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Interactions between perceived exertion and thermal perception in the heat in endurance athletes

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Abstract

Introduction: The study aimed to investigate how a distortion of perceived exertion in the heat may affect, during a self-paced cycling exercise preceded by prior cognitive task, the thermal perception and the subsequent regulation of power output in high level athletes. *Methods:* Eleven endurance trained male athletes completed four experimental sessions including a 30-min fixed-RPE (15-Hard) cycling exercise in neutral (TMP-22 °C) and hot (HOT-37 °C) conditions, following a 60-min incongruent Stroop task (EXP) or passively watching documentary films (CON). Central and peripheral performances of the knee extensors were assessed before the cognitive task and after the exercise. *Results:* Although mental demand and effort were higher in EXP ($P < 0.05$), no effect of prior cognitive task was observed on subjective feelings of mental fatigue or decline in power output at a fixed RPE. Average exercise intensity was lower in HOT than TMP ($3.14 \pm 0.09 \text{ W.kg}^{-1}$ vs. $3.42 \pm 0.10 \text{ W.kg}^{-1}$ respectively, $P < 0.05$). Skin temperature and warmth sensations were higher in HOT throughout the exercise ($P < 0.05$) but not thermal comfort. Central and peripheral parameters were not affected more in HOT than in TMP. *Conclusion:* Although the effects of combined stressors on the distortion of perceived exertion could not be verified, the greater decline in power output recorded in HOT than TMP suggest a high contribution of both perceptual and cardiovascular responses in the regulation of work rate when the subject is in mild hyperthermia.

Abbreviations

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