Pace versus prediction: Is the experience of the runner associated with success in a big-city marathon?

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ABSTRACT

PURPOSE: Pacing strategies during exercise are attributed to optimising the balance between the artefacts of fatigue and regulation of substrate metabolism. Pace judgement is set within a continuum of information from the ability to anticipate metabolic demands and select an appropriate strategy through to the accumulation of prior experience for completion of such a task that has a known end-point. Therefore the purpose of this study was to evaluate the importance of athlete experience to successfully regulate pace and attain a predicted end time during a marathon. **METHOD:** Following local institutional ethical approval n= 777 runners competing in the 2015 London Marathon agreed to participate. Using an on-line survey and opportunistic questionnaire at a pre-marathon event participants were asked to predict their race time. Athlete experience (EXP) was established based on the number of previously completed marathons using a Likert scale from 0 to greater than 10 with increments of 1 race. Athlete age was also recorded. All race data was downloaded from the race website generating 5Km split times, then converted to speed and normalised (%) to the final split time/speed ($m \cdot s^{-1}$). Prediction time (PT) was used a proxy for end-point and compared to finish time (FT). **RESULTS:** FT for whole group (WG) was 15479 ± 3311s compared to the group PT 15003 ± 2972s a significant difference of 476s (P= 0.0001). An R^2 of 0.863 observed for WG compared to 0.799 (EXP-0) and 0.852 (EXP-5) when comparing FT to PT. Significant differences observed between PT and FT for all EXP groups apart from EXP-5 (P= 0.0001). EXP-0 showed significant difference across all split times apart from 35-40 km (P=0.0001) with a decrease in normalised speed from 5km (109.0 ± 7.6) – 40km (89.9 ± 7.4%). The EXP-5 group showed significant changes in pace between 25-30 km (P= 0.001) (ES= 0.35) and 30-35 km (P= 0.0001) (ES= 0.44), decrease in pace from 5km (105.0 ± 5.7%) to 40km (93.7 ± 5.6%). **CONCLUSIONS:** These data suggest that successful marathon pacing is dependent on the experience of the athlete reflecting the development of the pacing template. Additionally experience is associated with better attainment of prediction time suggesting that less experienced runners should run with more experienced athletes with similar end-point targets.

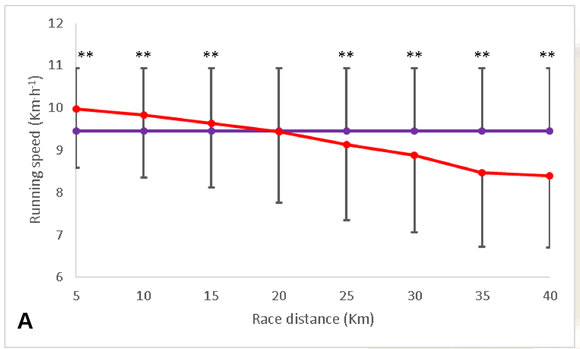
INTRODUCTION

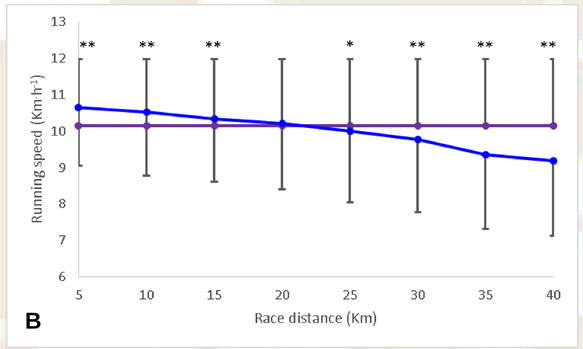
The ability to regulate pace is dependent upon the ability of the individual to make prospective judgments (cognitive) regarding the metabolic demands of the exercise challenge against their actual metabolic capacity. Modulations in pace, which are a function of biologically and cognitively orchestrated afferent signals, and the consequent homeostatically orientated efferent responses are manifest in order to prevent a complete depletion of the finite anaerobic capacity *(Scruton et al 2015. Open Access J Sport Med. 6: 249-257)*. Prior-experience has been shown to be associated with enhanced pace modulation and performance outcomes across a range of marathons *(Deaner et al 2015. Med Sci Sport Exerc. 47: 607-616)*. Prediction time provides a proxy indication of the anticipated performance with the pace profile reflecting the decision outcomes. Therefore the purpose of this study was to evaluate the importance of athlete experience to successfully regulate pace and attain a predicted time during a big city marathon.

