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The use of relative speed thresholds in team sports: Applications for GPS analysis

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INTRODUCTION

➢ Data from global positioning system (GPS) technology are typically presented as the distances covered in specific locomotor categories (e.g., walking, jogging, striding, sprinting).
➢ Differences have been shown between absolute thresholds and thresholds relative to maximum velocity (Gabbett, 2015).
➢ However, there are two distinct methods of using relative speed thresholds currently employed in the literature, 1) a maximum velocity sprint (Vˌmax) and 2) the maximum velocity achieved during each match (Vˌpeak).
➢ The purpose of this study was to compare the differences in data when analysing the same GPS files using either Vˌmax or Vˌpeak.

METHODS

➢ There were 99 GPS files analysed from rugby union match-play and split between forwards (n=59) and backs (n=40). Observations were classified into players who played the entire game, part of the game and then combined as overall.
➢ The participants involved were part of a regional academy and had the following characteristics (age: 17.5 ± 0.7 years; stature: 183.6 ± 6.6 cm; body mass: 90.6 ± 10.6 kg).
➢ Vˌmax was established by players performing a maximum 40 m sprint, whilst Vˌpeak was defined as the maximum velocity achieved during each match.
➢ The locomotor categories were defined as walking 0-20%, jogging 20-50%, striding 50-80% and sprinting 80-100% (Duthie et al., 2006) of either Vˌmax or Vˌpeak.
➢ The thresholds for small, moderate, large, and very large standardized changes (Cohen d) were 0.2, 0.6, 1.2, and 2.0, respectively. Magnitude based inferences were assessed as 25-75%, possibly; 75-95% likely; 95-99.5% very likely; >99.5%, almost certainly. Where the 90% confidence interval crossed both boundaries of the smallest worthwhile change (d ± 0.2), the magnitude of change was described as unclear.

RESULTS

➢ The differences between Vˌpeak and Vˌmax for walking, jogging, striding and sprinting are displayed in Figure 1.
➢ The mean Vˌmax and Vˌpeak for all players were 8.7 ± 0.6 and 7.2 ± 0.9 m.s⁻¹, respectively.

CONCLUSIONS

➢ The use of Vˌpeak seems to overestimate the distance covered in striding and sprinting whilst underestimating walking distance when compared to Vˌmax. Jogging also tended to be underestimated but there were several unclear results.
➢ Practitioners should look to use Vˌmax for relative speed thresholds as Vˌpeak from match-play is likely to change from match-to-match and consequently misrepresent the locomotor demands that players are exposed to.

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