# Sheffield Hallam University

## Clustered 10 s sprints enable well-trained runners to maintain speed compared to continuous 30 s sprints [abstract only]

RUDDOCK, Alan <http://orcid.org/0000-0002-7001-9845>, RAYNOR, Robert and THOMPSON, Steve <http://orcid.org/0000-0001-7674-3685>

# Clustered 10 s sprints enable well-trained runners to maintain speed compared to continuous 30 s sprints

ALAN D. RUDDOCK[1], ROBERT RAYNOR[2], STEPHEN W. THOMPSON[1]

[1] Sport and Physical Activity Research Centre, Sheffield Hallam University, UK

[2] Sheffield United Football Club, UK

Most sprint-interval training (SIT) research has used cycle ergometry with sedentary populations without reporting physiological or physical demands. This study aimed to; 1) report the internal and external demands of sprint-interval training using a non-motorised treadmill and 2) compare the physiological and physical demands of a traditional sprint-interval training session (SIT) with isovolume clusters of 10 s sprints interspersed with 10 s of recovery (CLU) in well-trained athletes. Seven endurance runners (age $32 \pm 5$ years; body mass $74.5 \pm 6.3$ kg; stature $182 \pm 5$ cm; $\dot{V}O_{2max}$ 61.2 $\pm 3.8$ ml$\cdot$kg$^{-1}\cdot$min$^{-1}$) provided informed consent to participate in the study that was approved by the local ethics committee and conducted according to the Declaration of Helsinki. SIT consisted of 4 x 30 s maximal effort sprints with 3 minutes passive recovery for a total sprint time of 2 min. CLU consisted of 4 sets of sprints with 3 minutes passive recovery between sets. Each set included 10 s maximal sprints with 10 s of passive recovery repeated 3 times for a sprint duration of 30 s. A Two-Way Repeated-Measures Analysis of Variance (ANOVA) with Bonferroni post-hoc analysis was used to investigate statistically significant differences between variables. A Wilcoxon signed-rank test was used to analyse rating of perceived exertion (RPE). Statistical significance was set at $P < 0.05$, Cohens $d$ and 90% confidence intervals were to analyse effect size. There were no statistically significant differences between groups for peak running speed. Mean speed decreased significantly across repetitions in SIT ($P \le 0.03$) however, mean speed was maintained in CLU, furthermore mean speed for repetition 4 was faster in CLU than SIT ($P = 0.03$; $d = 1.40$ [CI = 0.59]). There were no significant differences in mean or peak cardiorespiratory variables between groups, however peak %$\dot{V}O_{2max}$ for repetition 4 in CLU was significantly greater than repetition 1 ($P = 0.01$; $d = 1.05$ [CI = 0.61]). There were no significant differences between groups for blood lactate ([BLa]) in repetition 1 or 2, however, [BLa] was larger in SIT for repetitions 3 and 4 ($P \le 0.004$). RPE was significantly greater in SIT for each repetition compared to CLU ($P \le 0.03$). In conclusion, participants were able to maintain higher running speeds with CLU compared to SIT despite similar physiological demands. Coaches should investigate the use of CLU to optimise mechanical and physiological demands of sprint interval training.