EAORC BULLETIN 1,178 – 11 January 2026

CONTENTS

NOTICES

FORMATTED VERSION OF THIS BULLETIN

A pdf formatted version of this Bulletin is available for download at martinedwardes.me.uk/eaorc/eaorc_bulletins.htm.

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, 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, let me know.
And if you have any other ideas for extending the "EAORC experience", please contact me.

EDITORIAL INTERJECTIONS

Comments in curly brackets are editorial interjections. The Editor reserves the right to be wrong, and doesn't object to being called out on it.

ACADEMIA.EDU – Signaling Shifts and Economic Defensibility at Boomplaas Cave, South Africa

Archaeometry, 2025; 0:1–14 (2026) [Pre-publication].

J. PARGETER et al – Signaling Shifts and Economic Defensibility at Boomplaas Cave, South Africa

This study tests predictions of the Economic Defensibility Model (EDM) regarding the relationship between resource density and distribution, as well as signaling behavior among Late Pleistocene foragers. The EDM proposes that territorial signaling intensifies when resources are dense and predictable, as the benefits of broadcasting group membership and maintaining alliances outweigh signaling costs. We evaluate this model using data from Boomplaas Cave, South Africa, with deposits spanning the Last Glacial Maximum (29–19 ka) to the early Last Glacial–Interglacial Transition (19–14 ka). We examine proxies of signaling—ochre procurement and ostrich eggshell beads—relative to measures of resource density and predictability inferred from the site's faunal data. Results reveal a strong positive correlation between non-local ochre use and ostrich eggshell bead production, while ostrich eggshell bead densities are negatively correlated with gregarious grazer abundance. Contrary to EDM predictions, explicit signaling and cultural material social mediation behaviors expand when dense, predictable prey decline. These findings suggest that signaling technologies at Boomplaas were not mechanisms of territorial defense over defensible resources but strategies for maintaining social networks and mitigating subsistence risk under reduced ecological productivity. The intensification of bead production and the use of non-local ochre reflect social boundary defense and alliance-building strategies during periods of resource unpredictability. By integrating behavioral ecology with costly signaling theory, this study highlights the adaptive role of material signaling in buffering risk and sustaining social cohesion during climatic and environmental transitions in Late Pleistocene southern Africa.
https://www.academia.edu/145836725/Signaling_Shifts_and_Economic_Defensibility_at_Boomplaas_Cave_South_Africa

NEWS

NATURE BRIEFING – Poison arrows used 60,000 years ago

Traces of toxic compounds have been found on 60,000-year-old arrowheads, providing the oldest chemical evidence that Palaeolithic hunter-gatherers used poison to bring down prey. Chemical analysis revealed a compound called buphandrine, derived from the poison bulb plant (Boophone disticha), on arrowheads discovered in KwaZulu-Natal, South Africa. The use of poisons "shows advanced planning, strategy and causal reasoning" among hunter-gatherers, says archaeologist Justin Bradfield. It also suggests that they had a complex understanding of the properties of plants, says archaeologist April Nowell.
https://www.nature.com/articles/d41586-026-00051-8

NATURE BRIEFING – Moroccan quarry reveal 773,000-year-old hominin specimens

These 773,000-year-old fossils, recovered from a quarry in Morocco, could give researchers clues about the last common ancestor (LCA) — the ancient lineage we share with Neanderthals, whose exact identity has long eluded scientists. Researchers found that the fossils are similar in age to those of Homo antecessor, another proto-human species discovered in Spain, but are morphologically distinct. The age of the fossils fills a crucial gap from around 1,000,000 to 600,000 years ago in which few similar fossils have been discovered in Africa.
https://www.nature.com/articles/d41586-025-03986-6

NEW SCIENTIST HUMAN STORY – Early humans may have begun butchering elephants 1.8 mya

A 1.78-million-year-old partial elephant skeleton found in Tanzania associated with stone tools may represent the oldest known evidence of butchery of the giant herbivores.
https://www.newscientist.com/article/2510274-early-humans-may-have-begun-butchering-elephants-1-8-million-years-ago/

NEWS FROM SCIENCE – Fossils suggest humans took their first steps 7 million years ago

New analysis points toward a relatively old origin of bipedalism.
https://www.science.org/content/article/fossils-suggest-humans-took-their-first-steps-7-million-years-ago

NEWS FROM SCIENCE – Jellyfish sleep a lot like us—and for the same reasons

Study adds to evidence that sleep likely evolved among ancient animals as a means of repairing neurons.
https://www.science.org/content/article/jellyfish-sleep-lot-us-and-same-reasons

NEWS FROM SCIENCE – Fossils point to common ancestor of modern humans, Neanderthals

Bones from a Moroccan quarry belonged to a hominin that lived when the human lineage was splitting.
https://www.science.org/content/article/fossils-point-common-ancestor-modern-humans-neanderthals

SCIENCEADVISER – Fossils suggest humans took their first steps 7 million years ago

When did humans start walking upright? Newly analyzed fossils of Sahelanthropus tchadensis, an ancient hominin that lived 7 million years ago, are helping researchers take a step towards the right answer.

In the study, published last week in Science Advances, anthropologists revealed that the femur of Sahelanthropus naturally twists and has a bump where it once attached to butt muscles—two anatomical features that help modern humans stand, walk, and run stably. The femur also has a bump used by a ligament to attach the leg bone to the pelvis. In modern humans, this ligament keeps the torso from falling backward when we stand up. This is what " really sold the case for bipedalism," study leader and evolutionary morphologist Scott Williams told The Washington Post. "It's a subtle feature, so it wasn't recognized by the other groups."

