

## Sexual Development of Boys and Girls Aged 14-18 Years, Studying at Different Types of Schools

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On the basis of a large-scale examination of the psycho-emotional condition of students, a pilot survey has been carried out for assessment of the sexual development in three types of schools (secondary production-oriented school, secondary school of general education (Roma children) and a sports school).

The survey analyzes results of three periods — 1978, 1988 and 2004. Several things have been established: the manifestation of the secondary sex characteristics, through 8 indexes in boys and 6 indexes in girls, the influence of the biological development on the degree of manifestation of the sex characteristics, time and factors affecting the occurrence of the first menstruation and the first ejaculation, on the beginning of the first sexual contacts, etc.

Dependencies between the morphological indexes and the degree of sexual development have been sought through plural correlation. What impresses is that today's youth show a more accelerated sexual development which does not always correspond with their socialization in the contemporary society.

*Key words:* physical, biological, sexual development, harmonious and disharmonious type, acceleration, retardation.

The attempt to make a periodization of the ontogenic development of the individual is a complex task, because it is necessary to specify the influence of many factors, which for their part do not play one and the same role in the different stages and do not provide one and the same informativeness. Questions grow more complex since when considering the norm of an individual index we should take into account that an organism's systems do not develop synchronously.

In this connection the individual differences in the speed of the physical and sexual development and the discrepancy between the biological and calendar age of children require a differentiated approach with regards to the fact that the maximum acceleration of growth often (but not always) is connected with the development of the reproductive system.

Lately we have been witnessing the much earlier occurrence of the primary and secondary sex characteristics in both sexes.

A number of observations indicate that sexual maturation plays a significant role in developing the motorics, for increasing the individual motive and func-

tional characteristics, for the purposefulness of the personality and the frequent occurrence of a discrepancy between the biological and social maturity of the individual.

## Material and Methods

Within the framework of a large-scale research connected with assessment of the psycho-emotional condition of students of the 14-18 age bracket, a pilot poll survey and examination were carried out on the basic indexes characterizing the degree of sexual maturity with the two sexes in the indicated age groups. A total 212 boys and 236 girls, evenly distributed according to sex and age, were included in the survey. The survey was carried out in schools of different profiles in Haskovo and Plovdiv districts.

The characteristics of the observation units were: manifestation of the secondary sex characteristics in both sexes; relation between the degree of the biological development and the manifestation of the secondary sex characteristics; time of occurrence of the first menstruation and its nature; time of the first ejaculation; beginning of sexual contacts; relation between the sexual maturation and the morphological indexes; specification of the influence of certain factors on sexual maturation.

The assessment of the manifestation of the secondary sex characteristics was carried out in accordance with a modification of ours of the Zeller method in rating marks from 1 to 5, different for the individual characteristics. Boys were observed for 8 sex characteristics which in terms of the maximum number of rating marks give a total of 28. Girls were observed for 6 characteristics, giving the maximum rating mark of 22.

We determined the biological age by means of skeletometric methods, while the assessment of the morphological indexes — through the accepted anthropometric methods.

We sought plural correlation dependencies between the individual indexes providing objectiveness of the conclusions reached.

## Results

The manifestation of the sex characteristics was traced in different types of schools, and the data obtained were compared to other researches of ours from 1978 and 1988. (Table 1)

Analyzing the results of the manifestation of the secondary sex characteristics in the three age periods (1978,1988,2004), we should point out that 2004 saw a stronger manifestation of the secondary sex characteristics with boys at the age of 14, 15 and 16 years, after which no significant differences with the other periods were established. A similar tendency has been witnessed with girls, with the stability of the rating marks reached as early as the age of 16 years.

We tried to find out the influence of the degree of biological maturity on the manifestation of the secondary sex characteristics for the three periods under examination (Tables 2 and 3).

The data from the two tables show a direct relation between the degree of the biological development and the manifestation of the secondary sex characteristics as they are significant in both sexes between accelerated, retarded and normally developed.

