EAORC BULLETIN 1,192 – 19 April 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 – Controlled comparative tensile tests of backed versus non-backed edges' adhesion

Archaeometry 67, 267-283 (2025).

MICHAEL WILSON et al with METIN I. EREN – Controlled comparative tensile tests of backed versus non-backed edges' adhesion: Inferences into stone tool functional properties

Backing is a procedure for retouching a stone tool edge to an angle of or near 90 degrees. Archaeologists have recorded backed lithic specimens in the Pleistocene and Holocene around the world. One prominent hypothesis for the occurrence of backing is that it increases a stone tool's adhesion relative to what it would have otherwise been with unmodified, sharp edges. We conducted a highly controlled semi-static tensile test in which we assessed lithic specimens that possessed both a backed and a non-backed edge, opposing each other. We hafted each specimen's backed and non-backed edges to wood, and the bi-hafted stone implement was then pulled apart using an Universal Instron Materials Tester, allowing for a direct 'head-to-head' comparison of the two edge types' adhesive properties. Our tensile test results suggested no significant

difference between backed and non-backed edges in terms of adhesion, which does not support the hypothesis that backing increases a lithic specimen's adhesion.
https://www.academia.edu/165705589/Controlled_comparative_tensile_tests_of_backed_versus_non_backed_edges_adhesion_Inferences_into_stone_tool_functional_properties

ACADEMIA.EDU – Local environmental change and fallow deer hunting at Amud Cave

Journal of Human Evolution 214, 103830 (2026).

CHEN ZEIGEN et al with ERELLA HOVERS – Local environmental change and fallow deer hunting at Amud Cave: Evidence from a combined plant wax and tooth enamel isotope study

Neanderthal presence in the southern Levant has raised questions regarding behavioral flexibility and adaptation strategies across diverse climatic and ecological settings. The association of most Levantine Neanderthal sites with the last glacial period has led some researchers to frame their presence and subsequent disappearance from the region as climatically driven. Increasingly, the use of site-specific paleoenvironmental proxies and recognition of Neanderthal behavioral complexity are challenging simple climate-driven explanations, suggesting resilience to ecological impacts. Amud Cave is a key Levantine Middle Paleolithic site documenting Neanderthal occupation from Marine Isotope Stage (MIS) 4 through early MIS 3. Its two discrete occupation phases provide a framework for comparing local environmental dynamics across fluctuating glacial conditions. Here, we present an isotopic study of fallow deer (Dama mesopotamica) tooth enamel and plant waxes extracted from archaeological sediments directly associated with Neanderthal activity. These proxies are used to refine reconstructions of evolving hydroclimatic and ecological conditions at Amud and to evaluate their implications for hunting behavior. Plant wax hydrogen and carbon isotope results indicate that the late occupation phase was characterized by hydroclimatic variability alongside an expansion of woody vegetation in the cave's vicinity. This finding supports previously proposed climate-mediated changes in gazelle hunting practices. In contrast, tooth enamel isotope data does not indicate diachronic shifts in fallow deer home ranges. Oxygen, carbon, and strontium isotope ratios instead suggest persistent exploitation of low-lying channels near the cave, with only sporadic use of adjacent territories during both occupation phases. Together, these results indicate that Amud Neanderthals employed differential procurement strategies for distinct prey species, reflecting behavioral flexibility in hunting organization. Such flexibility likely enabled stable access to resources despite changing ecological conditions. Considered alongside evidence for amelioration during the Amud sequence, these findings underscore importance of non-climatic factors shaping Neanderthal persistence and disappearance from Levant.
https://www.academia.edu/165754838/Zeigen_C_Hovers_E_Hartman_G_2026_Local_environmental_change_and_fallow_deer_hunting_at_Amud_Cave_Evidence_from_a_combined_plant_wax_and_tooth_enamel_isotope_study_Journal_of_Human_Evolution_214_103830_https_doi_org_10_1016_j_jhevol_2026_103830

NEWS

GUARDIAN SCIENCE – Wild chimpanzees waging 'civil war' of with coordinated attacks between groups

New study describes what may be the first case of a unified community of chimps, in Uganda, turning on itself.
https://www.theguardian.com/environment/2026/apr/09/civil-war-chimpanzee-group-closer-to-human-condition-aoe

NATURE BRIEFING – Chimps wage 'civil war' after social split

A group of chimpanzees (Pan troglodytes) in Uganda appears to be embroiled in a 'civil war' that's been rumbling on for nearly a decade. The well-studied Ngogo chimpanzee group seemed to live in harmony until around 2015, at which point researchers noticed fractures among the community. By 2018, two factions had emerged, one of which has since made several co-ordinated attacks against the other. The divide might have been prompted by a combination of disease outbreak and shifting social hierarchies after the death of some key older individuals, researchers say.
https://www.science.org/doi/10.1126/science.adz4944

NATURE BRIEFING – AI 'teachers' can pass biases onto other AIs

Data generated by artificial-intelligence models can contain subliminal signals that 'teach' other large language models (LLMs) particular traits and biases. These preferences can be benign — a favourite animal, for example — but can also cause LLMs to encourage violent or unsafe behaviours. The biases were passed on even when researchers asked preferential LLMs to generate answers on a totally unrelated topic, scrubbed the data of clues about the initial trait and used the filtered output to train student models. But such transmission only occurred when the 'teacher' and 'student' shared the same base LLM.
https://www.nature.com/articles/d41586-026-01224-1

NATURE BRIEFING – Human evolution sped up after farming

An analysis of DNA evidence from more than 15,000 ancient humans has revealed that human evolution has accelerated over the past 10,000 years. Researchers identified almost 500 gene variants that evolved through natural selection in ancient European and Middle-Eastern people after the dawn of agriculture. Many of those variants are linked to the resistance to

diseases, such as tuberculosis. Accelerated evolution could reflect the intensification of lifestyle changes that started in the Neolithic period, such as new foods and pathogens, says population geneticist David Reich.
https://www.nature.com/articles/d41586-026-01204-5

