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**RELATIONSHIP BETWEEN THE PATTERN OF BODY
DEVELOPMENT AND SOCIALISATION**

PhD THESES

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The aims of the study

Puberty is a period of individual life when youth devote particularly intense attention to their own bodies, because in this phase very fast changes occur in their growth and maturation (Tanner 1961). To accept the new morphological characteristics may prove a problem to a pubertal child of average rate of maturation and even more difficulties to girls and boys with a development markedly different from the average. Complexity of human ontogenesis embraces not only biological growth and maturation, but mental, cognitive and affective progress as well as adaptation to the requirements of society called socialization process.

From these very complex spheres of development present dissertation focuses:

- 1) To examine gender- and age-related differences in the level of self-concept and school performance in puberty and postpuberty. My hypothesis was that school achievement in the boys would be poorer than in the girls during the whole puberty. The total self-assessment was supposed to decrease by age especially in the girls.
- 2) To identify the body shape characteristics influencing self-esteem and school achievement. My hypothesis was that obesity and endomorphy would be the main unattractive morphological features. I supposed that positive self-esteem was linked with musculo-skeletal robusticity in the boys and linearity in the girls. A straight relationship between body height and school performance was expected by considering the influence of socio-economic factors on both body and mental development.
- 3) To compare the selected morphological characteristics of body shape (fatness, robusticity, linearity) of boys and girls belonging to different self-concept subgroups of their ages and to examine the correlation between the children's scholastic achievement and body dimensions as well as body composition. The negative effects of body fatness and endomorphy were supposed to be important in puberty in the boys and in post-puberty in the girls. A decreasing influence of body shape on school achievement was expected by ageing.
- 4) To compare the self-concept level and school performance of boys and girls grouped by the sexual maturity status. Sexual maturation was supposed to be accompanied by an increase of self-esteem in the boys and the decreasing level of self-assessment in the girls, especially in body image. It was supposed poorer self-concept but better school performance of relatively early maturers in both genders.

Subjects and methods

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).

Self-concept was assessed by the Tennessee scale (Fitts 1964, adapted to the Hungarian population by Dévai and Sipos 1986). School achievement was appraised by the grade point average of theoretical subjects and physical education. Maturity was estimated by Tanner's stages of pubic hair, breast and genitalia. Data for menarche and spermarche were collected by "status quo" method.

Differences between the subgroups of sex, age and level of self-evaluation were tested by F-tests following one-way ANOVA's. In case of significant overall F, multiple post-hoc comparisons of the means were tested by Scheffé's formula. The relationships of grade point average with morphological characteristics were analyzed by linear regression. An alpha level of 5% was used in all tests of significance.

Results

1. The pattern of self-assessment

- ◆ The overall self-concept did not show sexual dimorphism with the exception of age-group 14 during the whole studied age interval, i.e. the overall self-esteem decreased in puberty and showed a slight increase in postpubertal ages in both genders.
- ◆ Despite of this sexual homogeneity in the overall self-concept, there were significant differences between the genders' self-esteem components: boys rated their own body and personality much higher than girls, these components of overall self-concept decreased in puberty in the girls. Girls esteemed their own moral and social worth much higher than boys in the postpubertal period.
- ◆ The grade point average (GPA) of girls was significantly higher than the GPA of boys during the whole puberty in contrast with the pattern of self-concept. This school achievement difference is due rather to the factors of education system than the effects of self-evaluation.
- ◆ The higher sensibility of girls was confirmed by this study not only in body image but also in the individual self-concept. The poorer school performance of boys was clearly showed.

◆ As a new scientific result, new Hungarian standard values of Tennessee scale were stated by this study.

2. The effects of morphological characteristics on psycho-social development

◆ 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 subgroups that were characterized by low level of self-concept differed from the two other subgroups in their morphological dimensions.

◆ 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.

◆ As a new scientific result, the regression analysis revealed that the attainment in physical education and the physical self-concept scores were negatively associated with the same morphological characteristics (endomorph mesomorph body shape, thick skinfolds, high BMI) in both genders. There are also some evidences that these characteristics of body shape had a slightly negative effect on the grade point average of girls even in theoretical subjects.

◆ Overall majority of my hypothesis were confirmed: the important role of body fatness and endomorphy in physical self-concept and the positive effect of the developed musculo-skeletal robusticity on school achievement were found. Since body height and the relative length of lower extremities did not related to the body image self-concept, I could conclude that the attractivity did not increased by the body linearity.

3. Age- and sex-dependent effects of morphological characteristics on the pattern of psycho-social development

◆ The negative effects of the considerable skinfold thicknesses, high relative fat content, high BMI showed in both genders: in the girls in each age groups (in connection with fat accumulation during the puberty), in the boys with the exception of age groups of 15 and 16 years (in connection with peak high velocity).

◆ 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.

◆ 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 somatotype of girls with high body image were ectomorphic endomorph and the dominance of 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.

4. The effects of maturation status on psycho-social development

◆ The sexual maturation was accompanied by decreasing physical self-concept in the girls and increasing body image in the boys. The individual and family self-evaluation decreased during maturation in both genders. It was found that earlier sexual maturation was accompanied by better body image in the boys.

◆ The poorer self-evaluation of post-menarcheal girls could be explained by the increasing body fat accumulation during puberty. The positive body image of early maturer boys is probably due to the occurrence of the spermarche before the significant acceleration of growth.

◆ The boys' scholastic achievement showed a robust decrease in connection with their maturation.

◆ In contrast with my hypothesis, the maturation status had a positive effect only on the body image in the boys. Girls' decreasing self-evaluation by sexual maturation was confirmed.

Conclusions

In puberty the physiological changes result in psychological instabilities and are often accompanied by the decrease of self-concept level. This current study has confirmed that the drop of self-concept level in girls arised mainly from the decrease of body image as it was stated by Németh and her colleagues (2002). The analysis of the relationship between the overall self-concept and the characteristics of body shape revealed that the most unfavorable body characteristics were in connection with high level of body fatness. These observations

drew attention to the possibility that pubertal overweight and obesity could more affect the adult mental health of females.

My results can give some information also about the considerable influence of the sexual maturation on adolescents' psycho-social adaptation, i.e. sexual maturation would help the physical evaluation of boys and has a negative effect on the self-esteem of girls. The sexual differences of school performance along the stages of sexual maturation should call our attention to apply different education methods for boys and girls.

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