

DEVELOPMENT OF A MULTIDIRECTIONAL SOCCER-SPECIFIC FIELD TEST OF REPEATED SPRINT ABILITY: VALIDITY AND RELIABILITY

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Repeated sprint ability (RSA) is fundamental to performance in the critical periods of multi-sprint team sports. Most RSA protocols involve unidirectional running and neglect the multidirectional nature of a sport like soccer. Only the test proposed by Bangsbo (1994) incorporates a multidirectional component and an active recovery. This study sought to examine the validity and reliability of this protocol. Criterion validity was evaluated by comparing results with performance in the Maximal Anaerobic Running Test (MART). Reliability and learning were evaluated using a multiple trials design.

Seven male games players, aged 19-32 years, performed the soccer-specific field test (SSFT) six times subsequent to a familiarisation session. The protocol consisted of seven maximal sprints over a distance of 34.2 metres, separated by 25 seconds of active recovery (Figure 1). The timing system recorded the time taken between the illumination of a light emitting diode (LED) and the breaking of the light beam at each gate. A right or left turn was randomly assigned to each sprint to increase ecological validity; the direction of which was indicated to the subject by the use of a right or left LED. Subjects performed the MART twice following a familiarisation session. Mean sprint time was analysed using a repeated measures ANOVA and a Tukey post hoc test where appropriate. Mean Coefficient of Variation (CV) was calculated using a two-way analysis of variance on the log-transformed variable (Hopkins et al. 1999). The strength of the relationship between SSFT and MART performance was established using a Pearson's product moment correlation coefficient.

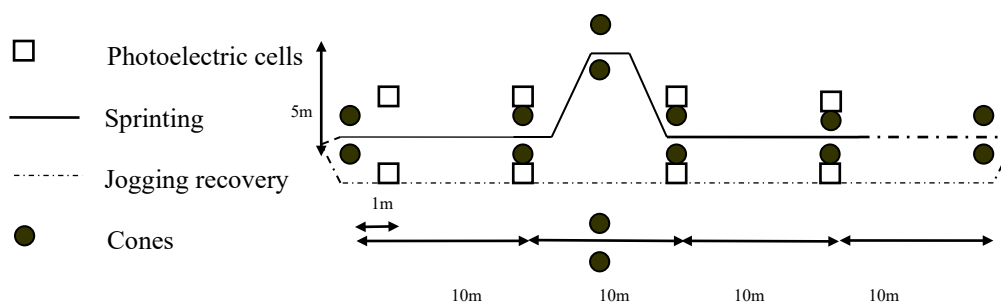


Figure 1 - Schematic representation of soccer-specific field test.

The average mean sprint time across all subjects and all trials was 7.664 ± 0.29 s. A within-subject mean coefficient of variation of 1.8% (95% CI, 1.5 to 2.4) was found for performance in SSFT across all six trials. Repeated measures ANOVA and a Tukey post hoc test established a significant difference ($p < 0.05$) between the mean of trial 1 and trials 3,4,5 and 6, as well as between the mean of trial 2 and trial 5. A variance ratio (VR) of 0.5689 was found for trials 1-3, compared to a VR of 0.2383 for trials 4-6. Mean sprint time in the SSFT and total running time in the MART had a correlation coefficient of $r = -0.298$ ($p = 0.516$).

Variability of performance, which was low throughout all trials, decreased with increased familiarisation; the majority of the learning effect appeared to have been overcome by trial three. The weak correlation between the SSFT and the MART possibly reflects the difference in the energetics of the two tests. In conclusion, the soccer-specific field test possesses strong logical and ecological validity, but until a “gold standard” laboratory test is devised that is shown to measure RSA, then criterion validity cannot be established. Furthermore, in assessing the reliability of newly devised field tests, a rigorous longitudinal model is advised, that includes the calculation of a mean coefficient of variation.

REFERENCES

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