

### **Effects of Cognitive Fatigue on High Intensity Circuit Exercise: Preliminary study**

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Cognitive fatigue (i.e., mental fatigue) is the psychophysiological response to a prolonged cognitively demanding task which results in the subjective feeling of “tiredness” and “lack of energy” (Marcora, et al., 2009). Evidence for cognitive fatigue impairing subsequent physical performance was supported by two prior studies using continuous aerobic exercise tasks (treadmill running, and stationary cycling). **PURPOSE:** To determine whether cognitive fatigue impairs subsequent physical performance in discontinuous high intensity circuit exercise (HIT). **METHODS:** As a counterbalanced repeated measure design, eleven participants (7 male and 4 female) completed a cognitively fatiguing computer task (vigilance) and a control task (video) for 52 minutes prior to completing HIT. The two visits were separated by at least 7 days. The HIT task involved participants completing 5 pull ups, 10 pushups, and 15 air squats consecutively for a 20 minute period. Participants were filmed during HIT to quantify behavioral performance (e.g., time-on-task and repetitions completed). **RESULTS:** Participants who were cognitively fatigued had decreased time-on-task ( $663 \pm 108$  sec) relative to when not cognitively fatigued ( $700 \pm 100$  sec),  $t(10) = 2.54, p = .03$ . Participants had decreased repetitions completed during the HIT when preceded by a cognitive fatiguing task ( $420 \pm 106$  sec) relative to a control task ( $436 \pm 93$ ); however, the difference failed to reach significance ( $t(10) = 1.42, p = .19$ ). **CONCLUSION:** Preliminary findings indicate that participants experiencing cognitive fatigue prior to the HIT task decreases time-on-task. This study corroborates previous research on continuous aerobic exercise and suggests that mitigating cognitive fatigue is important to achieve optimal physical performance. Though there was a trend of decreased repetitions completed as a function of cognitive fatigue, further data collection is needed to determine whether the differences can reach statistical significance.