NATURE BRIEFING – Sperm-whale chatter is akin to humanspeak

The structure of sperm whales' communications has close parallels with the phonetics of some human languages. The whales (Physeter macro-cephalus) communicate using a series of clicks called codas. The animals can differentiate the sound by changing the click's length or using rising and falling tones, which researchers found follow patterns that resemble those used in human languages such as Mandarin and Slovenian. "We're starting to see that these signals are organized in ways we didn't fully appreciate before," says behavioural ecologist Mauricio Cantor.
https://www.theguardian.com/environment/2026/apr/15/sperm-whales-alphabet-vocalizations-similar-humans

NATURE BRIEFING – Brain-gene activity differs between sexes

Researchers have uncovered more than one hundred genes that consistently differ in their expression between male and female brains. Most of the genes they identified are not located on sex chromosomes, but many of them are regulated by sex hormones such as oestrogen and testosterone. The work could help to explain why the risk of developing some brain conditions, such as schizophrenia and Alzheimer's, differs between males and females. "Understanding sex differences in disease susceptibility could lead to better treatments to benefit everyone," says neuroscientist Jessica Tollkuhn.
https://www.nature.com/articles/d41586-026-01227-y

NEWS FROM SCIENCE – What plunged these chimps into civil war? A new study traces the breakdown

Decades of observations tracked the fraying of once-friendly relations among Ugandan chimpanzees.
https://www.science.org/content/article/what-plunged-these-chimps-civil-war-new-study-traces-breakdown

NEWS FROM SCIENCE – Ten thousand years ago, human evolution went into overdrive

Ancient DNA reveals "massive" genetic shifts tied to rise of farming, wheels, and metal tools.
https://www.science.org/content/article/ten-thousand-years-ago-human-evolution-went-overdrive

NEWS FROM SCIENCE – An interspecies grooming ritual may have been spotted in desert ants

First-of-its-kind observation suggests red harvester ants may look to smaller ants to pick off parasites.
https://www.science.org/content/article/interspecies-grooming-ritual-may-have-been-spotted-desert-ants

NEWS FROM SCIENCE – Differences in cells' protein factories may help explain human diversity

Study links mutations in ribosome genes to traits such as height and weight.
https://www.science.org/content/article/differences-cells-protein-factories-may-help-explain-human-diversity

SCIENCEADVISER – A peaceful game of thrones

Naked mole rat colonies run a tight ship. They are eusocial mammals, organized around a single breeding queen like bees or ants, while the rest of the colony takes on nonreproductive roles. If that queen dies, her daughters typically fight, often violently, to take her place. But a new study published in Science Advances shows that succession doesn't always have to be so ruthless.

Researchers followed a single captive colony, known as the "Amigos," which was led by their queen Teré for more than 6 years. The team first increased colony density, a stressor known to affect reproduction in rodents. As the colony grew crowded, Teré continued to get pregnant and give birth, but none of her pups survived. Despite the reproductive failure, no aggression broke out and no subordinate females stepped in.

To further test how different stressors affect reproduction, the team relocated the colony to a new facility. Even though other environmental conditions were kept consistent, the move triggered a months-long pause in Teré's reproduction. During that lull, one of her daughters, Alexandria, began to breed, with pregnancies overlapping between mother and daughter, notably without any fighting.

After Alexandria died from a pregnancy complication, another daughter, Arwen, took her place. Over time, Arwen became the colony's primary breeder, while Teré stopped reproducing altogether. Thus, the colony moved from a single queen to a brief period of shared rule (known as plural breeding), then back to a single monarch—all without the usual "wars of succession" observed when a queen is removed.

The findings suggest that naked mole rat societies are more flexible than previously thought and can separate reproductive failure from social instability. "Our study reveals a 'hidden' side of reproductive organization in naked mole rat colonies," said co-first author Alexandria Schraibman in a statement, opening what she describes as "an entirely new line of inquiry."
https://www.science.org/doi/10.1126/sciadv.aef4157

SCIENCEADVISER – Ancient human DNA reveals "massive" genetic shifts tied to rise of farming

The human genome hasn't been as static recently as evolutionary biologists thought. By analyzing nearly 16,000 ancient human genomes from Europe and the Middle East, researchers measured human genetic change over 18,000 years and found hundreds of genetic shifts across Europe's population in a relatively short time. " It's a powerful new approach to detecting natural selection from ancient DNA," said evolutionary geneticist Iain Mathieson.

For example, the analysis, published this week in Nature, found new signs that natural selection nudged traits such as tuberculosis resistance and lower body fat to become more common in western Eurasians within the past 10,000 years or so. The work challenges previous studies of human evolution, based largely on analyzing the DNA of modern people, that had concluded our genomes were relatively stable over the past tens of thousands of years. Geneticist David Reich, an ancient DNA pioneer, led the work and said, "This is the most important work I have been involved in for a decade. … It is finally realizing the promise of ancient DNA to reveal as much about biology as history."

https://www.science.org/content/article/ten-thousand-years-ago-human-evolution-went-overdrive

THE CONVERSATION – Archaeologists have discovered 12,000-year-old dice

You can compare throwing one of these ancient dice to a coin toss – although this discovery also underscores that dice are much older than coins.

https://theconversation.com/archaeologists-have-discovered-12-000-year-old-dice-heres-what-they-reveal-about-the-history-of-play-280545

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

EMILY R. ORLIKOFF et al – Terrestrial Positional Behavior of Wild Pongo pygmaeus

As a predominantly arboreal animal in the wild, the terrestrial positional behavior of Pongo pygmaeus is poorly understood, having been studied almost exclusively in captive settings. This study uses camera-trap footage to provide the first assessment of wild orangutan terrestrial locomotor and postural behavior on natural substrates.

Video footage of orangutans from motion-activated cameras in the Gunung Palung National Park, West Kalimantan, Indonesia was collected over a five-year period. The resulting 100 instances of orangutan terrestriality were analyzed to document incidences of positional behavior, including hand and foot postures as well as overstride pattern during locomotion and qualitative assessment of hindlimb joint excursions during orthograde behaviors.

