

## SEXUAL MATURATION AND SOCIOFAMILIAL CONDITIONS' IN SCHOOL BOYS AND GIRLS IN SOFIA

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*Abstract: A sample of 447 boys and 465 girls from different districts of the city of Sofia was examined in the years 1984 and 1987. A considerable variation in the age at menarche in girls and in the age at first puberty signs in boys was noted, depending on parents' education, fathers' occupation, incomes per capita, number of children in family, dwelling conditions and type of household. The median age at menarche of the total material is  $12.86 \pm 0.11$  years and there are no significant changes during the last two decades. A new fact, early maturation in children from extended and multiple households in difficult dwelling conditions was noted.*

*Key words: Puberty in boys and girls; Menarche; Sociofamilial conditions; Type of household.*

### Introduction

The aim of the present study is to examine the process of sexual maturation of boys and girls in Sofia in connection with the individual sociofamilial environment. There are many studies on the influence of different sociofamilial factors on the process of sexual maturation, mostly on the age at menarche (review: Danker-Hopfe 1986). But in Bulgaria only the differences in age at menarche between town and village girls are reported in few papers (Damyanova 1974, Karamanlieva 1973, Katsulov, Ivanov 1973, Rashkova-Andreeva 1978) and there is not a more detailed study. In the 1980s in Bulgaria a semi-official thesis was that there exist only very small social differences in terms of puberty because the social homogeneity is reached (Stanchev 1981).

### Material and methods

447 boys and 465 girls, aged 9 to 17 years are investigated in the city of Sofia (366 800 inhabitants in 1946, 1 114 800 in 1985). The investigation is carried out in 1984 and 1987 in three schools in different districts of the city: a) in the central part; b) in Geo Milev district, built-up about 1965; c) in Nadezhda district, built-up about 1980. The sociodemographic structure of these districts is different.

The secondary sexual signs were evaluated from 0 to 3 (Miklashevskaya 1983). If needed, intermediate marks are used (0.5, 1.5, 2.5). The summary sexual maturation index (SMI) by Schwidetzky and Pavilonis was calculated, too. This index is a generalization of the particular sexual maturation signs and varies from 0 to 12. Its rubrication is: 0 - child stage; 0.5 - first puberty signs, prepuberty in boys; 1.5 (2.0) - early puberty, "phasis cetera" in boys (girls); 5.0 (6.5) - late puberty, "phasis lenta" in boys (girls); 10.5 - postpuberty; 12.0 - adult stage. (More details can be found in: Cieslik et al. 1986, Martirosov (1982). The age at the different stages of sexual maturation was evaluated by probit analysis.

An investigation for the sociofamilial conditions is carried out among the parents of the schoolchildren. For evaluation of the influence of the sociofamilial environment on sexual maturation, age at menarche in girls and age at first puberty signs in boys are

used. Single age groups divided by sociofamilial subsamples are not numerous. So three year moving average ages and sums are used to calculate the proportion of girls with menses (boys with puberty signs) in connection with the age, which is the base of probit analysis. Using this method we receive a good evaluation of the median age, but an overestimation of the standard deviations, so in Table 5 only medians and their standard errors are presented (see also table 6).

### Results and Discussion

The process of sexual maturation in adolescents in the city of Sofia is demonstrated in the tables 1 to 3.

The median age at menarche is  $12.86 \pm 0.11$  years. The results of the investigations on the age at menarche in Sofia during 1960–1980 differ strongly, from 12.5 to 13.1 years, when in recalled age studies in girls under 16 the correction needed is made (Angelov 1970, Damyanova 1975, Katsulov, Ivanov 1973, Todorov, Vizev 1979, Kadanoff et al. 1976). This wide variability is practically the same as the variability among city districts, established in the course of the present study (Table 4), which is due to the differences in the familial environment. In the city centre the educational and professional levels of the parents are higher, and the living conditions are better. Unfortunately, in earlier studies neither school localisation nor sociofamilial environment were taken into consideration. Thus it seems that there are no significant changes of the age at menarche in Sofia during the last two decades.

