



Online Publication Date: 01 June 2009

ORIGINAL RESEARCH

THE START CAPACITY MANIFESTATION AT THE 10-15 YEARS OLD BOYS DURING THE 50 SM EVENT

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Keywords: start capacity, manifestation, study

Abstract. This study was conducted with the aim of knowing the manifestation of the start capacity, at an age that represents the beginning of training for the competitive sports, in boys. For this purpose we have recorded, in the 50 m event, the cumulated time and interval time, on age categories (10-11, 12-13 years old and 14-15 years old), out of which we extracted the results for the 5 and 10m. The study was conducted on a group of 81 subjects (28 children of 10 and 11 years old, 24 of 12 and 13 and 29 of 14 and 15. As evaluation indicators we have used, for the anthropometrical profile, the waist and weight, for the manifestation of the start capacity, we used the 50m speed running event, with a standing start in a maximum intensity. The time recording was made every 5 m, with the help of the Brower Timing System, made in Utah, U.S.A. The analysis of the obtained values emphasizes an increase of the start speed, in the first three intervals and in the groups of 10-11 years old, 12-13 and 14-15 years old.

Introduction

It is not a secret for anybody in the world of sports the fact that the roots of high performance are looked in the initiation activity developed with children and juniors, where the foundation for high valued results is being made. In the athletics specialized literature the training issue approach is not unknown, because there have always appeared a series of data and information regarding the training and competition process. This information is permanently outdated and, despite the fact that their potential value is maintained and transmitted in time, new aspects come up, generated by new study results. In this paper we try to present a conclusion regarding the manifestation of the start capacity in the 50 m speed running event, at boys, at three successive ages 10-11, 12-13, 14-15, which can represent a starting point in the activity of trainers and coaches. The high level of performances, in modern sports, imposes the continuous perfecting of all sides of the training, an aspect that can be achieved by the specialists only by knowing the newest international studies and research.

Material and method

This study was initiated at the age in which the children enter puberty, a very difficult period regarding the body growth and development, and the improvement of psycho-motor skills level. This theme is part of a series of research analyzing the manifestation and education of speed at 10-15 years old children. This time we have centered on the study of start capacity, a capacity that characterizes the first phase of a sprint event, the „start and start launching”.

We followed: a) to record the cumulated time and interval time on a distance of 50 m, at boys, on age categories (10-11, 12-13 and 14-15 years old) of which we extracted the results for the first 5 and 10m; and b) to track and analyze the start capacity in relation to the age group of the subjects.

The study was conducted on a group of 81 subjects, which was divided into subgroup A, age 10 - 11, of 28 children; subgroup B, age 12-13, of 24; subgroup C, age 14-15, 29. As indicators of the anthropometrical profile we used the waist and the weight. In order to observe the manifestation level of the start capacity, we chose as a control event a speed run on the distance of 50m, with a standing start at a maximum intensity, the time being recorded through an electronic timer, in seconds and hundreds of a second, every 5 meters. The time recorded in the first interval of 5 m (0-5 m), second interval (5-10 m) third interval (10-15 m) and the cumulated time in 50 m were analyzed, for the three groups, and interpreted. The evaluation test was made with the help of the Brower Timing System, made in Utah, U.S.A. First, the children were accommodated with the control event, doing 1-2 laps in a previous training session. The Brower Timing System comprises the following elements: a) the SPEETRAP touch-pad; b) an electronic emitter of transmitting the starting impulse (SPEEDTRAP TS 175 MODES); c) IRD – T 175 photoelectrical cells; d) IRE light sources; e) CM705CR electronic timer.

In conducting this study we started from the hypothesis that during a 50 sm event, there are differences in manifestation of the start capacity from one age group to another.

