Sport Science

Is Running Economy an Emergent Property of Footwear-Driven Tuning of the Runner's Stride

Abstract

Running economy, defined as the energy cost of running at a given velocity, is improved in so-called "super shoes" compared with traditional footwear. Yet the biomechanical mechanisms underpinning these savings remain elusive. Traditional approaches often reduce the problem to discrete variables, but this risks overlooking how economy may emerge from the complex dynamics between the runner and footwear. The presentation considers how footwear might influence running economy through step biomechanics, and whether such effects could be interactive or additive. Preliminary data will be presented on how footwear affects step frequency–energy cost relationships, with attention to the processes through which differences arise. The conclusion encourages practitioners and researchers to reflect on whether the outputs we measure in sport and exercise science are more complex, and more context-dependent, than they first appear.

Mark Connick

Biography

Mark Connick is a postdoctoral researcher at QUT with expertise in sciences that underpin human physical performance. Combining knowledge and experience in computer science, wearable technologies, biomechanics and physiology, his work aims to understand the mechanisms of performance in team and individual sports. Mark has a developing research focus in sporting equipment and has provided expert reports and advice to World Athletics on the use of prosthetics and running shoes in competition. He has been an expert witness at the Court of Arbitration for Sport on the same topic. He has obtained industry, not-for-profit and philanthropic funding and his experience includes working on research projects funded by the International Paralympic Committee, Australian Institute of Sport, Queensland Academy of Sport, and Swimming Australia.