When locomoting terrestrially, Pongo pygmaeus primarily engaged in quadrupedal fist-walking with heel-strike. Wrist position and overstride pattern during quadrupedal walking were variable both within and between individuals. For posture, individuals were captured standing upright more often than pronograde, both monopedally and bipedally, and almost always with full extension of the hip and knee.

These observations of wild orangutan terrestrial positional behavior address prior ambiguities related to hand and foot positioning during locomotion. Maintained full extension of the hindlimb in the absence of substrate compliance indicates the form of bipedalism orangutans use in the trees translates to natural terrestrial substrates. Finally, the high proportion of observations with asymmetrical movement and posture may indicate a lateral decoupling of limbs in addition to the expected fore- and hindlimb independence of apes, suggesting orangutan positional adaptability is intrinsic regardless of substrate.

https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.70245

AMY J. SPIES et al – Craniofacial Fluctuating Asymmetry in Cross River Gorillas (Gorilla gorilla diehli)

Craniofacial fluctuating asymmetry (FA) in gorillas has been linked to environmental and/or genetic stress. Prolonged population declines increase levels of inbreeding, leading to developmental instability, which can manifest as FA. Among gorillas studied to date, craniofacial FA levels are highest in mountain gorillas (G. beringei beringei) and lowest in western lowland gorillas (G. gorilla gorilla), reflecting known levels of genetic diversity and inbreeding in these subspecies. This study assessed craniofacial FA in Cross River gorillas (G. gorilla diehli), a little-known subspecies with high levels of inbreeding due to a recent genetic bottleneck.

Thirty fixed landmarks of the craniofacial skeleton were used to assess FA in 30 Cross River gorillas using Procrustes ANOVA. Principal component analysis assessed variation in both symmetric and asymmetric components. Differences in FA magnitudes between Cross River gorillas and published data for other Gorilla subspecies were assessed using permutation tests.

Craniofacial FA accounts for 9.9% of shape variation in Cross River gorillas, whereas directional asymmetry accounts for 0.5%. Allometry accounts for 14.1% of shape variation in the symmetric component and 3.8% in the asymmetric component. Craniofacial FA magnitudes are higher in Cross River gorillas than in western lowland gorillas and lower than in mountain gorillas.

High FA in Cross River gorillas aligns with known levels of inbreeding, supporting the link between genetic stress and craniofacial FA in gorillas. Persistent inbreeding and the loss of genetic diversity may decrease population fitness, further increasing the risk of extinction.
https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.70233

MARGARET A. H. BRYER et al – Female Affiliation and Status in Semi-Free-Ranging Chimpanzees

Sex differences in social behavior and status are pervasive across primates and other mammals. In the wild, chimpanzees (Pan troglodytes) exhibit many sex-typed behaviors: adult female chimpanzees exhibit lower aggression, are subordinate to adult males, and also are generally less social than males. This pattern is thought to partly reflect the energetic constraints (e.g., feeding competition) that wild female chimpanzees face.

We test the drivers of sex differences in chimpanzee behavior by examining a semi-free-ranging African chimpanzee sanctuary group where individuals are provisioned, an environment that should relax ecological constraints on socializing. Using two years of focal observations on a group with 45 chimpanzees (17 males, 28 females), we examined sex differences in social proximity, grooming, aggression, coalition formation, and dominance.

In contrast to patterns in wild chimpanzees, we found that males and females in this population exhibited comparable rates of affiliative behavior. Males engaged in more aggressive behavior overall than females, as in the wild. However, females were equally likely to aggress either sex, and a high proportion of female aggression involved coalitions. Finally, David's scores revealed that a few of the adult females outranked some of the lower-status adult males.

These findings show that sex differences in chimpanzee social behavior are partially flexible, and females may show more affiliation, cooperation, and higher status when ecological conditions are favorable. More generally, some forms of female power can emerge even in a species with strong sex biases in behavior for male affiliation and status.
https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.70244

KIRSTY E. GRAHAM & MICHELLE A. RODRIGUES – Just Gal Pals! The Differential Treatment of Sexual Behavior Among Nonhuman Great Apes

There is a tendency in primatology to separate out sexual and sociosexual behaviors, roughly along the lines of reproductive and non-reproductive sexual behavior. Primatology perpetuates a heteronormative distinction that penetrative copulation between males and females has reproductive—but not social—value, while all sexual behaviors between same-sex pairs must be motivated by a distant social goal. Here, we interrogate these assumptions, and posit that there is scientific merit in examining social relationships across all forms of sexual behavior, and in examining proximate sexual motivations beyond heterosexual pairings. We use bonobos (bilia) as a case study, as they frequently engage in same-sex sexual behavior, and we make suggestions for expanding this approach to other species. We caution against overinterpreting nonhuman sexual behavior in ways that minimize the importance of socio-cultural experiences on human gender and sexuality; and we highlight the importance of broadening our ways of knowing about the sexuality of other species for their own sake. Finally, we conclude with some considerations of how queer perspectives on primate behavior can lead to new approaches, paralleling the role of feminist perspectives in primatology.
https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.70247

Current Biology

PAPERS

ELLA BEEN et al with ERELLA HOVERS – Rapid growth in a Neandertal infant from Amud Cave in Israel

