A104 Testing the Homogeneity of "White": Dental Morphology in Americans and Australians of European Decent

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Learning Overview: After attending this presentation, attendees will understand how phenetic variation between Australians and Americans of European descent results from their specific population histories and showcases the difficulties of associating biological variation with social categories commonly used to describe missing persons.

Impact on the Forensic Science Community: This presentation will impact the performance of the forensic science community, especially forensic anthropology, by highlighting: (1) how dental morphological characteristics are a valuable complement to the usual tools available for estimating bioaffinity of an unknown person; and (2) how social concepts of race and ethnicity do not necessarily reflect homogeneous groups over time and space, even in populations usually considered common, well studied, and well understood.

The populations of the United States and Australia share many commonalities. Both derive first from Western Europeans, especially from Great Britain. Later migration came from other areas of Europe, including Central, Southern, and Eastern countries, especially Germany, Italy, Greece, and the Slavic nations. Still later migration to both countries included populations from Asia. However, geography and history have shaped differences in migrations to the two nations, with West Africans transplanted in large numbers to the United States and migration from Latin America being significant, while Australia continues to attract a significant number of migrants from Asia. Today and throughout its history, the greatest proportion of migrants to Australia derive from Great Britain, many via previous residence in New Zealand.[1]

Given that Americans and Australians of European decent, commonly known as "Whites," both derive from migrants from the British Isles, later supplemented by Central, Southern, and Eastern Europeans, it might be assumed that there would be little to no phenetic difference between the two populations. They would be indistinguishable. In the United States, this reflects a general assumption about regional subpopulations of Whites within the nation. When forensic anthropologists use samples of European Americans in research, they are assumed to be homogeneous across regions. While many forensic anthropologists recognize that there are important differences among African Americans, Asian Americans, or especially Hispanic Americans, this recognition is not always true about European Americans. Patterned regional phenotypic variation complicates the forensic assessment of bioaffinity.

This study tested the hypothesis that Americans and Australians of European descent are phenetically homogeneous using linear discriminant function analysis. Dental morphological traits were scored following Edgar from casts of individuals born after 1980.[2] The samples were 63 individuals from a study of Australian twins, 100 from an orthodontic clinic in Memphis, TN, and 34 from an orthodontic clinic in New York City, NY. Data consisted of 25 dental morphological traits that could be scored and varied significantly between Australian samples and the combined United States. Correct allocation between the Australian and combined United States sample was 69.1%. Comparing the New York and Australian samples, 66.7% were correctly allocated, while Tennessee versus Australian samples were correctly identified 69.1% of the time. A comparison of the Tennessee and New York samples yielded a marginally better result, with 75.8% correct allocation.

These results may indicate that the variation in Australians of European descent is subsumed by that in Americans of European descent. The fact that Australian Whites could be discerned from American Whites at a rate significantly different from chance indicates that there is significant variation between the two populations. Interestingly, the highest rate of correct classification was between the two American samples, indicating the presence of regional heterogeneity within Americans of European descent. This patterned heterogeneity warrants further investigation, as estimates of bioaffinity are commonly applied nationwide that have been derived solely from regionally isolated populations.

Reference(s):

1. http://www.migrationheritage.nsw.gov.au/belongings-home/about-belongings/australias-migration-history/index.html.
2. Edgar H.J.H. 2017. *Dental Morphology for Anthropology: An Illustrated Manual*. London: Routledge.

European American, European Australian, Dental Morphology