

DYNAMICS OF THE SEXUAL DIMORPHISM INDICES OF BODY DIMENSIONS OF CHILDREN FROM BIRTH TO 17 YEARS

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Age characteristics in the process of forming of the direction and degree of definitive adult sex differences are reviewed using a great number of children's samples, collected by the authors and taken from the literature. To estimate the value of sexual differences the Kullback method is used. The analysis of 63 ethno-territorial samples of the newborns showed that the minimal variability belongs to the body mass – the main object of stabilizing selection and the main marker of the quality of intrauterine development. Body length and head and chest circumferences have relatively higher indices of sexual dimorphism, independent from ethnic and different ecological factors. Through the interval from birth to 7 years of age according to the data of three ethnic samples – Russians, Kazakhs, Kirghiz – the bigger skeletal and muscle dimensions of boys are maintained till the age of three years. Indices close to zero level through the age of 3-7 years in Russian and Kazakh samples are an evidence of comparable growth rates of children of both sexes. While negative values of the indices in Kirghiz children point to the more intensive growth processes in girls. The values of skinfolds in girls are higher through the whole interval and this tendency is stronger in 7-year-olds, more evident in Mongoloid groups. The common pattern of sexual dimorphism of skeletal and muscle dimensions through the period of 8-16 years may be described by the parabola of the 4th order with three bend points, connected with the differences of pubertal spurt in boys and girls. The dynamics of sexual differences of the skinfolds is characterized by a small degree through the second childhood and the beginning of the puberty, and its further gradual increase from 12 years of age towards the definitive status.

Key words: *sexual dimorphism, body dimensions, children from birth to 17 years*

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THE IMPACT OF PHYSICAL CONNECTEDNESS ON BODY HEIGHT IN SWISS CONSCRIPTS

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Background: Human populations differ in height. Recent evidence suggests that social networks play an important role in the regulation of adolescent growth and adult height. We further investigated the effect of physical connectedness on height. Material and Methods: We considered Switzerland as a geographic network with 169 nodes (district capitals) and 335 edges (connecting roads) and studied effect of connectedness on height in Swiss conscript from 1884–1891, 1908–1910, and 2004–2009. We also created exponential-family random graph models to separate possible unspecific effects of geographic vicinity. Results: In 1884–1891, in 1908–1910, and in 2004–2009, 1st, 2nd and 3rd order neighboring districts significantly correlate in height ($p < 0.01$). The correlations depend on the order of connectedness, they decline with increasing distance. Short stature districts tend to have short, tall stature districts tend to have tall neighbors. Random networks analyses suggest direct road effects on height. In 1884–1891, direct road effects were only visible between 1st order neighbors. In 1908–1910, direct road effect extended to 2nd and 3rd and in 2004–2009, also to 4th order neighbors, and might reflect historic improvements in transportation. Conclusion: Height in a district depends on height of physically connected neighboring districts. The association decreases with increasing distance in the net. The present data suggest that people can be short because their neighbors are short; or tall because their neighbors are tall (community effect on growth). The vision strongly contrasts the current concept of growth as a mirror of health and economic prosperity.

Key words: *community effect on growth, connectedness, body height, direct road effect, exponential-family random graph models*

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