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PHYSICAL SELF-CONCEPT IN RELATION OF BODY SHAPE IN HUNGARIAN ADOLESCENTS

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Abstract: *The main purposes of the present study were 1) to compare selected body shape factors (fatness, robusticity, linearity) of adolescents belonging to different physical self-concept subgroups; and 2) to examine the sexual dimorphism and the age changes in these characteristics by the level of self-concept. The subjects (1701 boys, 1708 girls; aged 11–18) formed a subsample of the 2nd Hungarian National Growth Study 2003–2006 (Bodzsár and Zsákai 2007). The boys and the girls were grouped by chronological age and the level of body image. The physical self-concept (body image) was assessed by the Tenessee scale (Fitts 1964, adapted to the Hungarian population by Dévai and Sipos 1986). The better the body image, the smaller the fatness (sum of the skinfold thicknesses, relative fat content, BMI, endomorphy) was found in both sexes. In adolescents having negative self-concept mesomorphy was significantly larger, while ectomorphy was significantly smaller than in their age-peers with average and good self-concept, however the relatively stunted skeleto-muscular development was not attractive. The presumed fact that obesity is not popular in adolescent has been confirmed by this study. These results informed us about the considerable influence of the media communication on adolescents' self-assessment and their fashion ideals, i.e. trained body shape is more attractive than the stout ones. Pubertal overweight and obesity, the discrepancy between the ideal and actual self-concepts in adolescence could have an important influence on the adult mental health.*

Keywords: *Hungarian National Growth Study (2003–2006); Adolescents; Obesity; Body composition; Self-concept; Body image.*

Introduction

In puberty, body dimensions as well as body proportions and body composition undergo remarkable changes. This process and the social reception influence the self-concept of children to a great extent. One of the most important problems of adolescents is the anxiety they have about their body and outward appearance (Tanner 1961). Even adolescents with an average development are usually unable to accept their body changes easily, and those with a shape significantly different from the average have even more difficulties in doing so. Nowadays the contribution of the media to these complex interactions is more and more outstanding.

This analysis focuses on some selected factors of body shape (fatness, robusticity, linearity) in relation of physical self-concept in puberty and postpuberty. The main purposes of the present study were 1) to compare the body shape characteristics of adolescents belonging to different physical self-concept subgroups; and 2) to examine the sexual dimorphism and the age changes in these anthropometric factors by the level of the self-concept.

The working hypothesis of our study was that the fatness of adolescents having positive body image would be significantly lower, but the linearity would be significantly higher than in their peers with negative physical self-concept. Additionally, a larger robusticity was expected in boys having positive self-concept.

Subjects and methods

The basic material used in this paper was a subsample of the 2nd Hungarian National Growth Study (2003–2006, Bodzsár and Zsákai 2007). The Table 1 shows the distribution of the subjects by age and sex.

The physical self-concept was estimated by the Tenessee scale (Fitts 1964, adapted to the Hungarian population by Dévai and Sipos 1986). It is a 20-item questionnaire concerning to the body image, state of health, physical appearance, skills and sexuality.

The body shape was assessed by (1) absolute and relative body dimensions (body height, shoulder breadth and bicristal breadth), (2) nutritional status (BMI, biceps and abdominal skinfolds), (3) body composition (four-component anthropometric method of Drinkwater and Ross 1980): relative fat, bone, muscle and residual mass; (4) somatotype: Heath–Carter anthropometric method (Carter and Heath 1990).

The statistical evaluation was made by SPSS v.14.0 software. Hypotheses were tested by ANOVA at 5% level of random error and the Scheffé's formula was used for pairwise comparisons.

Table 1. Distribution of the subjects by age and genders

Age (years)	Boys	Girls
11	238	272
12	278	306
13	252	293
14	259	242
15	182	162
16	173	172
17	200	155
18	119	111
Total	1701	1708

Results

Subjects were divided into self-concept subgroups by using the 25th and 75th centile values of the physical self-esteem scores as cut-off limits. The adolescents belonging to the upper quartile formed the "high" level self-concept subgroup; subjects belonging to the lower quartile formed the "low" level self-concept subgroup, and the "average" level self-concept subgroup means subjects scored between the high and low categories.

We can state in general that if significant difference (*) was found among the self-concept subgroups' mean body shape, it could be observed that the average and high level subgroups generally had similar body dimensions, while the low subgroups' anthropometric dimensions differed from the two other subgroups' ones (Figures 1–8).

Body fatness. The girls' self esteem was found more sensible to the features of body fatness than in the boys. Body dimensions of girls showed larger variance by the level of physical self-concept than of the boys, i.e. significant differences were found almost in each age group between the high and low body image subgroups. The body image did not influence the means of body shape characteristics of fatness in the boys belonging to the age groups of 15 and 16 years (Figures 1–3).