T a b l e 1. Manifestation of the secondary sex characteristics in boys and girls aged 14-18 years (total rating mark) in 1978, 1988 and 2004

Age, years	Total rating mark											
	Boys						Girls					
	1978		1988		2004		1978		1988		2004	
	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
14	17.25	1.69	17.15	1.90	18.32	1.59	15.21	1.45	15.13	1.30	16.21	1.43
15	21.47	1.73	20.55	1.73	22.27	1.74	17.47	1.53	17.11	1.26	18.03	1.58
16	23.11	1.84	23.02	1.35	23.78	1.51	18.52	1.61	18.33	1.41	18.80	1.71
17	24.60	1.81	24.73	1.49	24.83	1.77	19.70	1.58	19.61	1.38	19.86	1.53
18	24.96	1.84	25.11	1.44	25.31	1.53	19.87	1.64	19.97	1.39	20.35	1.64

T a b l e 2. Manifestation of the secondary sex characteristics (rating marks) with boys in different degree of biological development

Age, years	Periods								
	1978			1988			2004		
	Acceleration	Normal Development	Retardation	Acceleration	Normal Development	Retardation	Acceleration	Normal Development	Retardation
14	18.9	16.5	14.3	19.3	16.1	13.9	19.7	17.1	15.7
15	21.7	19.4	17.5	21.5	19.3	16.3	22.3	20.2	18.4
16	23.6	22.1	19.9	23.9	22.2	18.5	23.8	22.7	20.3
17	25.6	24.9	22.1	24.8	24.6	21.7	24.9	23.1	22.9
18	25.8	25.0	23.7	25.9	25.3	24.9	25.7	24.9	24.1

T a b l e 3. Manifestation of the secondary sex characteristics (rating marks) with girls in different stages of biological development

Age, years	Periods								
	1978			1988			2004		
	Acceleration	Normal Development	Retardation	Acceleration	Normal Development	Retardation	Acceleration	Normal Development	Retardation
14	15.4	14.5	11.5	15.9	14.7	10.9	16.1	15.3	12.2
15	17.4	15.9	13.2	17.9	16.8	13.8	17.9	16.4	14.1
16	19.1	17.3	15.1	19.3	17.9	15.9	20.1	17.5	16.7
17	20.5	19.7	17.3	20.6	19.8	17.7	20.7	20.1	18.3
18	21.2	20.7	19.4	21.5	20.6	20.4	21.1	20.4	19.8

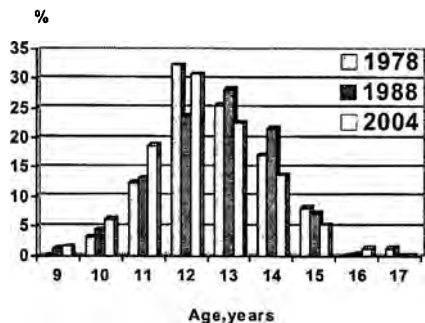


Fig 1. Age of occurrence of first menstruation in schoolgirls 14-18 years studied in 1978, 1988 and 2004

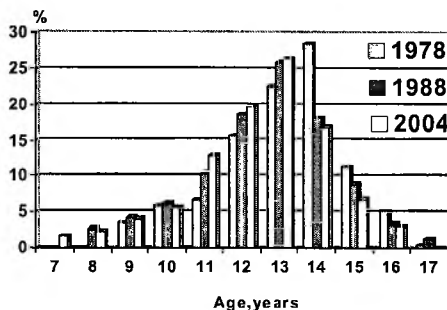


Fig. 2. Age of occurrence of first ejaculation in schoolboys 14-18 years studied in 1978, 1988 and 2004

The time of occurrence of the first menstruation in girls is influenced by a number of factors. With the recipients examined by us it was established that during the periods under examination it is different (Fig. 1).

It has been proved that the average age of occurrence of the first menstruation in the examined girls is  $12.74 \text{ years} \pm 1.24$ , and with girls from the secondary production-oriented schools it is manifested at  $12.75 \text{ years} \pm 1.28$ , while in Roma children -  $12.53 \pm 1.37$ , and in the sports school -  $12.53 \pm 1.37$ .

The time of occurrence of the first ejaculation in boys during the years of the three examined periods is as follows: 1978 -  $12.8 \pm 1.19$ ; 1988 -  $12.9 \pm 1.7$ ; 2004 -  $12.5 \pm 1.24$  (Fig. 2).

Of all the boys examined in 2004, 31.28% had their ejaculation earlier, in the mean norm the figure was 54.19 and another 14.53 had their ejaculation later. In its nature, in 10.32% of the boys it is manifested through pollution, while in 89.68% it is caused by masturbation. It should be stressed that during the mentioned year ejaculation was ascertained with nearly 8% of the schoolboys under 10 years of age.

The beginning of sexual contacts with boys and girls was specified through a poll in 2004 (Fig. 3).

