

# OBSERVATIONAL STUDY REGARDING ASPECTS OF THE PHYSICAL AND MOTOR DEVELOPMENT IN 14-18-YEAR OLD STUDENTS

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## Abstract

*The physical education activity has as main objective to develop the formative side of the students, while the education process, as a whole, aims to balance the relation between the formative and the informative. The efforts are directed toward the development of the adaptation ability to the permanent modifications in the young high-schooler's life. This research aimed to study the physical and motor development of high-school students, its main objective being to observe the way in which various somatic and motor parameters evolve over the course of the four years of study. This research started from the hypothesis stating that Highlighting certain particularities of the motor and somatic development of high-school students could constitute an important indicator for the physical education teachers in designing their teaching activity for this education level. The research methods used in this scientific endeavor were: the observation method; the testing method; the statistical-mathematical method of recording and interpreting the data.*

**Key words:** progress, student, high-school.

## INTRODUCTION

High-school education represents a higher stage of the Romanian education system, following middle-school and predating the university education. It is, or it should be, the stage in which the quality of the instructional process predominates (not just in regards to physical education), on the background of a considerable quantitative addition, a consequence of the combined "linear - concentric" character of the specialized curricula.

Currently, high-school education is structured on two levels: the junior level, comprising 9th and 10th grade, and the senior level, comprising 11th and 12th grade. In high-school, physical education always had a work volume of two hours per week in the curricula, for all of the grades. Today, after the educational reform of 1996, the problem of high-school physical education is surprising for a country that wants to "align" itself to Europe, but it doesn't want to see how things are really working (Cojocariu, V., 2002).

The high-school age period is the post-pubescent and adolescence stage during which the growth period completes and ends. "This period that some authors divide into three sub-stages - pre-adolescence (14-16 years old), the actual adolescence (16-18), prolonged adolescence (18-25), is linked to the status of adulthood and is characterized by the intense development of personality, all of these in the context of a gradual liberation from the family and school" (Epuran, M., Horghiodan, V., 1997).

If the pubescent period is dominated by the biological maturing of the genitalia, the post-pubescent period, the adolescence completes and ends the growth period not only biologically, but also socially.

As a time period, post-pubescence varies according to the interval between the end of puberty and adulthood. Due to the fact that in this period the physiological age differs from the chronological age, the advancement of the physiological age is maintained also in the post-pubescent age (Pantelimon, G., Verza E., Mielu, Z., 1997).

The girls present a 2-3 years advancement in comparison to the boys, gained mostly during the puberty; in the post-pubescent period the girls' increased rhythm of maturing is maintained, so that they reach earlier the age considered to be the end of the growth and differentiation process.

At the end of this stage, the body reaches somatic-vegetative maturity, characterized by a series of transformations that accelerates the maturing process of the body from all points of view.

## AIM, HYPOTHESIS, AND RESEARCH METHODS

This research tried to study the psycho-motor development of high-school students, its main aim being to observe the way in which various somatic and motor parameters evolve over the course of the four years of study. This research started from the following hypothesis:

*Highlighting certain particularities of the motor and somatic development of high-school students could constitute an important indicator for the physical education teachers in designing their teaching activity for this education level.*

In our study, the following research methods were used: observation method; testing method; statistical-mathematical method of recording and interpreting the data.

#### DEVELOPMENT OF THE RESEARCH

The research was conducted at the "Vasile Alecsandri" National College, with the direct support of teacher Ionela Tuduriu, between September 2013 and June 2014. This was the only high-school where the 12th grade students' data was available for the entire high-school period. All the tests and measurements were conducted by the teacher throughout the time when the students went through grades 9, 10 and 11, this researcher participating in the tests for the 12th grade. In order to highlight the way in which the students made progress from a motor and somatic point of view, tests and measurements were done for the following parameters: height, weight, 50m flat sprint, endurance running, long jumping, and oina ball throwing.

#### RESULTS OF THE RESEARCH

The progress of the students over the course of the four years of study is presented in the following tables (Tables 1-4).