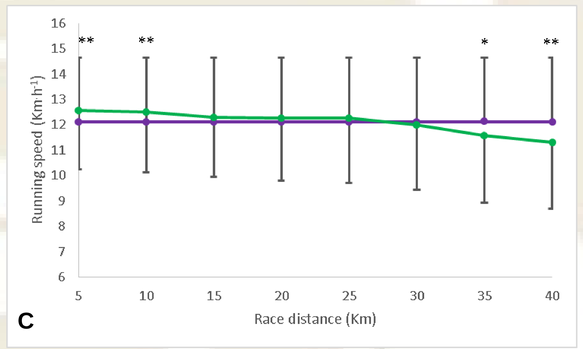
METHOD

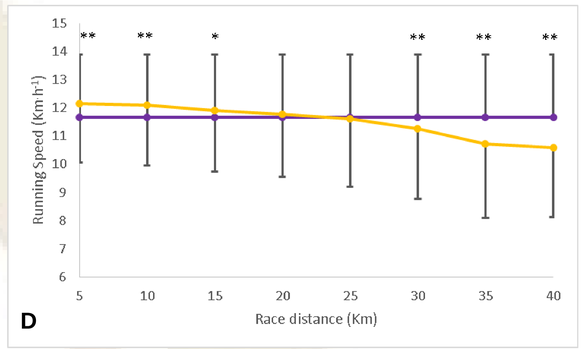
Following local institutional ethics approval n=777 runners completed an online survey or opportunistic questionnaire prior to competing in the 2015 edition of the London Marathon. Runners were asked their age, sex and race prediction time. Additionally the experience of the participants was determined using a Likert scale from 0 to greater than 10 increasing in increments of 1, reflecting the number of marathons they had completed prior to this race. All of the race data was downloaded from the race website generating 5Km splits, then converted to speed and normalised (%) to the final split time ($m \cdot s^{-1}$). Prediction time was used as a proxy for end-point and compared to the completion time. Data were then stratified by experience, prediction sensitivity and sex. Experience reflects previous number of completed marathons.

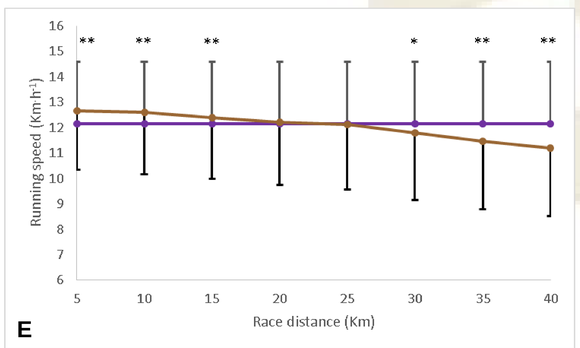
RESULTS

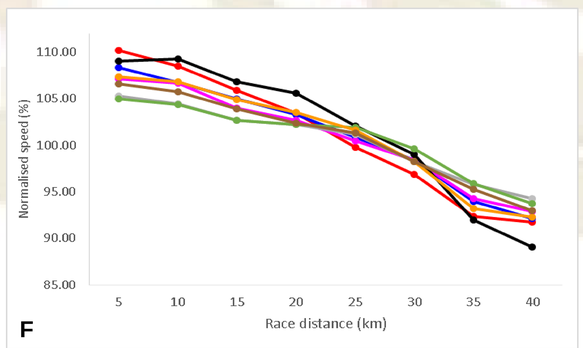












CONCLUSION

Panel A shows the responses for the 0 experience group, panel B completed 1 previous marathon, panel C previously completed 5 marathons, panel D completed between 6-10 marathons and panel E those who had completed in excess of 10 marathons. Significant differences *(p< 0.05), **(p< 0.001). Panel F, normalised responses across race distance for all groups. Finish time for whole group was 15479 ± 3311s compared to the group prediction time of 15003 ± 2972s a significant difference of 476s (P= 0.0001). These data suggest that successful marathon pacing is dependent on the experience of the athlete reflecting the development of the pacing template. Additionally experience is associated with better attainment of prediction time suggesting that less experienced runners should run with more experienced athletes with similar end-point targets. These findings have implications for understanding the potential medical risks associated with marathon running and given the primary instructions to big-city marathon runners to adopt an even pace, more work needs to be done on instructing runners how to achieve this.

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