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Ability to Reproduce RPE while Self-Selecting Treadmill Speed vs Incline

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Ratings of perceived exertion (RPE) are commonly used to self-regulate exercise intensity. **PURPOSE:** To investigate if subjects can reproduce a prescribed RPE by adjusting either the incline or speed alone on a treadmill. **METHODS:** Six men (age: 21.7 ± 0.8 yr; height: 172.6 ± 5.3 cm; mass: 86.5 ± 8.4 kg; body fat: $22.6 \pm 7.1\%$; VO_{2max} : 53.0 ± 7.2 ml·kg⁻¹·min⁻¹) and six women (age: 20.8 ± 0.4 yr; height: 162.3 ± 5.5 cm; mass: 66.9 ± 18.5 kg; body fat: $27.1 \pm 11.5\%$; VO_{2max} : 44.9 ± 5.6 ml·kg⁻¹·min⁻¹) completed a maximal oxygen consumption (VO_{2max}) and two RPE reproduction trials on a treadmill. During session one, subjects completed a graded exercise test to volitional fatigue using the modified Bruce protocol. Subjects received standardized instructions on Borg RPE scaling procedures. Oxygen consumption (VO_2), heart rate (HR), minute ventilation (VE), respiratory rate (RR), tidal volume (TV), and RPE (overall = RPE-O; peripheral = RPE-P;) were collected every minute. During the two 15-minute reproduction trials, the subjects were asked to adjust only treadmill speed or incline, in a counterbalanced order, to reproduce a RPE-O of 13 or 14 (somewhat hard). An average value from the minute before and after reaching the target RPE-O was used for statistical analysis. Dependent t-tests were used to determine differences between the VO_{2max} test and RPE reproduction trials. **RESULTS:** When comparing the speed (S) and VO_{2max} (V) trials at the prescribed RPE-O, there was no significant difference in relative VO_2 (S: 34.9 ± 9.5 ml·kg⁻¹·min⁻¹; V: 37.9 ± 6.5 ml·kg⁻¹·min⁻¹, $p = .158$), HR (S: 174.0 ± 13.1 b·min⁻¹; V: 173.9 ± 13.8 b·min⁻¹, $p = .992$), or VE (S: 70.5 ± 17.7 l·min⁻¹; V: 73.5 ± 17.7 l·min⁻¹, $p = .630$). There was a significant difference in RR (S: 38.6 ± 6.6 ; V: 33.6 ± 8.5 b·min⁻¹, $p = .047$), TV (S: 1.9 ± 0.5 L; V: 2.3 ± 0.6 L, $p < .001$), and RPE-P (S: 15.0 ± 1.3 ; V: 13.7 ± 0.8 , $p = .002$). When comparing the incline (I) and V trials at the prescribed RPE-O, there was a significant difference in relative VO_2 (I: 29.0 ± 6.3 , $p < .001$), HR (I: 158.9 ± 12.0 , $p = .010$), VE (I: 53.1 ± 8.7 , $p = .002$), RR (I: 30.0 ± 6.5 , $p = .022$), TV (I: 1.9 ± 0.6 ; $p = .001$), and RPE-P (I: 14.8 ± 1.6 , $p = .019$). **CONCLUSION:** The subjects more accurately reproduced the prescribed RPE exercise intensity when self-controlling treadmill speed rather than incline.

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