Abstract

This study presents a picture of postcranial nonmetric variation in five major geographical human population samples; American whites, American blacks, Chinese, Hawaiians and Australian Aborigines. It also examines the non-specificity hypothesis, which is concerned with the value of different types of variation in depicting population relationships. It tests this hypothesis by a comparison of postcranial nonmetric variation with three other types of osteological data; craniometric, cranial nonmetric and postcranial metric variation.

After a review of previous studies on postcranial nonmetric traits it became clear that these types of skeletal data have been greatly neglected. As there have been problems with defining these traits in the past, descriptions accompanied by illustrations and an investigation of variability as well as intraobserver error were made. Factors affecting intrasample variation in postcranial nonmetric traits were investigated by examining possible age changes, sexual dimorphism, side interdependence, side preference, intertrait association and effects of bone size. The most important finding with regard to these factors was that sex differences were significant for many postcranial nonmetric traits. Intersample variation was investigated by subjecting the postcranial nonmetric traits to a distance study. Using the mean measure of divergence, postcranial nonmetric traits were shown to be useful in separating the samples, at least in the female and pooled-sex samples. The two Australian samples (NSW coastal and South Australian Aborigines) were shown to be closer than any other two samples.

In order to determine how the postcranial nonmetric traits contributed to the distance analysis, they were subjected to a principal components analysis. Those traits contributing most were the hyperostotic and hypostotic traits and a few facet variations.

Principal components analysis is one of the few methods that allowed comparisons between the two different types of data sets used here, that is, metric and nonmetric data. Using principal components analysis, the relationships between the samples depicted by the postcranial nonmetric traits were compared with those depicted by the craniometric, cranial nonmetric and postcranial metric variables

The relationships depicted by the two metric data sets (cranial and postcranial) were concordant, while those depicted by the two nonmetric data sets (cranial and postcranial) were not concordant to the same extent. None of the osteological data sets was strictly concordant with relationships based on genetic markers. Cranial measurements remain the most useful data sets for simply separating populations as they show the greatest intersample variation. Nonmetric traits display much intrasample variation and thus may be better for use in regional studies.

The significance of the findings in this study is that the picture of intrapopulation and interpopulation variation in postcranial nonmetric traits is extended and clarified, especially in relation to other types of osteological data. Distance studies using postcranial nonmetric traits are possible but are more illuminating if the sexes are first separated. Postcranial nonmetric variation does have value in human population studies in that it yields biologically meaningful results, especially in conjunction with other types of osteological variation. Finally, the non-specificity hypothesis is not supported by this study.