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A study on acceleration phase maximum speed and average speed of different age group of school boys

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Abstract

The aim of this study was to find out the length of acceleration phase, maximum speed and average speed of different age group of boys' student during 50m run.

Materials & Methods: 60 boys' students were selected as subject for present research study. The data was collected from 50m performance of the subject and the total distance was divided into 5 equal zones.

Results: The length of Acceleration Phase was extended 0-30m for 10-11 yrs., 0-40 m for both boys groups 12-13 yrs. and 14-15 yrs. The maximum speed of 10-11 yrs., 12-13 yrs & 14-15 yrs. were 6.45, 6.77 & 7.70 m/sec. and average speed 5.76, 6.01 & 6.47m/sec respectively.

Conclusions: The schools going untrained boys have smaller acceleration zone and the length of acceleration zone increase with increase of age. The maximum speed and average speed were increase with increase of age.

Keywords: Untrained boys, acceleration phase, maximum speed

Introduction

Speed ability should not be equated with mechanical speed which is equal to the distance covered per unit of time. In several sports actions no distance is covered at all. Speed ability primarily signifies the ability to execute motor movements with high speed. These movements may be cyclic or acyclic in nature. According to Barrow and Mc. Gee (1971), speed is defined as "One's ability to perform successive movement of the same pattern at a fast rate". Speed may also be defined as "rapidity with which a movement or successive movements of the same kind may be performed by an individual".

For the direct improvement of acceleration ability short sprint are best means. The distance or duration of these sprints is based on practical experience as well as on some research findings. Henry (1952) found that sprinters achieve their maximum speed in about 6 seconds after start. Farfel (1952), Zdanov (1956) and Furnadziev & Petkova (1977) also found that irrespective of the performance level and age the maximum speed is achieved in 5-6 sec. after start. They also found that during a sprint the increase in speed is as follows:

At the end of –

1 st Seconds	-	55%	2 nd Seconds	-	76%
3 rd Seconds	-	91%	4 th Seconds	-	95%
5 th Seconds	-	99%			

Gundlach (1969), Furnadziev & Petkova (1977) and Letzelter (1975 & 1978) found the distance over which maximum speed can be maintained as follows:-

- 1) 12-13 year old children -15-20 m
- 2) 14-16 year old children -20-30 m
- 3) 12-13 year old trained children-20-30 m
- 4) Well trains adults -30 m longer

Purpose of the Study

- 1) To find out the length of average acceleration phase of the particular subject according to their age group.
- 2) To find out the maximum speed and average speed during 50m run of the subject according to their age group.

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Methodology

Subject

Total 60 boys student from 10 to 15 years were selected as the subject for this study. All the subjects were divided into three equal age group. Each age group consists of 20 subjects. The group was 10 & 11 yrs., 12 & 13 yrs. and 14 & 15 yrs. All the subjects were from same locality.

Sources of data

The data was collected from 50 m Dash Test and the 50m distance was divided into 5 equal zones. In every 10 m one timekeeper was placed. During 50m dash test the entire time keeper recorded the time from starting to her won marked zone such as start to 10m, start -20, Start-30m and so on. The method shown in fig.

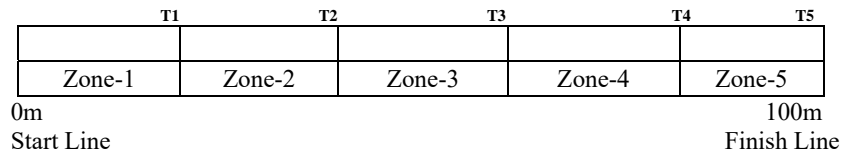


Fig. 1: Shows the method of collecting data

Result and Discussion

Personal data: 60 (sixty) boys students 10 to 15 years old were selected as the subject for the present study. Their personal data i.e. age, height and weight were recorded. The mean and SD of age, height and weight were presented in table-1

Table 1: Mean and SD of age, height & weight of three groups.

