How Can We Make Research More Relevant for Sport Practice?

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Sport scientists tend to design studies in which varying training forms, methods, or session models are regarded as competitive and contrasting, and countless publications have concluded that approach A is more effective than B. For example, the search term “interval vs. continuous exercise” generates more than 700 results in PubMed (per May 2024). Other similar comparisons and research questions have remained the subject of considerable debate: What is most effective of polarized versus pyramidial endurance-training intensity distribution? Altitude versus sea-level endurance training? Traditional versus block periodization? Early versus late specialization? Resisted versus unresisted sprint training? While these studies provide important understanding of underlying mechanisms, sport scientists often end up with definitive conclusions and practical applications in favor of one approach. In contrast, leading practitioners consider most of the above-mentioned features as complementary tools that can be employed when necessary. Indeed, elite endurance athletes typically apply both interval and continuous exercise, polarized and pyramidial intensity distribution, traditional and block periodization, and perform training both at altitude and sea level.\(^1,2\) Similarly, high-level sprinters perform both resisted and unresisted sprinting,\(^3\) and both early and late specialization have produced world-leading athletes.\(^4\)

There is no scientific evidence supporting the claim that a certain type of training is superior to all others, especially not when discussing athletes’ long-term development. Numerous studies of world-leading athletes have shown that success was achieved through complex combinations of training forms, methods, and session models. Unfortunately, misleading interpretations of short-term studies with a 1-dimensional research design have many times led to conclusions that are in direct contrast with results-proven practice, leading uncritical coaches and athletes into blind alleys. It is therefore pivotal that readers and listeners of training-related debates be aware of these possible differences in mindset between scientists and practitioners. In addition, we need scientists who provide complementary information by investigating the holistic and complex long-term development process of athletes.

Coaches and athletes aim to enhance performance. Performance in sport is determined by a complex interaction of numerous underlying variables that require various stimuli. Application of fundamental training principles, training forms, and training methods and manipulation of loading factors constitute the cornerstones of most training philosophies. Coaches apply a holistic and athlete-centered approach wherein planning and execution of training take individual predispositions and environmental factors into account.\(^5\) Through trial and error, they possess in-depth knowledge related to what kind of training should be performed at a given time or situation for each particular athlete, without necessarily possessing in-depth knowledge regarding the underlying mechanisms.

Academic sport scientists, on the other hand, are generally concerned with research projects and publishing papers. Most researchers study isolated variables under highly standardized settings to ensure internal validity. Within this context, there is limited or no room for application of fundamental training principles such as individualization and variation, and most scientific interventions are funded on a “one-size-fits-all” approach. Over the years, sport scientists have been criticized by practitioners for paying more attention to the underlying mechanisms than the sport-specific demands and practical applications to achieve improvements. For example, numerous studies have explored the physiological determinants and responses of repeated-sprint exercise in team-sport athletes, although the applied test protocols have not necessarily reflected the demands of the game.

Indeed, differences in mindsets largely explain the gap between science and best practice. To decrease this gap, modifications must be undertaken by both sides. Sport scientists must also explore research problems that to a larger degree aim to describe and understand best practice, including more multidimensional research designs and study cohorts that more closely resemble real-life situations. In addition, we need more scientists who provide complementary information by investigating athletes’ holistic and complex long-term development process. Leading practitioners, on the other hand, must challenge scientists on research questions in terms of what training concepts are both effective and sustainable from a longitudinal perspective. This approach requires well-educated coaches who can relate to and interpret scientific papers. Practitioners must also make themselves more available as study participants through the life cycle of a project. This does not necessarily have to involve time-consuming interventions that contradict with individually tailored and optimized training. In our most recent research project, our team used world-leading coaches as key informants, involving questionnaires of training characteristics, quality assurance of data through cross-referencing with historically reported training logs from some of their most successful athletes, in-depth and semistructured interviews to obtain supplementary information related to the qualitative aspects of training, and an extensive review process and follow-up interviews to clarify and ensure that our findings reflected the coaches’ perspectives.\(^5,6\) Other sport scientists and leading practitioners are hereby encouraged to journey along the same route, in accordance with the editorial mission of IJSPP.

References


