

CONTENTS

NOTICES	2
PUBLICATION ALERTS.....	2
EAORC NEWS – Replacing the Membership Page on the Website.....	2
ACADEMIA.EDU – The Foot in the Homo Fossil Record.....	2
ADRIÁN PABLOS – The Foot in the Homo Fossil Record.....	2
ACADEMIA.EDU – Rearfoot posture of Australopithecus sediba.....	2
THOMAS C. PRANG – Rearfoot posture of Australopithecus sediba and the evolution of the hominin longitudinal arch.....	2
NEWS	3
BREAKING SCIENCE – Philippine Ayta Magbukon People Have Highest Amount of Denisovan DNA.....	3
BREAKING SCIENCE – Great Apes Use ‘Hello’ and ‘Goodbye’ Signals to Begin and End Social Interactions.....	3
NATURE BRIEFING – Puppies are hardwired to understand us.....	3
SCIENCE DAILY – Like humans, apes communicate to start and end social interactions.....	3
SCIENCE DAILY – Philippine Ayta people have the most Denisovan DNA, study finds.....	3
PUBLICATIONS	3
Current Biology.....	3
PAPERS	3
MAXIMILIAN LARENA et al – Philippine Ayta possess the highest level of Denisovan ancestry in the world.....	3
Evolutionary Anthropology.....	4
PAPERS	4
JAYNE WILKINS – Homo sapiens origins and evolution in the Kalahari Basin, southern Africa.....	4
DAVID A. RAICHLEN & HERMAN PONTZER – Energetic and endurance constraints on great ape quadrupedalism and the benefits of hominin bipedalism.....	4
PAIGE MADISON – Brutish Neanderthals: History of a merciless characterization.....	4
CYRIL C. GRUETER & MICHAEL L. WILSON – Do we need to reclassify the social systems of gregarious apes?.....	4
MARLIZE LOMBARD & JOHN J. SHEA – Did Pleistocene Africans use the spearthrower-and-dart?.....	4
PAIGE MADISON & BERNARD WOOD – Birth of Australopithecus.....	4
Frontiers in Psychology.....	5
PAPERS	5
PETAR GABRIĆ – Differentiation Between Agents and Patients in the Putative Two-Word Stage of Language Evolution.....	5
TOBIAS REGNER & ASTRID MATTHEY – Actions and the Self: I Give, Therefore I am?.....	5
Nature Communications.....	5
PAPERS	5
MANUEL WILL et al – Different environmental variables predict body and brain size evolution in Homo.....	5
Nature Neuroscience.....	6
ARTICLES	6
ALYSSON R. MUOTRI – “Archealization” of human brain organoids.....	6
Nature Scientific Reports.....	6
PAPERS	6
MONAMIE RINGHOFER et al – Horses with sustained attention follow the pointing of a human who knows where food is hidden.....	6
M. BERK MIRZA et al – Contextual perception under active inference.....	6
MANUEL DOMÍNGUEZ-RODRIGO et al – Early Pleistocene faunivorous hominins were not kleptoparasitic, and this impacted the evolution of human anatomy and socio-ecology.....	6
MICHAELA MASILKOVA et al – Observation of rescue behaviour in wild boar (Sus scrofa).....	7
PLoS One.....	7
PAPERS	7
ADAM EGGLESTON et al – Parents reinforce the formation of first impressions in conversation with their children.....	7
PIOTR RADKIEWICZ & KRYSZYNA SKARŻYŃSKA – Who are the ‘social Darwinists’? On dispositional determinants of perceiving the social world as competitive jungle.....	7
Science Advances.....	7
PAPERS	7
HELEN GREEN et al – Dating correlated microlayers in oxalate accretions from rock art shelters: New archives of paleoenvironments and human activity.....	7
BENJAMIN PITT et al with DANIEL CASASANTO & STEVEN T. PIANTADOSI – Spatial concepts of number, size, and time in an indigenous culture...8	8

Trends in Cognitive Sciences	8
PAPERS.....	8
IRENE DE LA CRUZ-PAVÍA, CATERINA MARINO & JUDIT GERVAIN – Learning word order: early beginnings	8
Trends in Ecology and Evolution.....	8
PAPERS.....	8
J. TYLER FAITH et al with BERNARD WOOD – Rethinking the ecological drivers of hominin evolution	8
SUBSCRIBE to the EAORC Bulletin	8
UNSUBSCRIBE from the EAORC Bulletin	8
PRODUCED BY AND FOR THE EAORC EMAIL GROUP.....	8

NOTICES

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, do please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.