At 7 million years old, Sahelanthropus would be the earliest human ancestor to walk on two feet—if the new interpretation withstands further scrutiny—and could therefore help clarify the ongoing debate of exactly when hominins stood up straight. "I'm fairly convinced that this thing was a biped," said William. However, "I'd be foolish to think that it would settle it," he added.

https://www.science.org/doi/10.1126/sciadv.adv0130

SCIENCEADVISER – Reptilian rock-paper-scissors: Two paths for polymorphism in lizards

At the beginning of each breeding season, male side-blotched lizards—so named for the distinctive dark spot behind the front leg—prepare for a biological game of rock-paper-scissors. These reptilian Romeos develop one of three colors on their throats, with each hue corresponding to a different mating strategy.

Dominant orange males establish control over large territories containing multiple females; they even steal potential mates from blue males, which are less aggressive and guard only one or two females. Yellow males don't bother to secure any territory at all, instead sneaking onto their competitors' turf to secretly mate with females. And while vigilant blue males have an easier time spotting and chasing off intruders, orange males struggle to keep watch over their larger territories. Orange beats blue, blue beats yellow, and yellow beats orange. And just like rock-paper-scissors, it's really anyone's game. While one color morph may be more successful for a few seasons, it eventually gives way to a second, which gives way to the third, until the cycle starts over again.

While scientists previously assumed that the side-blotched lizard's color diversity stemmed from three separate genetic variants, a new analysis suggests the reality is more nuanced. As researchers report in Science, orange males inherit two copies of a particular gene variant, causing them to produce lower levels of a protein that helps make both pigments and neurotransmitters—potentially explaining the link between coloration and behavior. Because the variant is recessive, lizards that only inherit one copy end up blue. "It's a near-perfect association," lead study author Ammon Corl tells The New York Times. "This really couldn't arise by chance."

When the researchers looked for a third variant to explain the yellow color morph, however, they couldn't find one. In fact, yellow lizards turned out to be genetically identical to their blue counterparts, suggesting that the same genetic makeup interacts with the environment to produce two different traits—a phenomenon known as plasticity. The rock-paper-scissors strategy actually works better with two variants and plasticity than it would with three separate gene variants, the team writes, allowing all three color morphs to persist.

But such variations don't always stick around. In a second study published in Science, researchers investigated the curious case of the common wall lizard. White, orange, and yellow color morphs have stably coexisted within the species for millions of years, but this long-standing equilibrium was recently disrupted. Many wall lizards have developed a set of traits known as "nigriventris syndrome," which is characterized by a darker and greener body color, larger body and head size, and dominant behavior. Individuals with this combination of traits apparently proved hard to resist; sexual selection has strongly favored this phenotype and caused a single white form to become fixed across populations. The genes underlying nigriventris syndrome, the team reports, are separate from those responsible for the original color morphs.

As biologists Siddharth Gopalan and Todd Cosroe note in a related Science Perspective, both new studies provide insight into why polymorphic traits—variations in color, shape, and behavior—persist within a species when natural selection should

theoretically favor a single, optimal form. “Rather than being static genetic states,” they write, “polymorphisms may represent transient outcomes of dynamic interactions between genomes, plasticity, behavior, and ecology.”
{As an evolutionary topic, it’s kind of important and interesting, but I found the colours confusing. Orange usurpers, blue mate-guarders and yellow sneakers are the original rock-paper-scissors morphs of the side-blotched lizards, forming a stable system. The common wall lizards are yellow, white and red without a rock-paper-scissors relationship, making an unstable system. As a result, they now have a fourth, green morph, nigriventis (meaning black stomach). This is more dominant than the other morphs and is therefore taking over. Life always has other plans.}
https://www.science.org/doi/10.1126/science.aed4903
https://www.science.org/doi/10.1126/science.adw8265
https://www.science.org/doi/10.1126/science.adx3708

SCIENCEADVISER – Pooch prodigies learn new words by snooping

Although dogs are generally much better at commands like “sit” and “stay” than they are at learning the names of specific objects, some still go wild at the mention of a T-O-Y or T-R-E-A-T. One small group, dubbed “gifted word learner” dogs by scientists, demonstrates a remarkable ability to pick up new object labels. Now, a new study suggests these precocious pups, some of which can learn and remember the names of hundreds of toys, are even more impressive than previously thought. Researchers discovered that dogs with large vocabularies can learn new object labels simply by overhearing conversations between their owners. The eavesdropping canines could map new words to new objects, even when the word and the object weren’t presented simultaneously. The findings suggest that, sociocognitively speaking, these dogs are functionally on the same level as human toddlers, who can acquire new words by listening to third-party interactions starting when they are about 18 months old.
It remains unclear what cues these prodigy pooches are using to learn new words and what sets them apart from other dogs. “We don’t know if the dogs are doing it the same way as the kids,” lead study author Shany Dror told The Guardian. “But on the surface level, we see that the outcome seems to be the same.”
https://www.science.org/doi/10.1126/science.adq5474

