerobic exercise, video games). Have subjects take 4 assessments and record results.

Results

The first trend for the entire population is that in four out of five tests, participants did better when the preceding activity was to sit quietly. No single activity produced consistently poor performance across the different assessments. The second trend was very surprising. We observed a distinct difference in the pattern of performance between males and females. For males, playing video games and sports resulted in higher scores in each assessment along with sitting quietly in 2 of 5 assessments. Whereas with females, sitting quietly and listening to music were the highest scoring activities in 4 of 5 assessments. Conversely, males did worse when the activity performed was listening to music or sitting quietly. For females, playing sports resulted in lower performance. There was one exception. Assessment three was the only test where the male and female trends have similar results in that sitting quietly resulted in the worse performance and all the others activities are relatively the same.

Conclusions/Discussion

When we started this experiment, we believed that aerobic exercise would increase cognitive performance. Our hypothesis stated that if people engage in aerobic activities before taking cognitive performance tests, they will have better results than when listening to music, playing video games, or just sitting quietly. We disproved our hypothesis. We found that interactive brain activities, such as sports and video games, tended to benefit males and disadvantage females whereas passive activities, such as sitting quietly or listening to music, tended to benefit females and disadvantage males.

Summary Statement

Our study suggests that males perform better on cognitive tests if preceded by interactive activities (video games/sports) whereas females perform better on the same tests if preceded by passive activities (sit quietly/listening to music).

Help Received

My dad helped explain Standard Deviation and %RSD and how that applied to our data.