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A probable case of cranial osteopenia in aboriginal societies from northern Argentina

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Osteopenia is a pathological condition that involves a decrease in bone mineral density and consequently a disproportionate loss of bone mass. Such decrease in bone mineral density is the cause of symmetrical biparietal thinning or resorption in the human skull and its precise etiology is considered to be uncertain. This paper aims to present a case of cranial osteopenia which has caused the presence of biparietal thinning in an adult individual from an archaeological site in northern Argentina dated at the time of contact in the area. Age and sex examination and anthropometrical measurements were performed using standard techniques. Macroscopic evaluation was complemented with X-ray images. The affected skull belongs to a male individual of +50 years. Resorption affects symmetrically both parietals. Thinning in both bones extends from the upper temporal line up to 21 mm of the sagittal suture, covering a depressed surface located between the lateral eminence and the coronal suture. The affected areas form two significant concavities, appreciable in the superior and the lateral norms of the cranium. Both depressions on the skull exhibit diameters of 60 and 40 mm. Diploe and the outer and inner tables are of equal thickness. Cranial osteopenia, including bilateral resorption of parietal bones, is not a common finding in ancient skeletal material. The importance of the present study is to add a particular archaeological case in northern Argentina, and consequently in the southern cone of South America, to the geographic distribution of this rare condition in past populations of the world.

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Key questions and future directions: Integrating biomarkers to understand (trans) gender experience and health disparities

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Transgender and gender diverse (TGD) people have become increasingly visible and access to transition-related care is rising, particularly for youth. Political backlash and entrenchment in a gender binary, however, continue to marginalize TGD people, increasing risk for stress-related health disparities. Nonetheless, research use of biomarkers among TGD people remains limited. The 2016 National Institute of Health recognition of sexual and gender minority people as a health disparities population increases available funding for much-needed research. In this review, we identify future directions in this emerging area and show that the use of minimally-invasive biomarker sampling enables essential health data to be collected from a population often excluded from research. Among sexual minorities (e.g. gay men) biomarkers have been successfully employed to understand health risks due to structural inequities, stigma, and minority stress. To date, however, only two studies have assessed TGD health by integrating biomarkers to understand pathways linking stigma and stress to: 1) health among transmasculine people and 2) health among HIV+ transgender women of color. We identify key areas for future research, discuss research challenges and possible solutions, and specify theoretical approaches useful in this endeavor. Future areas should integrate intersectional, life-history, and developmental approaches to investigate areas including: developmental trajectories and long-term effects of minority stress, the role of social support and close relationships in resilience, interactions among exogenously-administered sex-hormones and stress physiology, and aging. Biological anthropologists are well positioned to lead community-based biomarker research to address the needs of this marginalized and hard-to-reach population.

Implementing Nutritional Geometry to identify dietary constraints and strategies in the red-bellied lemur (*Eulemur rubriventer*)

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Nutritional Geometry is a modeling tool that considers how the mixture of nutrients influences health and disease rather than focusing on any one nutrient in particular. We explored the nutritional ecology and dietary strategies of the red-bellied lemur (*Eulemur rubriventer*); particularly considering the balance of macronutrients and whether protein is the nutritional driver for foraging choices (protein leverage). We recorded the plant parts and insects in a single female's diet in the Ankadivory region, near Tsinjoarivo, Madagascar. Daytime follows were conducted for 30 days during the lean season; for six of these days plus six days in the abundant season, food intake during the 24-hour cycle was recorded. Diet items were analyzed for their compositions of protein, fat, nonstructural carbohydrates, and fiber; we quantified intakes of available protein and non-protein energy (carbohydrates and fat). The hypothesis that protein is the limiting macronutrient in *E. rubriventer* diets and drives foraging choices (i.e. was constant across seasons) was not supported. The study subject exceeded her recommended protein requirement (3.15-4.9 g of protein/day) in the lean season (5.07 g of protein/day) and the abundant season (8.76 g of protein/day); the protein: non-protein energy ratio varied three-fold across seasons. Finally, the 24-hour diet information revealed day-night differences, implying that, for cathemeral animals such as *E. rubriventer*, only looking at daytime diet consumption can lead to inaccurate diet profiles. This project provides information crucial for a more comprehensive understanding of food selection by *E. rubriventer*, and is important for both captive management and habitat protection.

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Geometric morphometric analyses of carpals and tarsals demonstrate differences in wild and captive baboon populations

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Morphological studies favor wild specimens over captive specimens because captive environments often have different physical demands that developmentally impact skeletal anatomy. While these differences have been quantified in long bones and crania, little is known about the effect of rearing environment in carpals and tarsals. Quantifying the extent to which a captive environment impacts carpal and tarsal morphology helps clarify their range of phenotypic plasticity. In this study, three-dimensional geometric morphometric (3D GM) analyses of *Papio cynocephalus* carpals and tarsals from a wild and captive sample were performed to identify any significant shape differences between the two groups (n = 60) when size is controlled for. Digitized landmarks on the talus, medial cuneiform, capitate, scaphoid, tibia and radius were collected for each individual. It was predicted that shape differences would be associated with a lesser range of motion in the captive specimens due to the invariable hard surfaces of their enclosures and a broader range of motion in the wild specimens due to their substrate variability and grasping uses. The results indicate that there are statistically significant differences in shape