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# RELATIONSHIP OF SELECTED KINEMATIC VARIABLES TO THE TECHNIQUE OF HOOK SHOT IN CRICKET

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**Abstract**

The present study was conducted in an attempt to identify the selected kinematic variables to the technique of Hook shot in Cricket. The following kinematic variables were selected for the purpose of study, namely: Linear kinematic variables at height of center of gravity at selected moments Placement of the foot, Execution (contact) in Angular kinematic variables Ankle joint, Knee joint, Hip joint, Shoulder joint and Elbow. We take five male inter-university cricket players of 18 to 24 years were selected as subjects for the present study. As the subjects had been undergoing training for a considerable period, therefore, it is assumed that they possess a good level of technique of batting. The purpose of the research was explained to all the subjects and subjects were motivated to put their best during each trial. The subject was filmed only in sagittal plane. The camera being used for the purpose was CANON- 70D, a motor driven camera, with the frequency of 24 frames per second. The distance of the camera from the subject was 3.10 meters away and the vertical height of the lens was 1.15 meters from the ground. After the video recording, the video was played and with the help of the computer software, the final position i.e., the moment contacts during placement of feet and execution of hook shot in cricket were obtained on the screen by trial-and-error method and kept in pause. The Centre of the mass of body segment and the whole body along with the angles were determined by Kinovea software.

Keywords: Hook Shot, Kinovea, Execution, Kinematic.

## Introduction

Sports researchers have been always seeking for new ways and means to enhance sports performance. Either it is nutrition, training, psychological training or some other therapeutic modalities they all aims at making the sports better every day. For the sake of excellence and specificity in the research area some allied fields have been formed namely Sports Physiology, Sports Biomechanics, Sports Psychology and many more. All such disciplines are targeting to help players to achieve excellence in their respective sports by making the best use of knowledge and technology. Biomechanics is the study of structure and function of biological systems by means and methods of mechanics. Under the umbrella of Sports Biomechanics, desired movements are analyzed in two ways namely kinetic(study of cause of motion) and kinematic (study of description of motion).The present study is an example of Kinematic analysis because it solely concern with description of motion assuming that all other factors are constant. We have used the 2D motion analysis software to analyze the movements. There are so many 2D and 3D motion analysis software are available in the market which are frequently being used for the analysis of sports movements. Depending upon the purpose of use and availability of fund one can buy this software. Using video clips is very popular and efficient way of analyzing

sports movements. Some movements can easily be tracked by ordinary camera but if you want to capture some highspeed movements you require advanced motion analysis camera.

**Purpose of the study**

The purpose of the study is to analysis the relationship of selected linear kinematic variables to the technique of Hook shot in Cricket.

**Methodology**

Five male inter-university cricket players of 18 to 24 years were selected as subjects for the present study. As the subjects had been undergoing training for a considerable period, therefore, it is assumed that they possess a good level of technique of batting. The purpose of the research was explained to all the subjects and subjects were motivated to put their best during each trial.

The following variables of hook shot technique were selected for the purpose of this study: -
A. Linear kinematic variables:
1. Height of center of gravity at selected moments.

- Placement of the foot
- Execution (contact)

B. Angular kinematic variables-

- Ankle joint
- Knee joint
- Hip joint
- Shoulder joint
- Elbow

**Table 1**

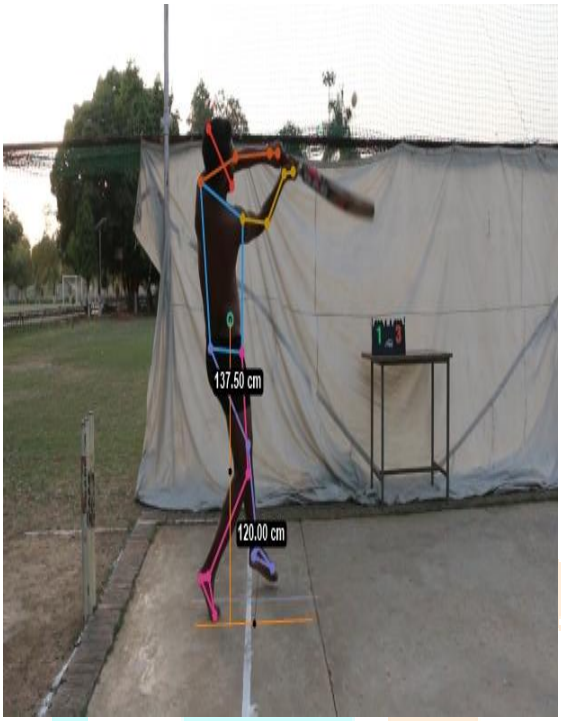
**Evaluating criteria of technique of Hook**

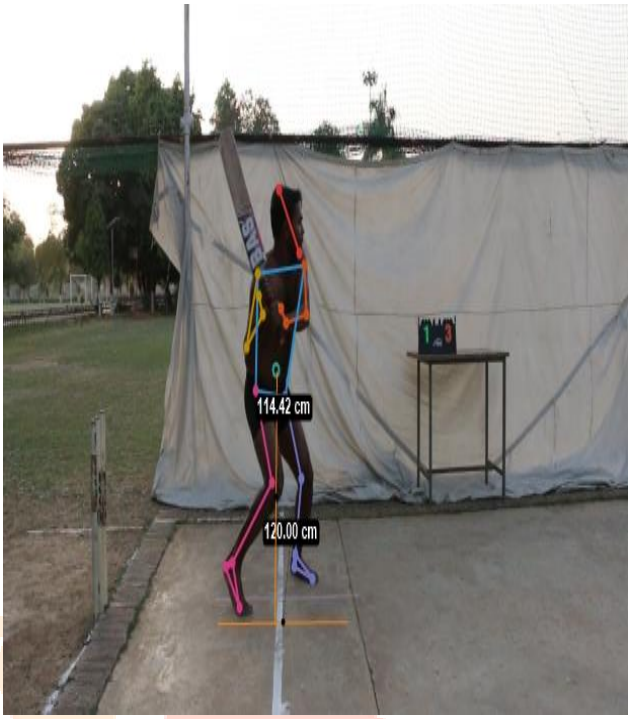
| S. No. | COMPONENTS | POINTS |
|---|---|---|
| 1. | Moment Placement of Feet | 10 |
| 2. | Moment Execution (Contact) | 10 |
| | Total | 20 |

