



## **CONSTRUCTION OF PLAYING ABILITY IN HOCKEY**

**Dr. K. John Bosco**

Assistant Professor, H.H The Rajah's College, Pudukkottai,  
Tamilnadu

### **Abstract:**

*Among different games and sports, field Hockey is a fast outdoor game. It is an accepted fact that Hockey is one of the most popular participation games around the world. Day by day the nature of the game changes its structure. The purpose of this study was to construct a skill test battery in Hockey. To achieve this purpose initially thirteen skill tests were designed by the investigators. A pilot study was conducted with thirty subjects, after analyzing the various factors, seven test items were finalised by keen observation and consultation with the experts. The seven skill test items were administered to ninety six college level Hockey players from affiliated colleges of Alagappa University, Karaikudi, Tamil Nadu, whose age ranged from 18 to 25 years. To find out the validity simple correlation was employed. Further stepwise multiple regressions were used for validating the test battery and to arrive the final test battery. The selected seven skill test items have shown sufficient reliability, objectivity and validity but only the following three test items namely Straight Hit, Flick and Speed dodge were part of the final test battery.*

**Key Words:** Construction, Objectivity, Reliability, Validity & Hockey

### **Introduction:**

Many sports skills tests are described in the professional literature. Some of these tests are valid and reliable others are not. No attempt is made in this project to describe all good sports skill tests, but a very adequate sampling is provided. Unless indicated otherwise, the described tests may be administered to male and females. Collins and Hodges (1978), describe 103 tests for twenty- six sports. Their comprehensive guide is an excellent source for skills tests.

Construction of tests is one of the most important phases of measurement and evaluation programmes. If poor tests are selected or constructed the evaluation programme will inevitably be very weak as well. Since a test cannot be considered valid unless it possesses suitable reliability. Once validity and reliability have been satisfied, the administrative usability is the next focus of attention with objectivity. In physical tests, the practice of having students paired off and scoring the performance of the partner is quite common, and in these setting, objectivity of the scores assumes greater importance than for a written test that is to be scored only by the teacher with a key. Sports skill test are designed to measure the basic skills used in the playing of a specific sport. Because of the wide range of skills in most sports, a selection of the most important skill is invariably necessary. The selection is usually based keeping in mind the literature available, opinion of experts as well as by applying appropriate statistical techniques. The skill test items are collectively called as skill test battery. The skill test helps the students to evaluate their performance in the fundamental skills the game and to provide an incentive for improvement.

Field Hockey is a field invasive sport in which players compete at the same field of action as their opponents (Hughes and Barlett, 2002). To obtain expert status in Field Hockey, players must excel in no less than four domains: physiological, technical, tactical, and psychological. (Ghosh, et al., 1991; Reilly and Borrie, 1992). Specific for Field Hockey is the intermittent running, e.g. the alternation of accelerating and

decelerating, and the many changes of direction while sprinting (Patel, et al., 2002; Spencer et al., 2004). Dureha & Mehrotra (2003) found that very limited number of experiments have been made in testing individual skills. Keeping this objective in mind the investigator attempted to construct the skill test battery in field Hockey.

**Materials and Methods:**

The purpose of this study was to construct a skill test battery in Hockey. To achieve this purpose initially thirteen skill tests were designed by the investigators. A pilot study was conducted with thirty subjects, after analyzing the various factors, seven test items were finalised by keen observation and consultation with the experts. The seven skill test items were administered to ninety six college level Hockey players from affiliated colleges of Alagappa University, Karaikudi, Tamil Nadu, whose age ranged from 18 to 25 years. The instructions and a demonstration of the test items were given properly to avoid any vagueness of the test. A good skill test possesses a high validity, objectivity and reliability. To find out the objectivity, reliability and validity simple correlation was employed. Further stepwise multiple regressions was used for validating the test battery and to arrive the final test battery.

**Objectivity of the Test Items:**

According to Barrow & McGee (1979) objectivity is a measure of the worth of the scores and is inherent in the test. Objectivity is enhanced by clear test directions, precise scoring methods, and adherence to them. These precautions were taken in the construction and administration of this test.

Table 1: Correlation Coefficients for All the Test Items

S.No	Test items	Co-efficient of Correlation 'R'
1	Straight Hit	0.91*
2	Right Leg Leading Hit	0.82*
3	Edge Shot	0.86*
4	Chip Shot	0.83*
5	Flick	0.90*
6	Speed Dodge	0.88*
7	Speed Jabbing	0.81*

\* Significant at the 0.01 level.