Group (Boys)	Age (Years)		Height (C.M.)		Weight (Kg.)	
	Mean	SD	Mean	SD	Mean	SD
10-11 Yrs.	10.97	0.52	138.55	8.23	26.45	3.14
12-13 Yrs.	12.95	0.58	154.70	9.70	37.80	7.03
14-15 Yrs.	15.03	0.51	166.75	3.58	48.20	7.02

Mean of age of three groups i.e. 10-11 Yrs. 12-13 Yrs and 14-15 yrs. boys were 10.97, 12.95 & 15.03 and SD were 0.52, 0.58 & 0.51 respectively. The mean of height of three groups

were 138.55, 154.70 & 166.75 and SD were 8.23, 9.70 & 3.58 respectively. The mean of weight of the three groups were 26.45, 37.80 & 48.20 respectively and SD were 3.14, 7.03 & 7.02 respectively.

The Data: The time of 50m run zone wise of the subject of three groups were considered as the data of this study. At the same time the data of Acceleration zone, Maximum speed and average speed obtained by the subject was recorded.

Presentation of Data: From the obtained time and distance zonal velocity was calculated for each zone. From these mean velocities for different zone of 50m run was find out. The mean velocities for different zone of 50m run for the three age group 10-11 Yrs., 12-13Yrs. and 14-15 Yrs. were presented in table 2

Table 2: Represent the mean score of zonal velocity for 50m run for three group of boys subject

Group	Velocity (m/sec.)				
	0-10 m (Zone-1)	10-20m (Zone-2)	20-30m (Zone-3)	30-40m (Zone-4)	40-50m (Zone-5)
10 -11Yrs. Boys	4.45	6.18	6.45	6.12	6.12
12-13 Yrs. Boys	4.51	6.38	6.52	6.77	6.56
14-15 Yrs. Boys	4.73	6.79	7.14	7.70	6.92

The zonal velocity of 10-11 yrs boys, 12 -13 yrs boys and 14-15 yrs boys subject in zone 1 - 4.45, 4.51, 4.73, in zone -2 - 6.18, 6.38, 6.79, in zone 3- 6.45, 6.52, 7.14; in zone 4- 6.12, 6.77, 7.70 and in zone 5- 6.12, 6.56& 6.92 respectively.

Discussion

From table no.2: It was observed that acceleration zone was extended from 0-30m for 10-11 yrs. and 0-40m for both group 12-13 yrs. & 14-15 yrs. boys group. With this information distance velocity curve for different age group of boys drawn in Fig. 2, Fig. 3 and Fig. 4 indicated the curves.

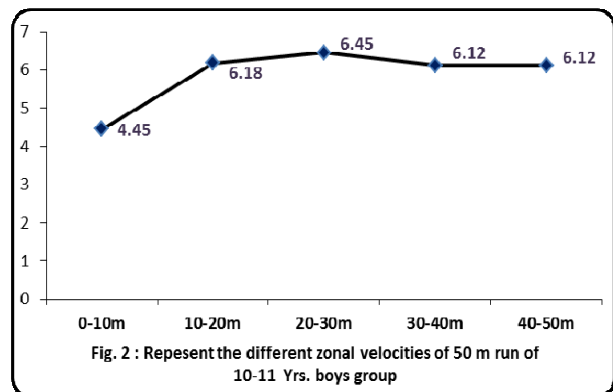


Fig. 2 : Represent the different zonal velocities of 50 m run of 10-11 Yrs. boys group

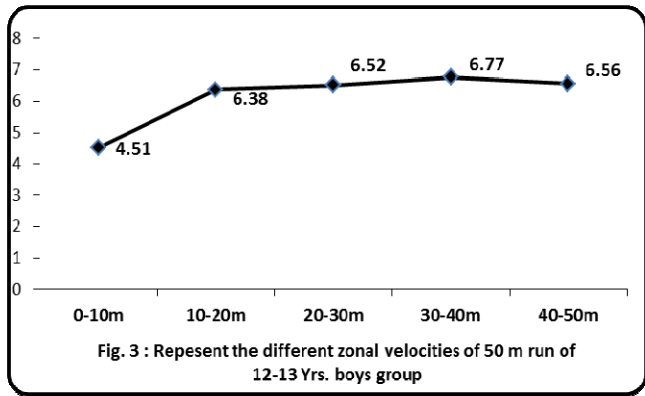


Fig. 3 : Represent the different zonal velocities of 50 m run of 12-13 Yrs. boys group

