BOOK OF ABSTRACTS Open Access

Accuracy of Pacing Strategy Predictions in Ride-Alone and Competitive Cycling Time Trials

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Introduction

The selection of an optimal pacing strategy during cycling largely influences the success or failure of the performance (Hettinga et al., 2012). Trained athletes are proposed to develop experience-primed, stable pacing schemas which are robust even in deceptive conditions (Beedie 2012; Mauger). However, pacing decisions made continuously during performance are informed by both internal and external factors (Renfree 2014), therefore unexpected environmental events (e.g. competitors' behaviour) are likely to challenge the initially planned pacing strategy. This study aimed to explore 1) the accuracy of cyclists' pacing strategy predictions prior to 16.1 km time trials (TT), and 2) whether the accuracy of these predictions differs between ride-alone and competitive conditions.

Methods

Twenty-seven trained male cyclists with 16.1 km TT experience performed three laboratory-based TTs on a CompuTrainer ergometer. Following a baseline TT, participants rode a ride-alone TT (ALONE) and a competitive TT (COMP) in a counterbalanced order. During COMP, participants performed against a simulated virtual avatar that depicted the speed profile of their baseline performance. Prior to each trial, participants used a pace forecasting tool to predict their speed profile over each distance quartile of the TT. Immediately post-trial, a retrospective account of their perceived speed profile was also recorded.

Results

COMP (M = 26.43 ± 1.32 mins) was performed in a significantly faster time than ALONE (M = 26.74 ± 1.61) ($p = .005$). There were no significant differences between predicted, actual and post-trial perceptions of speed profile at any distance quartile in the ALONE TT (Figure 1). In the COMP TT, both predicted ($p = .012$) and post-trial perceived pace ($p = 0.001$) were significantly slower than actual pace at 8 km. At 16.1 km, predicted pace was significantly faster than actual pace ($p = .003$) (Figure 2).

Discussion

When performing a ride-alone 16.1 km TT, trained cyclists are able to accurately predict their pacing strategy. They can also accurately perceive what strategy they performed following the TT. However, when performing a TT in the presence of a competitor, cyclists exerted a faster than predicted speed at 8 km and consequently performed slower than predicted in the final quartile, due to premature fatigue as a result of a faster mid-section. Furthermore, cyclists believed that this drop in pace at 8 km was greater than what it actually was in their retrospective perception. Despite pace deviating from the pre-trial planned strategy in COMP, this trial was performed faster than the ALONE trial suggesting that this deviation was beneficial for performance. These findings support the robustness of trained cyclists' pacing schemas in individual performance conditions but the presence of a competitor results in a deviation from this schema. Pacing decisions are therefore influenced by external cues and a competitor may allow cyclists to tap into an otherwise unused reserve capacity to produce an enhanced performance.

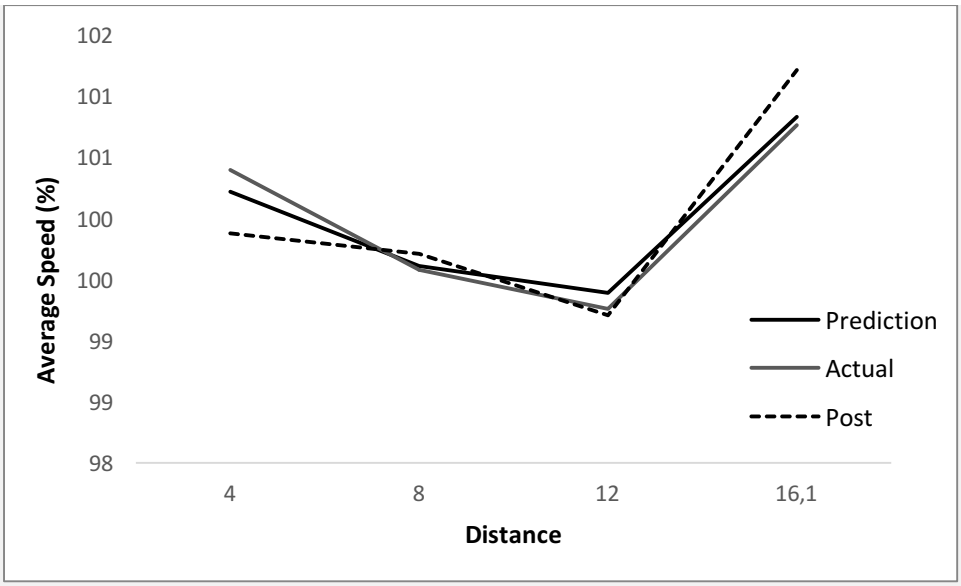

Figure 1: Mean predicted, actual and post-trial perceived speed profiles in a ride-alone 16.1 km cycling time trial

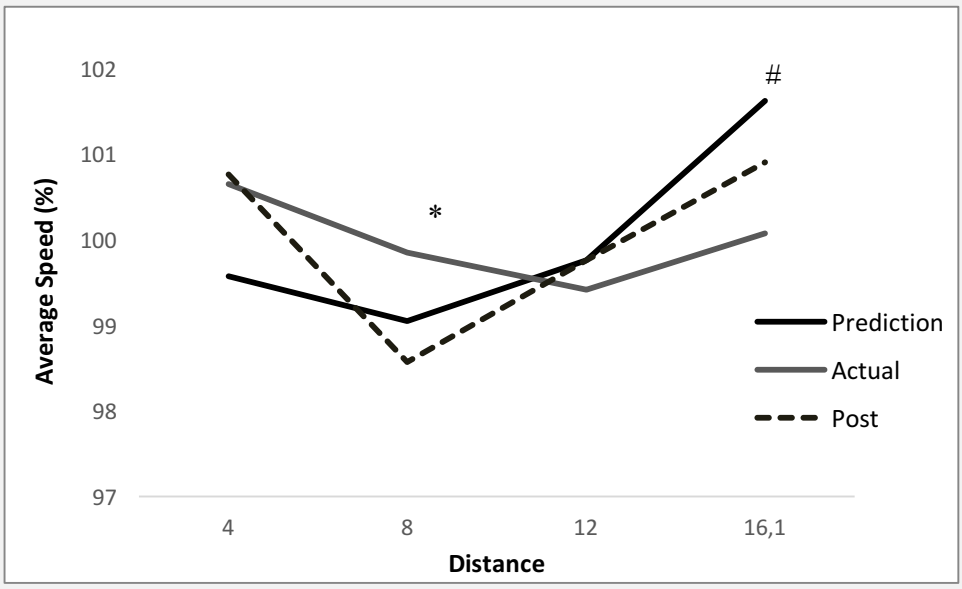

Figure 2: Mean predicted, actual and post-trial perceived speed profiles in a competitive 16.1 km cycling time trial
* denotes significantly faster speed than predicted and post-trial perceptions
# denotes significantly faster speed than actual

Key words: Endurance, Cycling, Pacing, Competitor

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