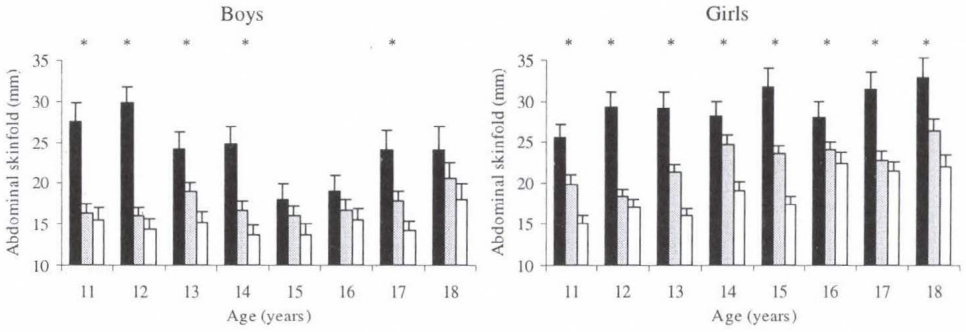

Figure 1: Abdominal skinfold (mean+SE) in body image subgroups (low: ■, average: ▨, high: □).

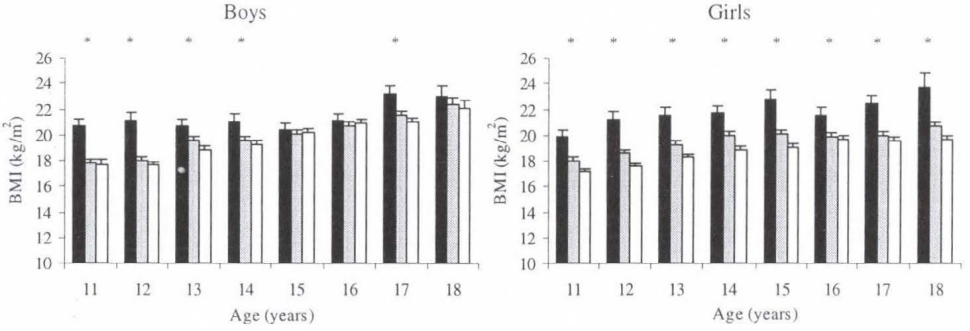

Figure 2: BMI (mean+SE) in body image subgroups (low: ■, average: ▨, high: □).

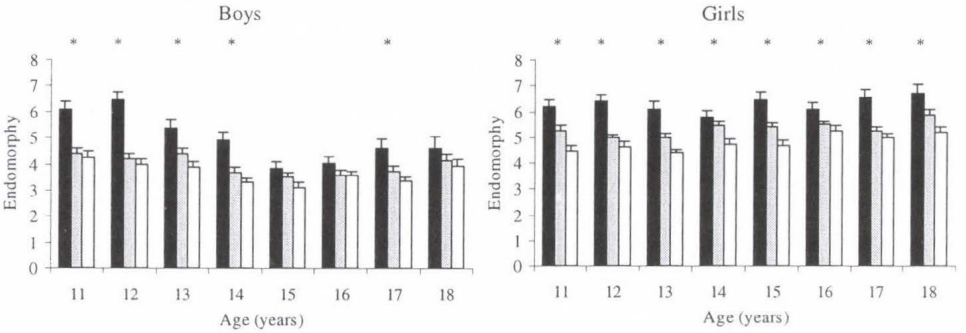

Figure 3: Endomorphy (mean+SE) in body image subgroups (low: ■, average: ▨, high: □).

Robusticity. Surprisingly, the relatively stunted muscular development was not popular even in the girls (Figure 4). The unpopularity of the mesomorphy and the relatively larger hip was considerable in both genders in puberty (Figures 5–6).

Linearity. Body height and the relative length of lower extremities did not related to the body image self concept (Figures 7–8).

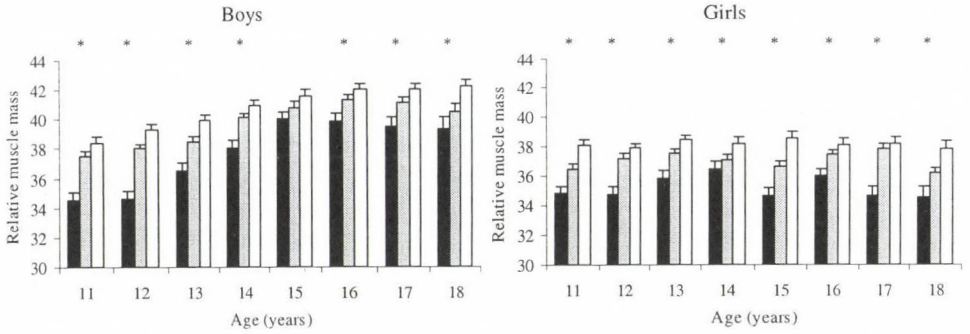

Figure 4: Relative muscle mass (%, mean+SE) in body image subgroups (low: ■, average: ▨, high: □).

