

## **Effect of an Acute Bout of Resistance Exercise on Math and Attention Skills**

Andrew P. Schiller, Haley E. VanNostrand, Abby V. Phillips, Jackson T. Balkin, Haley A. Jacobs, Kathryn T. Shoemaker, Fernando Winfield Murillo, Joseph L. Schiller, Richard H. Laird, IV., Jennifer A. McKenzie and Steve D. McCole. Department of Exercise Science and Physical Education, McDaniel College, Westminster, MD

**Purpose:** The purpose of this study was to investigate the effectiveness of resistance exercises on math and attention skills. **Methods:** Healthy volunteers (22 men and 24 women) with an average age of  $23 \pm 5$  yr were tested on three separate occasions in the McDaniel College Human Performance Lab. On the first day, they gave informed consent and completed a PAR-Q. Each participant's 15-repetition maximum (RM) was found on four different weight machines (chest press, leg press, leg extension, and seated row). On days two and three, which occurred  $\geq 7$  days apart, the participant would either sit quietly for 20 minutes (Control) or complete a warm-up and two sets of 15-RM on each of the four exercises (Lifting). The order of testing was counter-balanced. HR was measured on both testing days and RPE was measured on the lifting day. Immediately following the 20 minutes of rest or exercise, a d2 Test of Attention to assess concentration performance (CP), total number of items processed (TN), and total number of items processed minus error score (TN-E) and an arithmetic and algebra (Math) exam were administered. Paired t-tests with Bonferroni corrections and Wilcoxon signed rank tests were used to assess statistical significance ( $p < 0.05$ ). **Results:** All data are reported as mean  $\pm$  SD. On the lifting day RPE averaged  $16 \pm 2$  and participants completed more than 99% of the planned repetitions. The d2 results for the CP ( $171 \pm 34$  vs.  $161 \pm 25$ ), TN ( $436 \pm 78$  vs.  $412 \pm 61$ ), and TN-E ( $424 \pm 77$  vs.  $401 \pm 58$ ) values on the lifting day were all significantly greater ( $p < 0.017$ ) than the control day. The average math exam score on the lifting day of  $68 \pm 18\%$  was not significantly different ( $p > 0.05$ ) than the score of  $73 \pm 15\%$  on the control day. **Conclusion:** A single session of resistance exercises improved attention and processing speed. However, the resistance exercises had no impact on mathematical ability.

Funded by McDaniel College Student-Faculty Summer Research Fund.