

Understanding the role of the sport scientist in football: beyond data, the latest paper and the colourful dashboard

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Headline

Football clubs increasingly hire someone to lead a performance department, yet the role is often reduced to downloading GPS files and building dashboards. In this opinion piece I argue that the sport scientist should be a sport and training professional who masters science, not a data analyst who happens to work in sport. The value of the role lies in the quality of the decisions it supports and in its medium- and long-term contribution to the club.

Aim of the paper

To discuss what the role of the sport scientist in football should be, drawing on the literature and on our own applied research, and to propose practical principles for clubs, practitioners and educators.

Discussion

From “the physiologist” to the sport scientist

In recent years, football clubs have started to hire someone to lead a performance department, under titles such as head of performance or, simply, sport science. In Europe this role is part of almost every club. In South America it is established in the big clubs and is slowly finding its way into the rest. For a long time, however, this person was simply called “the physiologist”, meaning whoever measured, tested and handed numbers to the coaching staff. That label was never accurate. An exercise physiologist focuses on physiological responses and adaptations to exercise, and operating a gas analyser does not make anyone a physiologist. It requires understanding mechanisms, choosing protocols, controlling data quality and translating results into training. The sport scientist is a broader figure, whose task is to integrate several scientific areas applied to performance (1), from load monitoring and force–time testing to wellness, body composition, statistics and data visualisation. A physiologist may be part of that structure, but is not its synonym. In smaller clubs one person often wears several of these hats, which is fine as long as they know which one they are wearing.

Beyond the GPS and the dashboard

Being a sport scientist is not about handling GPS units or building Power BI dashboards. There is a big difference between operating a tool and understanding the phenomenon that the tool tries to capture. Buchheit and Laursen described how the technology era brought valuable tools but also data collection for its own sake, and called for integrating technology with foundational training knowledge (2). Dashboards full of colours and traffic lights give a reassuring sense of control, but a red light means little if nobody knows why it is red, how reliable the variable behind it is, or what to change in

training. A coach rarely needs twenty graphs. They need a clear, timely and well-founded answer, for example whether a player can train at maximal intensity today.

Coming from sport

This is why I believe the sport scientist should come from sport and training. Having coached, planned and made mistakes in a prescription, having been in the dressing room, on the pitch day after day and in pre-match training camps with the team, is what allows us to recognise when a number is signal and when it is noise, and what a coach can realistically change on a Thursday before a match. On that practical base, academic training is needed to interpret and analyse with rigour. The same applies to evidence. Being up to date is not having read the latest paper or social media post, but knowing under which conditions a study was conducted and whether they resemble our team (2,3). The same goes for training models. From classical and block periodisation (4) to tactical periodisation (5,6) and the structured microcycle (7), the sport scientist should know them deeply and use them according to the context, needs and possibilities of each club, rather than defend one against another.

Fatigue, individual responses and the purpose of training

We manage fatigue from many intellectual frameworks, using lactate, creatine kinase, urea, loss of force, rate of force development, power, heart rate variability and questionnaires, and yet we still do not fully understand it. Each marker captures part of the phenomenon and none explains it alone (8). The answer is not more markers, but integrating knowledge and combining laboratory data with daily information from the pitch. Athletes also respond differently to the same load (9). Training mainly produces adaptation and fatigue, and fatigue is inherent to effort, not an enemy. The real question is how we manage loads to maintain or produce adaptations that benefit performance, knowing that this balance is individual and changes across the season.

Test less, test better

Pre-season is the typical case. Everyone is tested on everything in a few days, long reports are produced, and the data are rarely used again. Testing makes sense when it tells us where the athlete starts, whether they are achieving the specific adaptations we seek and how they finish the season, and above all when it helps us prescribe. Before adding a test, I ask whether I can interpret its variables, which of them are reliable, which device and protocol are used, whether it resembles

the sporting action and whether it allows me to prescribe. In isometric hip adduction with force plates, peak force showed acceptable reliability while rate of force development variables did not (10). The same device, athlete and session yield variables that are useful and others that are noise. Popular indices such as the dynamic strength index showed moderate associations that did not survive correction for multiple comparisons (11). Individual change must be separated from measurement error, and simple free tools exist for that (12,13). Ecological tests that resemble the game are preferable, balancing specificity and reliability. Monitoring also requires distinguishing internal from external load (14) and reading GPS within the logic of the microcycle, since training and match loads do not relate linearly (15).

Injuries do not fit in a traffic light

Injuries emerge from interactions between load, injury history, fatigue, sleep, psychological factors and the environment (16), and the load-injury relationship is paradoxical (17). In our systematic review, isokinetic hamstring and quadriceps torque were consistently associated with indirect injury risk, but methodological heterogeneity limited generalisation and integration with load, fatigue and well-being was needed (18). With countermovement jump data, traditional statistics found no consistent differences between injured and non-injured players, whereas machine learning detected non-linear patterns (19). The role of the sport scientist is not to predict injuries, but to integrate medical, physiotherapy, physical and technical information so that the team can decide more prudently.

Performance is not success

Improvement must be based on measurable data, but it does not necessarily translate into results. Even within a squad, body composition and physical fitness alone did not estimate playing time (20). The work of the sport scientist should therefore not be judged by the league table. Where coaches change frequently, sport science should be the department that provides continuity, a medium- and long-term position that builds a data history, comparable testing across seasons and club knowledge that stays when a coaching staff leaves. That horizon also allows a real contribution to the academy, understanding how young players mature and respond to load on their way to the first team.

From inter- to transdisciplinary work

For years we talked about multidisciplinary teams, and in practice this often meant that each professional looked after their own patch. The doctor reported to the doctor, the fitness coach to the fitness coach, the analyst to the analyst, and the player was left in the middle, receiving messages that did not always speak to each other. Today, at best, we work in an interdisciplinary way, but football needs to move towards transdisciplinary work, building a shared intellectual framework that goes beyond each discipline (21). The sport scientist can lead this transition, not by giving orders but by articulating, translating and helping the staff think together, while accepting that the final decision belongs to the coaching staff (22). This requires humility to recognise the limits of evidence, tools and one's own knowledge, and the ability to anticipate problems before they appear.

Practical applications

- Hire sport scientists with both field experience and scientific training, and value interpretation over tool operation.

- Define the purpose of each test before running it, and keep only tests that are interpretable, reliable, close to the sporting action and useful to prescribe.
- Analyse change at the individual level, accounting for measurement error.
- Integrate load, fatigue and well-being data with daily observations from coaches and players.
- Judge the sport science department on processes and long-term development, including the academy, rather than on short-term results.
- Build a shared language and shared decision-making routines across staff to move from interdisciplinary to transdisciplinary work.

Limitations

This is an opinion piece informed by my experience in Chilean and South American football and by a selective, non-systematic reading of the literature. Several of the studies cited are our own and involved small samples of professional players. The structures and resources described may differ substantially across sports, countries and competitive levels.

AI Use Statement

Claude (Anthropic) was used to assist with structuring, condensing and translating into English the author's original Spanish manuscript. The author reviewed and edited the final text and takes full responsibility for its content.

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