Table 1. Sexual maturation in Sofia girls

Age at last birthday (years)	n	Girls with menses		Mean stage of the secondary sexual signs (0–3)			Mean sexual maturation index (0–12)
		n <sub>m</sub>	p (%)	Ma	Pu	Ax	
9	34	—	0	0.21	0.03	0	0.24
10	66	2	3.1	0.40	0.33	0.09	0.91
11	65	6	9.2	0.72	1.08	0.39	2.47
12	58	23	39.7	1.28	2.00	1.03	5.50
13	86	72	83.7	1.90	2.62	1.78	8.81
14	49	45	92.8	2.15	2.81	2.36	10.02
15	63	62	98.4	2.25	2.87	2.41	10.49
16	41	40	97.6	2.49	2.94	2.63	10.99
17	3	3	100.0	3.00	3.00	3.00	12.00

Table 2. Sexual maturation in Sofia Boys

Age at last birthday (years)	n	Mean stage of development of thesecondary sexual signs (0–3)			Mean sexual maturation index (0–12)
		Pu	Ax	Ba	
9	34	0.01	0.01	0	0.04
10	54	0.17	0.04	0.01	0.28
11	84	0.20	0.03	0.01	0.31
12	72	0.87	0.22	0.04	1.47
13	69	2.04	0.60	0.14	3.71
14	60	2.62	1.14	0.36	5.49
15	36	2.83	1.74	0.94	7.35
16	29	2.91	2.34	1.72	9.31
17	9	2.89	2.56	2.44	10.52

Table 3. Age at some stages of sexual maturation in Sofia girls and boys (years)

Signs:	Girls			Signs:	Boys			
	Mean	m	s		Mean	m	s	
Menarche	12.86	0.11	1.29	Pu	0.5	12.32	0.13	1.43
Ma 0.5	10.29	0.17	1.54	1.5	12.86	0.11	1.23	
1.5	12.31	0.12	1.32	2.5	13.59	0.11	1.21	
2.5	15.56	0.23	2.36	3.0	14.40	0.13	1.60	
3.0	17.03	0.49	2.83					
Pu 0.5	11.13	0.10	0.97	Ax 0.5	13.56	0.15	1.79	
1.5	11.76	0.09	0.93	1.5	14.72	0.14	1.41	
2.5	12.97	0.09	1.05	2.5	16.44	0.28	1.84	
3.0	13.57	0.14	1.89	3.0	17.39	0.51	1.94	
Ax 0.5	11.59	0.13	1.24	Ba 0.5	14.30	0.14	1.44	
1.5	12.75	0.10	1.21	1.5	16.07	0.17	1.17	
2.5	14.82	0.15	1.87	2.5	17.30	0.39	1.31	
3.0	15.81	0.22	2.07	3.0	17.73	0.56	1.38	
SMI 0.5	10.16	0.14	1.17	SMI 0.5	12.30	0.13	1.43	
1.0	10.88	0.11	1.12	1.5	12.76	0.11	1.32	
2.0	11.54	0.10	0.98	5.0	14.27	0.11	1.16	
6.5	12.97	0.10	0.94	10.5	17.10	0.33	1.31	
10.5	14.87	0.15	1.83					
12.0	17.17	0.36	1.63					

Table 4. Sexual maturation in different city districts of Sofia (years)

District	n	Girls: menarche			n	Boys: first puberty signs		
		Mean	m	s		Mean	m	s
Centre	112	12.35	0.14	0.85	149	11.72	0.11	0.63
Geo Milev	78	12.62	0.19	1.23	175	12.27	0.12	1.21
Nadezhda	275	13.15	0.16	1.37	123	12.31	0.13	1.53

The research has found that the maturation in girls is earlier in families with less children, higher education of the parents, with fathers nonmanual workers. The occupation of the mothers seems to have a small influence on the sexual maturation of their children, since there are many women nonmanual workers with only secondary education. The differences in age at menarche in connection with the monthly income per capita are very well expressed (13.1 o. 11.8 years). This is probably connected with the influence of the income on the proteine diet (Table 5).

