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Construction of Test to Judge Ball Sense Ability of Batsman in Cricket

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Abstract

The purpose of the test was to judge the ball sense ability of batsman in cricket. A total of sixty(60) male division level Cricket players (mean ± SD: age 16.37 ± 1.71 years, height 1.56 ± 0.03 m, weight 51.00 ± 5.62 kg) from LNIPE cricket academy, Gwalior (M.P) were selected as subject. Purposive sampling technique was used to attain the objectives of the study. Sixty subjects were tested on the test twice by researcher and reliability of test to judge ball sense ability by researcher was established by using "test- retest method". Grading limits are developed for test to assess the performance, to establish the reliability of the collected data Pearson's product moment correlation statistical technique was employed and alpha level was set at 0.05.The results of correlation test between testing first time and testing second time showed a significant positive correlation between testing first time and testing second time because p-value ($p<0.05$). Reliability co-efficient obtained from test (0.840) was found significantly reliable. It was conclude that the test that was constructed to judge ball sense ability of batsman in cricket is reliable and can be used for assessing the ball sense ability of batsman in cricket.

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INTRODUCTION

Cricket is a major world sport in terms of participants, spectators and media. It is a bat and ball game, which includes a variety of skills. Of all cricket's skills, batting is the most glamorous. At the highest level of the game,

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scoring runs and not being dismissed will bring fame and glory of a kind that is possibly unique in the world of sports (Woolmer, 2008). Batting in cricket is a quintessential example of a dynamic interceptive action in sport, and an ideal vehicle for studying interactions between perception and action (Stretch and Bartlett, 2000). In cricket the ball bounces before it reaches the batsman and, depending on how the raised seam hits the ground, the ball can unpredictably change direction after bouncing .This allows an estimate of the upper limit to the accuracy and speed of the batsman's spatiotemporal prediction (Brodribb & Maurice, 1976; Wilkins, 1997). Looking in the right place at the right time is particularly important in ball sports such as tennis, cricket or baseball, in which a player needs to determine the future trajectory of the ball and the timing of contact with it. In most such sports, a coach's advice is to "keep your eye on the ball" (Land & McLeod, 2000). Humans use visual information to respond to dangers and opportunities from a distance. This allows time to prepare motor responses before critical events occur. Expert sportsmen, for instance, make fine judgments about the flight of small, fast-moving balls before they impact with their bodies (Chapman, 1968; Land & McLeod, 2000; Regan, 1992). When hitting a ball with a bat, it takes time for visual information that reaches our eyes to be transformed into muscle contractions, and for muscle contractions to bring the bat to the appropriate place, so timing the hit requires prediction. The timing precision will therefore depend on how well one can predict the moment of interest at the last moment at which the timing can still be adjusted (Brenner & Smeets, 2011a). The brain needs to judge when the ball will be at a certain place, or where it will be at a certain time, so limitations in the resolution of visual judgments will give rise to some variability. Variability will also arise if the commands change for other reasons (Brenner & Smeets, 2011b; van Beers, 2009) or if the muscles respond slightly differently to the same commands on different occasions (Harris & Wolpert, 1998).

The test construction in physical education and sports is vital role for the measurement of specific physical, motor or psychological traits. The art of test construction requires a good deals or expertise. The basic concept in the construction/selection of test is that the test selected/ constructed should be measure precisely and objectively what it was desired to be measured (Kansal, 1996).

Reliability is consistency of measurement (Bollen, 1989), or stability of measurement over a variety of conditions in which basically the same results should be obtained (Nunnally, 1978).

There is no specific test to judge ball sense ability of the batsman so that is why researcher feel worthwhile to construct a test that is helpful to judge ball sense ability of batsman in cricket so that further research may be conducted related to ball judgement in various areas.

MATERIAL and METHODS

Study design and subjects

For the present study the data was collected from divisional level Cricket Players of LNIPE cricket academy, Gwalior (M.P).The purposive sampling technique was used to attain the objectives of the study. The study was delimited to 60 (mean ± SD: age 16.37 ± 1.71 years, height 1.56 ± 0.03 m, weight 51.00 ± 5.62 kg) male division level Cricket players. Age of the cricket players was ranging from 16 to 19 years. All the subjects were informed about the nature, purpose, and possible risk involved in the study and an informed written consent was taken from them prior to participation. All subjects were familiarized with all testing procedures.