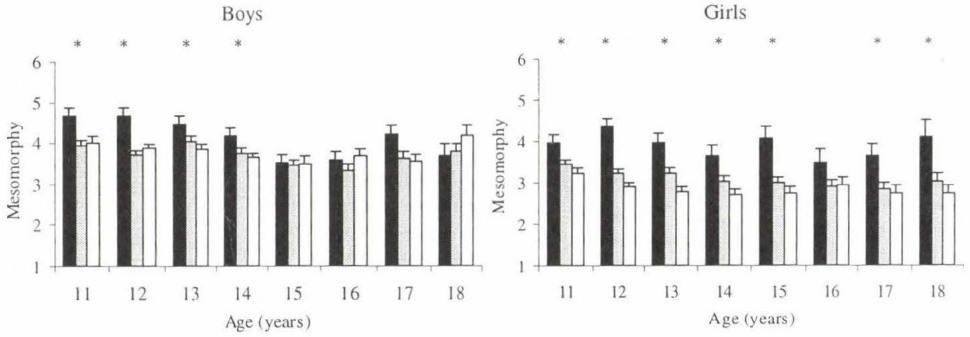

Figure 5: Mesomorphy component (mean+SE) in body image subgroups (low: ■, average: ▨, high: □).

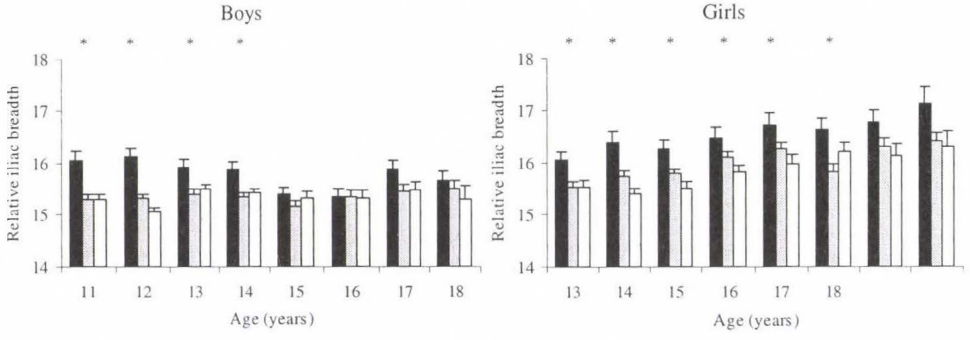

Figure 6: Relative iliac breadth (%, mean+SE) in body image subgroups (low: ■, average: ▨, high: □).

All these relationships can be summed up by the Heath–Carter somatotypes (Figure 9). Mean somatotype of boys having relatively high level of satisfaction with their body shape moved around the central type through the studied age interval. On the other hand, mean somatotype of boys with higher level of body image dissatisfaction 1) was significantly more endomorph than in the boys with lower level of dissatisfaction and 2) changed somatotype category by age, i.e. moved from the mesomorphic endomorph category toward the central somatotype (Figure 9).

Girls with relatively high level of satisfaction with their body had less endomorphic somatotype than their peers with lower level of body image self concept. Namely the

mean somatype of girls with high body image were ectomorphic endomorph and the dominance of the endomorph component increased by age, while the mean somatotype of girls with lower level of body shape satisfaction were in the mesomorphic endomorph or balanced endomorph area of the somatochart (Figure 9).

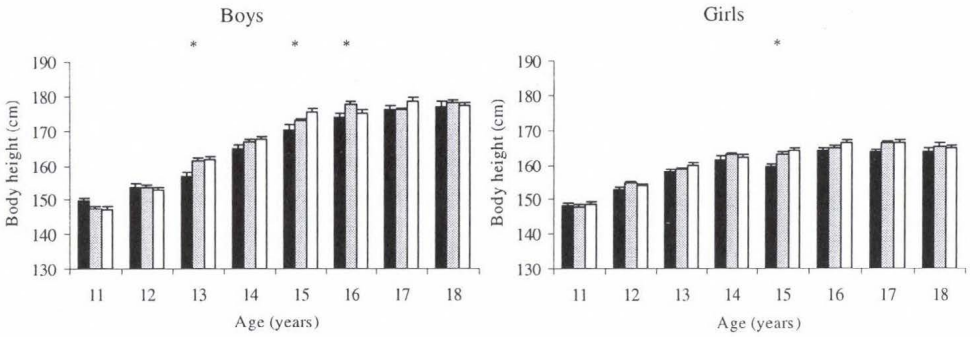

Figure 7: Body height (mean+SE) in body image subgroups (low: ■, average: ▨, high: □).

