

Abstracts of AAPA Poster and Podium Presentations

Head shape of adult males as a possible indicator of economic changes in northern Jordan (1900-1978).

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There are several anthropometric measurements used by health workers to evaluate nutritional status. These include stature, sitting height, stature by weight, and head circumference. This study associates head size but also shape in adults with changing economic conditions during early childhood. Pohlandt (1994) pointed out that there are two causes for long and narrow head: decreased mineralization rate and low ratio of bone mineral content. The hypothesis of this study is that adult head shape, as well as size, is influenced by changes in childhood nutrition. When economic conditions are very bad, nutrition and health suffer and will result in dolichocephaly. To test this hypothesis, I measured head length, width, and circumference of 398 adult males in Jordan. Fifty-four per cent are Jordanians, while 46% are Palestinians. I divided the modern history of Jordan and West Bank into four economic periods. The results of the study show that the Cephalic Index (CI) among Jordanians increases with economic improvement except that CI decreased during the last economic period. A different pattern is observed among Palestinians. The pattern among Jordanians can be explained in terms of maternal environment and early childhood malnutrition. When economic conditions were bad, mothers and infants suffered from malnutrition and deficits in health care services during prenatal and postnatal periods. Infants were born with very low birth weights and longer heads. However, the highest mean value of head circumference among Jordanians and Palestinians is obtained from those who lived their childhood during bad economic periods, an unexpected result.

What can morphological variation tell us about phylogenetic divergence?

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When living species are used as analogues for fossil ones, the assumption is made that the fossil and the living species

vary in the same way. Implicit in this assumption is the idea that closely-related living species themselves vary in the same way. These assumptions underlie many analyses, despite growing understanding that they are inaccurate. There is also an increasing awareness that many of the characters used for phylogenetic inquiry may contain no phylogenetic signal. Together, these two issues pose some serious challenges for those trying to interpret the phylogenetic relationships among fossil hominids.

In this paper, I first illustrate differences among patterns of inter-specific phenotypic facial variation within two living primate clades: 1) New World tamarins, and 2) African apes and humans. By comparing correlation and covariance matrices, I show that morphological variation is not constant among the species. In fact, the differences among variation patterns generally correspond to the phylogenetic relationships among these species, suggesting that patterns of variation have diverged through time in both clades. Based on the assumption that fossils and their analogue species do NOT vary in the same way, I then address the implications of this for analysis of fossil data, focusing on the relationships among early fossil members of the genus *Homo*.

The interpretation of phylogenetic relationships in the fossil record is confounded by a lack of understanding of how variation changes through time, and incorporating an understanding of time-related divergence in patterns of variation into our models can alter our understanding of human evolution.

Morphologic and genetic evidence for the kinship of juvenile skeletal specimens from a 2,000 year-old double burial at the Usu-Moshiri Site, Hokkaido, Japan.

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DNA analyses of ancient populations are mostly based on mitochondrial DNA because of its accessibility in decayed specimens. However, since the analysis of mitochondrial DNA can only provide information on the maternal line, detailed kinship between individuals who belong to the same

maternal line has hardly been clarified. In this study, we examined two 2,000-year-old juvenile skeletal specimens from a double burial of the Usu-Moshiri site, Hokkaido, Japan based on the mitochondrial DNA analysis combined with the similarity analysis of tooth size proportion that reflects the hereditary background of both parents. The result of the mitochondrial DNA analysis strongly suggested the existence of maternal kinship between these specimens. The similarity of tooth size proportions between these specimens was extraordinary high even compared with a true consanguineous human group. Taking the frequency of the pairs that showed this level of similarity in related and unrelated Japanese populations and the specimens' estimated ages into account, these two specimens were considered more likely to be siblings than other maternal relatives.

Approximate age at death of fragmentary fossils in the modern human origins debate.

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Since subadults tend not to exhibit robust superstructures such as large brow ridges, it is possible to mistake adolescent anatomy for more modern-like anatomy. In the modern human origins debate, replacement proponents have accused supporters of continuity of this very mistake and vice versa. Accusations have focused upon two samples of Late Pleistocene hominids, those from Vindija Cave and Klasies River Mouth. Specifically, it has been suggested that the modern-like aspects of the supraorbital fossils from these sites are a function of age rather than evolution. Since Le Moustier 1 Neandertal is one of the few Late Pleistocene adolescents that can be given a dental age, it may shed some light upon the debate surrounding these fragmentary fossils.

This study documents Le Moustier 1's anatomy and uses it to help distinguish adolescent from adult anatomy in the cases of the fragmentary Vindija and Klasies supraorbital fossils. Although Le Moustier 1's anatomy does indicate that two of the Vindija fossils are adolescent, these two fossils have already been excluded in studies that dem-

onstrate transitional aspects of the Vindija supraorbitals. Results of an analysis of the Klasies fossil KRM 16425 in light of Le Moustier 1 are ambiguous and highlight the need to be wary of confusing adolescent anatomy with modernity.

The use of skeletal data for the study of secular change: methodological implications of combining data from different sources.

