What does 'elite' mean in sport and why does it matter?

Drs Alun Williams, Stephen Day, Georgina Stebbings and Robert Erskine re-open a can of worms: defining the word 'elite' in sport.

Why does defining 'elite' matter?

The word 'elite' is widely used to describe the standard of athlete in a research or support setting. One might be asked for evidence of working with elite athletes when applying for a job in scientific support. Or the method section of a research article might state the participants were elite athletes. But do we all mean the same thing? Maybe you won't get the job because your understanding of elite didn't match the (non-)employer's. Perhaps a failure to replicate research on athletes was due to different levels of 'eliteness' of the participants. So a consistent definition of elite would be helpful, but it's a real can of worms.

Which definitions of 'elite' have been used?

Authors have used world records to track elite performance over time, but also the top 10 or more performances each year. Other authors variably define elite athletes as academy or university competitors, national or international level competitors, medal winners, Olympians, professional or semi-professional, world-class, performing within some percentage of world records, experienced, training frequently or exceeding some measured physiological variable such as $\dot{V}O_2max$ (Rankinen *et al.,* 2000).

Terms like world-class or 'high performance', as favoured by BASES, (www.bases.org.uk/High-Performance-Sport-Accreditation) are alternatives to elite but still need defining. Academy and university/varsity level athletes probably don't fit common notions of eliteness. Professionalism would also need defining (income above a certain level or full-time?), but vast differences in earning potential between sports, depending on popularity and commercial support, don't make professionalism universally applicable. Neither years of experience nor training frequency correlate perfectly with success (cf. 10,000 hours debate). Moreover, $\dot{V}O_2max$ is not identical to elite endurance performance, being only one physiological component of endurance performance, itself determined by lower level components such as stroke volume, blood haemoglobin content, etc. (Joyner & Coyle, 2008).

Differences also exist between individual and team sports. Many individual sports quantify performance directly - time to travel a certain distance, etc. Team sports usually don't, so individual performance might be inferred from competitive level attained. International competition experience as evidence of an individual's elite status might be meaningful in a popular sport in a relatively large country with high international ranking (e.g. England men's and women's rugby union, both currently ranked 2nd in the world; www.worldrugby.org/rankings), but pretty meaningless in a smaller country with a low international ranking (e.g. Bahamas men's and women's rugby union). In contrast, if the sport has a well-established league structure and professionalism, then better players gravitate towards more successful teams. So participation in the highest professional league would seem more robust than international experience. Accordingly, in some of our research (RugbyGene project) we identify competitive experience in the highest competitive league of a 'Tier 1' rugby union nation as a criterion for elite athlete status (Heffernan *et al*., 2015).

Swann *et al.* (2015) recently attempted to organise the worms in this particularly full can, helpfully documenting definitions used in scientific literature for expert/elite status and proposing a framework to evaluate claims about elite status. Their framework includes five variables (competitive standard, competitive success, experience, competitiveness of sport in athlete's country and global competitiveness of sport); each allocated a score, with an accumulated score classifying eliteness. Inevitably, variables and weightings in the proposed framework are arguable, but it's a strong contribution to providing a consistent definition of elite status for further development (as the authors recommend).

Preliminary conclusions

We do not claim to end debate on this issue here - quite the opposite. However, it is pertinent to us personally now because, as members of The Athlome Project Consortium (www.athlomeconsortium.org) that includes in its aims the study of elite athlete genetics, it is critical that all consortium groups use standardised, sensible definitions of elite. Much of science is becoming highly collaborative and involves analysis of 'big data', so clear operational definitions are essential.

Our current opinions about defining 'elite' in sport include:
- Wherever possible, prioritise quantitative performance data (e.g. personal best) over variables such as international or professional status
- In the absence of quantitative performance data (e.g. most team sports), prioritise competitive experience and success in highly competitive leagues over international representation
- Use Swann *et al.*'s framework to evaluate proposed definitions, refining with empathy for the sport
- Clearly state definitions in published work, allowing the audience to judge suitability - as proposed by Dr Richard Godfrey in a predecessor of The Sport and Exercise Scientist! (Godfrey, 1998). ∎

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