

## **Effect of Competition on Performance and Physiological Responses in Female Athletes**

BULLINGER D, BIGGERSTAFF K, ROGERS R, NICHOLS D, and BEN-EZRA V

Exercise Physiology Laboratory; Kinesiology, Texas Woman's University; Denton, TX

---

*Category: Masters*

*Advisor / Mentor: Biggerstaff K (kbiggerstaff@twu.edu)*

### ABSTRACT

Competition can increase an athlete's performance. The competitive drive frequently displayed by athletes may not exist if athletes are unaware of the competition. The purpose of this study is to determine if performance is improved when the athlete is not informed of the competitive setting. Eighteen college-aged females were recruited. All participants were current or former college or high school athletes (age:  $20.9 \pm 1.8$  yrs., HT:  $172 \pm 6.7$  cm, WT:  $68.1 \pm 9.9$  kg). Athletes were blinded to the purpose of the study. Prior to participation in experimental trials, athletes' maximal oxygen consumption ( $VO_{2max}$ :  $41.0 \pm 5.4$  mL/kg/min;  $HR_{max}$ :  $189 \pm 9$  b/p) was measured on a treadmill and they also performed a 20 min time trial for familiarization. In a balanced cross-over design, the athletes performed two 20 min time trials on separate days. The control trial (CT) was performed with only one athlete running. The competition trial (COMP) consisted of two athletes matched for  $VO_{2max}$  ( $\leq 5$  mL $\cdot$ min $^{-1}\cdot$ kg $^{-1}$ ), running on treadmills that were side by side. The athletes were not informed that they were competing with the other athlete during COMP. Overall distance, peak HR, and peak RPE were compared between CT and COMP using a paired samples t-test ( $p < 0.05$ ). Distance covered for each 5 min time interval was compared between CT and COMP and within corresponding conditions using a repeated measures ANOVA ( $p < 0.05$ ). Peak HR for each 2 min time interval and RPE for each 5 min interval were compared between CT and COMP using a repeated measures ANOVA ( $p < 0.05$ ). Overall distance covered was significantly different ( $p = 0.017$ ) between CT ( $3.06 \pm 0.45$  km) and COMP ( $3.28 \pm 0.44$  km). Distance covered during 0-5 ( $0.72 \pm 0.10$  km vs.  $0.77 \pm 0.10$  km) and 11-15 ( $0.76 \pm 0.11$  km vs.  $0.82 \pm 0.12$  km) min time intervals were significantly different ( $p = 0.018$ ) between CT and COMP, respectively. There were no significant differences in peak HR (CT:  $179 \pm 20$  b/m vs. COMP:  $184 \pm 14$  b/m,  $p = 0.134$ ) or RPE (CT:  $14.4 \pm 2.7$  vs. COMP:  $14.4 \pm 1.5$ ,  $p = 0.999$ ). The competitive environment, even though not explicitly identified, elicited a greater running distance without alterations in HR or RPE. This indicates that female athletes will compete without instruction to compete.