Neandertal infants are rarely found, with only a few individuals documented in the literature. Therefore, their growth and development remain poorly understood. Amud 7 is the articulated skeleton of an infant Neandertal discovered in Amud Cave, northern Israel. The cave was excavated in the 1960s and the 1990s and has yielded several human remains with distinct Neandertal affinities, as well as Middle Paleolithic stone tool assemblages, dated to approximately 51–56 thousand years old. Nearly 111 skeletal pieces of Amud 7 were found in situ, of which only the cranial bones were thoroughly described. It is the most complete Neandertal infant assigned to the 6- to 14-month age range. As such, it plays a significant role in our understanding of Neandertal paleobiology. The skeleton exhibits distinct Neandertal affinities in both cranial and postcranial remains, and its morphological features shed light on Neandertal phylogeny, growth, and development. Most notably, the infant exhibits signs of unusually rapid somatic growth, suggesting that Neandertals had a distinct developmental strategy in early life. Other rare Neandertal infants show the same pattern of accelerated early somatic and endocranial growth, suggesting a consistent difference in how our evolutionary relatives developed. Simultaneously supporting faster somatic growth and brain development would have resulted in high energetic demands. These findings emphasize the diversity of developmental strategies among hominin species and demonstrate that Neandertals might have followed a different developmental path, distinguishing them from H. sapiens.
https://www.cell.com/current-biology/abstract/S0960-9822(26)00374-X

eLife

PAPERS

VÍCTOR J LÓPEZ-MADRONA et al with DAVID POEPPEL – Speech is defined by theta-gamma coupled acoustic rhythms, mapped onto segregated populations in human early auditory cortex

Theta and gamma neural dynamics dominate the human auditory cortex during speech perception and have been proposed to track syllable boundaries and encode phonemic information, respectively. To what extent these rhythms are intrinsically generated or imposed by speech acoustics remains unsolved. Applying analytic methods from neuroscience to speech audio corpora from 17 languages, we found that canonical brain features —theta, gamma, and their phase-amplitude coupling— are a robust and specific acoustic signature of speech envelope across languages. They represent syllabic rate (2–6 Hz), vocalic features (30–50 Hz), and fundamental frequency (100–150 Hz). Intracerebral (sEEG) recordings from the auditory cortex of 18 epilepsy patients revealed that theta-gamma dynamics and their coupling are absent at rest. They emerge during speech perception and are linearly driven by the acoustic envelope, consistent with an evoked origin. Nevertheless, these responses originate from distinct yet functionally interconnected neural populations, indicating that the early auditory cortex demultiplexes speech timescales. Thus, early auditory cortex mirrors theta–gamma speech rhythms across segregated neural populations.
https://elifesciences.org/reviewed-preprints/110310

Frontiers in Human Neuroscience

PAPERS

ANNA ILONA ROBERTS & SAM G.B. ROBERTS – Food culture as a mechanism of social bonding and social identity in primates

Food culture is one of the identifying features of social life of any human being every day. The shared habits, rituals and beliefs around producing, procuring and consuming a wide variety of food types, textures and flavours shape how we feel and behave towards others. Food culture defines who we are, our identity and everyday values, and shapes social relationships. This helps us live in complex societies, where we form connections not only with family, but also with society at large and even far-away countries. However, food-related behaviours rarely leave traces in the fossil record, making the evolutionary origins of food culture difficult to reconstruct. Studies of non-human primates help clarify its evolution in the human lineage. Yet research on primate culture has focused largely on social learning and tool use, with relatively little attention given to the cultural dimensions of feeding behaviour. Here we propose that food culture may function as a mechanism of social bonding and social identity in primates, as it does in human groups. Drawing on the Social Brain Hypothesis, we suggest that shared dietary traditions—socially transmitted food preferences—may maintain cohesion in socially complex systems characterised by large groups, fission–fusion dynamics, and tolerant intergroup encounters. Behavioural similarity arising from shared food preferences may facilitate social bonding in complex social systems, providing an additional mechanism when tracking individual relationships becomes cognitively demanding. In humans, cultural behaviours such as food preferences are used to identify others as having the same identity or a different identity. This sense of social identity then affects how we treat others, with members displaying same cultural characteristics favoured over members where these characteristics are absent. This paper proposes that food culture may play a comparable role in primate social systems. We develop a conceptual framework to examine whether dietary traditions are present among primates, contribute to social complexity, influence tactical ranging decisions, and extend beyond feeding preferences to include traditions in vocalisations during feeding. This framework provides testable predictions for understanding how food culture may act as a socio-cognitive mechanism underpinning social bonding and the evolution of human food practices.
https://www.frontiersin.org/journals/human-neuroscience/articles/10.3389/fnhum.2026.1788917/full

iScience

PAPERS

SAKUMI IKI et al – Intrinsic recreation of moderately uncertain events in macaques

Curiosity drives information-seeking without extrinsic incentives. Prior studies using looking-time measures suggest that curiosity peaks at intermediate uncertainty. Yet developmental and comparative research often reports that increased looking does not necessarily translate into action, leaving open whether animals intrinsically take overt actions generating intermediate uncertainty. Here, we show that monkeys are biased not only to look longer, but also to spontaneously interact with their environment in ways that recreate intermediate uncertainty. In a reward-free, hide-and-seek-like touchscreen game, Japanese macaques (Macaca fuscata) chose between two buttons that produced puppet appearances with different levels of spatial noise: intermediate vs. low (Experiment 1) and vs. high (Experiment 2). When noise variation was perceptible rather than imperceptible, macaques shifted their choice bias toward the intermediate-noise button by 9.6% (Experiment 1) and 13.5% (Experiment 2), and reselected it faster. Such intrinsic tendencies may optimize information gain by promoting engagement with stimuli offering maximal learning opportunities.
https://www.cell.com/iscience/fulltext/S2589-0042(26)01195-8

Journal of the Royal Society Interface

PAPERS

NICHOLAS W. BARENDREGT et al – Information-seeking decision strategies mitigate risk in dynamic, uncertain environments

To survive in dynamic and uncertain environments, individuals must develop effective decision strategies that balance information gathering and decision commitment. Models of such strategies often prioritize either optimizing tangible payoffs, like reward rate, or gathering information to support a diversity of (possibly unknown) objectives. However, our understanding of the relative merits of these two approaches remains incomplete, in part because direct comparisons have been limited to idealized, static environments that lack the dynamic complexity of the real world. Here, we compare the performance of normative reward- and information-seeking strategies in a dynamic foraging task. Both strategies show similar transitions between exploratory and exploitative behaviours as environmental uncertainty changes. However, we find disparities in the actions they take, resulting in meaningful performance differences: whereas reward-seeking strategies generate slightly more reward on average, information-seeking strategies provide more consistent and predictable outcomes. Our findings support the adaptive value of information-seeking behaviours that can mitigate risk with minimal reward loss.
https://royalsocietypublishing.org/rsif/article/23/237/20251308/481321/Information-seeking-decision-strategies-mitigate