Procedure of test administration

The test was administered to all the subjects by the research scholar himself. The scores of test were recorded by researcher on the basis of performance in test. Each subject followed his own warming up procedure before actual performance. The subjects were given adequate demonstration and required instruction for test.

Description of test

Purpose: construction of test to assess the ball sense ability of batsman in cricket

Equipment: pitch, stumps, balls, bat, paint of red blue and green colour, protective gear of batsman and scoring sheet

Marking: Pitch was divided into three parts according to length

- Full length
- Good length
- Short length

Table 1: Each length is marked with the different colour

Length	Colour
Full Length	Green
Good Length	Blue
Short Length	Red

Test administration

The subject was instructed to warm up and practice before the actual administration of the test. The batsman was asked to pronounce the colour just after the release of the ball and simultaneously play shots according to the length of the ball e.g. Full length–front foot drive, good length- front foot defence and short of length- back foot shots. If the ball pitches on the edge of any length and batsman found difficulty in assessing that ball then another trial is given. A bowler is asked to bowl with a short run-up of 2-3 steps. Only one bowler was used in the entire test and also in the entire process of test construction to maintain the consistency of the testing process and reduce errors in testing. Each batsman had to face eighteen (18) balls on the basis of which the scores are given to batsman.

Scoring system

On correct judgement when he pronounce the colour and simultaneously play shot according to the length of the ball five (5) point is given.
On judgement when he pronounce the colour accurately but does not able to play shot according to the length of the ball three (3) point is given.
On incorrect judgement when he does not able to pronounce the colour and simultaneously play shot according to the length of the ball one (1) point is given.