SCIENCEADVISER – Poisoning the arrow: Ancient hunters employed toxic weapons

Some 60,000 years ago beasts like Syncerus antiquus—a giant buffalo with up to a 3-meter hornspan—and several large antelopes roamed Africa. Hunting such creatures was no small feat; humans needed to be clever to take down such massive prey. And clever they were, according to a new chemical analysis of arrowheads from South Africa: Hunters laced their weapons with poison to fell their targets faster.
Researchers tested five ancient arrowheads as well as five more recent (around 250-year-old) ones, and found the same toxins—alkaloids from the gifbol plant—on all of them. “This does not mean that the Kalahari bowhunters of today are frozen in time,” study co-author Marlize Lombard told IFLS. “Instead it demonstrates that their ancestors already had very advanced ways of hunting—long before previously thought, and possibly before elsewhere in the world.” Indeed, the oldest poisoned arrowheads known prior to this discovery date to only about 7000 years ago.
The toxins aren’t strong enough to kill instantly, so it’s likely the poison’s “primary function was to reduce the time required to track and subdue a wounded animal, thereby lowering the overall energetic cost of the hunt,” study author Sven Isaksson told IFLS. That means, cognitively, ancient hunters were quite sophisticated, he said. “It takes a developed working memory to be able to predict that if I put this arrowhead into that plant, it will shorten the delay before I get my hands on this meat,” he told The New York Times. “It shows advanced planning, strategy and causal reasoning—something that is very difficult to demonstrate for people living so long ago, but for which the evidence is increasing every year,” agreed archaeologist Justin Bradfield in comments to Nature.
https://www.science.org/doi/10.1126/sciadv.adz3281

SCIENCENEWS – 60,000-year-old poison arrowheads show early humans’ skillful hunting

A new analysis uncovers traces of poison on the South African arrowheads, pushing back the timeline for poisoned weapons by more than 50,000 years.
https://www.sciencenews.org/article/oldest-poison-arrowhead-hunting-weapons

SCIENCENEWS – In a first, orcas and dolphins seen possibly hunting together

New footage shows orcas and dolphins coordinating hunts, hinting at interspecies teamwork to track and catch salmon off British Columbia.
https://www.sciencenews.org/article/orcas-dolphins-hunting-together

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

DAVID B. WOOD & EDUARDO FERNANDEZ-DUQUE – Task Specialization in Infant Care in Wild Coppery Titi Monkeys (Plecturocebus cupreus)

Cooperative breeding is hypothesized to be central to human life history since it reduces the energetic investment from the mother to her offspring by distributing the energetic cost across multiple caregivers. Biparental care offers a simplified system to examine this hypothesis since maternal care is only modified by the care of one other individual. The Task Specialization Hypothesis posits that, in biparental systems, each parent performs unique tasks with minimal overlap, resulting in the necessity of care from both parents for successful reproduction. While biparental care is rare in mammals, it occurs in some primates; infants are actively cared for by both parents in coppery titi monkeys (Plecturocebus cupreus). Questions remain regarding how mothers and fathers contribute, and to what extent their caring tasks are specialized.
For 13 months, we observed 1300 h of infant care provided by 10 wild coppery titi monkey pairs at Estación Biológica Quebrada Blanco, Peru.
Fathers carried infants 65% of the time while females only carried them 14%. Infants attempted to receive food more often from fathers than mothers (daily rate mean difference = −4.7 attempts) and were more successful at doing so (success rate mean difference = −0.4). Fathers also groomed and played with infants more than mothers did.
Fathers are consistent caregivers to infants and contribute substantially to all caring tasks other than nursing. Our findings show both quantitative and qualitative sex differences in infant care, supporting the Task Specialization Hypothesis.
https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.70194

Cell Reports

PAPERS

GREGG A. CASTELLUCCI et al – Neural activity flows through cortical subnetworks during speech production

Speech production entails several processing steps that encode linguistic and articulatory structure, but whether these computations correspond to spatiotemporally discrete patterns of neural activity is unclear. To address this issue, we use electrocorticography to directly measure the brains of neurosurgical participants performing an interactive speech paradigm. We observe a broad range of cortical modulation profiles, and subsequent clustering analyses establish that responses comprised distinct classes associated with sensory perception, planning, motor execution, and task-related suppression. These activity classes are also localized to separate neural substrates, indicating their status as specialized networks. We then parse dynamics in the planning and motor networks using unsupervised dimensionality reduction, which reveals subnetworks that are sequentially active throughout preparation and articulation. These results therefore support and extend a localizationist model of speech production where cortical activity “flows” within and across discrete pathways during language use.
https://www.cell.com/cell-reports/fulltext/S2211-1247(25)01555-4

JIAJUN CHEN et al – Surrogate deep neural networks reveal hierarchical handwriting encoding in the human motor cortex

Skilled fine movements are essential for daily life. Although prior work has identified motor cortical tuning to low-level kinematic features like velocity and position, these findings fall short of explaining the precision underlying complex motor behaviors. Critically, it remains unclear whether and how the motor cortex (MC) represents higher-level features of movement. Using single-unit recordings from the human MC during handwriting, we employed surrogate deep neural networks (DNNs) as a tool to investigate these mechanisms. We found that surrogate DNNs capture key aspects of neural activity at both single-unit and population levels. Through this approach, we demonstrate that the MC encodes hierarchical information of movement, including both low-level kinematics and high-level features related to the written content. These results uncover neural encoding behind dexterous motor execution and provide a framework for studying the neural basis of complex behavior.
https://www.cell.com/cell-reports/fulltext/S2211-1247(25)01609-2

Current Biology

ARTICLES

OLEG I. LYAMIN – Sleep: Primates bear a social cost

Field studies of baboons, orangutans and chimpanzees suggest that social rank and group living can shorten and fragment sleep. The findings highlight the physiological costs of maintaining social bonds and the trade-offs inherent in primate societies.
https://www.cell.com/current-biology/abstract/S0960-9822(25)01548-9

PAPERS

CLARA HOZER et al with KLAUS ZUBERBÜHLER – Rank and social context influence sleep in wild chimpanzees

