The Effects of a Commercially Available “Energy Drink” On Margaria-Kalamen Step Test Performance
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ABSTRACT
The purpose of the study was to examine the effect of concurrent verbal encouragement on the performance of the WACT in female athletes vs. female non-athletes.

METHODS
Subjects: All subjects provided informed consent prior to participation. Nineteen college-age volunteers were recruited from the female student population at Texas A&M University-Kingsville. Ten of the subjects were active intercollegiate athletes (ATH, n=10) and nine were non-athletes (NON, n=9). The WACT was novel to all subjects. All subjects were blinded to the purpose of the study.

Pre-participation Screening/Testing: All subjects underwent a health screening according to guidelines set forth by the American College of Sports Medicine. Only subjects classified as low risk for untoward events during exercise based on these guidelines were included in the study. The majority of the non-athlete sample agreeing to participate, while not current intercollegiate athletes, were former athletes.

Wingate Anaerobic Cycle Test (WACT): The WACT is a 30 sec cycle ergometer task wherein subjects pedal as fast as possible against a resistance that requires a maximal effort for the 30 sec duration. The flywheel resistance is determined as a fraction of the subject’s body mass (0.095 kg body mass x 1 kg body mass for female adult athletes, 0.095 kg body mass x 1 kg body mass for female adult non-athletes). The test is preceded by a test specific warm-up lasting 4 min (0-1 min = 30 rpm against 0 kg, 1-3 min = 50 rpm against 0 kg). Following the warm-up, subjects have a 5 min rest period before the actual 30 sec test begins. Recovery from the 30 sec test includes at least one recovery period at light to moderate resistance (1 kg). Heart rate is monitored during warm-up, exercise, and recovery for this test.

Experimental Design: WACT Trial 1: All subjects performed a familiarity WACT trial without concurrent verbal encouragement. Three investigators were present for this session.

RESULTS
Age and Body Composition: ATH and NON did not differ significantly (p>0.05) with regard to age (ATH=20.5±1.5, NON=21.4±1.3 yr), body stature (ATH=170±6.0, NON=162.6±9.7 cm), BMI (ATH=24.5±2.2, NON=21.4±1.3 kg/m²), percent body fat (ATH=24.1±5.4, NON=27.9±5.1 %) or fat mass (ATH=17.6±4.3, NON=18.6±4.7 kg). However, the groups did differ in fat-free mass (ATH=53.7±6.6, NON=46.1±5.7 kg) (p<0.05).

WACT Performance: Peak power (PP), mean power (MP), and total work (TW) were compared between ATH and NON across VE and NVE using an ANOVA (1 between, 1 within), p<0.05. Age and body composition differences between ATH and NON were examined using independent t-tests, p<0.05.

Figure 1: Athlete vs. Non-Athlete Main Effect. When pooled across VE/NVE, ATH and NON differed significantly (p<0.05) in power output (Figure 1a.) and total work (Figure 1b.) completed during the exercise bout.

Figure 2: Verbal Encouragement vs. No Verbal Encouragement Main Effect. When pooled across ATH/NON, VE and NVE did not differ significantly (p>0.05) in power output (Figure 2a.) and total work (Figure 2b.) completed during the exercise bout.

Figure 3: Athlete/Non-Athlete Interaction with Verbal Encouragement. The ATH/NON interaction with VE/NVE was not significant (p>0.05).

CONCLUSIONS
Contrary to findings with males, concurrent verbal encouragement does not affect performance on the WACT, for athletes or non-athletes, in females. These results lend support to previous research suggesting females to be more intrinsically motivated than males, whether they are athletes or not. However, while the athletes did outperform the non-athletes, as was expected given the greater fat-free mass in the athletes, the verbal encouragement did not affect the two groups differently. Given this lack of significant interaction, it could be argued that gender appears to be the key determinant of intrinsic motivation. It should be noted that all of the subjects were volunteers, and the majority of the non-athletes were not recruited to participate, while not current collegiate athletes, were former athletes, most at the high school level. All of the true non-athletes who were examined did not agree to participate in the study. This may have led to the unexpected finding showing no differences between athletes and non-athletes with regard to their performance response to concurrent verbal encouragement during the WACT, and should be explored in future research.