

Performance Beyond Podiums, Performance Across the Lifespan

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In sport science, performance is commonly quantified through measurable outcomes such as time, distance, power, or ranking. Much of the work published in the *International Journal of Sports Physiology and Performance* (IJSPP) appropriately aims to understand determinants of competitive success in trained athletes, often within contexts that allow rigorous monitoring, testing, and evaluation of training interventions. Contributions published in IJSPP have been, and continue to be, essential for informing evidence-based training strategies and for disseminating high-quality applied research that strengthens the knowledge used by researchers and practitioners to support performance. In sport science research, performance is often operationalized as maximal output achieved in standardized competitive settings and most examined in young-adult, able-bodied, highly trained participants, which is highly informative for many applied questions but not necessarily representative of all performance contexts. With this definition, interpretation becomes strongly dependent on how closely the reader's context matches the study context. Findings from specific cohorts may be extended to athletes of different ages, to athletes with different constraints, or to settings where performance is also expressed as sustaining function, participation, and progression. For this reason, clarity about who was studied and what "performance" represents in that setting becomes particularly important.

Elite sport offers several examples that help illustrate this point. Equestrian events, for instance, have included riders in their mid-fifties to mid-sixties competing in the Olympic Games, although performance outcomes reflect a combined human-horse system and therefore should be carefully interpreted, keeping in mind the determinants of the specific discipline. For this reason, it is useful to also consider examples from other Olympic sports with different physiological and technical profiles. At the recent Milano Cortina 2026 Winter Games, besides having the oldest (46 yrs old) female alpine skier to compete at the Olympic Games, three 35-year-old female Italian athletes won gold in speed skating, alpine skiing, and short-track. These cases are not intended to suggest that age is irrelevant. Rather, they highlight that performance can be maintained and, in some contexts, optimized at ages that are not always reflected in the typically studied profiles, with practical consequences for research design and translation, particularly when we move from a group average effect to decisions made for an individual athlete with a specific age, history, and constraints.¹

Outside the Olympic setting, the same theme becomes even more evident when we consider how performance is expressed across

lifespan. In older age, sport is not only "exercise for health", but a specific form of exercise in which fitness components are maintained and developed through training and competition. For many master athletes, performance is expressed through continuing to compete and setting goals over time, often supported by social interaction and a sense of achievement. In these contexts, performance is reflected in the maintenance of capacity and durability, with adaptation and training tolerance developing over longer time scales. A similar need for contextual clarity applies in para-sport where athletes with disabilities perform within interactions between physiological capacity, functional constraints, assistive technology, and sport-specific classification systems. In this setting, what performance represents, and how it should be measured and compared, depends on how well these elements are described, in the same way that we report training load, testing conditions, and competition context in other areas of sport science. The same principle applies in youth sport where competition results can be reported as outcomes, but they are often discussed alongside development, learning, and the ability to progress training over time. Therefore, short-term results can be strongly influenced by growth, maturation, and experience, and they may not predict how outcomes will evolve in later stages.

Overall, these examples suggest that performance is best interpreted in relation to the setting in which it is expressed. What we label as "performance" is typically an outcome that reflects an individual's function at a given point in time under a specific set of demands and constraints. Those constraints may relate to biological age, training history, functional capacity, competition structure, or objectives, and they shape both what can be achieved and what should be measured, also over the lifespan. In practical terms, the way performance is operationalized determines what the findings tell us. Being explicit about what "performance" represents in a study, and about the setting to which the findings are most relevant, helps prevent conclusions from being extended beyond their natural boundaries and supports more appropriate translation into practice, particularly when the applied setting differs from the study setting.² High-performance sport will remain central to IJSPP, and clearer definitions of performance and applicability can support more appropriate translation into practice.

References

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