Sleep is subject to Darwinian fitness and thereby constrained by ecological and social factors. Nevertheless, most comparative research on sleep is conducted in laboratory settings, detached from environmental and social influences, which is problematic for evolutionary theories. We examined the natural sleeping patterns of wild chimpanzees in Budongo Forest, Uganda, using a remote-controlled, infrared camera system. We found that sleep in chimpanzees was significantly affected by social factors, including the sleeper's own rank and the composition of the nearby sleeping party. Nesting in groups increased sleep duration and decreased sleep fragmentation compared with sleeping alone, despite the fact that it delayed nesting times and advanced wake times. Rank had little impact on female sleep but a strong influence on male sleep, with high-ranking males generally experiencing shorter and more fragmented sleep compared with subordinate males. The presence of sexually active females also reduced sleep duration, by delaying nest building, advancing wake time, and increasing sleep fragmentation. Our data show that natural sleep patterns in chimpanzees are largely determined by social variables that continue to exert their influence into the night. We discuss the implications of studying sleep patterns of our closest relatives in ecologically and socially valid situations for future research on the evolution of sleep.
https://www.cell.com/current-biology/fulltext/S0960-9822(25)01564-7

MARCO FELE et al with ANDREW J. KING – Dominant baboons experience more interrupted and less rest at night

Sleep is a fundamental biological process. The amount and quality of sleep individuals get can impact various aspects of human and non-human animal health,1 ultimately affecting fitness. For wild animals that sleep in groups, individuals may disturb one another's sleep, but this aspect of social sleep has been understudied due to methodological challenges. Here, using nighttime rest (absence of bodily movements) as a proxy for sleep, we test the hypothesis that an individual's social dominance affects nighttime rest in a troop of wild, highly hierarchical chacma baboons (Papio ursinus). First, we show that the troop's nighttime rest (determined by 40 Hz acceleration data) is highly synchronized. Next, we link nighttime rest dynamics to daytime spatial networks and dominance hierarchy (from 1 Hz GPS data and direct observations). We show that baboon nighttime states (activity and rest) are more synchronized between similarly ranked individuals and, unexpectedly, that more dominant baboons experience more interrupted and less nighttime rest than lower-ranked baboons. We propose that this hierarchy effect is explained by higher-ranked baboons resting closer to more group members, which leads them to exert a greater influence on each other's nighttime behavior compared with lower-ranked individuals. Our study provides the first evidence for the impact of social hierarchies on aspects of sleep in a wild primate, suggesting that dominance status may impose trade-offs between social rank and the quality and quantity of sleep.
https://www.cell.com/current-biology/fulltext/S0960-9822(25)01336-3

Frontiers in Psychology

PAPERS

ZHIRONG TIAN et al – How culture values shape leadership and employee well-being: insights from altruistic and egoistic perspectives

Employee happiness is employees' positive feelings about their work and quality of life. Previous research has mainly focused on employees' own characteristics and behaviors, while there has been relatively little research on how leadership values affect employee happiness.

A survey was conducted among employees in service industry companies in Guangdong Province, yielding 448 valid responses. Using empirical analysis, the study examines how leaders' altruistic and egoistic values influence leadership effectiveness and, subsequently, employee happiness through emotional and cognitive mechanisms.

The findings show that leaders with altruistic values significantly improve leadership effectiveness, thereby improving employee happiness through a dual pathway: emotions cultivated by affective organizational commitment and cognitive appraisals as reflected in contact and satisfaction with management. These results highlight the key role of altruistic values in creating an organizational culture oriented toward employee happiness, underlining their importance in fostering trust, support, and collaboration within teams. In contrast, the study found that leaders with strong egoistic values had no significant positive impact on leadership, suggesting that overly self-centered values may undermine a leader's credibility and influence among employees.

This study provides a novel perspective on improving employee happiness by highlighting the importance of cultivating and promoting altruistic values in leadership development programs. It emphasizes the need for organizations to prioritize value-driven leadership practices that balance organizational goals and employee happiness, ultimately promoting a supportive and collaborative work environment.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2025.1637594/full

iScience

PAPERS

BRYCE MURRAY, LAURA MACLATCHY & LAUREN SARRINGHAUS – Chimpanzee locomotor risk-taking points to the importance of parental and alloparental supervision in humans

Adolescence is generally considered the life stage with peak risk-taking among humans, though this may be specific to the type of risk. To circumvent the safety constraints that limit experiments of physical risk-taking in humans, we used the natural behavior of wild chimpanzees as a model. All chimpanzees must navigate the same arboreal substrates where falls from the tree canopy are a major cause of trauma, and therefore have clear fitness consequences. Using instances of locomotor free flight as a proxy, we found that height from the ground and sex did not predict physical risk-taking. The latter finding is similar to human and chimpanzee economic risk-taking studies. We found that physical risk-taking correlated with age, peaking in infancy and decreasing gradually thereafter through juvenility and adolescence. We hypothesize that a similar pattern would be exhibited in humans if oversight were relaxed earlier in childhood, as it is among chimpanzees.
https://www.cell.com/iscience/fulltext/S2589-0042(25)02713-0

Nature

NEWS

Oldest known poison arrows show Stone Age humans' technological talents

Traces of a toxic chemical found on 60,000-year-old arrowheads hint at advanced planning by Palaeolithic hunters.
https://www.nature.com/articles/d41586-026-00051-8

Jellyfish sleep like humans — even though they don't have brains

Studying ancient sea creatures' snoozing habits could shed light on the origins of sleep.
https://www.nature.com/articles/d41586-026-00044-7

ARTICLES

PATRICIA MAIA NORONHA – I see Mozambique's baboons as windows into hominid evolution

In Gorongosa National Park in Mozambique, Rassina Farassi studies how humans came to walk on two legs.
https://www.nature.com/articles/d41586-025-04153-7

ANTONIO ROSAS – Of all the quarries: Casablanca fossils reveal African ancestors of Homo sapiens