Nature

NEWS

Revealed: how male and female brain cells differ in gene activity

Variations in gene expression could help to explain why brain-disease risks differ according to sex.
https://www.nature.com/articles/d41586-026-01227-y

Landmark ancient-genome study shows surprise acceleration of human evolution

Data from more than 15,000 ancient people reveal natural selection of hundreds of genes linked to immunity, skin tone, behaviour and other traits.
https://www.nature.com/articles/d41586-026-01204-5

Nature Communications

PAPERS

WENXIN YAN et al – Divergent neural representations of space and task between physical and virtual navigation in macaques

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.

Virtual reality is frequently used to explore the neural mechanisms of primate spatial cognition because it offers realistic simulations and precise experimental control. However, there remains a critical but untested assumption that virtual reality-based findings apply to real-world scenarios. We examined neural activity in the hippocampus and orbitofrontal cortex while two male macaque monkeys performed a spatial memory task in visually matched virtual and real environments. Monkeys learned the task efficiently in both settings. Neurons in both regions showed richer allocentric spatial representations in the real compared to the virtual environment, with individual cells unpredictably adjusting their specific responses. Cross-condition analyses revealed orthogonal population representations of task phases across the two environments. These results highlight the importance of studying monkeys in real-world settings, where they can fully express their behaviors and interact freely with their surroundings, to uncover the true neural basis of primate spatial cognition.
https://www.nature.com/articles/s41467-026-72141-0

JIJIA SUN, IGNACIO DE LA TORRE & FAYSAL BIBI – No evidence that hominin dispersal across Eurasia was part of a wider turnover in mammal distributions

The drivers and consequences of hominin dispersals out of Africa remain debated. The spatial and temporal distribution of large mammal faunas contemporaneous with early Homo provides direct evidence for their ecological context and impact. In this study, we conduct taxonomic and functional similarity analyses on fossil and extant Eurasian and African large mammal communities of the last 10 Ma. We test two hypotheses: 1) the dispersal of hominins across Eurasia around or shortly after ~2 Ma was part of a wave of faunal dispersals out of Africa; 2) the arrival of hominins at Eurasian sites coincided with major changes in the functional structure of large mammal communities. Our results indicate that hominin dispersals from Africa to Eurasia during the Plio-Pleistocene were not part of a larger faunal expansion. Instead, the most significant faunal interchange during the Plio-Pleistocene occurred between Europe and Asia, while African faunas have mostly remained distinct from Eurasian faunas since ~7 Ma. Our results suggest relative homogeneity in community functional structure across Eurasia and Africa since at least 10 Ma. In contrast to fossil communities, modern Eurasian and African terrestrial large

mammal faunas show strong geographic functional structure, which might reflect the selectivity of Late Pleistocene extinctions.
https://www.nature.com/articles/s41467-026-71648-w

Nature Humanities & Social Sciences Communications

PAPERS

CHRISTOS KALPAKIDIS – The argument from facticity: reassessing realism in Sartre's early philosophy
This paper argues that Jean-Paul Sartre's early philosophy—above all Being and Nothingness—advances a distinctive and insufficiently examined form of realism. Although Sartre rejects both classical metaphysical realism and idealism, his phenomenological ontology nevertheless commits him to a realist position that speaks directly to contemporary debates associated with "speculative" or "new" realism. At the centre of this position lies what I reconstruct as Sartre's "argument from facticity," which exhibits a structural parallel with recent arguments for basic or absolute facts in contemporary realism debates. Sartre anticipates these approaches while avoiding their characteristic dogmatisms—most notably, their reliance on mathematical or naturalized absolutes. His realism is neutral in that it eschews privileging domain-specific ontologies and instead treats facts as inherently temporal and indexical: they depend on temporal becoming and yet obtain universally across time. This conception is clarified by Sartre's appropriation of Husserl's phenomenological metaphysics of facticity, through which he develops an image of reality as internally incomplete yet intelligible, and of transphenomenal facts as manifestable only through the temporalisation of subjectivity. I conclude by arguing that Sartre's realism offers a compelling alternative to contemporary realist programs—such as those of Quentin Meillassoux, Markus Gabriel, and Paul Boghossian—by maintaining the independence of reality while acknowledging the partially constitutive role of finite subjects in its manifestation.
https://www.nature.com/articles/s41599-026-07304-x

Nature Lab Animal

ARTICLES

ANDREAS NIEDER – Feathered primate of the air: the carrion crow as model in cognitive neuroscience
The carrion crow (Corvus corone) is a highly adaptable passerine with exceptional problem-solving, learning and executive abilities, making it an ideal nonprimate model for high-level cognition. These skills rely on a densely neuron-packed pallium, especially the nidopallium caudolaterale, functionally analogous to the primate prefrontal cortex. Integrating behavioral, neurophysiological and neuroanatomical studies in crows provides key insights into the neural and evolutionary foundations of complex intelligence.
https://www.nature.com/articles/s41684-026-01726-5

Nature Reviews Neuroscience

PAPERS

LISA FELDMAN BARRETT & EARL K. MILLER – Categorization is 'baked' into the brain
Categorization, the grouping of objects, living organisms, actions or events into equivalence clusters, is fundamental to adaptive behaviour. Traditionally, it is assumed that categorization begins with feature detection and ends with assigning representations stored in memory. Here we review converging evidence from neuroanatomy, electrophysiology, brain imaging and cognitive science to suggest an alternative view: categorization is not the end stage of perception but occurs throughout signal processing, from the very beginning. It is a core computational strategy of the brain, implemented through a neural context created by predictive feedback signals that organize feedforward processing. Implications for theory, future research and neuropsychiatric disorders are discussed.
https://www.nature.com/articles/s41583-026-01036-2