According to Barrow & McGee (1979) arbitrary standard for acceptable objectivity was 0.80. Hence it was acceptable according to arbitrary standards for the evaluation of physical performance tests. Since objectivity coefficients are normally high for scores which are precise and numerical, such as those which are timed by two timers, it is therefore assumed that this test has acceptable objectivity.

**Reliability of the Test Items:**

Reliability of the tests was established by test–retest process from ten subjects whereby consistency of results was obtained by Intra-class correlation. The score of trial 1 was correlated with the score of trial 2. The reliability coefficients of the test items were presented in Table-II.

Table 2: Reliability Coefficient for Test-Retest Scores

S.No	Test Items	Co-efficient of Correlation 'R'
1	Straight Hit	0.90*
2	Right Leg Leading Hit	0.83*
3	Edge Shot	0.85*
4	Chip Shot	0.86*
5	Flick	0.91*

6	Speed Dodge	0.89*
7	Speed Jabbing	0.83*

\* Significant at the 0.01 level.

According to Barrow & McGee (1979) arbitrary standard for acceptable reliability was 0.80. Hence it was acceptable according to arbitrary standards for the evaluation of physical performance tests.

**Validity of the Test Items:**

Baumgartner et al. (2003) opined that it is possible to be reliable and objective, but not valid. However a test cannot be valid if it is either objectivity or reliability. The criterion for establishing test validity was a subjective ranking of the subjects according to playing ability. Ranking of players according to their playing ability was the criterion used for establishing the validity of the test items. Subjective ratings were done (from one to ten, point scale with ten being the highest) by a jury of experts (Rankings were based on skill test performance and subjective observation). Guidelines were given by the investigators regarding the system of grading. Test scores were correlated with the criterion score of rank. After obtaining the subjective rankings, inter judge correlations indicated an acceptable agreement ( $r = 0.72$ ) between two judges. The sum of the ratings of these judges was used in the overall ranking. The two judges whose ratings correlated highly were taken for analysis.

Table 3: Correlation Matrix for the Criterion Measure and Test Items

	PA	ST1	ST2	ST3	ST4	ST5	ST6
ST1	0.76*	-	-	-	-	-	-
ST2	0.73*	0.71*	-	-	-	-	-
ST3	0.68*	0.62*	0.46*	-	-	-	-
ST4	0.63*	0.27	0.43*	0.91*	-	-	-
ST5	0.49*	0.63*	0.42*	0.05	0.26	-	-
ST6	0.63*	0.81*	0.47*	0.06	0.16	0.86*	-
ST7	0.43*	0.76*	0.46*	0.24	0.13	0.73*	0.64*

\* Significant at 0.05 level

PA = Playing ability

ST1 = Straight Hit

ST2 = Right Leg Leading Hit

ST3 = Edge Shot

ST4 = Chip Shot

ST5 = Flick

ST6 = Speed Dodge

ST7 = Speed Jabbing

The above table clearly explains the validity of test items with criterion score and validity among other test items. Further stepwise multiple regression was used for validating the test battery and to arrive the final test battery.

Table 4: Stepwise Regression Analysis of Skill Tests Items in Ball Badminton

Steps	Variables	B	SE b	$\beta$
Step 1	Constant	4.09	0.31	
	Straight Hit	1.43	0.13	0.83
Step II	Constant	-1.07	0.86	
	Straight Hit	0.93	0.16	0.56
	Flick	0.15	0.03	0.47
Step III	Constant	4.03	0.63	
	Straight Hit	0.82	0.07	1.08
	Flick	-0.46	0.09	-0.53
	Speed Dodge	0.16	0.03	0.33

**Results:**

The test items entered in the following order: Straight hit, Flick and Speed Dodge. It is apparent that the “R” value changes incrementally. The addition of other tests does not enhance the validity of the final test battery. According to the results out of seven independent variables, the following three test items alone have significant influence on the playing ability. Although ordinarily one would not confidently conclude that skills other than three items really do not matter in the final playing ability, it is of statistical interest to say that they do not possess significant influence in the current context. The high validity and reliability scores for the seven tests in the final test battery module also affirm the fact that the administration of these three tests have been good, thereby assuring the administrative feasibility of the tests.

**Conclusions:**

The prime intention of the researcher was to construct a comprehensive module with limited number of test items and greater level of dependability. Hence stepwise multiple regression technique was employed. While analyzing results it was revealed that the following three test items namely Straight hit, Flick and Speed Dodge were part in the final test battery. The above said tests were found to be highly reliable and fully valid final test battery. Final test battery is believed, will be a significant contribution for the promotion of the game. The battery, when employed by the coaches, is expected to help them to come up with useful and reliable data that may be processed for monitoring and improving the playing ability of the subjects.

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