Several investigations into intraspecific differences in patterns of growth and development of the vervet monkey (*Chlorocebus aethiops*) have found progenesis (early growth cessation) in females, but the effect of this developmental difference on the cranium has not been investigated. This study seeks to correct this deficiency by examining skeletons of 36 individuals from a single, wild population from Kibwezi, Kenya. The sample is comprised of both males (n=17) and females (n=19) that range in age from infant to adult. The specimens were placed into discrete age classes using previously established dental eruption patterns. These classes were then plotted against the distance from opisthocranion to lambda suture.

The distance from opisthocranion to lambda suture was found to shrink throughout ontogeny in both sexes, but remains relatively large in adult females who are therefore, with regard to this feature, paedomorphic when compared with adult males. For juveniles without fully erupted canines and no M3, the average distance for males (n=9) is 10.5 mm and for females (n=4) is 10.6 mm. In contrast, a statistically significant difference (p=0.00016) was found between the adult male distance (n=4, average=3.95 mm) and the adult female distance (n=10, average=8.47 mm). This cranial variable, here entitled 'opisthocranion migration,' illustrates that the developmental process of progenesis in female vervet monkeys is evinced in the morphology of the skull. Due to the consistent sexual dimorphism of this feature, it is also possible to use the degree of opisthocranion migration in adults as a tool for sex estimation in this species.

Cranio-facial variation in sub-species of *Pan*.

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Genetic evidence suggests that *Pan troglodytes troglodytes, Pan troglodytes schweinfurthii* and *Pan troglodytes verus* represent three different populations, with the latter possibly being a distinct species. Morphological differences, however, are not clear-cut and bear directly on questions concerning taxonomy, sexual dimorphism and phylogeny in extant hominoids and early human evolution. We re-examine *Pan* cranial variation using Procrustes-based geometric morphometrics to: 1) quantify and examine overall cranial shape variation among *Pan* species and sub-species; 2) investigate whether the face, basicranium and cranial vault can distinguish sub-species of *Pan*; this is because different regions of the cranium have shown to preserve phylogenetic information differentially.

Our dataset comprises 123 adult chimpanzees and 36 bonobos, and a total of 53 3-D landmarks. To analyze cranial shape variation, we conducted principal component (PCA) and canonical variate (CVA) analyses on Procrustes shape coordinates. The PCA of the full cranial landmarks set shows a separation between the *Pan* species, but not the sub-species. The CVA distinguishes bonobos from chimpanzees, and also shows subtle separation among the chimpanzee sub-species. In the separate face, basicranium and cranial vault analyses, bonobos are best distinguished from chimpanzees in aspects of the face and basicranium. Among the sub-species, *P. t. verus* and *P. t. schweinfurthii* are most disparate from each other, particularly in the face. *P. t. troglodytes* consistently overlaps with *P . t. verus* and *P. t. schweinfurthii* in all three cranial regions.

These results suggest population differences between the western and eastern chimpanzees, but do not indicate consistent separation of the western chimpanzees as suggested by the genetic data.

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Is there an environmental effect on acoustic strategies of black and white ruffed lemurs (*Varecia variegata editorum*) in Ranomafana National Park, Madagascar?

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Acoustic signals convey messages about the location, behavior, and physical state of callers. Environmental factors affect vocal structure and sound transmission regardless of content. Time of day, temperature, wind speed, atmospheric pressure, and humidity affect the level of degradation and attenuation an acoustic signal endures while traveling from source to recipient. We predict that to increase the efficacy of communication, primates use acoustic signals when transmission is optimal. Therefore, call rates will vary with environmental factors.

We tested the prediction that environmental factors shape acoustic strategies of black and white ruffed lemurs (*Varecia variegata editorum*). Long calls are one of the most salient characteristics of the species, carrying over 1km. From July-August 2011 (N= 544 hours), we recorded instances of *Varecia* long calls (N=172). We tested whether call rates differed across morning, mid-day or late afternoon time periods, and wet vs. dry periods (chi-square), and if call rates were associated with changes in temperature, barometric pressure and wind speed (Spearman's rho).

Contrary to our predictions, call rates did not significantly differ across time periods and were not associated with temperature, barometric pressure or wind speed ($p > 0.05$). However, call rates significantly differed between wet and dry periods ($p<0.001$). A longer study comparing acoustic strategies across seasons may reveal relationships between abiotic factors and *Varecia* long calls, or that the acoustic strategies of ruffed lemurs are more heavily influenced by social than abiotic factors. Investigation of the social behaviors associated with calls may better elucidate the acoustic strategies of *Varecia*.

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Ontogenetic shape variation in the cranium of *Rungwecebus kipunji*.

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The cranial morphology of the endemic Tanzanian primate *Rungwecebus kipunji* is known only from juvenile specimens. Morphometric analyses of the first voucher specimen, an M1-stage male (FMNH-187122), identified similarities with *Lophocebus aterrimus* but supported the kipunji's generic status. The second voucher specimen, an M2-stage male (SHCP-2458), has undergone qualitative and phylogenetic analyses but has not been included in multivariate, morphometric studies. In this study, 3D geometric morphometrics was used to compare the cranial morphologies of FMNH-187122 and SHCP-2458. To facilitate comparisons, developmental simulation was used to estimate the M1-stage morphology of SHCP-2458, M2-stage morphology of FMNH-187122, and adult morphologies of both specimens. Objectives were to evaluate the affinities of SHCP-2458, characterize kipunji cranial development, and explore the impact of ontogenetic variation on estimates of adult morphology. Coordinate data were collected on 109 juvenile and adult-male crania representing five African papionin genera. The male developmental trajectory for each species was approximated by regression of Procrustes-aligned coordinates on dental stage. Juvenile and adult landmark configurations were simulated by application of developmental vectors to the juveniles' landmark coordinates. Affinities of actual and simulated kipunji crania were assessed using Procrustes distances and PCA. Next to FMNH-18722, SHCP-2458 is most similar to M2-stage *Lophocebus aterrimus*. Shape differences between FMNH-18722 and SHCP-2458—concentrated in the face and neurocranium—are greater than between M1- and M2-stage *Lophocebus* but similar in magnitude to *Papio*. Vectors of *L. aterrimus* and *Papio* provide the most accurate estimates of actual juvenile morphology. Affinities of simulated juveniles and adults will be discussed.

When artiodactyls lead anthropologists astray: important considerations, strengths, and limitations of comparing limb bone adaptation between artiodactyls and primates.

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Studies of adaptation of artiodactyl (e.g., sheep, deer, gazelles) limb bones are now commonly used as a means for understanding processes/mechanisms of adaptation in appendicular skeletons of primates. Benefits of