

Effects of Acute Exercise on Executive Functions of Cognition

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ABSTRACT

The purpose of this study was to evaluate the effects of an acute bout of aerobic exercise on executive functions of cognition, using the Interactive Stroop Effect Test. Men (N=) and women (N=), with a mean age of 22.33±, completed both a congruent and incongruent series on the Interactive Stroop Test before and after exercise. All participants were recreationally trained, exercising on an average of 1.24 hours a day and 4.5 days a week. The exercise bout consisted of running on a treadmill for 20 minutes at a moderate intensity, which was determined by using the Rate of Perceived Exertion scale. To evaluate the effects of exercise on Stroop performance, two paired t-tests were used to compare the means of the pre-exercise and post-exercise tests. Two separate t-tests were run for the congruent and then the incongruent Stroop Tests, which stand independent of each other; therefore the scores of each test were not affected from the participation in the other. The congruent t-test depicted a t-stat of 3.58, which was greater than the t-critical of 1.74. This indicated that there was a statistically significant difference in the time taken to complete the test after the exercise bout. The incongruent t-test depicted a t-stat of 5.05, which was greater than the t-critical of 1.73, signifying that there was a statistically significant difference in the time taken to complete the test after the exercise bout. Significance was set a $P < 0.05$. The congruent test resulted in a $P = 0.001$ and the incongruent test resulted in a $P = 0.00005$, suggesting that the results most likely did not occur by chance. Therefore, the results concluded that exercise leads to significant improvement on executive functioning in regards to goal directed behavior and basic cognitive processes.