If there is a journal you feel I should be tracking on a regular basis, do let me know.

And if you have any other ideas for extending the “EAORC experience”, please contact me.

EAORC NEWS – Replacing the Membership Page on the Website

The new membership page is now live. If you wish to add a comment, just send me a few kind words about EAORC and I'll include them.

You can add a comment no matter how you receive the bulletin – first-hand by email every Sunday, by copied email, by ResearchGate notification, or any way you access the bulletin.

Many thanks in anticipation, and especial thanks to those who have already responded.

Martin

ACADEMIA.EDU – The Foot in the Homo Fossil Record

In Mitteilungen der Gesellschaft für Urgeschichte 24 (2015)

ADRIÁN PABLOS – The Foot in the Homo Fossil Record

In this article, the foot in the Homo fossil record throughout the world is reviewed. The main problem with the study of foot remains is the paucity of fossils from this anatomical area, in particular from the earlier members of the genus Homo. In spite of this, a comprehensive review of the morphology of the entire fossil record for the foot has been achieved. All the fossils belonging to the genus Homo are proposed to be biped due to the presence of longitudinal and transversal arches, the robusticity pattern of the metatarsals and an adducted hallux. Even in the early members of the genus Homo, the morphology of the foot is modern-like, with size being practically the only variation observed. Of the foot remains attributed to the genus Homo, two morphotypes become apparent: small-sized and large-sized individuals. It is important though to take into account that the earliest Homo feet belonging to smaller individuals could not belong to the genus Homo. Later, a new robust bauplan appears in the Homo fossil record for the foot represented by Homo erectus/ergaster, Homo antecessor, the hominins from Sima de los Huesos and Neandertals. Finally, modern humans display long feet that are gracile compared with their ancestors. An examination of the morphology of the Neandertal foot and of the foot from Sima de los Huesos confirms the evolutionary relationship between these two populations. However, enough differences exist between the two samples to indicate that they are in fact morphologically distinct. A parallel gracilization process is proposed in both modern humans and Neandertals.

[https://www.academia.edu/21777925/The foot in the Homo fossil record](https://www.academia.edu/21777925/The_foot_in_the_Homo_fossil_record)

ACADEMIA.EDU – Rearfoot posture of Australopithecus sediba

In Nature Scientific Reports 5:17677 (2015).

THOMAS C. PRANG – Rearfoot posture of Australopithecus sediba and the evolution of the hominin longitudinal arch

The longitudinal arch is one of the hallmarks of the human foot but its evolutionary history remains controversial due to the fragmentary nature of the fossil record. In modern humans, the presence of a longitudinal arch is reflected in the angular relationships among the major surfaces of the human talus and calcaneus complex, which is also known as the rearfoot. A complete talus and calcaneus of Australopithecus sediba provide the opportunity to evaluate rearfoot posture in an early hominin for the first time. Here I show that A. sediba is indistinguishable from extant African apes in the angular configuration of its rearfoot, which strongly suggests that it lacked a longitudinal arch. Inferences made from isolated fossils support the hypothesis that Australopithecus afarensis possessed an arched foot. However, tali attributed to temporally younger taxa like Australopithecus africanus and Homo floresiensis are more similar to those of A. sediba. The inferred absence of a longitudinal arch in A. sediba would be biomechanically consistent with prior suggestions of increased midtarsal mobility in this taxon. The morphological patterns in talus and calcaneus angular relationships among fossil hominins suggest that there was diversity in traits associated with the longitudinal arch in the Plio-Pleistocene.

