

# **The validity and reliability of an established series of Badminton-specific field tests**

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## **Introduction**

Establishing the reliability and validity of fitness assessments is important if test results are used effectively. Measures of reliability describe how consistent the results are from a procedure. If a fitness test is valid, then it is an appropriate method for the evaluation of that specific fitness component. The present study investigated the reliability and validity of Badminton England's junior testing programme. Throughout the past 15 years Badminton England has administered twice-yearly fitness assessment on their junior national squad players. This comprehensive set of data comprises results from around 220 juniors, 27 of whom have gone on to become senior internationals, so the programme now represents a valuable resource on the development of badminton fitness and is used to guide training and preparation for English junior players. Tests for power and movement speed are included in the testing programme and the purpose of this study is to report the reliability and validity of these procedures in the assessment on Badminton-specific fitness.

## **Methods**

The fitness test procedures used in this study were identical to those used by Badminton England and in some cases historical data were used in the analysis. New data on movement speed tests were performed on a group of Italian junior national squad players. These players were previously inexperienced in the speed tests and so were used in the assessment of reliability. Similarly, because England players are ranked more highly than their Italian equivalents, comparisons between the players of the two nations were performed to address the validity of the speed tests. Additionally, data from English junior players who have gone on to become senior internationals were compared with their less-successful counterparts to determine validity of the speed and power tests.

Leg power was evaluated using simple jump tests (vertical jump and standing long jump). Movement speed was assessed using tests developed based on typical training drills. Specifically, 'general speed' was assessed with players making ten lateral movements across a court and 'agility' was assessed with a Badminton-specific drill. Reliability was quantified using intra-class correlation coefficient (ICC) and coefficient of variation (CV) and differences between groups of players were assessed for validity using independent t-tests.

## **Results**

The reliability of the speed test procedures was very good, with ICC values ranging from 0.96 to 1.00 and CV all below 2%. Furthermore, when the three trials of the reliability study were examined separately, it appears that there was no evidence of a learning effect between the first, second and third trials.

By comparing Italian players with English players who were matched for gender, age and height, it is evident that the players from the higher-ranked nation (i.e., England) performed the speed tests significantly better than those from the lower ranked country. This observation was seen in both the general speed test ( $14.5 \pm 0.7$  vs.  $15.4 \pm 1.0$  s) and agility test ( $11.9 \pm 0.9$  vs.  $12.8 \pm 1.0$  s; England vs Italy, respectively). Additionally, English juniors who went on to achieve senior international recognition (i.e., 'future elite') achieved superior results for both speed tests (males and female players) and jump tests (females only) compared to their less successful peers.

### **Conclusions**

These findings support the use of the English junior fitness testing programme as demonstrated by the high levels of reliability and validity reported here. Provided that players and test administrators are appropriately prepared the procedures and data from the English junior testing programme may be a valuable resource in helping to guide fitness development in junior players from all nations.