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The Effects of Aerobic vs Anaerobic Exercise on Cognitive Function in College Aged Individuals

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Many college aged students enjoy exercising as a lifestyle choice in between studying for exams. While exercise is beneficial to improving physical fitness, certain types of exercise may provide additional benefits to improving cognitive function, therefore aiding in memory recall. **PURPOSE:** To evaluate the effects of aerobic and anaerobic exercise on memory recall (MR) and reaction time (RT). **METHODS:** 17 healthy college aged individuals (9 male, 8 female, age 18-25 years) were evaluated on three separate days. On the first day, subjects performed a baseline MR and RT test. On the second day, subjects completed a MR and a RT before and after aerobic exercise. The aerobic exercise consisted 20 minutes of cycling at 75% of their age predicted maximum heart rate. The final day of testing was conducted in a similar manner, but this time anaerobic exercise was performed. The anaerobic exercise consisted of 3 short bouts of cycling exercise with each exercise bout covering 700 m with intensity equal to .03 kp/kg. As for the MR and RT, a computerized MR test was administered, which consisted of 15 words that flashed on the screen for one second each. Subjects were then asked to recall as many words as possible in 30 seconds. The RT were completed on the computer, consisting of two parts. The simple RT required pressing a button as soon as the letter appeared while the choice RT consisted of matching the proper letter on the keyboard with the correct choice on the screen when flashed. A two way ANOVA with repeated measures was used to compare differences in exercise conditions and time on MR and RT. **RESULTS:** The average number of words recalled decreased after completing the aerobic (5.4 ± 1.2 vs. 4.8 ± 1.6 words; $p > 0.05$) and anaerobic (5.3 ± 1.7 vs. 4.2 ± 1.8 words; $p < 0.05$) exercise tests. However, choice RT improved after both aerobic and anaerobic conditions when compared to the baseline (417.8 ± 50.3 vs. 406.4 ± 57.5 ms, $p > 0.05$ and 421.30 ± 45.0 vs. 407.9 ± 50.8 ms, $p > 0.05$, respectively). Furthermore, simple RT also slightly improved after aerobic exercise (295.4 ± 31.7 vs. 289.5 ± 32.9 ms, $p > 0.05$), but not after completing the anaerobic test (288.4 ± 16.5 vs. 294.7 ± 21.9 ms; $p > 0.05$). **CONCLUSION:** Findings of the study suggest that there may not be significant benefits of short bouts of exercise on MR but modest improvements in RT may be achieved.