NEWS

BREAKING SCIENCE – Philippine Ayta Magbukon People Have Highest Amount of Denisovan DNA

New research led by Uppsala University scientists suggests that there were multiple archaic human species that inhabited the Philippines prior to the arrival of anatomically modern Homo sapiens and that these archaic groups may have been genetically related.

<http://www.sci-news.com/genetics/ayta-magbukon-denisovan-dna-09957.html>

BREAKING SCIENCE – Great Apes Use ‘Hello’ and ‘Goodbye’ Signals to Begin and End Social Interactions

In a paper published this week in the journal iScience, an international team of researchers documented chimpanzees (Pan troglodytes) and bonobos (Pan paniscus) purposefully using signals to start and then end social activities, a behavior not seen outside of the human species until now.

<http://www.sci-news.com/biology/joint-commitment-great-apes-09953.html>

NATURE BRIEFING – Puppies are hardwired to understand us

Nearly 400 adorable puppies have helped researchers to show that dogs’ ability to understand human pointing — a rarity in the animal kingdom — appears to be hardwired in doggy DNA. The team used 8-week-old labrador and golden-retriever pups in a series of experiments to see how the furballs responded to human cues, such as pointing and ‘puppy talk’. Some puppies were more successful than others, but the researchers found that approximately 43% of that variation in performance was due to genetics. The finding suggests people strongly selected for these abilities in the past, paving the way for dogs to become the human mind-readers they are today.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=8a4a37e4c1&e=1db4b9a19b>

SCIENCE DAILY – Like humans, apes communicate to start and end social interactions

When we're talking to another person, we probably wouldn't leave without saying goodbye; that would just be impolite. Apes seem to do something similar, researchers report in a study, in which they documented apes purposefully using signals to start and then end interactions -- a behavior not seen outside of the human species until now. They also found that the social and power dynamics between the interacting apes affected the communication efforts used, which the researchers say mirrors patterns similar to human politeness.

<https://www.sciencedaily.com/releases/2021/08/210811113148.htm>

SCIENCE DAILY – Philippine Ayta people have the most Denisovan DNA, study finds

Researchers have known from several lines of evidence that the ancient hominins known as the Denisovans interbred with modern humans in the distant past. Now researchers have discovered that the Ayta Magbukon in the Philippines have the highest level of Denisovan ancestry in the world. In fact, they carry considerably more Denisovan DNA than the Papuan Highlanders, who were previously known as the present-day population with the highest level of Denisovan ancestry.

<https://www.sciencedaily.com/releases/2021/08/210812123052.htm>

PUBLICATIONS

Current Biology

PAPERS

MAXIMILIAN LARENA et al – Philippine Ayta possess the highest level of Denisovan ancestry in the world

Multiple lines of evidence show that modern humans interbred with archaic Denisovans. Here, we report an account of shared demographic history between Australasians and Denisovans distinctively in Island Southeast Asia. Our analyses are based on ~2.3 million genotypes from 118 ethnic groups of the Philippines, including 25 diverse self-identified Negrito populations, along with high-coverage genomes of Australopapuans and Ayta Magbukon Negritos. We show that Ayta Magbukon possess the highest level of Denisovan ancestry in the world—~30%–40% greater than that of Australians and Papuans—consistent with an independent admixture event into Negritos from Denisovans. Together with the recently described Homo luzonensis, we suggest that there were multiple archaic species that inhabited the Philippines prior to the arrival of modern humans and that these archaic groups may have been genetically related. Altogether, our findings unveil a complex intertwined history of modern and archaic humans in the Asia-Pacific region, where distinct Islander Denisovan populations differentially admixed with incoming Australasians across multiple locations and at various points in time.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00977-5](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00977-5)

JAYNE WILKINS – Homo sapiens origins and evolution in the Kalahari Basin, southern Africa

The Kalahari Basin, southern Africa preserves a rich archeological record of human origins and evolution spanning the Early, Middle and Late Pleistocene. Since the 1930s, several stratified and dated archeological sites have been identified and investigated, together with numerous open-air localities that provide landscape-scale perspectives. However, next to recent discoveries from nearby coastal regions, the Kalahari Basin has remained peripheral to debates about the origins of Homo sapiens. Though the interior region of southern Africa is generally considered to be less suitable for hunter-gatherer occupation than coastal and near-coastal regions, especially during glacial periods, the archeological record documents human presence in the Kalahari Basin from the Early Pleistocene onwards, and the region is not abandoned during glacial phases. Furthermore, many significant behavioral innovations have an early origin in the Kalahari Basin, which adds support to poly-centric, pan-African models for the emergence of our species.