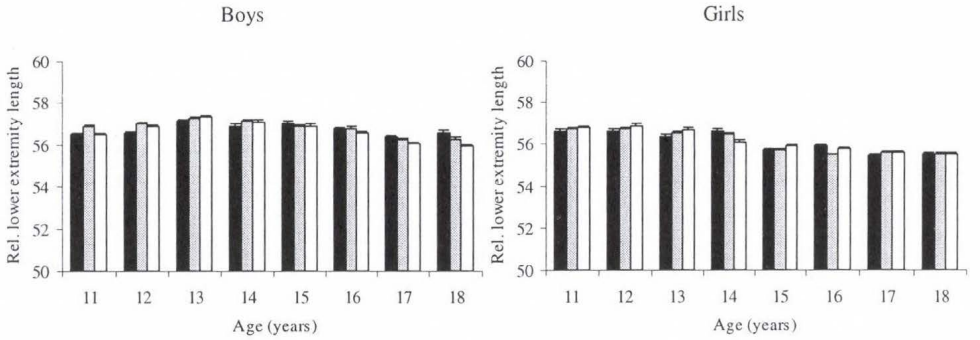

Figure 8: Relative length of lower extremities (mean+SE) in body image subgroups (low: ■, average: ▨, high: □).

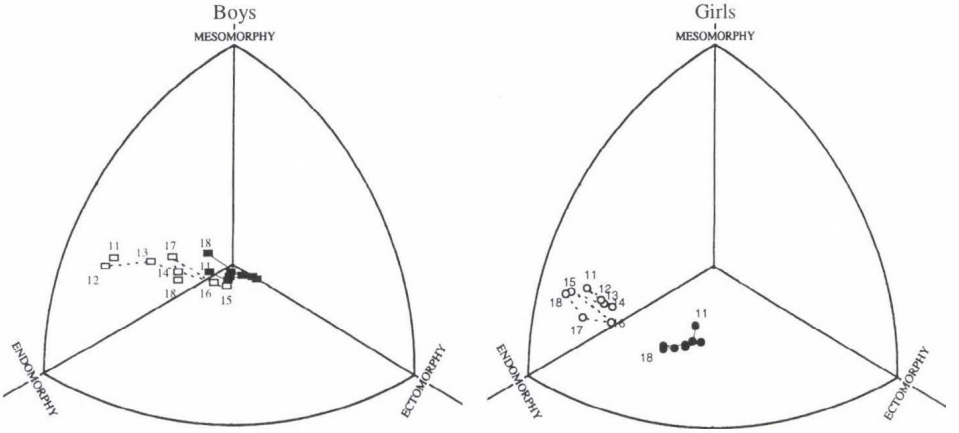

Figure 9: Mean somatotype of adolescents with high (boys: ■, girls: ●) and low (boys: □, girls: ○) level of body image.

Conclusions

The presumed fact that obesity is not popular in adolescence has been confirmed by this study, namely: 1) the most unattractive body shape among Hungarian children in general was the endomorph, stout one with thick skinfolds in both genders, i.e. endomorphy and high level of body fat content were the most unpopular characteristics of the body shape. 2) The better the body image, the smaller the fatness (sum of the skinfold thicknesses, relative fat content, BMI, endomorphy) was found in both genders.

Since body height and the relative length of lower extremities did not related to the body image self concept, we could conclude in contrast of our working hypothesis that the attractivity did not increased by body linearity.

The analysis of the relationship between the physical self concept and the anthropometric characteristics revealed the most unfavourable body characteristics in Hungarian adolescents as follows (most of them are in connection with high level of body fatness):

- considerable skinfold thicknesses,
- high relative fat content,
- high BMI,
- high endomorph or mesomorph components of somatotype,
- low ectomorph component,
- low relative bone and muscle mass content.

As a final conclusion we can state that it would be very important to prevent pubertal overweight and obesity, because these nutritional disorders are accompanied with severe somatic and health consequences both in adolescence and adulthood, as well as the discrepancy between the ideal and actual self-concepts in adolescence may considerably influence not only the adolescent but also the adult mental health.

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