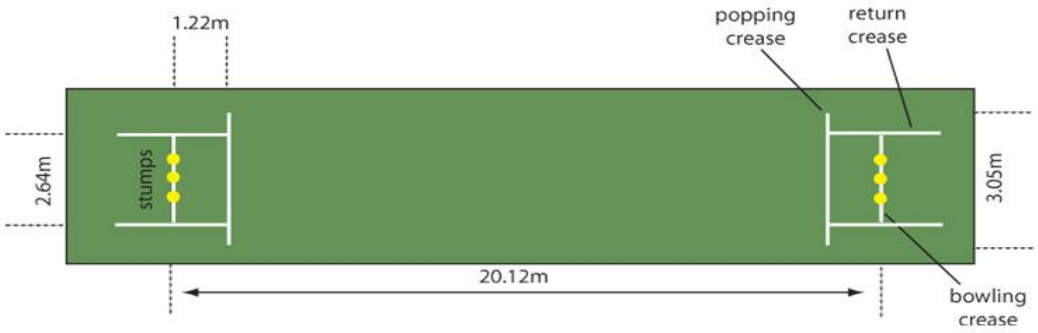

Figure 1. A standard pitch with measurement

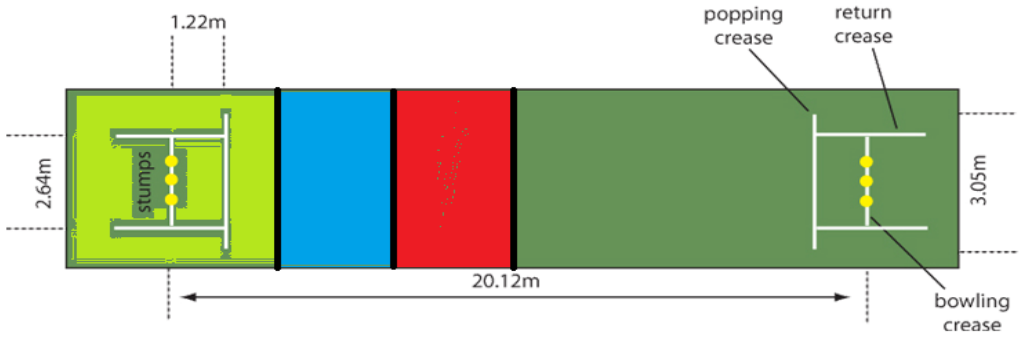

Figure 2. Area marked with different colours for the purpose of test

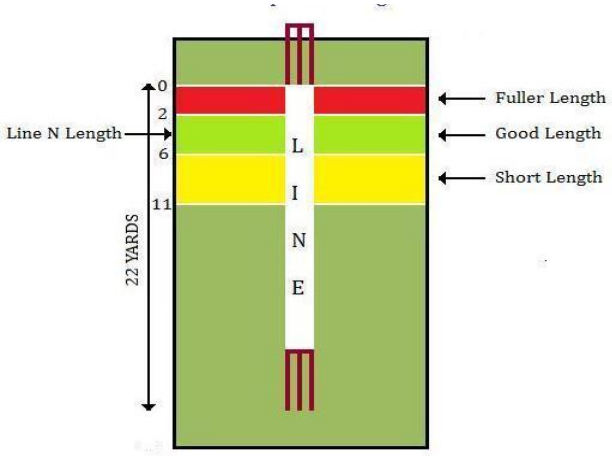

Figure 3. Line and length on pitch

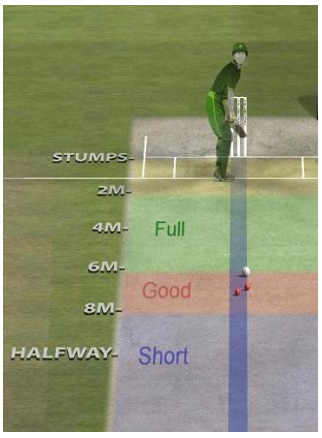

Figure 4. Length of the ball on pitch

Criterion measures

After this setup batsman is asked to bat. When the bowler comes to bowl batsman call the length of the ball by calling the colour of length simultaneously playing shots according to the length. If he pronounces correct judgement of length of ball and shot selection simultaneously then one point is given to him. If he is not able to judge length of the ball or wrong selection of shots then no points will be given. A total of 18 trials are given to each batsman. Out of 18 trials total number of correct judgement will be the score of batsman.

For the purpose of the test, same test is conducted after four (4) days on the same pitch, with the same subjects, at same time and against the same bowler.

To establish the reliability of the collected data Pearson's product moment correlation statistical technique was employed and the level of significant was observed at 0.05 level.

RESULTS

Table 1 shows the descriptive statistics for the data collected for establishing reliability of test to judge ball sense ability of batsman in cricket.

Table 1: Descriptive statistics

	Mean	**Std. Deviation**	**Skewness**		**Kurtosis**	
	Statistic	**Statistic**	**Statistic**	**Std. Error**	**Statistic**	**Std. Error**
Ball sense judgement	70.20	6.60	.040	.309	-.956	.608

The value of mean and standard deviation for ball sense judgement is 70.20±6.60and skewness and kurtosis is 0.40 and -.956 respectively. These values may be used for further analysis.

The Shapiro-wilk test is used for testing normality of data by taking into account the values of both skewness and kurtosis. The data is normal if this test is not significant.

Table 2: Tests of Normality

	Shapiro-Wilk		
	Statistic	**df**	**Sig.**
Ball sense judgement score	.966	60	.091

From the table 2 it may be concluded that the data on ball sense judgement score are normal because Shapiro-wilk test for ball sense judgement was insignificant as the p value is greater than 0.05.

To develop grading criteria for assessing ball sense ability of batsmen in cricket 60 subjects were tested. The mean score was 70.20, with the standard deviation as 6.60. The scores were normally distributed. The assessment of ball sense judgement was divided into five grades i.e. very poor, poor, average, good and very good.