Surprising fossil finds in a Moroccan quarry reveal 773,000-year-old hominin specimens that are close to the ancestor of modern humans.
https://www.nature.com/articles/d41586-025-03986-6

PAPERS

JEAN-JACQUES HUBLIN et al with DAVID LEFÈVRE & PHILIPP GUNZ – Early hominins from Morocco basal to the Homo sapiens lineage

Palaeogenetic evidence suggests that the last common ancestor of present-day humans, Neanderthals and Denisovans lived around 765–550 thousand years ago (ka)1. However, both the geographical distribution and the morphology of these ancestral humans remain uncertain. The Homo antecessor fossils from the TD6 layer of Gran Dolina at Atapuerca, Spain, dated between 950 ka and 770 ka (ref. 2), have been proposed as potential candidates for this ancestral population3. However, all securely dated Homo sapiens fossils before 90 ka were found either in Africa or at the gateway to Asia, strongly suggesting an African rather than a Eurasian origin of our species. Here we describe new hominin fossils from the Grotte à Hominidés at Thomas Quarry I (ThI-GH) in Casablanca, Morocco, dated to around 773 ka. These fossils are similar in age to H. antecessor, yet are morphologically distinct, displaying a combination of primitive traits and of derived features reminiscent of later H. sapiens and Eurasian archaic hominins. The ThI-GH hominins provide insights into African populations predating the earliest H. sapiens individuals discovered at Jebel Irhoud in Morocco4 and provide strong evidence for an African lineage ancestral to our species. These fossils offer clues about the last common ancestor shared with Neanderthals and Denisovans.
https://www.nature.com/articles/s41586-025-09914-y

Nature Communications

PAPERS

AIDA RAMEZANI et al – Historical reconstruction of human moralization with word association and text corpora

We are providing an unedited version of this manuscript to give early access to its findings. Before final publication, the manuscript will undergo further editing. Please note there may be errors present which affect the content, and all legal disclaimers apply.

Moralization, the process by which concepts and practices gain moral attributes, plays a pivotal role in shaping individual and social behaviour. However, research on how moralization unfolds over time remains limited. We present HistMoral, an open-

access computational framework based on human word association, historical text corpora, and graph neural networks that enables scalable, retrospective analysis of moral trajectories of many different concepts. We apply our framework to analyze the moral time courses of over 20,000 concepts within the Corpus of Historical American English over the past 150 years, as well as within the New York Times annotated corpus from 1987 to 2007. Our findings provide robust evidence of moralization across diverse categories, from diseases to world leaders, and identify moralization around economic-political shifts of recent decades.
https://www.nature.com/articles/s41467-025-67891-2

Nature Ecology & Evolution

ARTICLES

LUÍSEACH NIC EOIN – Face to face with a Denisovan

Although there are a variety of archaic human remains from China that date to the Middle Pleistocene, reaching agreement on how to slot them into hominin phylogeny has proved challenging. Two papers led by Qiaomei Fu published in Science and Cell in summer 2025 used molecular methods to overcome this difficulty for one specimen of interest, a hominin cranium from Harbin, China. Dated using uranium series to a minimum of 146,000 years ago, the Harbin cranium has been suggested as a possible Denisovan or a new sister species to Homo sapiens. In the Science paper, Fu et al. report successful retrieval of 95 endogenous proteins from the Harbin cranium, including three amino-acid variants derived from Denisovans. A protein-based phylogeny grouped Harbin with the Denisova 3 genome, further supporting a Denisovan affiliation. In the Cell paper, the authors report successful ancient mtDNA extraction from the Harbin cranium's dental calculus. The mtDNA falls within Denisovan mtDNA variation and is related to a mtDNA branch found in individuals at Denisova Cave.
https://www.nature.com/articles/s41559-025-02934-x

CORRECTIONS

ADRIANO R. LAMEIRA et al – Author Correction: Sociality predicts orangutan vocal phenotype

After publication of the article, an error was identified in the data entry of the maximum frequency parameter for the Suaq orangutan population. Recalculation of entropy measures and reanalysis of the mixed models revealed that, for maximum frequency, the previously reported effect of sociality is no longer statistically supported (Emergence and self-organization: F = 0.321, P = 0.573; Complexity: F = 0.009, P = 0.927). The original results for duration remain unchanged and continue to show a significant effect of sociality. While the loss of statistical support for one parameter is regrettable, the revised findings are scientifically meaningful. They align with recent findings in chimpanzees, showing that control over vocal parameters such as frequency and duration may operate independently. This suggests that social influences on vocal phenotypes may target specific acoustic features, and that specific populations may deploy features of vocal novelty in culturally localized ways.
https://www.nature.com/articles/s41559-025-02954-7
ORIGINAL PAPER (EAORC Bulletin 980)
https://www.nature.com/articles/s41559-022-01689-z

Nature Scientific Data

PAPERS

MADDALENA BRESSLER et al – Figurative Archive: an open dataset and web-based application for the study of metaphor

We are providing an unedited version of this manuscript to give early access to its findings. Before final publication, the manuscript will undergo further editing. Please note there may be errors present which affect the content, and all legal disclaimers apply.