i) The performance was recorded in $1/10^{th}$ of point.
ii) The angle at selected joint was recorded in nearest degree.
iii) Time taken in complete skill or movement was recorded in second.
**iv)** Distance, displacement and height of Center of gravity were measured in meter.

## Results

The statistical analysis of the data, collected on five cricket players and the results of the study have been presented in this chapter. Pearson's product moment correlation was used to find out the relationship of selected kinematic variables with the technique of the subjects in hook shot. The level of significance was set at 0.05




**Stick figure and center of gravity of subject at moment placement and moment execution (contact) of feet during hook shot in Cricket**

Table 2

Mean and standard deviation of angular kinematic variables at moment placement of feet in technique of hook shot

| S. no. | Kinematic Variables | Mean (in degrees) | Std. Deviation |
|---|---|---|---|
| 1. | Right ankle joint | 97.60 | 10.38 |
| 2. | Left ankle joint | 111.00 | 6.93 |
| 3. | Right knee joint | 134.20 | 18.06 |
| 4. | Left knee joint | 144.20 | 12.03 |
| 5. | Right hip joint | 156.20 | 5.45 |
| 6. | Left hip joint | 129.20 | 19.42 |
| 7. | Right Shoulder joint | 28.20 | 14.27 |
| 8. | Left Shoulder joint | 29.40 | 20.13 |
| 9. | Right Elbow joint | 51.40 | 23.16 |
| 10. | Left Elbow joint | 96.60 | 38.06 |

The values of mean and standard deviation for the angular kinematic variables at moment of placement of feet are shown in table-1. These values may be used for further analysis in the study.

Table 3

Mean and standard deviation of linear kinematic variable at moment placement of feet in technique of hook shot

| S. no. | Kinematic variable | Mean (in cm) | Std. Deviation |
|---|---|---|---|
| 1. | Center of gravity | 118.45 | 7.36 |

The values of mean and standard deviation for the all linear kinematic variables at moment of placement of feet are shown in table-2. These values may be used for further analysis in the study.

Table 5
Mean and standard deviation of linear kinematic variables at execution in technique of hook shot

| S. no. | Kinematic variables | Mean (in cm) | Std. Deviat |
|---|---|---|---|
| 1. | Center of gravity | 128.36 | 10.24 |

The values of mean and standard deviation for the linear kinematic variab moment of execution are shown in table-4. These values may be used for fu analysis in the study.

Relationship of selected angular kinematic variables to the techniqu subjects in hook shot. The score of each of the independent variables of linea angular kinematic were correlated with the techniques of subjects in hook shot.

Table 4
Mean and standard deviation of angular kinematic variables at moment execution in technique of hook shot

| S. no. | Kinematic variables | Mean (in degrees) | Std. Deviation |
|---|---|---|---|
| 1. | Right ankle joint | 109.00 | 12.98 |
| 2. | Left ankle joint | 138.00 | 7.38 |
| 3. | Right Knee joint | 142.20 | 11.60 |
| 4. | Left Knee joint | 160.80 | 10.47 |
| 5. | Right Hip joint | 173.00 | 4.30 |
| 6. | Left Hip joint | 158.40 | 7.53 |
| 7. | Right Shoulder joint | 47.20 | 17.15 |
| 8. | Left Shoulder joint | 129.20 | 32.33 |
| 9. | Right Elbow joint | 64.00 | 27.88 |
| 10. | Left Elbow joint | 112.80 | 44.11 |

The values of mean and standard deviation for the angular kinematic variables at moment of execution are shown in table-3. These values may be used for further analysis in the study.


**Angles at various joints of subject at moment placement of feet and moment execution (contact) during hook shot in cricket.**

## Discussion

In case of selected kinematic variables, the angle at left ankle and angle at hip joint of the angular kinematic variables has exhibited significant relationship to the technique of subjects in hook shot at moment placement of feet. In case of moment execution angle at left shoulder joint showed significant relationship with performance. Angle at left ankle and hip joint showed positive correlation with performance it means that if angle at left ankle and hip joint increases at the time of feet placement than the performance of hook shot increases and if angle at left ankle and hip joint decreases at feet placement than the performance of hook shot decreases. Angle at left shoulder joint showed negative correlation with performance of hook shot it means that if angle at left shoulder joint decreases at the time of execution than the performance of hook shot

increases and if angle at left shoulder joint increases at the time of execution than the performance of hook shot decreases.

The relationship of selected linear kinematic variable (height of center of gravity at selected moments) to the technique of the subjects selected moments showed insignificant relationship.

## Conclusion

It was hypothesized that selected kinematic variables will have significant relationship with the technique of hook shot; however, in the pretext of present findings hypothesis was not accepted at 0.05 level of significance. So, the hypothesis as stated earlier is rejected in selected kinematic variables.

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