<https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21914>

DAVID A. RAICHLEN & HERMAN PONTZER – Energetic and endurance constraints on great ape quadrupedalism and the benefits of hominin bipedalism

Bipedal walking was one of the first key behavioral traits that defined the evolution of early hominins. While it is not possible to identify specific selection pressures underlying bipedal evolution, we can better understand how the adoption of bipedalism may have benefited our hominin ancestors. Here, we focus on how bipedalism relaxes constraints on nonhuman primate quadrupedal limb mechanics, providing key advantages during hominin evolution. Nonhuman primate quadrupedal kinematics, especially in our closest living relatives, the great apes, are dominated by highly flexed limb joints, often associated with high energy costs, and are constrained by the need to reduce loads on mobile, but less stable forelimb joints. Bipedal walking would have allowed greater hind limb joint extension, which is associated with reduced energy costs and increased endurance. We suggest that relaxing these constraints provided bipedal hominins important benefits associated with long distance foraging and mobility.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21911>

PAIGE MADISON – Brutish Neanderthals: History of a merciless characterization

The idea that Neanderthals were brutish and unintelligent is often traced back to Marcellin Boule, a French paleontologist who examined the specimen known as the Old Man in the first decades of the 20th century. This article examines the work of Boule's predecessors and aggregate a variety of literature to underline an argument that this idea has much earlier origins and is rooted in the first recognized specimen discovered in the Neander Valley in 1856. Reorienting our understanding of the brutish Neanderthal to account for its 19th-century origins, allows for a reexamination of the factors in 19th-century culture, science, and society which contributed to this caricature, especially the concepts of race and species' extinction. Such a reexamination dismantles the narrative of Boule's error while providing a new vantage point to think about Neanderthals in the present.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21918>

CYRIL C. GRUETER & MICHAEL L. WILSON – Do we need to reclassify the social systems of gregarious apes?

Decades of research have led to a solid understanding of the social systems of gregarious apes: chimpanzees, bonobos, gorillas, and gibbons. As field studies have increasingly collected data from multiple neighboring habituated groups, genetic and social interconnections have been revealed. These findings provide a more nuanced picture of intergroup relations in apes, and have led to claims in the literature that some ape taxa have multilevel societies. A multilevel society is defined as a nested collection of social entities comprising at least two discernible levels of social integration between the individual and the population. We argue that the evidence for multilevel sociality *sensu stricto* in apes is currently inconclusive and that it is premature to abandon the traditional classification of ape social systems. However, available findings appear to be consistent with the existence of some degree of higher social grouping patterns. We propose the term supra-group organization which may adequately capture ape social systems when viewed from a top-down perspective.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21919>

MARLIZE LOMBARD & JOHN J. SHEA – Did Pleistocene Africans use the spearthrower-and-dart?

Archeologists commonly suppose that among complex projectile weapons humans use as subsistence aids, the spearthrower-and-dart preceded bow-and-arrow use. And yet, neither ethnographic nor archeological records furnish any robust evidence for spearthrower-and-dart use in Africa. Instead, evidence grows apace for ever-more ancient bow-and-arrow use. Here we explore these findings and their implications for models of early Homo sapiens behavior.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21912>

PAIGE MADISON & BERNARD WOOD – Birth of Australopithecus

The announcement of a fossilized child's skull discovered in a quarry in 1924 sub-Saharan Africa might not have seemed destined to be a classic paper. This contribution focuses on anatomist Raymond Dart's 1925 paper in which he designated the Taungs skull the type specimen of *Australopithecus africanus*. We combine an account of Dart's training and experience, with

a telling of the fossil's discovery, analysis, the initial response of a mostly skeptical community, and a review of subsequent discoveries that consolidated the case Dart made for a hitherto unknown human close relative. Dart's paper presented evidence that confirmed the prescience of Charles Darwin's prediction that Africa was the birthplace of modern humans. The Taungs skull's unique mix of great ape and human attributes eventually led to a paradigm shift in our understanding of human evolution.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21917>