**Table 1 Results recorded by the 9th students during the tests and measurements**

No	LAST NAME AND FIRST NAME	GENDER M/F	BIRTH YEAR	HEIGHT (CM)	WEIGHT (KG)	CONTROL CHALLENGE RESULTS			Oina ball throwing (m)
						50 m sprint (sec)	Endurance running: (min)	Long jumping (cm)	
1	A.A.	M	1995	167	55	8,5	4,33	176	16
2	A.C.	F	1995	168	56	8,4	4,21	151	17
3	A.C.A	F	1995	179	61	6,2	4,23	151	23
4	A.M.E	M	1995	164	65	8,5	4,29	141	20
5	B.C.R	M	1995	150	43	7,6	4,47	147	22
6	B.I.A.	M	1995	168	63	6,1	4,43	231	25
7	C.R.A	M	1995	169	54	8,0	4,31	167	18
8	C.A.L.	F	1995	166	51	7,5	4,52	172	24
9	D.C.G.	F	1995	164	55	6,6	4,26	202	26
10	D.L.M.	M	1995	163	51	7,1	5,42	206	31
11	F.V.	F	1995	171	53	8,0	4,26	161	18
12	G.G.	F	1995	178	56	7,2	5,33	191	34
13	M.M.I.	M	1995	178	70	8,9	4,49	160	20
14	M.C.G.	M	1995	155	51	7,4	4,37	181	32
15	N.E.	M	1995	175	66	8,4	4,50	151	23
16	N.R.	F	1995	163	50	8,5	4,45	71	20
17	P.T.	F	1995	162	58	8,6	4,34	121	17
18	S.I.	F	1995	164	52	7,4	4,43	171	32
19	Ş.G.	M	1995	165	53	7,0	4,47	186	17
20	Ş.Ş.	M	1995	170	63	8,0	4,41	171	26
21	T.F.	F	1995	176	65	7,1	4,27	196	20
22	T.T.	M	1995	161	50	8,6	4,27	101	23
23	Ț.A.	F	1995	156	47	8,6	4,56	131	19
24	Z.M.	F	1995	161	53	8,6	4,39	146	20
ARITHMETICAL MEAN				165.37	53	7.78	4.45	161.75	21.62

**Table 2 Results recorded by the 10th students during the tests and measurements**

No	LAST NAME AND FIRST NAME	GENDER M/F	BIRTH YEAR	HEIGHT (CM)	WEIGHT (KG)	CONTROL CHALLENGE RESULTS			Oina ball throwing (m)
						50 m sprint (sec)	Endurance running: (min)	Long jumping (cm)	
1	A.A.	M	1995	171	60	8,4	4,12	181	17
2	A.C.	F	1995	172	59	8,4	4,01	156	19
3	A.C.A	F	1995	184	63	6,1	4,13	156	28
4	A.M.E	M	1995	167	64	8,3	4,09	151	25
5	B.C.R	M	1995	151	45	7,6	4,29	151	29
6	B.I.A.	M	1995	172	61	6,0	4,13	236	35
7	C.R.A	M	1995	173	52	7,5	4,01	161	18
8	C.A.L.	F	1995	171	52	7,4	4,02	176	28
9	D.C.G.	F	1995	170	58	6,4	4,06	206	33
10	D.L.M.	M	1995	165	50	6,8	5,22	211	41
11	F.V.	F	1995	174	56	7,9	4,16	171	18
12	G.G.	F	1995	181	60	6,9	5,03	196	39
13	M.M.I.	M	1995	182	72	8,6	4,29	156	20
14	M.C.G.	M	1995	161	53	7,1	4,27	196	38
15	N.E.	M	1995	180	69	8,0	4,30	156	20
16	N.R.	F	1995	167	54	8,0	4,25	90	17
17	P.T.	F	1995	166	56	8,2	4,04	121	17
18	S.I.	F	1995	167	51	7,2	4,03	181	37
19	Ş.G.	M	1995	168	58	6,8	4,27	191	18

20	Ş.Ş.	M	1995	173	64	8,0	4,11	171	36
21	T.F.	F	1995	182	60	6,8	4,07	196	22
22	T.T.	M	1995	164	52	8,3	3,57	106	24
23	Ț.A.	F	1995	160	49	8,4	4,52	151	19
24	Z.M.	F	1995	163	55	8,3	4,09	141	20
ARITHMETICAL MEAN				170.16	57	7.55	4.21	167	25.75

**Table 3 Results recorded by the 11th students during the tests and measurements**

No	LAST NAME AND FIRST NAME	GENDER M/F	BIRTH YEAR	HEIGHT (CM)	WEIGHT (KG)	CONTROL CHALLENGE RESULTS			
						50 m sprint (sec)	Endurance running: (min)	Long jumping	Oina ball throwing
1	A.A.	M	1995	174	61	8,2	3,57	182	19
2	A.C.	F	1995	174	59	8,1	4,07	153	21
3	A.C.A	F	1995	186	63	6,0	4,07	162	30
4	A.M.E	M	1995	168	63	8,0	3,57	153	28
5	B.C.R	M	1995	155	45	7,2	4,17	162	26
6	B.I.A.	M	1995	174	63	6,0	4,03	241	38
7	C.R.A	M	1995	175	53	7,2	4,11	171	21
8	C.A.L.	F	1995	172	62	7,3	4,22	176	26
9	D.C.G.	F	1995	172	53	6,1	4,00	211	38
10	D.L.M.	M	1995	168	53	6,4	5,02	221	44
11	F.V.	F	1995	176	62	7,4	4,07	167	20
12	G.G.	F	1995	182	63	6,7	4,52	221	41
13	M.M.I.	M	1995	184	74	8,4	4,09	166	22
14	M.C.G.	M	1995	164	54	6,9	4,00	201	37
15	N.E.	M	1995	181	68	7,9	4,10	153	23
16	N.R.	F	1995	169	55	7,9	4,19	118	20
17	P.T.	F	1995	167	52	7,9	4,14	126	21
18	S.I.	F	1995	168	52	6,8	4,00	187	36
19	Ş.G.	M	1995	170	59	6,8	4,12	201	23
20	Ş.Ş.	M	1995	174	67	7,7	4,01	161	38
21	T.F.	F	1995	184	65	6,4	4,01	201	25
22	T.T.	M	1995	166	54	8,1	4,00	131	27
23	Ț.A.	F	1995	162	50	7,8	4,32	161	24
24	Z.M.	F	1995	164	53	7,9	4,08	141	22
ARITHMETICAL MEAN				172	58	7.29	4.10	173.6	27.91

