WHAT TYPE OF RATING SCALE IS MORE ACCURATE FOR VISUALLY ESTIMATING RELEVANT BIOMECHANICAL VARIABLES OF THE SOCCER KICK?
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Introduction
Different types of rating scales have been developed to guide the qualitative analysis of sports technique and improve rating accuracy (Morrow et al., 2000). However, there is lack of research regarding what type of scale is more accurate for sports-specific biomechanical variables and previous studies (e.g., Genaidy et al., 1993; Morrison et al., 2005) suggest that rating accuracy is influenced by scale effects, such as proximity of the estimated value to the end of the scale. Thus, this study aimed to assess 1- what type of scale is more accurate for the rating of biomechanical variables of the soccer kick and 2- whether rating accuracy is influenced by scale effects.

Methods
A group of 327 novice raters (182 male and 145 female; mean ± SD age = 19.2 ± 0.24 years) rated the soccer kick technique of 32 school children (mean ± SD age = 8.5 ± 2.25 years) using 4 different types of rating scale (analogue, numerical analogue, Likert and numerical Likert). Seven variables were rated from video recordings of the children’s performance: 1 – speed of approach, 2 – length of last step and 3 – support foot position, from the approach phase; 4 – angle of maximum knee flexion, from the back swing phase; 5 – angle of maximum trunk flexion, 6 – angle of ball release and 7 – angle of maximum hip flexion, from the follow through phase. The difference between visual ratings and objective digitised values was measured to the nearest millimetre on the scales using a ruler to calculate absolute estimation error (EE). The scale range was divided into intervals of equal length (e.g., low, middle, high angular range) to assess scale effects. Two-way ANOVAs (scale type x scale interval; p < .01), L statistic, and Scheffé post-hoc tests were used to assess differences in rating accuracy between scale types and between scale intervals.

Results
The differences in EE between scale types were significant for Angle of maximum hip flexion (L(3,592) = 16.78; p < .001) and nearly significant for Length of last step (L(3,605) = 6.82; p < .02), but were non-significant for the other variables. The differences in EE between scale intervals were significant for all variables.

Discussion/Conclusion
Compared to the plain analogue type, numerical and Likert scale designs afforded subtle reductions in EE. Rating accuracy improved when the values were close to the end of the scale, in agreement with Genaidy et al. (1993), and also near to the vertical and horizontal references of measure. The findings can be used to optimize scale design and promote an awareness of the influence of scale effects on rating accuracy. Further studies may assess whether such awareness yields increased accuracy in novices.

References

Keywords: Soccer, Accuracy/Consistency, Biomechanics