Nature Scientific Reports

PAPERS

CAROLIN RÖDING et al with KATERINA HARVATI – A morphological analysis of the modern human frontal bone from Hahnöfersand, Germany
Frontal bone morphology is considered informative concerning phylogenetic and taxonomic affinities in hominin fossils. However, evaluating individual frontal bone features, especially macroscopically and with qualitative data, can produce contradictory results. One example is the enigmatic frontal bone from Hahnöfersand, Germany, initially dated to ca. 36 ka. A previous description of this specimen found that it exhibits a mix of modern human- and Neanderthal-like features and interpreted it as a potential hybrid between Homo neanderthalensis and Homo sapiens. In this case study, we apply a nearly landmark-free technique (i.e., surface registration) to reassess Hahnöfersand's supposed intermediate morphology in the context of a revised chronology of ca. 7.5 ka. A three-dimensional comparative analysis was conducted using a dataset of Neanderthals, Middle Pleistocene European hominins, and a diverse Homo sapiens sample. Principal components analysis, Mahalanobis distances, and pairwise Procrustes distances place Hahnöfersand within the variability of Holocene Homo

sapiens, with no evidence of intermediate morphology. These findings support Hahnöfersand's attribution to recent Homo sapiens and highlight the efficacy of the surface registration method for morphological assessments of taxonomy in isolated fragmentary remains, where interpretation is driven entirely by the preserved morphology and, if available, dating.
https://www.nature.com/articles/s41598-026-48468-5

Neuron

ARTICLES

FRANK VAN OVERWALLE – On the search for language in the cerebellum
Casto et al. carried out an extensive investigation demonstrating the involvement of the cerebellum in linguistic processing and identified a language-specialized area located mainly in posterior Crus I/II. The study offers an analysis of the cerebellum's contribution to language at the level of words and sentences, in comparison with numerous other cognitive and social domains and in relation to the neocortical language network.
[SOURCE PAPER: COLTON CASTO et al with EVELINA FEDORENKO – The cerebellar components of the human language network – see EAORC Bulletin 1,180 – https://www.cell.com/neuron/fulltext/S0896-6273(25)00986-9]
https://www.cell.com/neuron/abstract/S0896-6273(26)00084-X

New Scientist

ARTICLES

MICHAEL MARSHALL – The first apes to walk upright may have evolved in Europe
A single femur found in Bulgaria appears to represent an ape or early hominin that walked on two legs before any known African hominin, but the evidence is far from conclusive.
https://www.newscientist.com/article/2518516-the-first-apes-to-walk-upright-may-have-evolved-in-europe/

MICHAEL MARSHALL – Our extinct Australopithecus relatives may have had difficult births
Simulations of Australopithecus hominins' anatomy suggest that when they gave birth, they may have exerted tremendous pressure on their pelvic floors, putting them at risk of tearing.
https://www.newscientist.com/article/2519325-our-extinct-australopithecus-relatives-may-have-had-difficult-births/

DAVID STOCK – The skull transforming our family tree and the hunt for Ancestor X [podcast]
Denisovans were an enigmatic human species that, until recently, had only been identified thanks to DNA from fragmentary fossils, including a finger and a jaw bone. More recently, a spectacular skull found in Harbin, China, has enabled us to put a face to this mysterious species and potentially give the Denisovans a new name: Homo longi, or Dragon Man. But it didn't stop there. Three more skulls uncovered in Yunxian, China, are upending everything we know about human evolution. These 1-million-year-old artefacts offer a tantalising hint that Homo sapiens may be much older than previously thought and suggest we may be looking in the wrong time and place to find Ancestor X, the relative that modern humans, Neanderthals and Denisovans all descend from.
Join paleoanthropologist, Ella al-Shamahi as we explore the story of Denisovans and how they are changing everything we know about human evolution.
https://www.newscientist.com/video/2518955-the-skull-transforming-our-family-tree-and-the-hunt-for-ancestor-x/

MICHAEL LE PAGE – Human populations evolved in similar ways after we began farming
An analysis of ancient and modern DNA suggests the extent of convergent evolution in different peoples around the world is even greater than we thought.
https://www.newscientist.com/article/2518181-human-populations-evolved-in-similar-ways-after-we-began-farming/

JAMES WOODFORD – Neanderthal infants were enormous compared with modern humans
A detailed analysis of the best-preserved Neanderthal infant skeleton ever found suggests that our ancient relatives grew much faster as young children.
https://www.newscientist.com/article/2523132-neanderthal-infants-were-enormous-compared-with-modern-humans/

JAMES URQUHART – Why early humans radically changed their toolkits 200,000 years ago
A decline in ancient megafauna in the Middle East coincided with a shift towards smaller, lighter toolkits in the archaeological record – though scientists are still in debate about why.
https://www.newscientist.com/article/2522425-why-early-humans-radically-changed-their-toolkits-200000-years-ago/

JAMES WOODFORD – Chimpanzee group's violent rupture hints at evolutionary roots of war
Researchers who observed a murderous conflict unfolding in a once-unified group of wild chimpanzees say there are parallels with civil wars in human societies.
https://www.newscientist.com/article/2522541-chimpanzee-groups-violent-rupture-hints-at-evolutionary-roots-of-war/

Philosophical Transactions of the Royal Society B

PAPERS

BRUCE RAWLINGS et al with SARAH FRANCES BROSNAN – Clever vermin? Collective intelligence in rats and roaches

