H13 Forensic Anthropology, Repatriation, and the "Mongoloid" Problem

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After attending this presentation, the participant will understand: 1) discriminant function analysis (DFA) is a powerful tool for estimating ancestry from skeletal remains, 2) DFA using interlandmark distances (ILDs) can distinguish between Asian groups and American Indians very well, 3) morphometric relationships within and among Asian and Native American groups undermines the "Mongoloid" label and grouping, and 4) an appreciation of population histories is important in analyzing modern human remains.

Establishing the cultural affiliation of human remains is a vital part of the Native American Grave Protection and Repatriation Act (NAGPRA), which mandates the evaluation and repatriation of human remains to the appropriate Native American tribes. Often, the decision whether to repatriate and to whom is primarily based on biological data. Native American remains are a concern for forensic scientists and museum personnel, who need to distinguish between Native American remains and those from other groups (Pickering and Jantz 1994). The illegal sale of human remains is also a NAGPRA violation if the remains are those of an American Indian.

The estimation of ancestry is more complicated if one tries to discriminate among closely related groups. Native Americans and Asian groups share a more recent common ancestor and have traditionally been grouped under the "Mongoloid" label. "Mongoloids" are supposed to share a variety of soft tissue and skeletal traits (such as anterior zygomatic projection, brachycephaly, and shovel-shaped incisors) though the trait frequencies rarely have been tabulated. Hefner (2002) analyzed a large sample and found that certain nonmetric traits used to distinguish "Mongoloids" were unreliable. Brace (1996), in analyzing craniometrics, found that the Mongols were the most divergent of the "Mongoloid" groups he examined. The morphometric differences among Asian groups and Native Americans are not well established.

Ousley (2000), Ousley and McKeown (2001), and Mann and Ousley (2001) have shown that DFA of ILDs calculated from cranial landmark coordinates recorded with a three-dimensional digitizer is a quick and nondestructive method of recording overall morphology and determining the ancestry of complete or incomplete remains with accuracy and precision. The main advantages of using ILDs are that the forensic anthropologist only needs sliding and spreading calipers to collect ILDs, DFA can be easily used, including stepwise DFA to select the best variables to use, and partial remains can be more easily assessed. These advantages are naturally contingent on the appropriate populations being sampled.

Using a three-dimensional digitizer, cranial landmark data from over 400 Asians and over 500 Native Americans at the National Museum of Natural History, Smithsonian Institution, were collected. Seventy-eight landmark coordinates were recorded on each cranium, representing over 3,000 ILDs that could be calculated, but analysis centered on Type 1 landmarks, those located at the intersection of sutures. The continental groups were comprised of Mongolians (100), East Asians (Japanese, Chinese, Korean, Buriat, Chukchi), Alaskan (Aleut, Eskimo, Indian) and Plains, Western, and Southern Native Americans. Interestingly enough, one museum cranium labeled "Chinese" was an outlier and was determined to be of European descent based on DFA of ILDs from Chinese and 19th Century American Whites (posterior probability = .99).

The results show promise for use in forensic (especially Repatriation) situations where ancestry may be Asian as opposed to Native American. Mongolians were found to be the most divergent Asian group and were clearly distinct from East Asians and Native Americans. DFA classifies all three groups 94% correctly. One remarkable feature of the Mongolians is their extreme hyperbrachycephaly, probably among the highest in the world. East Asians showed greater similarity to Native Americans, especially Alaskan Native Americans, than to Mongolians, but could be separated from Alaskans 93% correctly using 25 variables in DFA. The similarity between East Asians and Alaskans is likely due to relatively recent gene flow across the Bering Strait.

Our results remind the forensic anthropologist that ancestry will reflect population histories, and that terms such as "Mongoloid" may be misleading both biologically, because they tend to mask underlying variation, and taxonomically, because in this case Mongolians are quite divergent from East Asians and Native Americans.

The use of ILDs continues to show great promise for use in forensic laboratories and museums where human remains are analyzed in terms of ancestry.

Craniometrics, Discriminant Function Analysis, Mongoloids

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