Frontiers in Psychology

PAPERS

PETAR GABRIĆ – Differentiation Between Agents and Patients in the Putative Two-Word Stage of Language Evolution

Language evolution remains a hotly debated, yet somewhat controversial topic, due to our limited ability to experimentally investigate it and observe it in nature. While some researchers contend that modern-like language emerged in a single leap from a “languageless” state (Berwick, 1998; Chomsky, 2002; Berwick et al., 2013; Nóbrega and Miyagawa, 2015; Berwick and Chomsky, 2016, 2019; Chomsky et al., 2019; Tattersall, 2019; Reboul, 2021), others believe language evolution followed a more gradual path (Bickerton, 1990, 2000, 2007; Arbib, 2005; Hurford, 2007, 2012; Krause et al., 2007; Knight, 2009; Casielles and Progovac, 2012; Dediu and Levinson, 2013, 2014, 2018; McMahon and McMahon, 2013; Collier et al., 2014; Janković and Šojer, 2014; Tallerman, 2014, 2016; Lieberman, 2015; Everett, 2016; Planer, 2017; Gabrić et al., 2018, 2021; Michlich, 2018; Gabrić, 2019, 2021a,b; Progovac, 2019; Barham and Everett, 2020; Botha, 2020; Lameira and Call, 2020; Mounier et al., 2020; Neto, 2020). Several scholars from the latter school of thought have proposed that there was a two-word stage in the course of language evolution, in which utterances could not combine more than two words (Jackendoff, 1999; Gil, 2008, 2009; Hurford, 2012, p. 585ff.; Jackendoff and Wittenberg, 2014; Progovac, 2015, 2016; Benítez-Burraco and Progovac, 2020).

These models agree that the putative two-word stage did not exhibit syntax. However, they disagree on whether or not there existed rules for inferring the semantic relationship between the two words expressing a compositional proposition. Focusing on semantically transitive events, I combine in the present paper language evolution models with previous empirical studies in linguistics to argue that the two-word stage was indeed governed by rules for inferring the compositional meaning of the utterance, in that (1) words were either associated with fixed (“predetermined”) semantic roles (i.e., agent, patient, predicate) or (2) there was a fixed order of semantic roles and the same words could be assigned different semantic roles in different utterances. Given the proposed existence of rules for producing and interpreting semantically compositional messages, it would appear that the putative two-word stage of language evolution did in fact exhibit syntax.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.684022/full#B64>

TOBIAS REGNER & ASTRID MATTHEY – Actions and the Self: I Give, Therefore I am?

Self-signaling models predict less selfish behavior in a probabilistic giving setting as individuals are expected to invest in a pro-social identity. However, there is also substantial evidence that people tend to exploit situational excuses for selfish choices (for instance, uncertainty) and behave more selfishly. We contrast these two motivations (identity management and self-deception) experimentally in order to test which one is more prevalent in a reciprocal giving setting. Trustees' back transfer choices are elicited for five different transfer levels of the trustor. Moreover, we ask trustees to provide their back transfer schedule for different scenarios that vary the implementation probability of the back transfer. This design allows us to identify subjects who reciprocate and analyze how these reciprocators respond when self-image relevant factors are varied. Our results indicate that self-deception is prevalent when subjects make the back transfer choice. Twice as many subjects seem to exploit situational excuses than subjects who appear to invest in a pro-social identity.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.684078/full>

Nature Communications

PAPERS

MANUEL WILL et al – Different environmental variables predict body and brain size evolution in Homo

