



## Physical Anthropology Section – 2003

### H3 Race and Ethnicity in Subadult Crania: When Does Differentiation Occur?

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Poster attendees will learn about survey data solicited from practicing forensic anthropologists on the issue of when skeletal attributes develop sufficiently to assign "race" to a largely intact human cranium.

For at least the past few decades, the concept of "race" has been debated within the discipline of anthropology and professionals have taken various stances on whether or not "human races" exist. Regardless of the fact that the biological definition of race does not apply to humans, forensic anthropologists are nevertheless often able to classify skeletal remains to socially recognized racial or ethnic groups with a measure of accuracy. However, owing to the complexities of polygenic inheritance and increasing admixture, racial classification is often far more difficult than assigning stature, sex, or age, although standard references agree the skull is the obvious choice for attempting to make racial distinctions.

In discussions of methodologies utilized in racial assessments, whether anthroposcopic or morphometric, there appears to be an underlying assumption, seldom voiced, that these methods are applicable to the remains of adults and adults only. Few references even make mention of racial assessments in subadults, and those that do generally refer to differences in long bone growth, and indicate this inter-group variability as being primarily of exogenous rather than endogenous origin. Krogman and Iscan (1986) have a section devoted to "Racial Differences" in their chapter "Skeletal Age: Early Years," in which they conclude, "We see no valid reason to hold that there are any *racial* differences (their emphasis), in the sense that differences in sequence or time may be genetically entrenched and, hence, significant." However, they do indicate "This problem has not been systematically studied save for the possibility of differences in the first two decades of life, and even here studies have focused mainly on evidence gained from the hand and wrist..." The scant references to racial differences among subadults include Choi and Trotter's (1970) study of American fetal skeletons, and research conducted by Hauschild (1937) concerning skull differences in the third fetal month. It is curious that while differences have been postulated and studied in fetal remains, albeit meagerly, there has been no systematic or recent study of racial variation in children or adolescents.

With regard to the development of skeletal traits associated with sex, it is widely held that these features do not appear until puberty and are ultimately of genetic origins that result in the timed differential production and release of hormones. In fact, although they are influenced environmentally, all growth processes that eventually culminate in the adult body size and morphology are guided by genetic and hormonal influences. However, general somatic growth occurs both prior to and after puberty. Therefore, it does not necessarily follow that skeletal traits associated with racial differences would have any direct relationship with puberty. Certainly some discrete traits, including dental traits such as Carabelli's cusp or shoveling of incisors, appear dichotomously or discontinuously during the growth of an individual. However, morphometric racial traits, such as those in the cranium, are a function of differential growth among individuals of varying genetic backgrounds. Undoubtedly, these traits could be influenced to some extent by the same exogenous dietary, pathologic and socioeconomic factors that act upon long bone growth and development. However, because crania develop differently than long bones, it is possible they are not as markedly affected, or alternately, affected in different ways.

The first objective of this study was to canvass the forensic anthropologic community regarding at what point in skeletal maturation they consider documenting morphological differences in the cranium that are typically associated with race or ethnicity. In addition, the author began to collect skull photographs of subadults of various ages and ethnicities to possibly further and more directly address this issue.

In May of 2002, a total of 245 surveys were sent to the membership mailing list of the Physical Anthropology Section of the American Academy of Forensic Sciences (AAFS). As of the writing of this abstract, 85 of those surveys were returned to the author for a response rate of 34.7%. Of the 85 respondents, 30 were Fellows in the Academy, 20 were Members, 17 held the rank of Provisional Member, 15 were Student status, 2 were Trainee Affiliates, and 1 was a non-member. The greatest number of participants (n=27 or 31.8%) reported their years of experience at 5-15 years, while 18 (21.2%) reported 15-25 years of experience, and 14 (16.5%) reported 25 or more years of experience. Of the 85 respondents, 26 (29.4%) reported either 5 or less years of experience or that they did not typically practice on their own. The survey also asked each participant to report on their average number of human cases per year and the average number of cases involving subadult/immature remains in which they participate annually (averaging the past five years).

The key question in the survey was worded as follows: "What would be the lowest age-at-death at which you would typically feel 'professionally comfortable' assigning 'race' or 'biological affinity' to a largely intact human cranium?" The survey asked participants to choose only one of the following responses:

- "I do not advocate assigning 'race' to human remains, regardless of age.
- Only when skeletal maturation is totally complete (i.e., all epiphyses are fused).
- 20-25 years at time of death
- 15-20 years at time of death
- 10-15 years at time of death



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- 5-10 years at time of death
- 0-5 years at time of death
- "I've never considered the question, and do not feel comfortable answering it."

Responses were tallied and then sorted by years of experience, cases per year, and other survey parameters.

Within the 85 responses, all of the above answers were selected by at least one survey participant. One individual (1.2%) did not advocate assigning race to human remains, regardless of age, and one other individual (1.2%) declined to answer the question. Six respondents (7.1%) had never considered the question or did not feel comfortable answering it. The most frequent response (n=29 or 34.1%) was from those who indicated they would "typically feel professionally comfortable assigning race" when an individual is in the 15-20 year range; 15 of 85 (17.6%) reported they would feel comfortable assigning race only when skeletal maturation is totally complete; another 15 of the 85 respondents (17.6%) indicated they would assign race in the 20-25 year range; 7 respondents (8.2%) would assign race in the 0-5 year range; 6 (7.1%) answered they would assign race in the 5-10 year category; and 5 participants (5.9%) would consider 10-15 years at time of death as the lowest age at which they would assign race. (It is interesting to note that there was no obvious correlation between the answer to the above question and the respondents' membership category or years of experience.) In summary, of the 77 survey respondents who answered the question and indicated they do report race, 59 of those (76.6%) would not feel comfortable doing so until after age 15, an age that roughly correlates with the post-pubertal period in most subadults.

As previously suggested, there is no biological reason to assume that the continuous types of morphological racial variability seen, in the cranium or elsewhere, are related to hormonal changes that occur specifically during the mid-to-later teenage years. However, from the survey one can conclude that forensic anthropologists are reluctant to assign a race below age 15. It is hoped that this paper will be the basis of a research agenda that helps illustrate at what point anthropologists can or cannot differentiate race or ethnicity from the crania of subadults.

The presentation will provide a more thorough discussion of survey responses, as well as photographic evidence of subadult crania of various age and ethnic backgrounds. Future directions of study are to utilize Fordisc on crania of various ages, particularly older children, to see if any ethnic distinctions emerge, since the race differences Fordisc keys in on are mostly based upon shape rather than size (R Jantz, personal communication). Additionally, radiographs and photographs of living children and adolescents will be utilized to examine at what age cranial variations begin to emerge among subadults of varying ages.

### References

- Choi, S.C. and M. Trotter (1970) A statistical study of multivariate structure and race-sex differences of American white and negro fetal skeletons. *AJPA* 33: 307-313.
- Hauschild, R. (1937) Rassenunterscheide zwischen negriden und europiden Primordial-cränien des 3 Fetalmonats. *Zeitschrift für Morphol und Anthropol*, 36: 215-279.
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### Race, Subadults, Cranium