Research on metaphor has steadily increased over the last decades, as this phenomenon opens a window into a range of linguistic and cognitive processes. At the same time, the demand for rigorously constructed and extensively normed experimental materials increased as well. Here, we present the Figurative Archive, an open database of 996 metaphors in Italian enriched with ratings and corpus-based measures (from familiarity to semantic distance and preferred interpretations), derived by collecting stimuli used across 11 studies. It includes both everyday and literary metaphors, varying in structure and semantic domains, and is validated based on correlations between familiarity and other measures. The Archive has several aspects of novelty: it is increased in size compared to previous resources; it offers a measure of metaphor inclusiveness, to comply with recommendations for non-discriminatory language use; it is displayed in a web-based interface, with features for a customized consultation. We provide guidelines for using the Archive to source materials for studies investigating metaphor processing and the relationships between metaphor features in humans and computational models.
https://www.nature.com/articles/s41597-025-06459-7

Nature Scientific Reports

PAPERS

NEDA SHAHIDI et al – Freely foraging macaques value information in ambiguous terrains

Among non-human primates, macaques are recognized for thriving in a wide range of novel environments. Previous studies show macaques' affinity for new information. However, little is known about how information-seeking manifests in their spatial navigation pattern in ambiguous foraging terrains, where the location and distribution of the food are unknown. We investigated the spatial pattern of foraging in free-moving macaques in an ambiguous terrain, lacking sensory cues about the reward distribution. Rewards were hidden in a uniform grid of woodchip piles spread over a 15 sqm open terrain and spatially distributed according to different patchy distributions. We observed Lévy-like random walks in macaques' spatial search patterns, balancing relocation effort with exploration. Encountering rewards altered the foraging path to favor the vicinity of discovered rewards temporarily, without preventing longer-distance travels. These results point toward continuous exploration, suggesting that explicit information-seeking is a part of macaques' foraging strategy. We further quantified the role of information seeking using a kernel-based model, combining a map of ambiguity, promoting information seeking, with a map of discovered rewards and a map of proximity. Fitting this model to the foraging paths of our macaques revealed individual differences in their relative preference for information, reward, or proximity. The model predicted that a joint contribution of all three factors performs and adapts to an ambiguous terrain with scattered rewards, a prediction we confirmed using further experimental evidence. We postulate an explicit role for seeking information as a valuable entity to reduce ambiguity in macaques' foraging strategies, suggesting an ecologically valid way of foraging in ambiguous terrains.
https://www.nature.com/articles/s41598-025-32879-x

New Scientist

ARTICLES

MICHAEL MARSHALL – What if the idea of the autism spectrum is completely wrong?

For years, we've thought of autism as lying on a spectrum, but emerging evidence suggests that it comes in several distinct types. The implications for how we support autistic people could be profound.
https://www.newscientist.com/article/2509117-what-if-the-idea-of-the-autism-spectrum-is-completely-wrong/

JAMES WOODFORD – Was our earliest ancestor a knuckle-dragger, or did it walk upright?

Did Sahelanthropus, which lived 7 million years ago, walk on two legs like a modern human? It's complicated.
https://www.newscientist.com/article/2509929-was-our-earliest-ancestor-a-knuckle-dragger-or-did-it-walk-upright/

NPJ Artificial Intelligence

PAPERS

MAARTEN BUYL et al – Large language models reflect the ideology of their creators

Large language models (LLMs) already play an influential role in how humans access information. However, their behavior varies depending on their design, training, and use. We prompt a diverse panel of 19 popular LLMs to describe 3,991 prominent persons with political relevance, and then judge how positively they portray each person. When comparing these assessments, we find disparities in ideological positions between LLMs across different geopolitical regions (Arabic countries, China, Russia, and Western countries), and across different languages (the United Nations' six official languages). Moreover, among only models from the United States, we find significant normative differences related to progressive values. Among Chinese models, we characterize division between internationally- and domestically-focused models. Our results suggest that the ideological stance of an LLM reflects the worldview of its creators. This poses the risk of political instrumentalization and raises concerns around technological and regulatory efforts aiming to make LLMs ideologically 'unbiased'.
https://www.nature.com/articles/s44387-025-00048-0

NPJ Complexity

PAPERS

GABRIEL RAMOS-FERNANDEZ et al – Uncovering complementary information sharing in spider monkey collective foraging using higher-order spatial networks

Collectives are often able to process information in a distributed fashion, surpassing each individual member's processing capacity. In fission-fusion dynamics, where group members come together and split from others often, sharing complementary information about uniquely known foraging areas could allow a group to track a heterogenous foraging environment better than any group member on its own. We analyse the partial overlaps between individual spider monkey core ranges, which we assume represent the knowledge of an individual during a given season. Sets of individuals with complementary overlaps are identified, showing a balance between redundantly and uniquely known portions, and we use simplicial complexes to represent these higher-order interactions. The structures of the simplicial complexes show holes in various dimensions, revealing complementarity in the foraging information that is being shared. We propose that the

complex spatial networks arising from fission-fusion dynamics allow for adaptive, collective processing of foraging information in dynamic environments.
https://www.nature.com/articles/s44260-025-00060-0

Patterns

PAPERS

ERIK HOEL – Quantifying emergent complexity
Complex systems can be described at myriad different scales, and their causal workings often have a multiscale structure (e.g., a computer can be described at the microscale of its hardware circuitry, the mesoscale of its machine code, and the macroscale of its operating system). While scientists study and model systems across the full hierarchy of their scales, from microphysics to macroeconomics, there is debate about what the macroscales of systems can possibly add beyond mere compression. To resolve this long-standing issue, here, a new theory of emergence is introduced that can distinguish which scales irreducibly contribute to a system's causal workings. The theory's application is demonstrated in coarse grains of Markov chains, revealing a novel measure of emergent complexity: how widely distributed a system's causal contributions are across its hierarchy of scales.
https://www.cell.com/patterns/fulltext/S2666-3899(25)00320-4

