

Journal of Science and Cycling

Breakthroughs in Cycling and Triathlon Sciences



Special number: World Congress of Cycling Science 2015, 1/2 July 2015, Utrecht

Editors: Mikel Zabala (PhD)
Greg Atkinson (PhD)



Science & Cycling
1 & 2 July 2015, Utrecht



OPEN ACCESS

www.jsc-journal.com

The effect of deceptive information about receiving cooling on pacing pattern during a 20-km cycling time trial in the heat

Koen Levels^{1,2}✉, Jos de Koning^{1,3}, Carl Foster^{1,3}, Hein Daanen^{1,2}

Abstract

Introduction Cooling during exercise in the heat has been shown to be beneficial for performance (Bongers et al. 2014), but it is still unclear to what extent this effect can be contributed to actual physiological or perceptual changes and to what extent the expectation of receiving cooling during cycling plays a role. Therefore, the aim of this study is to investigate the effect of false information about receiving cooling on performance and pacing pattern during a 20-km cycling time trial in the heat.

Methods 16 trained male participants performed three 20-km cycling time trials (TTs) in $30.5 \pm 0.1^\circ\text{C}$ with $45 \pm 3\%$ relative humidity. The first two TTs were with (WIND) or without (CONTROL) 4 m/s convective cooling during km 7-13. In the third TT, participants performed one of two trials in which they were deceived about receiving convective cooling during the TT. They either did not expect cooling during km 7-13 but did receive it (FALSE-NEG) or did expect cooling but did not get it (FALSE-POS). Power output (PO), heart rate (HR), rectal temperature (Tre), mean skin temperature (Tsk), thermal sensation (Tsens), thermal comfort (Tcomf), and RPE were measured.

Results During and after cooling, Tsk, Tsens, and Tcomf were lower in WIND than CONTROL, no differences were found in HR and Tre, and PO was lower during the entire TT in CONTROL than in WIND (239 vs. 251 W; $P=0.02$; Figure 1a). In FALSE-NEG, physiological parameters followed a pattern similar to CONTROL whereas pacing pattern prior to convective cooling was similar to CONTROL and during the cooling it was similar to WIND. After the cooling, no differences in pacing pattern were found between conditions (Figure 1b). In FALSE-POS, no differences in pacing were observed despite higher Tsk, Tsens, and Tcomf (Figure 1c).

Discussion: Deceiving participants about the occurrence of convective cooling during self-paced exercise alters the pacing pattern of a 20-km cycling time trial in the heat. This shows the importance of expectations regarding thermal load in self-paced exercise.

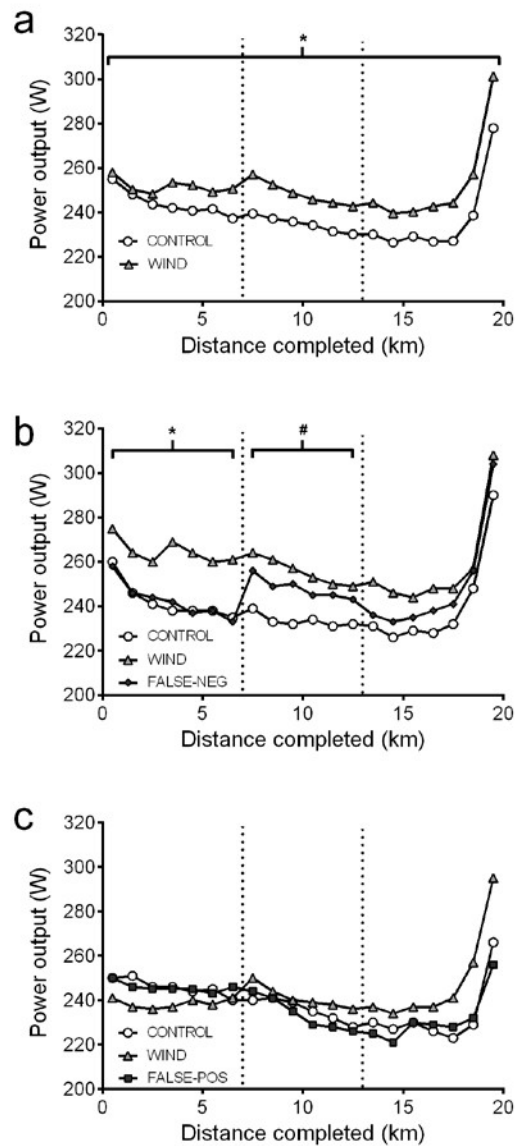


Figure 1 Pacing patterns during the 20-km cycling TT. CONTROL vs. WIND (a), FALSE-NEG subgroup (b), and FALSE-POS subgroup (c). Error bars are not displayed for clarity reasons. * Higher PO for WIND than for CONTROL ($P < 0.05$). # Lower PO for CONTROL than for WIND and FALSE-NEG ($P < 0.05$).

✉ **Contact email:** k.levels@vu.nl (K. Levelst)

¹ MOVE Research Institute Amsterdam, Faculty of Human Movement Sciences, VU University, Amsterdam, The Netherlands

² TNO, Soesterberg, The Netherlands

³ Department of Exercise and Sport Science, University of Wisconsin-La Crosse, La Crosse, USA