Increasing body and brain size constitutes a key macro-evolutionary pattern in the hominin lineage, yet the mechanisms behind these changes remain debated. Hypothesized drivers include environmental, demographic, social, dietary, and technological factors. Here we test the influence of environmental factors on the evolution of body and brain size in the genus *Homo* over the last one million years using a large fossil dataset combined with global paleoclimatic reconstructions and formalized hypotheses tested in a quantitative statistical framework. We identify temperature as a major predictor of body size variation within *Homo*, in accordance with Bergmann's rule. In contrast, net primary productivity of environments and long-term variability in precipitation correlate with brain size but explain low amounts of the observed variation. These associations are likely due to an indirect environmental influence on cognitive abilities and extinction probabilities. Most environmental factors that we test do not correspond with body and brain size evolution, pointing towards complex scenarios which underlie the evolution of key biological characteristics in later *Homo*.

<https://www.nature.com/articles/s41467-021-24290-7>

Nature Neuroscience

ARTICLES

ALYSSON R. MUOTRI – “Archealization” of human brain organoids

Ancient DNA sequencing has opened the door for comparative paleogenomics, providing the genetic information of our closest relatives. Most of the comparative genetics between archaic and modern humans has been on introgressed genomic sites [2]. These are regions in our genomes where modern humans have adopted archaic elements via ancestral interbreeding and admixture. While many research focuses have been on these introgressed sites' clinical benefits and consequences, studying the sites where modern and archaic humans diverge can be of important clinical value.

<https://www.nature.com/articles/s41386-021-01133-z>

Nature Scientific Reports

PAPERS

MONAMIE RINGHOFER et al – Horses with sustained attention follow the pointing of a human who knows where food is hidden

When interacting with humans, domesticated species may respond to communicative gestures, such as pointing. However, it is currently unknown, except for in dogs, if species comprehend the communicative nature of such cues. Here, we investigated whether horses could follow the pointing of a human informant by evaluating the credibility of the information about the food-hiding place provided by the pointing of two informants. Using an object-choice task, we manipulated the attentional state of the two informants during food-hiding events and differentiated their knowledge about the location of the hidden food. Furthermore, we investigated the horses' visual attention levels towards human behaviour to evaluate the relationship between their motivation and their performance of the task. The result showed that horses that sustained high attention levels could evaluate the credibility of the information and followed the pointing of an informant who knew where food was hidden ($Z = -2.281$, $P = 0.002$, $n = 36$). This suggests that horses are highly sensitive to the attentional state and pointing gestures of humans, and that they perceive pointing as a communicative cue. This study also indicates that the motivation for the task should be investigated to determine the socio-cognitive abilities of animals.

<https://www.nature.com/articles/s41598-021-95727-8>

M. BERK MIRZA et al – Contextual perception under active inference

Human social interactions depend on the ability to resolve uncertainty about the mental states of others. The context in which social interactions take place is crucial for mental state attribution as sensory inputs may be perceived differently depending on the context. In this paper, we introduce a mental state attribution task where a target-face with either an ambiguous or an unambiguous emotion is embedded in different social contexts. The social context is determined by the emotions conveyed by other faces in the scene. This task involves mental state attribution to a target-face (either happy or sad) depending on the social context. Using active inference models, we provide a proof of concept that an agent's perception of sensory stimuli may be altered by social context. We show with simulations that context congruency and facial expression coherency improve behavioural performance in terms of decision times. Furthermore, we show through simulations that the abnormal viewing strategies employed by patients with schizophrenia may be due to (i) an imbalance between the precisions of local and global features in the scene and (ii) a failure to modulate the sensory precision to contextualise emotions.

<https://www.nature.com/articles/s41598-021-95510-9>

MANUEL DOMÍNGUEZ-RODRIGO et al – Early Pleistocene faunivorous hominins were not kleptoparasitic, and this impacted the evolution of human anatomy and socio-ecology