We looked for the relation between the sexual development and morphological indexes. Through a plural regression between the final height, the height in recent years, BMI and puberty development it has been proved that there exist low correlation relations, except for those during the 14<sup>th</sup> and 15<sup>th</sup> years.

A number of factors influencing sex maturation were witnessed during the general examination of 874 students of both sexes aged 14-18 years: type of nervous system, system of values, influence of the social, family and school environment, the psycho-emotional tension and depression, the health status, mode of life, etc.

## Conclusions

1. An increase in the rating marks of manifestation of the secondary sex characteristics in 2004 in comparison with 1978 and 1988 was proved, with the manifestation influenced by the degree of biological development.
2. The time of occurrence of the first menstruation and ejaculation comes much earlier as a result of the influence of a number of factors.

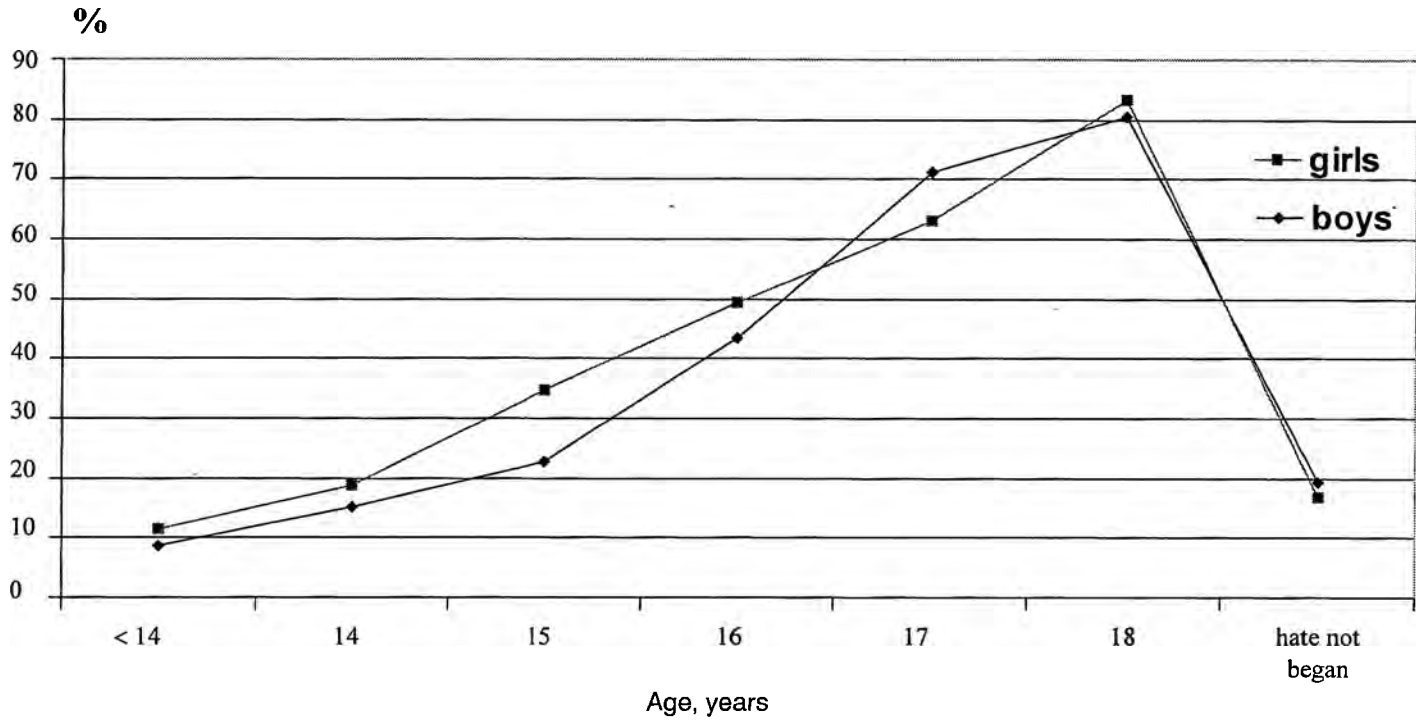


Fig. 3. Percentage of school children 14-18 years of age studied in 2004, who have begun having sexual contacts

3. In recent years sexual contacts start much earlier with girls as compared to boys and have their peak between 15 and 16 years. This necessitates the implementation of a purposeful prophylactic activity, the aim being to curb them.

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