



Relationship Of Reaction Time, Agility, Speed Of Movement And Flexibility To Performance In 110 Meter Hurdles

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ABSTRACT

The purpose of this study was to measure the relationship of reaction time, agility, speed of movement and flexibility to the performance of subjects in 110 meter hurdles event. The subjects for this study were 10 male hurdlers of L.N.I.P.E., Gwalior who have participated in M.P. State Athletic Meet. The age group of subjects was 16 to 25 years. Reaction time was measured by Anand's electronic reaction time apparatus; Shuttle run (4 x 10 yards) was used to access the agility; speed of movement was represented by 50 yard dash test and while sit and reach test was used to check the flexibility of the subjects. The performance of the subjects was also recorded in 110 meter hurdles. The product moment correlation method was used in order to find the relationship between the performance of subjects in the event of 110 meter hurdles and Reaction time, Agility, Speed of movement and Flexibility. The finding of the study revealed that these were insignificant relationship between the reaction time, agility, speed of movement and flexibility to the performance in 110 meter hurdles. The obtained values of correlations were found insignificant at 0.05 level.

Keywords: Reaction Time, Agility, Speed of Movement, Flexibility, 110 MH

INTRODUCTION

Hurdling events are dashes in which competitors must clear a series of ten barriers called hurdles, which are made of metal and wood (or metal and plastic). The hurdles are placed at equal distances over the course. The distance from the starting line to the first hurdle and the distance from the last hurdle to the finish line is almost same. The key to success in the hurdles is sprinting smoothly, while skimming just over the hurdles. It is a ground for disqualification if an athlete goes around the hurdle instead of over it, or if an athlete purposely knocks down hurdles. Outstanding hurdlers have included Fanny Blankers Koen of Neitherland, Colin Jackson of the United Kingdom, Lee Calhoun, Glenn Davis, Rodney Milburn, Edwin Moses, Gail Devers of the United State.

Hurdling as an activity in the Eton School sports dates back to 1843. More specifically the 120 yards or 'high'; hurdles event was introduced at the Oxford University Sports of 1864. The barriers in those early days-Crude Sheep hurdles rigidly staked in the ground were sufficiently fearsome as to discourage contact consequently the hurdling pioneers used an ungainly bent leg clearance style in order to make sure of sailing safely over each obstacle. The times, therefore, were very slow by modern standards but the 16.0 second mark recorded by 19 year old Clement Jackson in 1865, the year before the height of the ten hurdles was standardized at 3 feet 6 inches, must have been a fine performance since it was not bettered anywhere in the world for twenty six years.

Reaction Time

Reaction time is the time elapsing between movement of application of a stimulus and movement response.

Agility

It is defined as the ability of the body or parts of the body to change directions rapidly and accurately.

Flexibility

Flexibility is the ability of an individual to move the body and its parts through as wide a range of motion as possible without undue strain to the articulation and muscle attachments.

Speed

Speed is the ability of the body to make a rapid movement at the same time in the shortest possible time.

METHODOLOGY

The subjects for this study were Ten (10) male athletes of 110 meter hurdlers events, between the age group of 16 to 25 years, who had participated in M.P. State Athletic meets were selected as subjects for this study. Since these Athletes have been trained for a considerable period, they were considered skillful and their technique had stabilized.

To establish the relationship of reaction time, agility, speed of movement and flexibility to performance in 110 meters hurdle, the scores of the following were taken as criterion measures

- Reaction Time was measured in seconds.
- Agility was measured by shuttle run (4 x 10) yards and recorded to the nearest of 1/10th of a second.
- Speed of movement was measured by 50 meter run/walk test and recorded to the nearest of 1/10th of a second.
- Flexibility was recorded with the sit and reach test. The scores were in inches.
- Performance in 110 meter hurdles was measured in seconds.

ADMINISTRATION OF THE TEST AND COLLECTION OF DATA

In order to assess the reaction time, agility, speed of movement, flexibility and the performance of subjects in 110 meter hurdles event. The following methods were employed:

Reaction Time

Purpose: To measure the speed of reaction in response to a visual Stimulus.

Equipment: Electronic Reaction Timer supplied by Anand Agencies, Poona was used.

Description: There were four wooden boards marked as A, B, C, and D. Out of these, A and B were the starting boards and C and D, were the stepping boards. Subject stood on the starting board putting one foot on each board. After the onset of an auditory stimulus he lifts one of the leg which was pre-determined and which was told to the subject from A and B and step on C and D.

