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# 'Priming' exercise and O<sub>2</sub> uptake kinetics during treadmill running

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## Abstract

We tested the hypothesis that priming exercise would speed  $\dot{V}_{O_2}$  kinetics during treadmill running. Eight subjects completed a square-wave protocol, involving two bouts of treadmill running at 70% of the difference between the running speeds at lactate threshold (LT) and  $\dot{V}_{O_2\max}$ , separated by 6-min of walking at 4 km h<sup>-1</sup>, on two occasions. Oxygen uptake was measured breath-by-breath and subsequently modelled using non-linear regression techniques. Heart rate and blood lactate concentration were significantly elevated prior to the second exercise bout compared to the first. However,  $\dot{V}_{O_2}$  kinetics was not significantly different between the first and second exercise bouts (mean  $\pm$  S.D., phase II time constant, Bout 1: 16  $\pm$  3 s vs. Bout 2: 16  $\pm$  4 s;  $\dot{V}_{O_2}$ slow component amplitude, Bout 1: 0.24  $\pm$  0.10 L min<sup>-1</sup> vs. Bout 2: 0.20  $\pm$  0.12 L min<sup>-1</sup>; mean response time, Bout 1: 34  $\pm$  4 s vs. Bout 2: 34  $\pm$  6 s;  $P > 0.05$  for all comparisons). These results indicate that, contrary to previous findings with other exercise modalities, priming exercise does not alter  $\dot{V}_{O_2}$  kinetics during high-intensity treadmill running, at least in physically active young subjects. We speculate that the relatively fast  $\dot{V}_{O_2}$  kinetics and the relatively small  $\dot{V}_{O_2}$ slow component in the control ('un-primed') condition negated any enhancement of  $\dot{V}_{O_2}$  kinetics by priming exercise in this exercise modality.

**Keywords:**  $\dot{V}_{O_2}$  dynamics;  $\dot{V}_{O_2}$ slow component; Phase II time constant; Exercise modality; O<sub>2</sub> deficit; Warm-up