Collective intelligence (CI) is the capacity of groups to outperform individuals in tasks such as decision-making, coordination and problem-solving. A significant challenge to studying CI is that it encompasses a wide variety of behaviours that are underpinned by different mechanisms. To balance inclusivity with conceptual clarity, we propose a typology of CI mechanisms including self-organized coordination, distributed decision-making, cooperative problem-solving, statistical aggregation and culture and cultural improvement. This typology helps clarify the minimum requirements for CI and how other, more cognitive complex mechanisms may have layered on top of these. As model comparative species, we focus on two ecologically successful generalists, rats (Rattus) and cockroaches (Blattodea). Cockroaches show evidence of collective behaviours, but these rely on a more ancestral set of mechanisms that lack cognitive complexity. Conversely, rats share important ecological traits with cockroaches but exhibit social traits found in primates, including cultural learning, distributed decision-making, empathy and cooperation. This comparison can show how similar collective outcomes can emerge even with disparate mechanisms and provide a way to uncover evolutionary design principles of CI. Ultimately, we can use such comparisons to determine which features of CI are universal properties of collectives and which are contingent on specific cognitive adaptations.
https://royalsocietypublishing.org/rstb/article/381/1948/20240441/481355/Clever-vermin-Collective-intelligence-in-rats-and

MATTHEW GILDEA et al – Individual versus collective associative learning in ants

Although associative learning has been traditionally studied at the individual level, it may also operate in group contexts, particularly in social species such as ants. This study investigated whether colonies of Temnothorax rugatulus ants exhibit collective learning—defined as group-level information acquisition emerging from dynamic individual learning—by examining whether individuals learn more effectively in a colony than alone. Using a visual associative learning paradigm, we trained ants to associate a visual cue with food availability and compared performance between isolated individuals and colonies. We tested subjects across 17 sessions, comprising acquisition and reversal phases, and quantified performance based on the time spent at correct versus incorrect cues. Our results revealed that ants trained in colonies learnt associations more rapidly than those trained alone during both phases. Additionally, observations showed that colony-trained ants spent more time in correct corridors during training and engaged in more tandem runs early in learning. These findings suggest that social interactions—particularly recruitment behaviour—enhance associative learning of individual ants in colonies. This study underscores the importance of considering the social environment in learning research and suggests that collective learning may be an adaptive mechanism in social animals.
https://royalsocietypublishing.org/rstb/article/381/1948/20240442/481356/Individual-versus-collective-associative-learning

JAKE S. BROOKER, EDWIN J. C. VAN LEEUWEN & ZANNA CLAY – Social structure as a form of collective intelligence: a new framework

Collective intelligence arises when group-level cognition exceeds the capabilities of individual members, enabling more effective learning, decision-making and problem-solving. While sociality underpins collective behaviour across taxa, the structural dimensions of social organization remain underexamined as active components of this phenomenon. Here, we propose that social structure—the patterned distribution of relationships and interactions within a group—is not only a context in which cognition unfolds, but also a core mechanism through which collective intelligence is enabled and sustained. Specifically, we argue that social structure emerges from cognition at the individual level, while simultaneously shaping cognition by influencing how information is distributed and applied across the group. Empirical evidence suggests that variations in network connectivity, stability and cohesion in social animals mediate problem-solving at the individual and collective levels. By examining these dynamics, we may come to understand how individuals engage in heuristic and rational decision-making and how social structures support or hinder collective cognition. Our framework situates social structure at the centre of collective cognition, offering a unified model that links individual decision-making with emergent group behaviour. This perspective expands current approaches to distributed cognition and sheds light on the organizational foundations of intelligence across diverse taxa.
https://royalsocietypublishing.org/rstb/article/381/1948/20240443/481357/Social-structure-as-a-form-of-collective

ELIZABETH WARREN et al with DORA BIRO – Chimpanzees spontaneously prepare for mutually exclusive possibilities, and collective context strengthens this behaviour

In both humans and non-human animals, collectives can sometimes overcome individual cognitive biases or shortcomings to execute more rational behaviour than individuals. To investigate differences in strategy and outcome between individuals and collectives in a logical reasoning task, we presented an inverted U-shaped tube to individuals and pairs of chimpanzees (Pan troglodytes) and examined their preparatory actions towards rewards that could fall from either end of the tube. Given that individual chimpanzees have typically produced a suboptimal one-handed strategy in past variants of this task, we predicted that pairs would outperform individuals primarily through subjects sharing the apparatus, each placing one hand

under one tube end such that they collectively account for both possible outcomes. Unexpectedly, over half of our chimpanzees spontaneously produced the optimal two-handed behaviour (covering both ends) on their own, providing evidence that individuals may be able to reason about mutually exclusive future possibilities. This reduced the capacity for pairs to improve upon individual performance. Notably, however, we observed an increase in individual usage of the two-handed strategy in the collective setting. This individual improvement may have arisen from an effect of collective facilitation, such as competition, suggesting an alternative mechanism through which collectives may outperform individuals.
https://royalsocietypublishing.org/rstb/article/381/1948/20240444/481358/Chimpanzees-spontaneously-prepare-for-mutually

REBECCA KOOMEN – Cooperative sustainability: a case for collective intelligence
Group-dwelling species face challenges that can be overcome with collective intelligence (CI): problem-solving abilities of collectives that outpace those of individuals. The breadth of topics within CI is large and growing—simultaneously a strength and a limitation of the field. This article explores a methodological approach for mitigating these limitations by examining variability across species, strategy types and cognitive abilities within the same challenging context: common-pool resource (CPR) dilemmas. In doing so, I formulate a framework for categorizing the breadth of strategies for overcoming CPR dilemmas based on their social cognitive demands. Broadly, these strategies can be grouped into ecological sustainability mechanisms and cooperative sustainability strategies (CSS), ranging from bats sustaining their food supply via diminishing returns of overconsumption to the human practice of developing rules and institutions to manage resources sustainably. I then outline existing connections between CSS and CI, highlight key points of synthesis and discuss how integrating these two fields could generate new research avenues.
https://royalsocietypublishing.org/rstb/article/381/1948/20240445/481359/Cooperative-sustainability-a-case-for-collective

