

## Speed of movement among District, State and National level of track and Field Athletes: A comparative study

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### Abstract

The purpose of the study was to compare the selected Speed of Movement of track and field athletes at different levels of achievement. It was hypothesized that there may be no significant difference in Speed of Movement of track and field athletes at different levels of achievement. For the purpose of the study, 90 male track and field athletes from Gujarat were selected as a subject. Thirty athlete (n=30) from district level and thirty athlete (n=30) from state level participated as subjects for the study. Hence, purposive sampling technique was considered for selection of subjects. The age of the subjects was ranged from 15-18 years. Descriptive statistics was used to process the data prior to employing inferential statistics. Analysis of Variance (ANOVA) was used to compare Speed of Movement of track and field players of different level on selected criterion variables separately. Level of significance was set at 0.05. It is evident from table-2 that significant difference was found between the Speed of Movement of District & State (-0.8067), District & National (-2.5633) and State & National level (1.7567). The observed sequence of performance of Speed of Movement in three groups is National>State>District. It may be concluded that Speed of Movement is increased with level of performance.

**Keywords:** speed, movement, athletes, achievement, hypothesized, significant

### 1. Introduction

Physical or psychomotor, skills are in evidence whenever people perform practical activities in a competent manner, whether in the world of sports, the world of work, or the world of leisure. Despite such current socioeconomic tendencies as automation in the workplace, increased leisure time and boom in home entertainment, the importance of physical skills to the individual and to society in general appears to be maintained and indeed perhaps increased.

Psychomotor movement is a complex quality and is influenced by the physical performance factors with underline the action of all movements. These factors comprise speed, power, strength and reaction time. Speed of movement, agility, flexibility, kinaesthetic perceptions, coordinative abilities and the like. These psychomotor movements can be restricted or imbalanced by certain structural factors comprising height, weight, body type, structure and posture. These physical performance factors are effective in the enhancement of psychomotor performance of the sports person. (Phillips and Hoornack, 1979) <sup>[1]</sup>

Psychomotor elements exercise a great control and influence over performance in sports. Total fitness of the performance is of most importance in order to get optimal performance at the prestigious sports competitions at the international level. Fitness is a product of exercise and training. All these components of total fitness are mutually interdependent, and

are required in different proportion according to the type and nature of the activity for the sports being undertaken.

### 2. Methodology

#### 2.1 Objective of the study

The purpose of the study was to compare the selected Speed of Movement of track and field athletes at different levels of achievement.

#### 2.2 Hypothesis

It was hypothesized that there may be no significant difference in Speed of Movement of track and field athletes at different levels of achievement.

#### 2.3 Subjects

For the purpose of the study, 90 male track and field athletes from Gujarat were selected as a subject. Thirty athlete (n=30) from district level and thirty athlete (n=30) from state level participated as subjects for the study. Hence, purposive sampling technique was considered for selection of subjects. The age of the subjects was ranged from 15-18 years.

#### 2.4 Administration of Tests: (Nelson Speed of Movement Test)

The objective of the test was administered to measure speed of movement of the students. The following equipments were arranged by the researcher before commencement of the final test, Wooden Meter Scale, Table and Chair, Measuring Tap, Chalk/Marker, Ruler, Pencil, Paper and Pad, Quiet Room for Testing. The performer set on a table with his hands resting on the edge of the table; palms facing each other with the inside

<sup>1</sup> D. Allen Phillips and James E. Hoornack, Measurement and Evaluation in Physical Education, (New York: John Wiley and Sons Inc., 1979)

of the little fingers 30 cm apart and first in line with the lines marked on the table. The tester held the time i.e. wooden meter scale near its top and it hung right midway between the subject’s palms with the base line of the time positioned evenly with the upper edges of the subjects index fingers. After the preparatory command ‘ready’ was given, the meter scale was dropped and the subject attempted with a horizontal movement and stopped it as quickly as possible by clapping the hands together. Twenty trails were given in all too every one of the subjects. The score for the combined response movement was read from the times at the point just above the upper edge of the hand after the catch was made. The five slowest and five fastest trails were discarded and an average of

the middle ten trails were recorded as the subjects score.

