Sport Science

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IDS 300W: Interdisciplinary Theories and Concepts

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Abstract

Sports science isn't just about weight and running anymore. It has grown up, and it's multidisciplinary, with people studying body biology and brain and social science all working together to support performance and health. This paper outlines how these different experts collaborate and how gender, new technologies, and teamwork among experts are essential. We discovered that to solve a significant problem such as reducing injuries, we must go outside one discipline and address the whole person. This is also related to the requirement of understanding the differences in how to train athletes based on gender. Ultimately, the best sports scientists are the ones who are experts in their own area of study but also understand how to connect and communicate with others across this multidisciplinary field of research and study.

Sports science has expanded from exercise science to a interdisciplinary and multidisciplinary mix of biology, emotions and sociology all geared at achieving the best performance outcomes. As the stakes in professional sport have never been higher, organisations are looking for player support solutions that are rooted in evidence (Mason, 2025). Such a finding implies that practitioners can no longer work in their own bubble; they must be some type of interactive engagement. The point is that performance is impacted by a number of factors, from the gender of the player to the settings in which they play.

Sports science is the ultimate blending of sciences to help people perform, exercise and stay active (American Public University, 2025). It's a merging of fields that look at the human body in a physical, mechanical, psychological, and nutritional way. Where traditional exercise science focuses on how the body responds to stress in a general way, applied sport science looks at how to make body-specific changes to achieve better outcomes with respect to actual physical performance (Mason, 2025).

This field of study is beneficial to trainers because it helps them create personalized programs for every athlete. For example, studying an athlete's throwing motion through math and biomechanics may improve those specific athletic skills (American Public University, 2025). Yet, as Padulo (2025) notes, things are changing, and rapidly, due to the tools available these days. Smart devices and real-time applications allow for "precision tracking" of athletic performance. It's not just step counts that devices are tracking these days. Blood glucose levels, sleep cycles and more are all being tracked, and this gives trainers and physiologists an in depth view of what's going on in an athlete.

One of the biggest changes in sports is how all the different professionals are collaborating more and more. Hausken Sutter (2021) reports that topics like the mechanisms of injury are too complex for one person to fully understand. Complex systems theory has been applied, and this means that scientists now view injuries as chaotic processes, in which many variables, such as movements of the body, interactions with the environment, and personal stressors all play together in unpredictable ways.

Because of this complexity, there is a Human Performance Team in that all professionals have different teams with a body expert, nutritional expert, and mental expert all working under one lead to ensure everyone has the same goal (Mason, 2025). The biggest change has been the shift from closely working in professional teams to being truly interdisciplinary. Working together allows professionals to draw the connections between the athlete's muscles being fatigued, their mind not being confident, and what they are eating (Hausken Sutter, 2021).

An often-overlooked consideration of this interdisciplinary study is thinking about genders and individual considerations. Padulo (2025) explains how we must think of things like age, socioeconomic class, and gender when we plan a training program. Gender studies in the sports sciences ensure that training and mental health are suited to every unique individual.

For example, exercise and recovery from exercise or injuries are probably entirely different for male and female athletes alone due to hormones and how their bones and muscles are structured. Furthermore, gendered social perceptions could also play a role in how an athlete perceives training or recovering from an injury (Hausken Sutter, 2021). If we train future sports scientists in gender studies, then there won't be a one size fits all approach to the needs of

athletes. Inclusivity here is not just the right thing to do, but the scientific thing to do if we want to keep everyone, from professionals to the elderly, healthy and strong (Padulo, 2025).

Artificial Intelligence (AI) and machine learning is the latest development in the field of sports science. Injury prediction and personalized training plans are already being developed (Padulo, 2025). The growth of big data in sport brings with it heavy privacy and fairness concerns, however. Practitioners should ensure that performance data is not the limited property of wealthy teams.

This combined approach has only recently started to include mental wellbeing as an important performance factor. Sport psychologists are now integrated into the team rather than sitting on the sidelines, helping athletes to reduce stress and develop mental toughness to avoid burnout (Mason, 2025). This wider approach makes allowance for the emotional and mental aspects of athletes as well as the physical (Padulo, 2025).

The new domain of sports science has cemented a collaborative approach of simple techniques with a full view of people. By adding body science, mind science, and gender science, practitioners are better equipped to help athletes these days. The collaborative journey to the T shaped practitioner presents a broader outlook to address complicated problems like performance and injury management. As technology improves, the field will need to pay attention to equity and inclusion to better serve diverse athletes across the globe, presently, and in the future.

References

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