Humans are unique in their diet, physiology and socio-reproductive behavior compared to other primates. They are also unique in the ubiquitous adaptation to all biomes and habitats. From an evolutionary perspective, these trends seem to have started about two million years ago, coinciding with the emergence of encephalization, the reduction of the dental apparatus, the adoption of a fully terrestrial lifestyle, resulting in the emergence of the modern anatomical bauplan, the focalization of certain activities in the landscape, the use of stone tools, and the exit from Africa. It is in this period that clear taphonomic evidence of a switch in diet with respect to Pliocene hominins occurred, with the adoption of carnivory. Until now, the degree of carnivorism in early humans remained controversial. A persistent hypothesis is that hominins acquired meat irregularly (potentially as fallback food) and opportunistically through klepto-foraging. Here, we test this hypothesis and show, in contrast, that the butchery practices of early Pleistocene hominins (unveiled through systematic study of the patterning and intensity of cut marks on their prey) could not have resulted from having frequent secondary access to carcasses. We provide evidence of hominin primary access to animal resources and emphasize the role that meat played in their diets, their ecology and their anatomical evolution, ultimately resulting in the ecologically unrestricted terrestrial adaptation of our species. This has major implications to the evolution of human physiology and potentially for the evolution of the human brain.

<https://www.nature.com/articles/s41598-021-94783-4>

MICHAELA MASILKOVA et al – Observation of rescue behaviour in wild boar (*Sus scrofa*)

Here, we provide unique photo documentation and observational evidence of rescue behaviour described for the first time in wild boar. Rescue behaviour represents an extreme form of prosocial behaviour that has so far only been demonstrated in a few species. It refers to a situation when one individual acts to help another individual that finds itself in a dangerous or stressful situation and it is considered by some authors as a complex form of empathy. We documented a case in which an adult female wild boar manipulated wooden logs securing the door mechanism of a cage trap and released two entrapped young wild boars. The whole rescue was fast and particular behaviours were complex and precisely targeted, suggesting profound prosocial tendencies and exceptional problem-solving capacities in wild boar. The rescue behaviour might have been motivated by empathy because the rescuer female exhibited piloerection, a sign of distress, indicating an empathetic emotional state matching or understanding the victims. We discuss this rescue behaviour in the light of possible underlying motivators, including empathy, learning and social facilitation.

<https://www.nature.com/articles/s41598-021-95682-4>

PLoS One

PAPERS

ADAM EGGLESTON et al – Parents reinforce the formation of first impressions in conversation with their children

The tendency to form first impressions from facial appearance emerges early in development. One route through which these impressions may be learned is parent-child interaction. In Study 1, 24 parent-child dyads (children aged 5–6 years, 50% male, 83% White British) were given four computer generated faces and asked to talk about each of the characters shown. Study 2 (children aged 5–6 years, 50% male, 92% White British) followed a similar procedure using images of real faces. Across both studies, around 13% of conversation related to the perceived traits of the individuals depicted. Furthermore, parents actively reinforced their children's face-trait mappings, agreeing with the opinions they voiced on approximately 40% of occasions across both studies. Interestingly, although parents often encouraged face-trait mappings in their children, their responses to questionnaire items suggested they typically did not approve of judging others based on their appearance.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0256118>

PIOTR RADKIEWICZ & KRYSZYNA SKARŻYŃSKA – Who are the 'social Darwinists'? On dispositional determinants of perceiving the social world as competitive jungle

The naive social Darwinism, also called the Competitive Jungle Belief (CJB), according to the theory of the Dual-Process Motivational (DPM) model, is recognized as an expanded perceptual scheme acting as a cognitive mediator between deep individual characteristics and the area of socio-political attitudes and ideologies. This article aims to show the individual differences that can be dispositional characteristics to believe in the Competitive Jungle scheme's principles. The presented studies' main theoretical question is to find out whether the CJB bases on positive "individual resources" or rather some psychological deficits. In an extensive survey study, including four random-representative samples of adults Poles (with N ranging from 624 to 853 respondents), we tested the predictive power of the five categories of variables: 1) attachment styles; 2) Big Five personality traits; 3) Dark Triad of personality; 4) basic human values and 5) moral judgments. The results showed the psychological profile of social Darwinists as clearly dysfunctional in terms of personal life quality. They express characteristics like admiration for power and desire to dominate, pursue one's goals at all costs, exploitative attitude towards people, and hostility. On the other hand, they reveal a fearful style in close relations with others and have low self-esteem and low self-sufficiency. From the societal perspective, such beliefs make up a vision of social life that is unfavorable for building a cooperative, helpful, and relatively egalitarian society. The supreme idea that only those who do not sympathize with others and are ready to use them can be successful and survive is far from the principles of liberal democracy.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0254434>

