

AGE CHANGES OF BODY MEASUREMENTS OF YOUNG ADULTS IN HUNGARY

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Abstract: Age changes of body height and body weight were analysed in a sample of Hungarian university students (3,918 twenty years old male and 659 nineteen years old female students), who were investigated between 1976-1985. Every students were measured twice, first time in the first and second time in the fifth (last) academic year of their study at the university. The results showed positive age changes of these body measurements, which were different according to the place of birth of the students, as well as the effect of the positive secular trend.

Key words: Body height; Body weight; Age changes; University students; Place of births.

Introduction

Body measurements change not only in childhood during the growth process, but in adulthood, too. These age changes can be investigated both by longitudinally and cross-sectionally. However, in cross-sectional studies the results show not only the "pure" age changes of the body measurements, but the effects of the secular trend and the selective survival to them, too (Susanne 1980). The majority of the studies concerning these changes reported only the stature, and only some of them contain data about the other measurements of the body and head (Susanne 1980).

The number of the studies referring to the age changes of the young adults under age of 30 are also very limited (Büchi 1950, Gsell 1966, Miall et al. 1967, Borkan and Norris 1977). Therefore the aim of this study is to analyse the changes of body height and body weight in young adults in Hungary.

Material and Methods

The data were obtained during medical checks carried out on Hungarian university students at the Health Center of the Technical University of Budapest. The sample consists of ten consecutive classes of the students of this university, who were registered between 1976-1985. They were investigated twice, first in the second term of the first academic year, and second, in the first term of the fifth (last) academic year during their studies at the university.

Here only the data of the two largest age groups, i.e. the male students (n=3,918), who were 20 years old in the time of the first investigation, and the female students (n=659), who were 19 years old in the time of the first investigation, were taken into consideration. Among the several body measurements which were investigated, only body height and body weight are utilised in this study.

Results and Discussion

The body height and body weight of the male students (Table 1) show an almost continuous increase in the investigated ten consecutive classes both in the first and the fifth academic year, in spite of the small yearly fluctuations, which are regular of such studies. This may be caused by the secular trend and it agrees well with the results of another study of us, which also showed a positive secular trend in Hungarian university students (Gyenis and Till 1986).

In connection with the age changes in the sample the data of the male students in every class are higher in the fifth, than in the first year. The differences in body height are between 0.34 cm and 0.86 cm, while the differences in body weight are between 1.96 kg and 3.21 kg, and all of them are significant (Table 1). In comparison with our data Büchi (1950) observed a 0.75 cm increase in stature in males between 20-37 year of age.

The data of the female students (Table 2) show the same tendency as the data of the male students. Thus, the values of the two body measurements increased during the investigated period (with small yearly fluctuations), but in body weight the differences between the values of the first and the fifth years are much more smaller in female, than in male students. The differences in body height are between 0.21 cm and 0.72 cm, and all of them are significant, while the differences in body weight are between 0.03 kg and 0.93 kg and only three of them are significant. In Büchi's (1950) sample the increase in body height of the females was 0.54 cm between 20-28 year of age.

The data were analysed according to the birth place of the students, too. The male students (Table 3) born in Budapest are taller and heavier, than the students born elsewhere in the country, both in the first and the fifth academic year. The change in body height with the age are the same in the two groups (0.58 cm), but the change in body weight is larger in the group of the students born elsewhere in the country (2.67 kg), than in the students born in Budapest (1.82 kg), and all of the differences are significant.

In female students it can also be seen positive age changes in both body measurements according to the place of birth, but the differences between the values of the two groups are smaller, than in male students (Table 4). In contrary to the data of the males, the changes are larger in female students born in Budapest, than in students born elsewhere in the country. The differences in body height and body weight are significant for those students, who were born in Budapest, while in students born elsewhere in the country only the body height showed significant difference.

Summarising our results, the data of body height and body weight of our sample show well the positive age changes of the measurements investigated longitudinally in a 3.5 year interval between the first and fifth academic years, as well as the effect of the secular trend. Finally, we also found differences in age changes of these body measurements between the male and the female students according to their place of birth.