PLoS One

PAPERS

MARC D. PELL et al – Speak or shout? Nonverbal vocalizations promote rapid detection of emotions in vocal communication
Human vocal expressions of emotion can be expressed nonverbally, through vocalizations such as shouts or laughter, or speakers can embed emotional meanings in language by modifying their tone of voice ("prosody"). Is there evidence that nonverbal expressions promote "better" (i.e., more accurate, faster) recognition of emotions than speech, and what is the impact of language experience? Our study investigated these questions using a cross-cultural gating paradigm, in which Chinese and Arab listeners (n = 25/group) judged the emotion communicated by acoustic events that varied in duration (200 milliseconds to the full expression) and form (vocalizations or prosody expressed in listeners' native, second or foreign language). Accuracy was higher for vocalizations overall, but listeners were markedly more efficient to form stable categorical representations of the speaker's emotion from vocalizations (M = 417ms) than native prosody (M = 765ms). Language experience enhanced recognition of emotional prosody expressed by native/ingroup speakers for some listeners (Chinese) but not all (Arab), emphasizing the dynamic interplay of socio-cultural factors and stimulus quality on prosody recognition which occurs over a more sustained time window. Our data show that vocalizations are functionally suited to build robust, rapid impressions of a speaker's emotion state unconstrained by the listener's linguistic cultural background.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0327529

MAEVE WINTER et al – Keep the bedtime story: A daily reading ritual improves empathy and creativity in children
Creativity and empathy are interconnected skills that have shown concerning declines in young people, yet both can be enhanced through practice-based interventions. We examined whether a two-week nightly bedtime reading routine could improve empathy and creativity in children aged 6–8 (N = 38). Participants were randomly assigned to either read picture books straight through or pause at a conflict point to ask two reflection questions about characters' feelings and potential actions. Children completed measures of empathy (modified Interpersonal Reactivity Index) and creativity (Wallach-Kogan Alternative Uses Test) before and after the intervention. Both groups showed significant improvements in cognitive empathy, total empathy, creative fluency, and creative originality, regardless of the reflection condition. However, children in the pause group demonstrated significantly greater gains in creative fluency compared to the read-through group. Older children showed lower creative originality than younger children, with no sex differences observed. These findings suggest that consistent bedtime reading—with or without structured reflection—may enhance empathy and creativity in young children, providing families with an accessible intervention to counter societal declines in these critical skills.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0340068

PER F. ANDERSSON, MARTINA TESTORI & SERGIO LO IACONO – Inequality aversion and prosocial punishment: Evidence from a one-shot public goods game
The willingness to engage in costly punishment of free riders (prosocial punishment) is crucial to foster group cooperation and understand public goods provision. While prosocial punishment is common across societies, its motivations remain unclear. Scholars have suggested that people resist inequitable outcomes and willingly bear costs to sanction free riders, seeking a fairer distribution of payoffs. This study tests a key implication of such fairness-driven arguments: if inequality aversion drives prosocial punishment, individuals should punish less when redistribution occurs, as equality concerns would be already satisfied. We conducted a pre-registered 2x2 between-subjects lab experiment (N=320), where participants completed a Social Value Orientation (SVO) task and played a one-shot Public Goods Game (PGG) with a Punishment Stage. We manipulated endowment inequality and the presence of redistributive taxation. Pre-registered analyses show that (1)

inequality aversion does not predict prosocial punishment; (2) punishment levels do not significantly differ across treatments. However, exploratory results suggest that under high inequality, redistribution reduces the intensity of punishment towards richer individuals. This could indicate that inequality aversion triggers prosocial punishment only at acute inequality levels.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0337425

SAVANNAH ADAMS & OSCAR YBARRA – Separate and unequal: Moral domains differ in corresponding social judgments of others
Current research on morality supports the idea that the moral landscape is comprised of several domains. However, the extent to which these domains may be thought of as equivalent when used as the basis for forming impressions or making social judgments is not yet understood. Past literature suggests that there may be notable differences in the evolutionary and social development of different moral behaviors, which raises questions about how actions based in different domains may be interpreted and judged by others. Across three studies, we had participants evaluate social targets based on behaviors pertaining to the moral domains. Results showed that correspondent inferences, attributional bias, and willingness to cooperate differed across domains. Interestingly, the Equality and Property domains emerged distinct. This research contributes to contemporary morality literature and proposes a new direction for understanding how morality plays a role in social judgment.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0338026

Science

PAPERS

SHANY DROR et al – Dogs with a large vocabulary of object labels learn new labels by overhearing like 1.5-year-old infants
Children as young as 18 months can acquire novel words by overhearing third-party interactions. Demonstrating similar learning processes in nonhuman species would indicate that the social-cognitive skills supporting this process are not exclusively human but may have evolved, or can develop, in other species, offering valuable insights into the origins of language-related cognition. In this study, we demonstrated that a small group of Gifted Word Learner dogs, which possess an extensive vocabulary of object labels, can learn new labels by overhearing their owners' interactions. Moreover, we show that these dogs can acquire novel object-label mappings even when the labels and objects are not presented simultaneously. Taken together, these results suggest that Gifted Word Learner dogs possess sociocognitive skills functionally parallel to those of 18-month-old children.
https://www.science.org/doi/10.1126/science.adq5474

Science Advances

PAPERS

SVEN ISAKSSON, ANDERS HÖGBERG & MARLIZE LOMBARD – Direct evidence for poison use on microlithic arrowheads in Southern Africa at 60,000 years ago
Poisoned weapons are a hallmark of advanced hunter-gatherer technology. Through targeted microchemical and biomolecular analyses, we identified traces of toxic plant alkaloids on backed microliths from Umhlatuzana Rock Shelter in KwaZulu-Natal, South Africa, excavated from a level dated to 60,000 years ago. The alkaloids buphandrine and epibuphanisine only originate from Amaryllidaceae indigenous to southern Africa. The most likely source is Boophone disticha (L.f.) Herb. bulb exudate, also associated with historically documented arrow poisons. To our knowledge, we present the first direct evidence for the application of this plant-based poison on the tips of Pleistocene hunting weapons. The discovery highlights the complexity of subsistence strategies and cognition in southern Africa since the mid-Pleistocene.
https://www.science.org/doi/10.1126/sciadv.adz3281

