

# Cycling performance: What is it and how big is it?

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Thanks to the sterling work of the editorial board and the expert reviewers, the second issue of the *Journal of Science and Cycling* is here!

In this issue, there is quite a broad selection of papers. Some authors describe the differences in performance between various samples of athletes. For example, Jürgens et al. (2012) analyzed the participation and performance by nationality in an Ironman Triathlon, and show that there was improvement in performance between 1995 and 2011. From the regression slope presented in their Figure 4, it can be estimated that the improvement in performance during this time period was less than 10%. This raises the eternal, yet tricky, question of what magnitude of performance difference or change actually is practically significant for cycling and triathlon research.

Driller et al. (2012) studied the reliability of a 30-min performance test on the Lode ergometer. In agreement with other past studies, the coefficients of variation for the power output outcomes were very small compared with those for physiological responses. This raises another crucial question for cycling scientists of which is the most appropriate outcome to choose in our research. There are now so many, sometimes complicated, approaches to indicating cycling performance, yet researchers much balance how externally valid a measure is compared with the inherent noise there is in its measurement.

I am always interested in whether bioscience and medical approaches to research can translate to cycling performance research. For example, researchers interested in human hypertension have selected their primary outcomes of systolic and diastolic blood pressure and these are relatively easy to measure. Through years of research and round-table discussions, these researchers have also selected minimal values for measurement error and the magnitude of blood pressure change which is predicted to alter health status or the risk of future disease.

In cycling research, there are many great studies in which the selection of a primary outcome, which in my view this has to be related to power output, has been clearly-rationalized, based on its application to real world competitions and its measurement error. It is also best practice to at least discuss, but preferably decide, whether the observed differences or changes in study outcomes are actually practically significant. This process encourages researchers to select a minimally

worthwhile difference in performance. I encourage all potential authors of the *Journal of Science and Cycling* to think about these important components of applied research, i.e. relevance, measurement error and practical significance of their study outcomes.

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