

Commentary on *Intervals, Thresholds, and Long Slow Distance: the Role of Intensity and Duration in Endurance Training*

Stephen A Ingham

Sportscience 13, 54, 2009 (sportsci.org/2009/sai.htm)

Physiology, English Institute of Sport, Loughborough University, Leicestershire, LE11 3TU, United Kingdom. [Email](mailto:).

[Reprint pdf](#) · [Reprint doc](#)

The origin of our species is probably based upon a hunter-gatherer primate that has evolved adaptive mechanisms to cope with phasic demands for improving functional energetic capability. Whilst the training of the human body may one day be facilitated by molecular exercise physiology, for now we are beholden upon observation of gross markers to measure performance change.

Elite athletes are different from the general population. Further, the current level and volume of research on elite athletes does not provide the evidence base for how they should prepare. Controlled trials in the laboratory on elite athletes are often not possible, so there is a need either for such studies that accurately simulate high performance programs or for longitudinal measurements on high performance athletes training for competition. The [current paper](#) outlines the disparity between the methods used in training athletes capable of stepping onto a world or Olympic podium and how the training literature is often interpreted.

Most of the time an experienced and successful coach will draw their knowledge and inspiration from experience in the sport, not research. In the current paper Stephen Seiler and Espen Tønnessen talk of these coaching methods developing *like* Darwinian selection. Whilst we are not dealing with the opportunity to pass on one's genes, there is a tangible and forceful gravitation towards methods that are intolerant of failure. As Darwin put it: "Natural selection is daily and hourly scrutinizing, throughout the world, the slightest variations; rejecting those that are bad, preserving and adding up all that are good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being in relation to its organic and inorganic conditions of life." The parallels with the coaching journey are clear. These are the lessons that a coach and athlete experience on a

day-to-day step-by-step basis.

But just as vestiges reside in species, high performance training programs contain residual imperfections. The current paper highlights, in my opinion, the most common mistake: the accuracy of training execution. Specifically, this paper supports my own observation that for endurance athletes (particularly middle-distance), low-intensity training is performed too high whilst high-intensity training is performed too low. I surmise that the latter is a product of the former. The case studies illustrate the effects of including higher volumes of accurately performed low-intensity training. It is not clear whether low-intensity training is more effective than high intensity training or whether low-intensity work simply allows more rapid recovery and preserves high intensity systems for performance of high-end work.

When working with middle and long distance athletes, this bunching of intensities on the plot of percentage of training time vs intensity is the first thing I look for when establishing a profile and understanding of ways in which preparation and performance can be improved. Further, there is a tendency for sports physiologists to prescribe types of sessions to an athlete with inadequate knowledge of the athlete's program or how it is performed.

In short the current article fully describes the dichotomy between the majority of scientific training studies, their interpretation and application versus the actual content of high performance training. Seiler's group should be applauded for their presentation of the reality of high performance training programs to the world of empirical observation. Why? Because as Darwin said himself, "There is grandeur in this view of life".

[Back to article/homepage](#)

Published Nov 2009

©2009