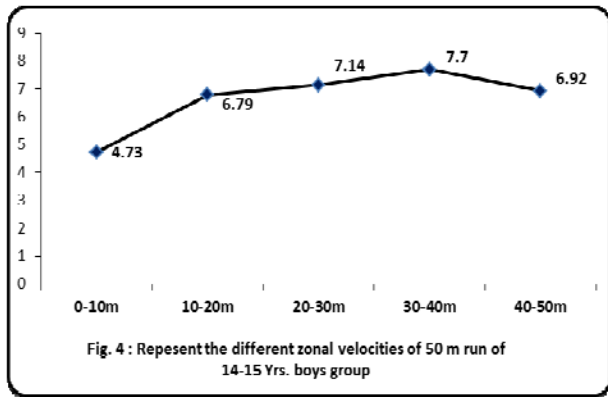


Fig. 4 : Represent the different zonal velocities of 50 m run of 14-15 Yrs. boys group

From the fig.2 it was observed that acceleration zone was extended from 0-30 m for 10-11yrs. boys group. It was also observed that the maximum speed of the subject was 6.45 m/sec and average speed of the subject was 5.76 m/sec. From Fig.3 it was observed that acceleration zone was extended from 0-40m for 12-13yrs. boys group. It was also observed that the maximum speed of the subject was 6.77 m/sec and the average speed of the subject was 6.01m/sec. From the fig.4 it was observed that acceleration zone was extended from 0-40 m. for 14-15yrs. boys group. It was also observed that the maximum speed of the subject was 7.70m/sec and average speed of the subject was 6.47m/sec. From these curves length of acceleration zone, maximum speed and average speed were found out. Table no.3 indicated the result.

Table 3: Length of acceleration zone, maximum speed and average speed for different age group of boys.

Group (Boys)	Acceleration zone(m)	maximum speed (m/sec)	average speed (m/sec)
10-11 yrs.	0-30	6.45	5.76
12-13 yrs.	0-40	6.77	6.01
14-15 yrs.	0-40	7.70	6.47

It was observed that the acceleration zone was extended 0-30m for 10-11yrs boys but 0-40m for both group that is 12-13 yrs and 14-15 yrs. boys. The maximum speed obtained by 10-11yrs, 12-13yrs and 14-15yrs boys were 6.45m/sec, 6.77m/sec and 7.70 m/sec and average speed of all three group were 5.76m/sec, 6.01m/sec and 6.47m/sec respectively. From the table value It was all so seen that mean score of maximum speed of different groups of boys increased with increase of age, the value for 10-11yrs boys group was 6.45m/sec. but it was increase for the 12-13yrs. boys group 6.77m/sec (the rate of increase was 4.72%). Again the value was further increase to 7.70m/sec (the rate increase was 12.08%) for 14-15 yrs. boys group.

Conclusion

On the basis of the result of the present investigation for 10-15 yrs. untrained school going boys students with the existing limitation of the study following conclusions were drawn

- 1) The untrained 10-15yrs. school going boys have smaller acceleration zone. The acceleration zone wear extended 0-30m for 10-12yrs. boys group and 0-40m for both group i.e. 12-13 yrs. and 14-15yrs. boys group.
- 2) The maximum speed of different age group of boys increased with increase of age. The maximum speed of different age group was 6.45, 6.77 & 7.70m/sec. The rate of increase of maximum speed was 4.72% for 10-11yrs to 12-13yrs boys and 12.08% for 12-13 yrs. to 14-15 yrs. boys group.

- 3) The average speed of different age group of boys increased with increase of age. The average speed of all three group were 5.76m/sec, 6.01m/sec and 6.47m/sec respectively.

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