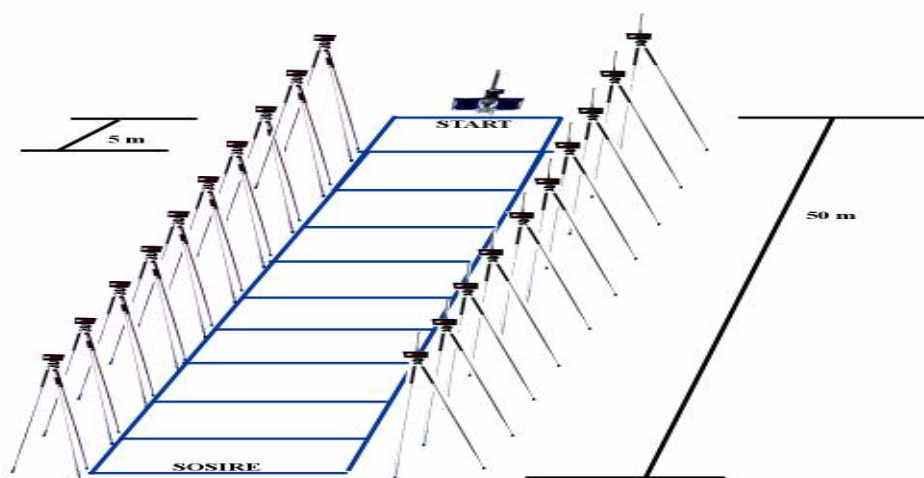


Figure 1. Repartition of the photoelectrical cells for the electronic timing at the 50sm event

Results and discussions

The average anthropometrical values, for the three groups, are presented in table 1

VÂRSTA	WEIGHT (G) kg				
	G min	G max	average	Standard deviation	CV%
10-11 y.o. Gr. A	28	52	36	6,20	17,22
Amplitude	24		-	-	-
12-13 y.o. Gr. B	33	62	44	8,81	20,02
Amplitude	29		-	-	-
14-15 y.o. Gr. C	41	79	59	10,00	16,95
Amplitude	38		-	-	-
VÂRSTA	WAIST (T) m				
	T min	T max	average	Standard deviation	CV%
10-11 y.o. Gr. A	1,33	1,56	1,45	0,06	4,14
Amplitude	0,23		-	-	-
12-13 y.o. Gr. B	1,39	1,70	1,56	0,08	5,13
Amplitude	0,31		-	-	-
14-15 y.o. Gr. C	1,49	1,90	1.71	0,09	5,26
Amplitude	0,41		-	-	-

Table 1. Average values of the anthropometrical indicators

In relation with age, the subjects of Gr. C have all the values of tendency indicators, X min, X max and average value, higher than the subjects of groups A and B, both at weight and waist. The average growth in **weight** is 23 kg and in **waist** 26 cm, in relation with gr. A, whereas in relation with Gr. B, of 15 kg respectively 15 cm. In all of the three groups, a low homogeneity characterizes the subjects.

In the 50 sm running event, the interval time is an indicator that has a precise target and thus a larger differentiation power. The data can be used also for a comparative analysis between the three groups.

Interval	Distance (m)	Average time			Average speed (m/s)			Average acceleration (m/s ²)			V ₂ -V ₁			acc ₂ -acc ₁		
		group			group			group			group			group		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
I	0-5m	1,43	1,36	1,31	3,49	3,67	3,81	2,44	2,69	2,90	3,49	3,67	3,81	2,44	2,69	2,90
II	5-10m	0,96	0,91	0,83	5,20	5,49	6,02	5,41	6,03	7,25	1,71	1,82	2,21	2,97	3,34	4,35
III	10-15m	0,85	0,82	0,73	5,88	6,09	6,84	6,91	7,42	9,38	0,68	0,60	0,82	1,50	1,39	2,11
total time for 5m		1.43	1.36	1.31	3.49	3.67	3.81	2.44	2.69	2.90						
total time for 10m		2.39	2.27	2.14	4.18	4.40	4.67	1.74	1.93	2.18						
total time for 15m		3.24	3.09	2.86	4.62	4.85	5.24	1.42	1.56	1.83						
total time for 50m		9.15	8.58	7.70	5.46	5.82	6.49	0.59	0.67	0.84						

Table 2. Values obtained by the three groups, on intervals from 0 to 15m and cumulated