**2.5 Statistical Analysis**

Descriptive statistics was used to process the data prior to employing inferential statistics. Analysis of Variance (ANOVA) was used to compare Speed of Movement of track and field players of different level on selected criterion variables separately. Level of significance was set at 0.05.

**3. Result**

The descriptive measure in terms significant difference of to compare Speed of Movement of track and field players of different level are shown in Table 1 & Table 2.

**Table 1:** Comparison of Speed of Movement among District, State and National level of Track and Field Athletes (n=90)

Levels	Mean (Centimeter)	S.D.	Analysis of Variance					
				Sum of Squares	Df	Mean Square	F	Sig.
District (n=30)	9.1167	0.31082						
State (n=30)	9.9233	0.20457	Between Groups	103.073	2	51.536	35.471	0.000
National (n=30)	11.6800	2.05433	Within Groups	126.403	87	1.453		
Total (N=90)	10.2400	1.60573	Total	229.476	89			

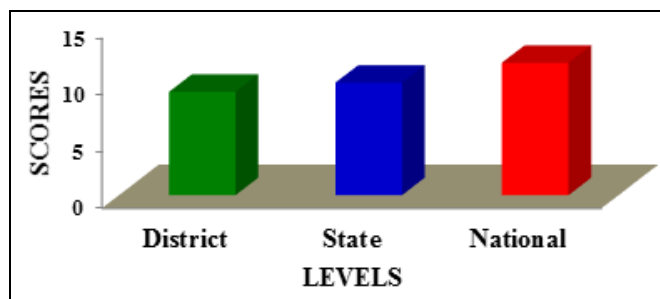
- Since significant differences was found among the District, State and National level athletes in related to Speed of Movement, LSD post hoc test was applied to compare Paried Means

**Table 2:** LSD test for mean Comparison on Speed of Movement among District, State and National level of Track and Field Athletes

(I) levels	(J) levels	Mean Difference (I-J)	Sig.
District	State	-0.8067(*)	0.011
	National	-2.5633(*)	0.000
State	National	-1.7567(*)	0.000

\* The mean difference is significant at the 0.05 level.

- It is evident from table-2 that significant difference wae found between the Speed of Movement of District & State (-0.8067), District & National (-2.5633) and State & National level (-1.7567).
- The observed sequence of performance of Speed of Movement in three groups is National>State>District. It may be concluded that Speed of Movement is increased with level of performance.



**Fig 1:** Comparison of Mean Scores of Speed of Movement among District, State and National Level of Track and Field Athletes

**4. Discussions**

There was a statistically significant difference between groups as determined by one-way ANOVA {F (2, 87)=35.471, p =0.000}. A LSD post-hoc test revealed that the distance to complete the speed of movement was statistically significant better in District (9.1167<sup>±</sup> -0.8067, p=0.011), State (9.99233<sup>±</sup> -2.5633, p=0.000) and National level athletes (11.6800<sup>±</sup> -1.7567, p=0.000).The statistical findings revealed that F- value 35.47 which was significant at 0.05 levels. It indicates that there was a significant difference on speed of movement among district, state and national level track and field athletes. The LSD post hoc test also revealed the pairwise mean comparison among the district, state and national level athletes. It shows that the three participating group differs significantly. Also, the speed of movement of national level player was 11.68 which were greater than state level (9.99) and district level (9.11).

**5. Conclusions**

This could be attributed to the fact that the National level players are having better speed of movement than state and district players. The training age and training stage of the national level athletes are much higher than the state and district level players. The type of training and coaching which they undergo for their competition makes them better on their speed of movement which is very much related to their response time or performance time which is the sum of reaction time and movement time. In the nutshell we can say that the national level players are on higher side in their speed of movement due to their physical fitness, skill execution and physical capacity demanded for better performance at that level.

## 6. References

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