On the contrary, the differences in connection with the dwellig surface per capita are not very clear. They are complicated by the different disposition of the dwellings, which determines the number of inhabitants per room, and also by the type of the household. In extended and multiple households the children mature early, although they live in more difficult dwelling conditions. Moreover, in the small households when the number of inhabitants per room is higher, the sexual maturation is retarded. In the households with relatives, however, the girls, living in dwellings with 2.5 and more inhabitants per room mature most early. Thus there are two minima in the curve of the connection of the age at menarche and the number of inhabitants per room: in girls living in the best and in girls living in the most difficult dwelling conditions.

**Table 5. Sexual maturation in Sofia girls and boys in function of different sociofamilial conditions (years)**

Conditions		Girls: menarche			Boys: first puberty signs		
		n	Mean	m	n	Mean	m
number of sibs	0	102	12.46	0.11	109	12.26	0.12
	1	318	12.81	0.08	338	12.40	0.07
	2-3	45	13.22	0.21			
father's education	high	130	12.61	0.11	189	12.33	0.12
	secondary	110	12.94	0.14	86	12.56	0.12
	primary	25	13.36	0.36			
mother's education	high	124	12.54	0.12	168	12.48	0.10
	secondary	131	12.90	0.13	107	12.55	0.15
	primary	14	14.28	0.32			
father's occupation	manual work	107	13.13	0.15	67	12.55	0.19
	nonmanual	161	12.56	0.10	220	12.38	0.09
mother's occupation	manual work	51	12.79	0.20	30	12.38	0.27
	nonmanual	214	12.72	0.09	247	12.43	0.08
monthly income per capita (leva)	less than 99	83	13.06	0.16	63	12.76	0.22
	100-139	101	12.95	0.14	93	12.63	0.14
	140-179	45	12.55	0.22	65	12.39	0.17
	180 and more	23	11.84	0.26	28	11.95	0.38
dwelling surface per capita, m <sup>2</sup>	less than 9.9	23	12.98	0.31	26	12.41	0.37
	10-19.9	130	12.95	0.13	101	12.33	0.11
	20 and more	93	12.65	0.13	119	12.49	0.12
inhabitants per room	0.5-1.25	38	12.48	0.18	54	12.23	0.35
	1.33-1.5	62	12.78	0.19	68	12.62	0.14
	1.67-2.33	84	13.53	0.17	66	12.60	0.17
	2.5 and more	73	12.34	0.17	57	12.53	0.14
type of the household	simple	179	12.87	0.11	158	12.46	0.10
	extended	49	12.69	0.17	99	12.33	0.09
	multiple	39	12.37	0.22			
inhabitants per room (simple household)	0.5-1.25	27	12.54	0.19	39	12.01	0.75
	1.33-1.5	59	12.86	0.20	58	12.66	0.17
	1.67-2.33	60	13.28	0.21	38	12.64	0.28
	2.5 and more	27	13.08	0.46	19	13.10	1.48
(extended and multiple household)	0.5-2.33	38	13.11	0.11	53	12.58	0.18
	2.5 and more	46	12.23	0.19	38	12.41	0.21

The differences in the age at the first puberty signs in boys in connection with their family environment follow the differences in the age at menarche in girls, but they are not so well expressed (Table 5). Perhaps it is due to some subjectivity and indetermination in the evaluation of the appearance of the secondary sexual signs. However, when in girls the dependence of the sexual maturation on some factor is well expressed (for example, on income), it is well expressed and statistically significant in boys too ( $p = 0.001$  in girls,  $p = 0.05$  in boys).

For more connections between sexual maturations and sociofamilial environment established by this study parallels could be found with other investigations (Laska-Mierzejewska 1983, Bodzár 1975, Danker-Hopfe 1986). But the authors could not find a research on the dependence of the sexual maturation on the type of household. The early sexual maturation in adolescents from households with relatives in difficult dwelling conditions could be connected with the influence of the psychical factors (Hulanicka 1986).

In conclusion, the sexual maturation of adolescents in Sofia is under the strong influence of the sociofamilial conditions. This influence is expressed both in boys and girls. A new fact is the type of connection between dwelling conditions, the type of household and sexual maturation: early maturation in children in extended and multiple households in difficult dwelling conditions.

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