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Influence of Acute Resistance Training on Memory, Executive Function, and Mood

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Acute exercise has been shown to improve performance on several domains of cognitive function. The majority of research has focused on the benefits of aerobic exercise, but research on the cognitive and mood effects of acute heavy resistance training (RT) is limited. **PURPOSE*:*** To determine how an acute bout of RT affects cognitive function and mood. **METHODS*:*** This was a within-subject design. College-aged males (n=21) visited the laboratory on 3 days, separated by at least 1 week. During session 1, subjects were tested for their 5-repetition maximum (5RM) on the box squat, bench press, and lat pulldown. During sessions 2 and 3, participants completed a rest or RT condition in a counterbalanced order. Prior to both sessions, participants completed trials 1-6 of the Rey Auditory Verbal Learning Task (RAVLT). During the RT session, participants completed 3 sets of 8-12 repetitions at 70% of estimated 1RM on the box squat, bench press, and lat pulldown. Training took ~40 minutes (including warm-up and cool-down). After the RT or 40 min seated rest, participants completed the recall and recognition trials of the RAVLT and a cognitive test battery in the Automated Neuropsychological Assessment Metrics (ANAM) Test System. The test battery included 10 tests that assessed memory, processing speed, executive function, and mood. Comparisons in cognitive performance and mood were made using a paired t-test. **RESULTS:** Higher scores on the color subtest of the Stroop Task, a test of processing speed, were found after RT compared to rest (training=69.57±2.03; rest=65.43±2.01; p=0.01). Better performance was observed in the Matching-to-Sample task, a spatial working memory task, after rest compared to RT (training=41.33±2.77; rest=45.33±2.53; p=0.03). There were no other differences in cognitive performance between conditions (p>0.05). After RT, participants had higher anger (training=11.05±3.34; rest=5.62±1.81; p=0.04), depression (training=6.43±2.22; rest=2.57±1.08; p=0.02), restlessness (training=32.33±4.15; rest=14.58±3.18; p=0.0001), and vigor (training=55.62±3.63; rest=48.24±3.90; p=0.04). **CONCLUSION:** Acute RT has limited effects on cognitive function in college-aged males, but increases anger, depression, restlessness, and vigor when assessed after cognitive tasks.