**Table 4 Results recorded by the 12th students during the tests and measurements**

No	LAST NAME AND FIRST NAME	GENDER M/F	BIRTH YEAR	HEIGHT (CM)	WEIGHT (KG)	CONTROL CHALLENGE RESULTS			
						50 m sprint (sec)	Endurance running: (min)	Long jumping (m)	Oina ball throwing (m)
1	A.A.	M	1995	176	62	7,7	3,47	186	23
2	A.C.	F	1995	177	58	7,1	3,27	161	22
3	A.C.A	F	1995	186	64	5,9	3,43	166	29
4	A.M.E	M	1995	169	60	7,2	3,57	156	30
5	B.C.R	M	1995	160	46	7,0	3,58	156	27
6	B.I.A.	M	1995	175	62	6,0	3,43	246	39
7	C.R.A	M	1995	176	54	6,7	3,31	181	21
8	C.A.L.	F	1995	176	56	6,9	3,52	186	25
9	D.C.G.	F	1995	173	55	6,1	3,58	221	37
10	D.L.M.	M	1995	169	58	6,3	4,42	236	46
11	F.V.	F	1995	177	60	7,5	3,37	196	22
12	G.G.	F	1995	183	59	6,7	4,17	216	44
13	M.M.I.	M	1995	184	75	7,9	4,00	166	25
14	M.C.G.	M	1995	166	57	6,7	4,01	221	34
15	N.E.	M	1995	182	72	7,3	4,01	166	24
16	N.R.	F	1995	170	54	7,7	4,22	124	22
17	P.T.	F	1995	169	56	8,0	3,34	134	23
18	S.I.	F	1995	171	57	6,8	3,48	191	33
19	Ş.G.	M	1995	172	66	6,4	3,59	224	23
20	Ş.Ş.	M	1995	177	69	7,3	4,07	177	38
21	T.F.	F	1995	186	64	6,5	4,10	206	26
22	T.T.	M	1995	168	57	7,6	3,38	131	29
23	Ț.A.	F	1995	164	50	7,8	4,02	171	25
24	Z.M.	F	1995	166	51	7,9	3,58	151	23
ARITHMETICAL MEAN				173.83	59	7.04	4.10	182	28.,75

The calculation of the arithmetical mean for each parameter allows the presentation of a centralized situation in the following table (Table 5):

**Table 5 Progress of the parameters' arithmetical mean over the course of the four years of study**

Grade	Height (cm)	Weight (Kg)	50m sprint (sec.)	Endurance running (min.)	Long jumping (m)	Oina ball throwing (m)
<b>IX</b>	165.37	53	7.78	4.45	161.75	21.62
<b>X</b>	170.16	57	7.55	4.21	167	25.75
<b>XI</b>	172	58	7.29	4.10	173.6	27.91
<b>XII</b>	173.83	59	7.04	4,10	182	28.,75

In the table above one can see an improvement in all the measured indices, which confirms that fact that the students have experienced a motor and a somatic development.

### CONCLUSIONS

The study allowed the following conclusions:

- from a somatic point of view, over the course of the four years, the students experienced an average progress of 8,4 cm in height and of 6 kg in weight, representing a normal development, considering that the temptation of the computer is high, which often affects the excessive weight gain. The highest "jump" for these differences was recorded when the students passed from the 9th to the 10th grade (4.79 cm in height and 4 kg in weight), which shows that the young people get closer to the end of their growth period.
- From a motor point of view, the following differences were recorded between the initial (9th grade) and the final results (12th grade): for the sprint, the average progress was of 0.74 tenths of a second; for the long jump, the average progress was of 0.20 m; for the endurance running, the average progress was of 35 seconds; and for the oina ball throwing, the average progress was of 7,08 m.

One can see that, unlike the somatic development that recorded higher values between 9th and 10th grade, the performances recorded a higher "jump" between grades 11 and 12. Considering these aspects, one can conclude that the working hypothesis was confirmed, in the sense that this study can be a guide for the physical education teachers when designing their teaching process, being able to program a higher work volume for the terminal grades.

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