The tester pressed one of the short keys giving the required stimulus (auditory). Short key was a double key which gave the stimulus and also started the chronoscope. As soon as the subject received a stimulus he lifts his foot from the right or left A or B boards and steps on the left or right C or D boards, which stopped the chronoscope and reaction time to the auditory stimulus was recorded.

Scoring: The time out of the best of the three trials was recorded in seconds

Agility Test

Purpose: To measure the speed in changing body position or direction

Equipment: Four blocks of wood 2x2x4 inches and a stop watch

Description: Two parallel lines were marked on the floor ten yards apart. The blocks of wood were placed behind one of the line. The subject started from behind the other lines on the signal 'Ready' 'Go' the subject ran to the blocks, picked one up, ran back to the starting line and placed the block behind the line, he then ran back and picked up the second block which he carried back across the starting line. Two trials were allowed with same test in between.

Scoring: The time of the better of the two trials to the nearest 1/10th of a second was recorded.

Speed of Movement

Purpose: To measure speed

Equipments: On the Institute track a 50 yards was marked with starting and finishing lines. Two stop watches (one for each time keeper), wooden clapper were used for this test.

Description: Two subjects ran at a time they took position behind the starting line and on the command 'on your mark', the subject stood with front foot just behind the starting line with "clap" the subjects started the run.

Scoring: The score was time taken to complete the course to the nearest 1/10th of a second between the starting signal and the instant subject crossed at finishing line.

Flexibility

Purpose: To measure trunk & hip flexibility

Equipments: A box and measuring scale

Description: The subject sat comfortably on the floor with shoes off. Legs extended and feet flat against the sit and reach apparatus. The subject placed one hand on top of the other with fingers pad on finger nails. On the signal the student gradually reached as far forward as possible and hold this position for three seconds until the test administrator placed a mark at the end of the subjects finger tips, subjects were permitted 3 additional attempt to push the mark further.

Scoring: The farthest point reached in the 3 attempt was recorded

Performance in 110 Meters Hurdles

Purpose: To measure the performance in 110 Meter hurdles

Equipments: Starting block, 20 Hurdles, stop watch, clapper, standard track of 110 meters straight.

Description: Two subjects ran at a time they took position behind the starting line, on the command 'on your mark', the subject attains a stable Position, followed by 'set' command when subjects again attained stationary position the 'clap' was made. With 'clap' the subjects started their run. The performance was recorded as per AFI rules.

Scoring of Data

The performance of subjects in the event of 110 meter hurdles, reaction time, agility, speed of movement was recorded in seconds and flexibility in inches. All the scores of the test items were analyzed statistically.

ANALYSIS OF DATA AND RESULTS OF THE STUDY

The Statistical analysis of data collected on 10 male students of LNIPE Gwalior who participated in 110 meters hurdles event of MP State Athletic Meets.

In order to study the relationship of scores obtained from dependent variable namely the performance of subjects in 110 meter hurdles event and independent variables namely reaction time, agility, speed of movement and flexibility, product moment correlation method was used. For obtaining the coefficient of correlation, the following formula was used:

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

The obtained values of coefficient of correlation for selected variables are presented in table 1.

TABLE 1
RELATIONSHIP OF REACTION TIME, AGILITY, SPEED OF MOVEMENT AND FLEXIBILITY TO
PERFORMANCE IN
110 METER HURDLES

S.no.	VARIABLES	COEFFICIENT OF CORRELATION 'r'
1.	Reaction time	-0.204
2.	Agility	-0.256
3.	Speed of Movement	-0.043
4.	Flexibility	-0.0093

The required value of coefficient of correlation for 8 degree of freedom at 0.05 level of significance is .632.

DISCUSSION OF FINDINGS

As shown in table 2 that the obtained values of co-efficient of correlation of selected variables such as reaction time, agility, speed of movement and flexibility did not exhibit the significant relationship with the performance of subjects in the event of 110 meter hurdles, since the obtained values were less than the required value of 'r' = .632 for 8 degree of freedom at .05 level of significant. However, the motor qualities like reaction time, agility, speed of movement and flexibility are considered important for the hurdle events. The obtained value of coefficient of correlation was probably due to small size of the sample and the limitation of the studies.

DISCUSSION OF HYPOTHESIS

The hypothesis as stated earlier that there would be no significant relationship of reaction time, agility, speed of movement and flexibility with the performance of 110 meter hurdles stands accepted.

CONCLUSION

Within the limitations of the study the following conclusion may be drawn:

There is insignificant relationship between reaction time, agility, speed of movement and flexibility with the performance of subjects in 110 meter hurdles events.

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