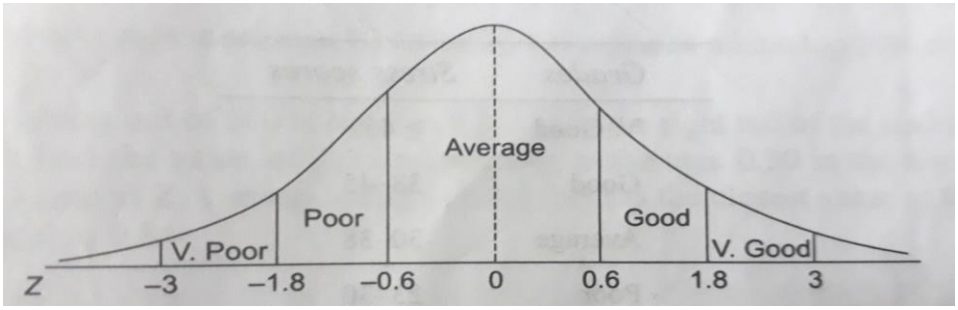

Figure 5. Normal curve for grading distribution

The normal curve needs to be divided into five grades and therefore,

Width of each grade = 6/5 = 1.2

To find the limits of these five grades we go for following computations using

$z = x-\mu/\sigma$

For z = -1.8,

$-1.8 = x - \bar{x} / s = x-70.20 / 6.60 = 58.32$

For z = -0.6,

$-0.6 = x - \bar{x} / s = x-70.20 / 6.60 = 66.24$

For z = 0.6,

$-0.6 = x - \bar{x} / s = x-70.20 / 6.60 = 74.16$

For z = 1.8,

$-1.8 = x - \bar{x} / s = x-70.20 / 6.60 = 82.08$

Thus the limits of five grades i.e. i.e. very poor, poor, average, good and very good would be as follows:

Table 3: Grading criteria for assessment of ball sense ability of batsmen in cricket

Grades	Ball Judgement Scores
Very poor	≥58
poor	58-66
average	66-74
good	74-82
Very good	<82

For establishing scientific authenticity of test for judgement of ball sense ability of batsman in cricket, sixty subjects were selected for the study.

Reliability

The reliability of test to assess ball sense ability by researcher was established by using "test- retest method". Sixty subjects were tested on the test twice by researcher. The test was conducted by researcher himself and experts. The scores of test obtained twice were correlated using product moment correlation.

Table 4 shows the descriptive statistics for the data collected for establishing reliability of test to judge ball sense ability of batsman in cricket.

Table 4: Descriptive statistics

	Mean	Std. Deviation	N
Testing first time	70.20	6.60	60
Testing second time	70.60	6.40	60

The value of mean and standard deviation for testing first time 70.20±6.60 and for testing second time 70.60±6.40 are shown in table 1. These values may be used for further analysis.

The reliability co-efficient of test to judge ball sense ability of batsman in cricket is presented in table 5.

Table 5: Reliability co-efficient of test to judge ball sense ability of batsman in cricket

	Co-efficient of correlation	**p-value**	**Sum of Squares and Cross-products**	**Covariance**
Testing	.840*	.000	2096.80	35.53

***Significant at 0.05 level.*

Table 5 illustrates the results of correlation test between testing first time and testing second time**.** The results showed a significant positive correlation between testing first time and testing second time**.** It is significant because p-value (=0.00) is less than 0.05.

Table 5 indicates that reliability co-efficient obtained from test (=0.840) were found significantly reliable. The analysis of data shows that in test subjects have shown consistency of performance which is evident from the value of co-efficient of correlation.

DISCUSSION and CONCLUSION

Statistical analysis of data reveals that test to judge ball sense ability of batsmen in cricket was chosen had fairly high reliability co-efficient.

Footwork and timing plays important role in batting, but before that the visual information received by brain is important factor in ball judgement. Humans use visual information to respond to dangers and opportunities from a distance. This allows time to prepare motor responses before critical events occur. Expert sportsmen, for instance, make fine judgments about the flight of small, fast-moving balls before they impact with their bodies (Chapman,1968 ; Regan, 1992; Land & McLeod , 2000). When hitting a ball with a bat, it takes time for visual information that reaches our eyes to be transformed into muscle contractions, and for muscle contractions to bring the bat to the appropriate place, so timing the hit requires prediction. The timing precision will therefore depend on how well one can predict the moment of interest at the last moment at which the timing can still be adjusted (Brenner & Smeets, 2011a).

Arriving at a certain position in synchrony with an external stimulus, such as a moving ball, is quite different from attempting to make movements of a

particular duration. While moving towards a ball, one is constantly updating one's estimate of the desired place and time of interception on the basis of new, more reliable information (Brenner & Smeets, 2011a; López-Moliner, Brenner, Louw, & Smeets, 2010). The brain needs to judge when the ball will be at a certain place, or where it will be at a certain time, so limitations in the resolution of visual judgments will give rise to some variability. Variability will also arise if the commands change for other reasons (Brenner & Smeets, 2011b; van Beers, 2009) or if the muscles respond slightly differently to the same commands on different occasions (Harris & Wolpert, 1998).

On the basis of above results and findings researcher can conclude that the test that was constructed to judge ball sense ability of batsman in cricket is reliable and can be used for assessing the ball sense ability of batsman in cricket

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