

## ABSTRACTS

lifestyle and environmental factors interact with molecular mechanisms to shape the pace of aging and aging-related disease in the brains of long-lived primate species, including our own.

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### Misidentification of Hispanic individuals during death investigations: the impact of identification errors on research questions in anthropology and public health

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Vital records include governmentally gathered information on deaths, including demographic variables such as age, sex, race, and ethnicity. They are used to understand trends in public health, such as changes in death rates due to motor vehicle accidents, homicide, and substance abuse. These records can reveal patterns of health disparities related to neighborhood effects, rural/urban risks, and racial and ethnic inequity. In New Mexico, the death investigators and medical examiners assign the information that goes into each individual's record, which is then compiled in larger datasets and made available for public health research. Errors in these records can affect inferences researchers make about causes health disparities.

Here, we examine the accuracy of vital records related to Hispanic ethnicity by comparing the information in death investigation reports to reports made by next of kin (NOK) in telephone interviews, using data from the New Mexico Decedent Image Database ( $n = 2209$ ; nmdid.unm.edu). This comparison revealed that investigators underestimate Hispanic deaths in the state. Overall, for each individual that NOK identified as Hispanic, investigators misidentified them 34% of the time. For 20% of cases, investigators did not record individuals as Hispanic when NOK did. In 6% of cases, investigators described individuals as Hispanic when NOK did not. Despite this high error rate, statistical analyses showed that neither average age at death nor proportions of manners of death differed between investigator- and NOK-identified Hispanics. Inaccuracies in the assignment of race and ethnicity in vital records can influence broader anthropological and public health research.

### Life expectancy over time and death seasonality among captive former biomedical research chimpanzees

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An accurate assessment of longevity and mortality is vital to the study and conservation of any species. Recent reports on a retired U.S. population of captive former biomedical research chimpanzees provided life tables, survival statistics, ages at death, current age-sex composition, population projections, and future animal care cost projections. However, the accuracy of such information is often confounded by time and the size and age of the population. We analyzed 2,249 individuals observed between 1900-2014 to determine whether life expectancy changed over time and whether a seasonal pattern in mortality existed. Results indicated a dramatic increase in median age at death beginning around 1985, rising from 15.2 years in 1985 to 30.3 years in 2000 to 36.2 years in 2014. Furthermore, season of mortality was unevenly distributed among the 1,190 observed deaths. Percent of deaths was greatest during the winter months of December, January, and February ( $n=338$ ), followed by autumn (Sep-Nov,  $n=321$ ), spring (March-May,  $n=272$ ), and summer (Jun-Aug,  $n=259$ ,  $\chi^2=14.54$ ,  $df=3$ ,  $p<0.001$ ). Our study demonstrates that the use of age at death alone in chimpanzee life history analyses can be misleading, as it is likely that captive populations have not yet reached their full aging potential. Life expectancy estimates may be influenced by improved husbandry practices over time, but they may also be an artefact of population aging and more individuals living out their lives. Population development and seasonal variation need to be thoroughly considered when making management or conservation decisions based on age of death analyses.

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### Theorizing the Genomic Archive as Method for an Abolitionist Science

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In their 2019 *Current Anthropology* article, "Patchy Anthropocene: Landscape Structure, Multispecies History, and the Retooling of Anthropology," Tsing et al. argue for a recalibration of the tools of anthropology in order to develop a "sympiogetic relationship" between anthropologists and their allies, including biologists and ecologists (Tsing et al. 2019:S188). A "patchy anthropology"

comes alongside other recent calls for a radical reconfiguration of the anthropological discipline, including the theorization of an "abolitionist anthropology" (Shange 2019) and "The Case for Letting Anthropology Burn" (Jobson 2020).

While calls for paradigm shifts in the anthropological discipline are not new, the recent proliferation of theoretical concepts that call upon anthropologists to think beyond disciplinary boundedness in order to agitate and retool the way we know and learn within the discipline lend themselves well to the biological anthropologists' toolkit.

In this paper, I will demonstrate how a reconceptualization of genomic and molecular anthropological data as archival is one way we unsettle the subjective-objective binary that, despite calls for a critical biocultural anthropology and interdisciplinary scholarship in biological anthropology (Fuentes 2010, Leatherman and Hoke 2016, Leatherman and Goodman 2019), persist in our discipline. In order to go beyond mere scholarly collaboration that stops where subjective theory ends and objective data begins, we need an abolitionist, patchy, mixed-methods anthropology that leans into the subjective nature of all data and allows for a radical reconfiguration of how we make meaning from it – regardless of whether it is collected in the field, the museum, or the laboratory.