Analyzing the values obtained by the three groups on 5 meters intervals, we observe an improvement of the time, from one group to another, with the increasing age. Thus, in **group A** the average value of the recorded time for the first interval is of 1.43 s and it corresponds to an average speed of 3.49 m/s, for the second interval, 0.96 s respectively 5.20m/s, indexes that characterize the start capacity. In the case of the 12-13 years old subjects (**group B**), following the same way of analyzing and interpreting the data, we se that the average time recorded for the first interval is of 1,36 s. corresponding to an average speed of 3,67 m/s and for the second interval, 0,91 s respectively a speed of 5,49 m/s. In **group C** the average value of the recorded time for the 0-5m interval is of 1,31 s corresponding to an average speed of 3,81 m/s whereas for the 5-10 m interval, we have a time average of 0,83 s to a speed average of 6,02 m/s.

In all three groups, the variation of the acceleration average is within the same intervals. In the first phase it has positive values, with the highest and ascendant values in I-II intervals, and then suddenly drops in the III interval.

Regarding the interval time indicators, the average time and the average speed for the 0-5m interval indicate an improvement of the start speed with age, as well as the average acceleration. On this basis the lowest average time and the maximum average speed on intervals have improved with age.

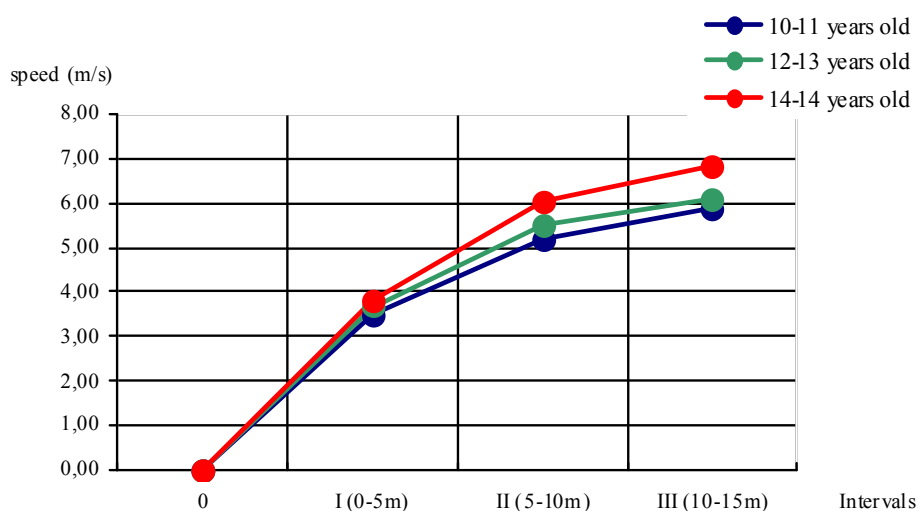


Chart 1. Evolution of the speed, on intervals, on age categories

In Chart 1 it is illustrated the evolution of the speed on intervals, for the three researched groups. Analyzing the total time obtained at 5m and 10m we observe also an improvement of values from one group to another with the increase in age. With the time improvement, we also observe a better speed and acceleration average. Thus, the speed improves from 2,44 m/s², at group A to 2,69 m/s², at group B, respectively 2,90 m/s² at group C. This increase of the speed value for the first 5m indicates a positive evolution of the start capacity with the increasing age. Even if the next two intervals, 5-10m and 10-15m, can be reported as being a part of the

acceleration phase in a speeding event, they were nevertheless presented, because with their help we can better emphasize the increase in values from one stage to another.

