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### Effect of Different Exercise Modalities on Executive Function in College-Aged Individuals

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Despite the well-documented neurophysiological effects of exercise, most Americans, specifically college-aged individuals, do not meet the recommended level of physical activity. Thus, it is important to investigate other interventions that may have neurophysiological effects similar to exercise. Mechanical whole-body vibration (WBV) is one technique that has been shown to elicit similar physiological effects as aerobic exercise; however, the effects on the brain are not well documented. **PURPOSE:** The aim of this study is to compare the effects of different exercise modalities on executive function. **METHODS:** Seventeen subjects (11 females and 6 males; age  $19.59 \pm 1.21$  years; height  $171.15 \pm 5.0$  cm; weight  $84.48 \pm 39.5$  kg) completed a randomized, cross-over study that consisted of exercising on a recumbent bicycle and treadmill, WBV, and a control session. Before and immediately after each session, subjects completed a series of computerized cognitive tests that measured attention, response inhibition, visuo-spatial working memory and reaction time. Each exercise session consisted of a 5-minute warm-up and 20 minutes of moderate (40-59% of heart rate reserve) intensity exercise on the designated modality (recumbent or treadmill). The WBV session consisted of subjects standing barefoot on a vibrating platform with an oscillating vibration of 30Hz for 20 minutes. The control session consisted of subjects sitting quietly in the laboratory for 20 minutes. **RESULTS:** An acute bout of recumbent cycling significantly decreased attention (pre:  $70.50 \pm 1.26$  s; post:  $69.69 \pm 1.49$  s;  $p=.049$ ) and reaction time (pre:  $121.99 \pm 9.44$  s; post:  $128.03 \pm 8.40$  s;  $p=.026$ ) when compared to an acute bout of exercising on a treadmill and WBV. A single session of WBV significantly decreased visuo-spatial working memory (pre:  $43.29 \pm 10.49$  s; post:  $47.95 \pm 11.64$  s;  $p=.008$ ) when compared to an acute bout of exercising on a treadmill and recumbent bicycle. A significant interaction for main effect of group occurred in response inhibition ( $F=3.117$ ,  $p=.041$ ). **CONCLUSION:** A single session of exercising on a recumbent bicycle and WBV impaired executive function in college-aged individuals, whereas exercising on a treadmill did not impair executive function.

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