### New cercopithecoid fossils from Hadar

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Cercopithecoid primates are present at many Neogene fossil sites in the Middle and Lower Awash Valleys of Ethiopia, including four taxa from the Hadar Formation deposits at Hadar. The Sidi Hakoma, Denen Dora, and Kada Hadar monkey communities are dominated by *Theropithecus oswaldi* cf. *darti*, while *Parapapio* cf. *jonesi*, cf. *Rhinocolobus turkanaensis*, and *Cercopithecoides meaveae* are rare among the faunal collections. Here we present several new specimens from the Hadar Formation that add to the non-*Theropithecus* cercopithecoid sample, including comparative analyses of a nearly complete male mandible allocated to cf. *Rhinocolobus* (A.L. 1001-4) from the Kada Hadar Member with a sample of 200 extant colobines and African fossil colobines. Although similar to *Rhinocolobus* specimens in symphyseal and corpus proportions, A.L. 1001-4 is somewhat smaller and less robust than other *Rhinocolobus*

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males, has a broader  $P_4$  and  $M_2$ , and a wider lateral eminence. The symphysis lacks a median mental foramen, consistent with cf. *R. turkanaensis* from the Afar Basin and unlike material from the Turkana Basin. As the most complete cf. *Rhinocolobus* from the Afar, this specimen adds considerably to the hypodigm and provides a better assessment of variation in this genus between the older Afar and younger Turkana samples. Other notable new Hadar specimens include a juvenile *C. meaveae* mandible (A.L. 173-28) and a poorly preserved mandible referred to cf. *Parapapio cf. jonesi* (A.L. 1541-1), both from the Denen Dora Member. Collectively, these specimens indicate greater continuity of the monkey fauna through time within the Hadar Formation than previously recognized.

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### Quantitative assessment of the influence of the glenoid *labrum* in the morphology of the glenoid cavity of the scapula in hominoids

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The glenoid cavity of the glenohumeral (shoulder) joint is characterized, in vivo, by the presence of a fibrocartilaginous rim around its perimeter, i.e., the glenoid *labrum*. Previous qualitative assessments of the *labrum* indicate that there are differences in the morphology of the glenoid cavity when the *labrum* is present, especially in humans, which might affect functional aspects of the glenohumeral joint not previously contemplated. In this study, we used quantitative techniques (2D and 3D geometric morphometrics and linear measurements) to characterize the morphology of the glenoid cavity of a sample of humans (N=8), chimpanzees (N=10) and cercopithecoids (N=14), recorded both with and without *labrum* to assess effects it might have in the depth, surface area and shape of the glenoid cavity. Results indicate that

the *labrum* adds a significant amount of surface area and depth in humans without affecting the overall shape of the glenoid. In chimpanzees, the *labrum* only adds depth to the glenoid but not surface area. These findings indicate that the glenoid *labrum* increases the contact between the glenoid cavity and the proximal humerus in humans and chimpanzees, possibly acting as a stabilization mechanism of the glenohumeral joint. Conversely, the presence of *labrum* in cercopithecoids does not increase the available surface area of the glenoid or its depth, but it increases their variability with regards to shape. Overall, results indicate that there might be a need to re-evaluate the locomotor inferences made from the skeletal morphology of the glenoid cavity both in extant and fossil hominoids.

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### Evolution and lifestyle effects on sex differences in the human immune system

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The "Pregnancy Compensation Hypothesis" posits that sex differences in the mammalian immune system is an evolved, adaptive trait explained by selection on female immunity during pregnancy, during which increased immunomodulation is required to both tolerate the fetus and continue to stay healthy. In humans, post-industrial changes in reproductive ecology are expected to exacerbate these sex differences, as lower parity leaves female immune systems under-stimulated. Yet, robust tests of how lifestyle change impacts immune system sex differences are rare. To address this gap, we collected interview, genome-wide blood gene expression (n=459), and immune cell type data (n=658) from traditional Turkana pastoralists as well as individuals of the same genetic background that have recently moved to cities. We found that lifestyle alters sex differences in immune function, such that monocyte, neutrophil, basophil, and eosinophil counts exhibit distinct male-female differences in pastoralist versus urban settings. However, despite urban lifestyles being associated with overall reductions in female parity, we did not find evidence that these reproductive changes explain sex x lifestyle effects on immune cell counts. We are currently

following up on these results 1) at the molecular level, by using our gene expression data to identify genes with exacerbated male-female differences in urban relative to pastoralist environments and 2) across species and contexts, by using comparable datasets from non-human primates, other subsistence-level human populations, and human cohorts in the U.S. Overall, our work provides insight into how sex differences in health are impacted by the sociocultural and ecological changes that accompany lifestyle transitions.

### Parsing out functional signals: The influence of phylogeny on the primate first metatarsal

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The hallux metatarsal (MT1) supports locomotor and positional behaviors in primates and has been the focus of work investigating the evolution of bipedality and grasping abilities in fossil primates. The degree to which the morphology of articular facets and plantar diaphyseal curvature reflect function across all primates, however, has been understudied and is explored herein.

We used 3D geometric morphometric methods to explore MT1 shape in relation to function and phylogeny. Ninety MT1 surface meshes were downloaded from Morphosource to generate a broad sample of extant anthropoids that encompass a range of locomotor repertoires. Sliding semi-landmark patches were placed on articular facets, and one curve was fitted along the plantar midline diaphysis. Landmark coordinates underwent a generalized Procrustes analysis before subsequent analyses.

A principal component analysis of the whole dataset reveals 67.24% of the variance is contained within the first two PCs. PC1 separates hominoids from all other primates but is highly correlated with centroid size ( $R^2=0.65$ ). While a discriminant analysis performed on the proximal facet correctly identifies knuckle-walkers and bipeds, no such differentiation is found among other anthropoids. The distal facet showed some clustering by locomotor category, and a discriminant analysis performed well for most groups. To account for the effects of phylogeny on the patterns observed, a phylogenetic PCA was performed. Results demonstrate no significant patterns, and previous clusters dissolve.