

SizeChina: Head Shape Variation between Chinese and Western Populations

Roger Ball

Asian Ergonomic Lab, Hong Kong Polytechnic University

Univariate anthropometric data have long documented a difference in head shape proportion between Chinese and Caucasian populations. This difference has made it impossible to create eyewear, protective helmets and hygienic facemasks that fit both groups well. However, it has been unknown to what extent and precisely how the two populations differ from each other in form. In this study, using a large data set from two recent 3D anthropometric surveys, one in North America and Europe, and one in China, we show significant statistical variations between head shapes of the two groups. We apply geometric morphometrics to dense surface data to quantify and characterize the shape differences. The comparison shows that Chinese heads are rounder than Western counterparts, with a flatter back and forehead. The quantitative measurements and analyses of these shape differences will help to answer questions in many fields, including anthropometrics, product design, cranial surgery and cranial therapy.