

## Comment on Passfield et al: Validity of the Training-Load Concept

A recent review by Passfield et al<sup>1</sup> critiqued the validity of the training load concept. They raise several interesting issues, many of which we agree with and have previously voiced.<sup>2</sup> However, we contend that they did not criticize the concept of training load, as reported in their title and affirmed in various sentences of the article, but rather the *metrics* used to quantify training load. Training load is a higher-order, multidimensional construct that is not directly measurable but can be quantified in various ways according to how it is operationalized. For this reason, there can be no single “gold standard” criterion measure.<sup>3</sup> Training load is the amount of physical training done or experienced by athletes.<sup>3,4</sup> Internal and external training load are subdimensions of training load—each also a multidimensional construct—and can be operationalized to permit the use of measures as indicators of the construct(s).<sup>3</sup> Questioning training load as a construct would require questioning its conceptualization, not the measures (operationalization of the construct).

In response to concerns that some measures of training load are not representative of training dose (which contrasts existing evidence<sup>5,6</sup>), Passfield et al<sup>1</sup> propose that “one way to conceptualize a session’s training dose is by its immediate effect on subsequent performance” (referred to as acute performance decrement [APD]). A training effect is a *consequence* of the dose, among many other factors, and it is therefore not the dose itself.<sup>4</sup> Training load (dose) and APD may be highly related in many situations, but they are distinctly different constructs. Identifying this dose–response relationship can support the validity of training load measures, but the opposite does not necessarily invalidate the measure. The absence of a dose–response association may be due to other factors, such as APD not reflecting all the mechanisms of training effects, or inappropriate modeling of the two constructs. Whether the APD can be useful to “conceptualize” training load needs to be presented in relation to relevant outcomes of the training process. This link was not presented or explained.

The APD is likely the consequence of fatigue at different levels, including neuromuscular and mental. The latter may explain the association with NASA Task Load. The NASA Task Load, however, is a multidimensional subjective experience of “workload” (task) according to 6 domains: mental demands, physical demands, temporal demands, performance, effort, and frustration level. The construct measured is unquestionably different to training load (dose). The relation between the various training load measures and APD may be interesting to understand the effects of fatigue but has nothing to do with the validity of the training load construct.

We commend Passfield et al<sup>1</sup> for adding important discussion points to the topic of training load, but we argue, within a normal scientific debate, that they did not (1) challenge the concept of training load, (2) show the lack of validity of common measure

of training load, (3) show the validity of APD as training load criterion, and (4) show the validity of NASA Task Load to quantify training load.

Shaun J. McLaren, Newcastle Falcons Rugby Club, Newcastle upon Tyne, United Kingdom, and Department of Sport and Exercise Sciences, Durham University, Durham, United Kingdom

Tzllil Shushan, School of Health Sciences, Western Sydney University, Sydney, NSW, Australia

Christoph Schneider, Department of Training and Exercise Science, Faculty of Sport Science, Ruhr University Bochum, Bochum, Germany, and Department of Cardiology and Angiology, Contilia Heart and Vascular Center, Essen, Germany

Patrick Ward, Seattle Seahawks, Seattle, WA, USA

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