GUILLAUME DERA et al – Mapping life's disparity and evolutionary constraints in a geometric complexity space
The Earth's biosphere exhibits a notable diversity of forms, yet the full morphological extent and limits of life remain largely unexplored. Here, we develop a geometric complexity space for comparing all known unicellular and multicellular phyla using fractal descriptors of the density and heterogeneity of body mass and structure. By applying this approach to a large set of extant biological shapes, we show that life exploits a tiny portion of structural possibilities, clustering around linear, rounded, and densely structured forms, while consistently avoiding complex heteromorphic ones. We show that this restriction results from deep physical, metabolic, and developmental limitations, shaped over geological time by the evolution of body size and ecological lifestyle. Our findings provide a global, quantitative perspective on the long-standing interplay between chance and necessity in evolution, with implications for the expected forms of life beyond Earth.
https://www.science.org/doi/10.1126/sciadv.aea6945

JESSICA I. CEREZO-ROMÁN et al – Earliest evidence for intentional cremation of human remains in Africa
Human cremation on an open pyre demands intensive labor, communal resources, and sensory exposures. We report the earliest evidence for intentional cremation in Africa, the oldest in situ adult pyre in the world, and one of only a few associated with hunter-gatherers. A large cremation feature at Hora 1 in Malawi dates to ~9500 years ago and contains the remains of a small, gracile adult with evidence for perimortem defleshing and postcremation manipulation. Subsequent revisiting of the site to build fires in the same place provided additional pyrotechnological spectacles. High-resolution, multiproxy reconstruction of the ritual associated with cremation and its subsequent deposition demonstrates complex mortuary practices among ancient African foraging groups with substantial social investment and use of natural landscape features as persistent mortuary monuments.
https://www.science.org/doi/10.1126/sciadv.adz9554

Trends in Cognitive Sciences

PAPERS

JOHN B. MUEGGE, HYOJU KIM & BOB MCMURRAY – Decoupling speech processing from time
Accurate processing of speech requires that listeners map temporally unfolding input to words. A long-held set of principles describes this process: lexical items are activated immediately and incrementally as speech arrives, perceptual and lexical representations rapidly decay to make room for new information; and lexical entries are temporally structured. In this framework; speech processing is tightly coupled to the temporally unfolding input. However, recent work challenges this: low-level auditory and higher-level lexical representations do not decay and are instead retained over long durations, speech perception may require encapsulated memory buffers, lexical representations are not strictly temporally structured, and listeners can substantially delay lexical access in some circumstances. These findings suggest that current theories and models of word recognition need to be reconceptualized.
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(25)00144-5

CAROLINE F. ROWLAND et al – Constructing language: a framework for explaining acquisition
Explaining how children build a language system is a central goal of research in language acquisition, with broad implications for language evolution, adult language processing, and artificial intelligence (AI). Here, we propose a constructivist framework for future theory-building in language acquisition. We describe four components of constructivism, drawing on wide-ranging evidence to argue that theories based on these components will be well suited to explaining developmental change. We show how adopting a constructivist framework both provides plausible answers to old questions (e.g., how children build linguistic representations from their input) and generates new questions (e.g., how children adapt to the affordances provided by different cultures and languages).
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(25)00142-1

Trends in Ecology and Evolution

ARTICLES

BRADLEY D. OHLINGER & TAKAO SASAKI – How miscommunication can improve collective performance in social insects
Communication errors are typically viewed as detrimental, yet they can benefit collective foraging in social insects. Temnothorax ants provide a powerful model for studying how such errors arise during tandem running and how they might improve group performance under certain environmental conditions.
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(25)00280-3

PAPERS

JACOB JOHNSON, KIRSTEN SHEEHY & KATE L. LASKOWSKI – Playing dice with behavior: drivers of stochastic individuality
Animal behavior is often viewed as stemming from predictable genetic and environmental factors. However, despite our best attempts to control genetic and environmental influences on behavior, variation among individuals still persists: what we call ‘stochastic individuality’. Increasing research suggests that this might be more than just measurement error, and might instead be rich in biological insights. In this review we examine what is known about stochastic individuality, including potential biological mechanisms and its potential adaptive value, and we provide guidance for how to quantify and test outstanding questions about its role in driving patterns of behavioral diversity. Incorporating stochasticity may be a key missing component in mapping the links from genotype to phenotype and predicting the interplay between phenotype and fitness.
https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(25)00288-5

STINE KEIBEL BLOM, CHRISTY ANNA HIPSLEY & GUOJIE ZHANG – Phenotypic signatures of incomplete lineage sorting in hominids

Incomplete lineage sorting (ILS) generates widespread genomic discordance in rapidly radiating lineages, yet its phenotypic impacts remain poorly understood. Among hominids, over 30% of the human genome supports conflicting phylogenetic trees due to ILS, affecting numerous genes with morphological functions. We present a trait-based approach integrating comparative morphology, population genomics, and functional experiments to identify and validate ILS-affected traits in hominids, often interpreted as convergent adaptations. Phylogenetically incongruent traits are frequent in the craniofacial and appendicular skeletons, highlighting priority areas for ILS investigation and ascertainment bias. This approach requires collaborative models bridging morphological and genomic data gaps in non-human hominid research, illuminating the forces shaping great ape evolution and establishing a roadmap for exploring ILS consequences in diverse taxonomic groups.
https://www.cell.com/trends/ecology-evolution/abstract/S0169-5347(25)00294-0

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