and nitrogen isotope indicators ($\delta^{15}N$) of dietary protein intake during the 6th-5th century BCE at the Greek colony Himera to examine the relationship between physical activity and diet. We test the hypothesis that OA is associated with diets low in animal protein. Bones of 13 individuals with OA present at two or more joints (7 male, 5 female, 1 unidentified), and 11 individuals observed to have no OA at any joint (7 male, 4 female), were isotopically analyzed. Only adults aged 15-50 years were included, as OA development is positively correlated with age. Mann-Whitney U tests revealed no statistically significant isotopic differences between OA and non-OA groups (p=0.9547 for $\delta^{13}C$, p=0.6085 for $\delta^{15}N$). Although three males exhibit outlying $\delta^{13}C$ and $\delta^{15}N$ values, there are no statistically significant isotopic differences between the sexes (p=1.0000 for $\delta^{13}C$, p=0.4389 for $\delta^{15}N$). This study shows that activity levels, sex, and by extension, status may not have heavily influenced individuals' diets at Himera, at least in terms of access to animal protein. This study therefore supports interpretations that ancient Greeks may have mainly consumed animal protein in religious and sacrificial contexts, with these sacrifices equalizing individuals' access to animal protein, regardless of social or occupational divisions.

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Absolute brain size correlates very strongly with social group size in Primates

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Two recent research reports assessed the "social intelligence" hypothesis in Primates using the largest datasets to date and concluded that ecological variables are more important than social variables in explaining the evolution of larger brains (DeCasien et al., 2017; Powell et al., 2017). However, both exclusively analyzed relative brain size, not absolute brain size. It is not legitimate to use relative brain size unless one can show body size has a direct, independent, causal effect on sociality. It has been argued that larger bodies might simply *allow* for larger brains, and don't have a direct causal influence on the functioning of brains. Empirically, absolute brain size correlates with behavioral ability across primates much better than relative brain size, which is consistent with how we think brains work. Therefore, it is critical to assess the strength of the association between absolute brain size and social group size. For the Powell et al. dataset (n=155), log endocranial volume correlates r=.68 (p<.001) with log group size, but only r=.16 (p<.05) with percent-fruit-in-diet (phylogeny accounted for using independent contrasts). In addition, adding log body size into a multiple regression predicting log endocranial volume removes the association with percent-fruit-in-diet (p=.69), but maintains a strong association with social group size (p<.001; phylogeny accounted for using independent contrasts), suggesting that the contrary conclusions from these recent studies are simply due to peculiarities of their phylogenetic generalized least-squares regression methods. Thus, the social intelligence hypothesis is actually very strongly supported by these new datasets.

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Tibial torsion and patterns of metatarsal robusticity in humans: an osteometric study

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Here we use osteometric data from a modern human sample to test the hypothesis that the very low degree of tibial torsion in the Dmanisi D3901 H. erectus individual (1°; modern humans average 15-20°) is related to its unusual pattern of metatarsal robusticity (Pontzer et al., 2010). Anatomically, a lower degree of tibial torsion may be expected to produce a more medial orientation of the foot, with greater stresses engendered in the more central rays of the foot during locomotion. This may explain the relatively greater robusticity in the Dmanisi MT III and IV compared to modern humans. Here we compare tibial torsion and MT robusticity in a sample of 40 young male human individuals from the Robert J. Terry Anatomical Skeletal Collection at the Smithsonian Institution. Tibiae were photographed and the resulting images were used to calculate tibial torsion. MT robusticity (dorso-plantar and medio-lateral bending strength and axial strength) was estimated from external measurements and biplanar x-rays. We found no relationship between tibial torsion and the pattern of robusticity (either bending or axial strength) among the metatarsals. Our results suggest that tibial torsion alone is not adequate to explain MT robusticity patterns in D3901. The extent to which tibial torsion actually influences foot orientation during locomotion is unclear, but our separate experimental study has so far failed to reveal relationships between tibial torsion, foot orientation, and stress patterns in the foot in living human subjects, which corroborates these osteometric results.

Brain size, body size, and time allocation strategies in primates

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Diurnal primates spend most of their daytime hours in three categories of activity: resting, foraging, and locomotion. Discovering how different components of species-typical time budgets relate to one another may offer insight on the evolution of primate time allocation strategies. Here, we test the relative strength of time spent in each of these activities in predicting one another. The time budget percentages in our dataset are drawn from published data in focal follow and scan sampling studies of wild non-human primates and represent mean species-level values, averaged between sexes and studies (n=47 species). Using phylogenetic least squares regression, we find that resting is much stronger than foraging as a predictor of locomotion (ΔBIC=26.03), and resting is much stronger than locomotion as a predictor of foraging (ΔBIC=34.49). These patterns persist after controlling for log brain size, log body size, percent folivory, group size, and mean ambient temperature. Brain size and body size, when adjusting for one another, are the strongest non-time budget predictors of time spent resting. Larger brain size is associated with less resting and larger body size is associated with more resting. Entering resting time into models attenuates the effects of brain and body size on locomotion and foraging, which suggests that resting may mediate the effects of brain and body size on foraging and locomotion. These results suggest that brain and body size may coevolve with relative resting time, and tradeoffs between resting and other more energetically expensive behaviors may influence the structure of species-typical time allocation strategies.

The path to *Homo,* revisited

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The transition from *Australopithecus* to *Homo* was not straightforward. Exploration of this divergence is complicated by the diverse morphology that characterizes the genus *Homo* at this transition, the existence of coexisting taxa, and their wide geographic distribution. The likely ancestor of *Homo* is also uncertain. Recent studies have indicated that multiple evolutionary forces have been acting on our lineage, contributing to the complex evolution of our genus. Here we build on a previous study, providing an expanded analysis (both in terms of fossils and data points) of the evolutionary processes that have driven the