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Table 1: Height and weight of the male students in the 1st and 5th academic year of their study

Year of the first investigation	n	Height						Weight					
		Mean	1st SD	academic year Mean	5th SD	Diff. Mean	Diff. SD	Mean	1st SD	academic year Mean	5th SD	Diff. Mean	Diff. SD
1976	489	175.37	6.38	176.23	6.41	0.86***	0.79	67.19	8.19	69.26	9.16	2.07***	4.24
1977	450	175.63	6.25	176.47	6.26	0.84***	0.78	67.72	7.86	69.66	8.74	1.94***	4.08
1978	355	177.14	6.61	177.86	6.72	0.72***	0.85	68.37	8.65	70.89	9.75	2.51***	4.20
1979	374	177.38	6.63	177.83	6.66	0.45***	0.88	68.30	8.71	70.68	9.01	2.38***	3.53
1980	373	177.36	6.30	177.76	6.31	0.40***	0.77	68.35	7.49	71.55	8.78	3.21***	4.02
1981	439	177.71	6.70	178.14	6.74	0.43***	0.76	68.85	8.69	71.53	9.64	2.67***	4.36
1982	418	177.84	6.51	178.40	6.55	0.56***	0.74	69.37	8.36	71.33	9.56	1.96***	4.36
1983	431	177.57	6.31	178.06	6.31	0.49***	0.72	69.58	8.87	72.11	10.09	2.52***	4.21
1984	327	177.29	5.99	177.83	6.06	0.54***	0.68	69.53	7.91	71.64	9.29	2.11***	4.47
1985	262	177.48	6.37	177.81	6.40	0.34***	0.70	70.40	7.93	72.42	8.98	2.02***	4.26
Total	3,918	177.00	6.47	177.58	6.48	0.58***	0.79	68.65	8.34	70.99	9.37	2.34***	4.19

***p<0.0001

Table 2: Height and weight of the female students in the 1st and 5th academic year of their study

Year of the first investigation	n	Height						Weight					
		1st academic year Mean	1st academic year SD	5th academic year Mean	5th academic year SD	Diff. Mean	Diff. SD	1st academic year Mean	1st academic year SD	5th academic year Mean	5th academic year SD	Diff. Mean	Diff. SD
1976	74	163.38	5.97	164.01	5.85	0.64***	0.69	54.82	6.74	54.97	6.67	0.16	3.22
1977	72	163.03	6.72	163.70	6.61	0.67***	0.63	56.24	7.92	57.02	7.09	0.78	3.82
1978	71	165.00	5.92	165.72	6.05	0.72***	0.80	56.44	7.00	56.91	7.05	0.47	3.77
1979	64	165.57	5.08	165.81	6.00	0.24*	0.74	55.86	5.14	56.50	5.51	0.64	3.54
1980	71	165.09	5.75	165.54	5.70	0.45***	0.64	56.57	7.30	57.50	7.17	0.93*	2.92
1981	58	165.20	5.60	165.76	5.60	0.56***	0.76	56.43	6.33	56.46	6.07	0.03	2.97
1982	51	164.95	6.38	165.51	6.35	0.57***	0.72	55.62	6.23	55.98	5.94	0.36	2.65
1983	79	165.63	6.02	165.84	6.13	0.21*	0.61	55.69	6.27	56.41	6.18	0.72*	3.15
1984	62	165.33	5.66	165.68	5.64	0.35***	0.51	57.05	6.97	57.57	7.07	0.52	4.50
1985	57	164.22	6.16	164.56	6.14	0.34**	0.68	56.91	6.68	57.42	6.47	0.51	3.97
Total	659	164.72	5.97	165.19	5.95	0.47**	0.70	56.14	6.71	56.66	6.57	0.53*	3.48

*p<0.05

**p<0.001

***p<0.0001

Table 3: Height and weight of the male students in the 1st and 5th academic year of their study according to their birth place

Birth place	n	Height						Weight					
		1st academic year Mean	1st academic year SD	5th academic year Mean	5th academic year SD	Diff. Mean	Diff. SD	1st academic year Mean	1st academic year SD	5th academic year Mean	5th academic year SD	Diff. Mean	Diff. SD
In Budapest	1,525	177.54	6.58	178.12	6.61	0.58***	0.78	69.32	8.72	71.15	9.47	1.82***	4.05
Elsewhere	2,393	176.66	6.37	177.24	6.38	0.58***	0.80	68.23	8.05	70.90	9.28	2.67***	4.23
Total	3,918	177.00	6.47	177.58	6.49	0.58***	0.80	68.65	8.33	70.99	9.35	2.34***	4.20

*** p<0.0001

Table 4: Height and weight of the female students in the 1st and 5th academic year of their study according to their birth place

Birth place	n	Height						Weight					
		1st academic year Mean	1st academic year SD	5th academic year Mean	5th academic year SD	Diff. Mean	Diff. SD	1st academic year Mean	1st academic year SD	5th academic year Mean	5th academic year SD	Diff. Mean	Diff. SD
In Budapest	303	165.40	5.99	165.92	5.99	0.51***	0.68	55.85	6.98	56.83	6.73	0.99***	3.11
Elsewhere	356	164.14	5.90	164.58	5.85	0.44***	0.71	56.38	6.46	56.52	6.45	0.13	3.71
Total	659	164.72	5.71	165.19	5.95	.47***	0.70	56.14	6.71	56.66	6.58	0.52***	3.47

***p<0.0001

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