Science Advances

PAPERS

HELEN GREEN et al – Dating correlated microlayers in oxalate accretions from rock art shelters: New archives of paleoenvironments and human activity

Oxalate-rich mineral accretions, often found in rock shelters around the world, offer important opportunities for radiocarbon dating of associated rock art. Here, sample characterization and chemical pretreatment techniques are used to characterize the accretions, prescreen for evidence of open-system behavior, and address potential contamination. The results provide stratigraphically consistent sequences of radiocarbon dates in millimeter-scale laminated accretions, demonstrating their reliability for dating rock art, particularly symbolic markings commonly engraved into these relatively soft deposits. The age sequences are also consistent with correlations between distinctive patterns in the layer sequences visible in shelters up to 90 km apart in the Kimberley region of northwestern Australia, suggesting their synchronized formation is not entirely shelter specific but broadly controlled by variations in regional environmental conditions. Consequently, these accretions also offer potential as paleoenvironmental archives, with radiocarbon dating of layers in nine accretions indicating four, approximately synchronous growth intervals covering the past 43 ka.

https://advances.sciencemag.org/content/7/33/eabf3632?utm_campaign=toc_advances_2021-08-13

BENJAMIN PITT et al with DANIEL CASASANTO & STEVEN T. PIANTADOSI – Spatial concepts of number, size, and time in an indigenous culture

In industrialized groups, adults implicitly map numbers, time, and size onto space according to cultural practices like reading and counting (e.g., from left to right). Here, we tested the mental mappings of the Tsimane', an indigenous population with few such cultural practices. Tsimane' adults spatially arranged number, size, and time stimuli according to their relative magnitudes but showed no directional bias for any domain on any spatial axis; different mappings went in different directions, even in the same participant. These findings challenge claims that people have an innate left-to-right mapping of numbers and that these mappings arise from a domain-general magnitude system. Rather, the direction-specific mappings found in industrialized cultures may originate from direction-agnostic mappings that reflect the correlational structure of the natural world.

https://advances.sciencemag.org/content/7/33/eabg4141?utm_campaign=toc_advances_2021-08-13

Trends in Cognitive Sciences

PAPERS

IRENE DE LA CRUZ-PAVÍA, CATERINA MARINO & JUDIT GERVAIN – Learning word order: early beginnings

We examine the beginning of the acquisition of the relative order of function and content words, a fundamental but cross-linguistically highly variable aspect of grammar. A review of the existing empirical literature shows that infants as young as 8 months of age can distinguish between functors and content words, and have a rudimentary knowledge of the order of these two universal lexical categories in their native language. Furthermore, human adults and non-human animals such as rodents process the same linguistic information differently from infants, emphasizing the developmental relevance of bootstrapping function/content word order from surface cues available in the input. We discuss the implications of these findings for a synergistic view of language acquisition, considering how grammar acquisition interacts with word learning.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(21\)00121-2](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00121-2)

Trends in Ecology and Evolution

PAPERS

J. TYLER FAITH et al with BERNARD WOOD – Rethinking the ecological drivers of hominin evolution

A central goal of paleoanthropology is understanding the role of ecological change in hominin evolution. Over the past several decades researchers have expanded the hominin fossil record and assembled detailed late Cenozoic paleoclimatic, paleoenvironmental, and paleoecological archives. However, effective use of these data is precluded by the limitations of pattern-matching strategies for inferring causal relationships between ecological and evolutionary change. We examine several obstacles that have hindered progress, and highlight recent research that is addressing them by (i) confronting an incomplete fossil record, (ii) contending with datasets spanning varied spatiotemporal scales, and (iii) using theoretical frameworks to build stronger inferences. Expanding on this work promises to transform challenges into opportunities and set the stage for a new phase of paleoanthropological research.

[https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(21\)00125-7](https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(21)00125-7)

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