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Previous research by Meadows Jantz and Jantz (1999, *American Journal of Physical Anthropology* 110:57-67) has shown that skeletal measurements may be useful for the study of secular change in size and proportion. Combining data from several different sources, Meadows Jantz and Jantz found that secular change was greater in males than females, greater in the lower limb bones than the upper limb bones, and greater in "Whites" than "Blacks" but not at a statistically significant level.

The purpose of this research is to determine whether it is methodologically sound to combine data from different sources into racial categories for an analysis of secular change. Change in the femur length in the Terry Collection and the Coimbra Collection were examined. It was found that the results from an analysis of secular change can be very misleading when the samples from different collections are combined. No significant secular change was found in males or females in either the Terry Collection or the Coimbra Collection regardless of "race" when each collection was analyzed separately. When data from both collections was combined and analyzed, secular change was visible in males and statistically significant in females. The secular change in males and females in the combined-collections analysis is a result of the source of the data and the combination of the data from different collections, and not any measurable secular changes in each sample. It is concluded that the source of the data (the collection) is a more important consideration than dividing a sample into biologically meaningless racial categories when investigating human skeletal variation.

Morphology as a key to evolutionary change in the primate brain.

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The aim of this study is to determine whether there are specific suites of features which characterize distinct patterns of orga-

nization between humans, apes, and monkeys.

The study sample consisted of whole brain magnetic resonance images (MRIs) of live, adult individuals of 10 anthropoid species: capuchins (N = 3), Rhesus macaques (N = 2), mangabeys (N = 3), baboons (N = 2), gibbons (N = 3), orangutans (N = 4), gorillas (N = 2), chimpanzees (N = 6), bonobos (N = 4), and humans (N = 37). Three-dimensional landmarks defined on the surface and on subcortical structures of the brain were located on 3-D MRI reconstructions of each individual using MEASURE software. The landmark coordinate data were scaled for differences in size and analyzed using a principal coordinates analysis application of Euclidean Distance Matrix Analysis (EDMA). This method defines clusters of individuals and identifies specific linear distances that are influential in defining those clusters.

First, analysis of cortical surface landmarks alone does not produce taxonomically relevant clusters of individuals. When subcortical structures are included in the analysis, a unique pattern defines the human brain, including the relative positions of subcortical frontal and temporal structures. In contrast, analysis of only non-human anthropoids indicates that cortical surface landmarks are influential in distinguishing ape from monkey taxa. Thus, patterns of neuroanatomical organization differ in monkeys as compared to apes, as well as in non-human anthropoids as compared to humans. However, the patterns distinguishing these groups are defined by different suites of characters. These results suggest that two adaptations potentially associated with varying biological processes may have been responsible for these two evolutionary divergences.

Evidence for a major faunal turnover at around 2.3 ma in the Shungura Formation, Ethiopia.

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It has widely been suggested that the environment in the Plio-Pleistocene of Africa became increasingly dry and open through time, which in turn affected fauna. However, there are discrepancies among researchers as far as the timing of the major change. For Vrba (1995), the major faunal turnover is situated in the interval 2.8-2.5 Ma. Behrensmeyer et al. (1997) suggest that the most important faunal change and a marked variability (Potts 1996) occurred after 2.5 Ma, whereas Bobe and Eck (2000) indicate a rapid change in taxonomic abundance at around 2.8 Ma. In this paper a multivariate method is used to discriminate localities of the Shungura Formation based on their taxo-

onomic composition. The dependability of the method used was first tested by applying it to modern bovids from African game parks. An attempt was made to reach isotaphonomy by using skeletal elements of similar behavior only, and by considering localities that are characterized by similar depositional conditions. The row and column profiles of this analysis point to a major faunal change at the base of Member G, dated to around 2.3 Ma. This change is interpreted to have been caused by environmental transformation that occurred around that time period, probably the appearance of an open environment that dominated the Shungura Sequence for the first time. The same environmental change correlates in time with the dental and mandibular transformations within the East African robust lineage, perhaps suggesting environmental causes for the appearance of *Australopithecus boisei*.

Social support and its relations to blood pressure in Kuwaiti Family.

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High Blood Pressure (BP) is a major health problem world-wide. Many factors affect blood pressure, particularly stress. The main goal of this study is to examine socio-cultural changes within the Kuwaiti family structure and their relationship to systolic blood pressure (SBP) and diastolic blood pressure (DBP) levels. 373 married women and men were examined in major hospitals throughout Kuwait. Sociocultural and physical information was requested from participants through a questionnaire. Data were entered in a SPSS program: t-tests and correlations were the major statistical analysis. The more social support a person receives, the lower is his/her SBP and DBP. Because of the support received within the extended family from relatives, members of such families had a lower BP. Family size is also important in maintaining a lower BP. The more people in the household, the lower the level of BP compared to people living alone in the same household. Some significant differences have found between males and females. More studies are needed to examine other variables.

Incongruence and homoplasy in the mammalian skeleton.

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Characters from the postcranium are often underrepresented in mammalian systematic studies, largely due to the perception that postcranial elements are too functionally labile to be of use for phylogeny reconstruction. However, it is unknown how ex-