Parent-Offspring Correlations in Body Measurements, Physique and Physiological Variables among Santhals of West Bengal

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Abstract

Intrafamilial resemblances in different morpho-physiological variables were examined among Santhals, a tribal population from West Bengal. Data were collected on 400 families that included 400 fathers, 400 mothers, 292 sons and 170 daughters. The parent-offspring and mid-parent-offspring correlation coefficients reveal that the degree of resemblance varies considerably from one measurement to another. Relationship between the parental and the filial generation is stronger in the transverse and longitudinal measurements, followed by head and face measurements and the weakest in the circumferential and bulk measurements.

Key Words: Body Measurements, Somatotype, Santhals, Parent-Offspring Correlations, Familial Resemblance,Tribe

Introduction

Morpho-physiological features are the product of continuous and complex interaction of biological or indigenous and environmental or exogenous factors. Biological factors influencing these characteristics, among other, are heredity or genetics, age and sex of an individual. Exogenous factors, on the other hand, include both environmental and socio-cultural factors such as nutrition, altitude, climate, socio-economic status, religious practices, cultural activities and mode of subsistence.

It is now well established that both environmental and genetic factors contribute to the patterns of growth and development of different body measurements (*Devi and Reddi, 1983*). Therefore, all the anthropometric traits are the result of the influence of either genetic or environmental factors, or combinations of both (*Susanne, 1975*). The influence of genetic and environmental factors in anthropometric traits indicates varying degree of hereditary control over their phenotypic expression (*Singh, 1992*). In terms of phenotypic resemblances of relatives, correlations among parent-offspring probably provide the best estimates of the genetic resemblance of parent and children in human populations (*Mueller, 1976*). The parent–offspring and mid-parent–offspring correlation coefficients indicate that to what extent genetic determination varies from one measurement to another (*Susanne, 1975*). Correlations among first degree relatives, i.e. parent–offspring and sib–sib pairs with respect to body size are affected by assortative mating and common household environment (*Malik and Singh, 1996*). In a panmictic population, for polygenic traits, correlation coefficient for mid-parent–offspring and parent–offspring would occur 0.71 and 0.50 respectively, though the observed correlation coefficient are mostly lower than the expected values both for mid-parent– offspring and parent– offspring (*Susanne, 1975*).

Further, it is useful and imperative to study the familial resemblance of a trait under different environmental conditions and in different ethnic groups, as heritability and familial resemblance is a property not only of a trait but is also a function of the population (*Falconer, 1960*). Gene frequencies and environmental