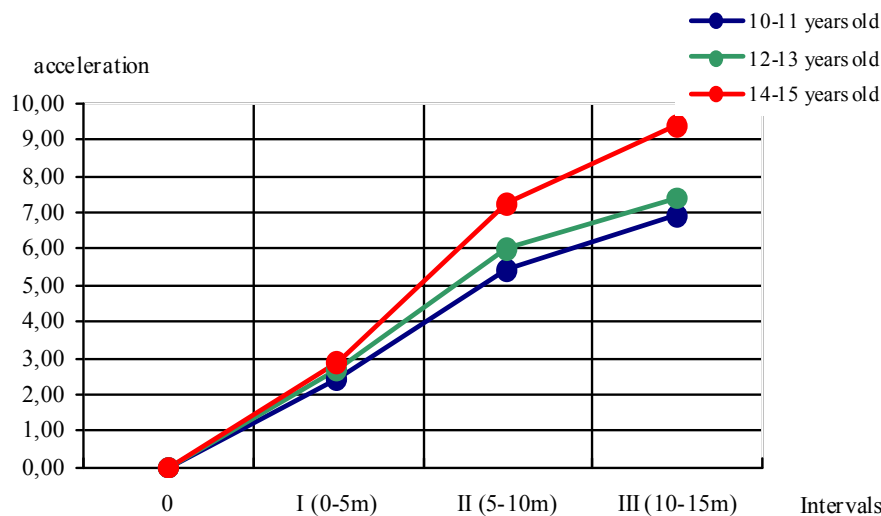


Chart 1. Evolution of the acceleration, on intervals, on age categories expressed in m/s²

In Table 2 we can easily see that the average acceleration increases in the second interval, in comparison with the first, with 1,74 m/s in group A, 1,82 m/s in group B and 2,18 m/s in group C, whereas for the third interval we can see an increase of 1,42 m/s, in group A, 1,56 m/s in group B and 1,83 m/s in group C. We can easily see, even if the acceleration is transposed on a continuous ascending curve, that the progression rate is smaller from one interval to another (Chart 2). This is due to the fact that the subjects leave with an initial speed equal to zero and tend to obtain the maximum speed that a child can develop, but is also due to the fact that the level of progress for the acceleration drops with the increasing speed.

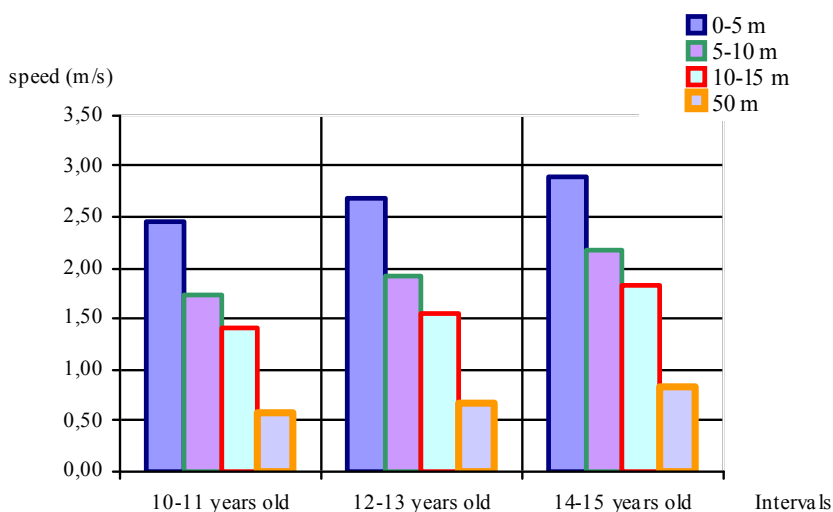


Chart 2. Evolution of the acceleration, on intervals, on age categories

Conclusions

The analysis of the results emphasized the following conclusions:

1. From an anthropometrical point of view all three samples, A, B, and C have at the **body weight** indicator a relatively poor homogeneity index. The amplitude is of 24 kg in Gr. A, 29 kg in Gr. B and 38 kg. Gr. C. The variability coefficient, in the same order, has values of: 17,22%, 20,02% and 16,9%. The Quetlet nutrition index, with average values of 248, 282 and 345 g/cm., increases with age category;
2. The averages calculated for time and speed, on the starting sequences of 0-5 m, 5-10 m and 10-15 m, have values that show a notable progress regarding the acceleration capacity. The progress rate averages record smaller values from the first to the third interval;
3. The start capacity has improved with the increasing age of the subjects;

4. The extreme values, minimal and maximal, prove a poor homogeneity regarding the start and accelerating capacity.

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