LUCIO VINICIUS, CASSANDRA GUNASEKARAM & ANDREA BAMBERG MIGLIANO – Ultimate and proximate explanations for human cumulative culture and collective intelligence
The controversy remains over whether chimpanzee culture is cumulative or why it may have remained incipient compared with human cumulative culture. In this perspective, we argue that many debates over cumulative culture and collective intelligence can be clarified by extending the parallels between genetic and cultural evolution. Inspired by Dobzhansky's formulation, we first argue that understanding cultural and cognitive differences between humans and chimpanzees requires evidence from the population-level distribution of evolved cultural traits, in addition to evidence for cultural reinvention or social learning at the individual level. Second, we propose that debates over the role of collective intelligence in cultural evolution can be solved if more attention is given to Tinbergen's differentiation between proximate and ultimate levels of explanation. Since cumulative cultural evolution implies that individuals become less likely to hold the totality of culture even with the assistance of social learning, we propose that hominin intelligence evolved to become at the same time more general, cultural and collective than in other African apes. Finally, we discuss our Foraging Niche Hypothesis, which points to increased fitness returns to tool making and spatial mobility as ultimate explanations, with the later evolution of increased general intelligence offering a proximate account for the cultural divergence between hominins and chimpanzees.
https://royalsocietypublishing.org/rstb/article/381/1948/20240446/481360/Ultimate-and-proximate-explanations-for-human

BAHAR KÖYMEN & OWEN WADDINGTON – Collaborative reasoning and problem-solving in early childhood
A core aspect of human intelligence is the ability to reason. Recently, the social dimension of reasoning has been emphasized such that reasoning enables people to justify their beliefs/proposals to collectively solve problems, in which the goal of the participants is to reach the decision that provides most benefit to all. An important debate in the literature is whether collaborative reasoning leads to good/optimal decisions. Here, we contrast these traditional and social views on reasoning and review the evidence on whether individuals benefit from collective reasoning in a special population: young children. We argue that collaborative problem-solving contexts uniquely facilitate the development of young children's reasoning as it pushes them to treat their partners' perspectives as equal to their own, enabling them to better understand and evaluate them.
https://royalsocietypublishing.org/rstb/article/381/1948/20240447/481361/Collaborative-reasoning-and-problem-solving-in

FRANCESCO D'ERRICO, ANDRA MENEGANZIN & IVAN COLAGÈ – Scaffolding minds: human collective intelligence through space, body and material symbols
Human collective intelligence (CI)—the capacity of groups to solve problems, make decisions and acquire knowledge beyond individual capabilities—is here understood as an emergent phenomenon that evolved in our lineage from a distinct trajectory of epistemic niche construction (ENC), and progressively sustained the latter. Humans systematically alter their informational landscapes in materially visible ways by creating enduring spatial and artefactual scaffolds for improved cognitive performance and social coordination. In this paper, we propose a set of criteria to define ENC and track its emergence in the archaeological record. These criteria highlight the importance of persistent, publicly accessible and evolutionarily incremental modifications that sustained behavioural coordination among individuals in space and time. We apply this framework to three major domains of material culture: the structuring of space for collective action, the culturalization of the human body

and the emergence of exosomatic artefacts to store coded information. We argue that these practices did not merely externalize knowledge but progressively transformed material culture and environments into targeted epistemic infrastructures able to scaffold and amplify group-level performances characteristic of CI, thus shedding light on the evolution of human cognition and social organization.
https://royalsocietypublishing.org/rstb/article/381/1948/20240448/481362/Scaffolding-minds-human-collective-intelligence

BHAVYA DEEPTI VADAVALLI, ZACHARY H. GARFIELD & LUKE GLOWACKI – Social structure shapes consensus decision-making norms in small-scale societies

Humans are uniquely capable of reaching consensus within large, hierarchically structured societies. Yet the pathways by which consensus emerges, especially under constraints imposed by social organization, remain poorly understood. We use an agent-based model to explore how marriage structure, social group nesting and decision-making norms can shape a group's ability to reach consensus. In our model, simulated agents are embedded in multi-level social networks and possess noisy information. Decisions are spread via three different cascades, each with different interaction norms. We find that grouping of individuals into families via marriages impedes consensus by slowing the rate of information diffusion and elevating informational entropy, especially when nested further into kin groups. By contrast, increasing the size of nested subgroups in a multi-level network reduces redundant social ties and promotes consensus. Finally, decision-making norms that rely on formation of coalitions or representative bodies lead to faster group decisions by bypassing early-stage clustering of information within families. These results offer insights into how consensus dynamics are shaped by social structure and provide a theoretical bridge between research on network topology, collective intelligence and human social evolution.
https://royalsocietypublishing.org/rstb/article/381/1948/20240449/481363/Social-structure-shapes-consensus-decision-making

MARIA PYKÄLÄ, DANICA DILLION & MIRTA GALESIC – Heterogeneous learning strategies interact with social network structure and problem complexity to benefit collective search

Groups can outperform individuals by sharing and aggregating information through diverse social structures and learning strategies that shape how innovations are discovered and transmitted. At the same time, groups must solve problems that vary in complexity, from relatively simple decisions to complex tasks with many interacting components such as scientific discovery. Interdisciplinary research shows that collective outcomes depend on learning strategies, group structure and problem complexity, yet it remains unclear how these factors together influence the success of collective search and problem-solving. We develop an evolutionary agent-based model in which selection operates at the group level: networks compete based on collective performance and reproduce, selecting for successful proportions of learning strategies. We use this framework to study the co-emergence of learning strategies across network sizes and densities and across tasks of varying complexity. Our results show that payoff-biased and frequency-biased social learning can co-exist, with their relative prevalence shifting as a function of network structure and task complexity. These findings suggest that no single learning strategy distribution is universally the best; instead, network structure and task complexity jointly shape the proportions of different learning strategies to support collective search.
https://royalsocietypublishing.org/rstb/article/381/1948/20240450/481364/Heterogeneous-learning-strategies-interact-with

MEHDI MOUSSAID, WATARU TOYOKAWA & RALF KURVERS – Asymmetrical social copying drives behavioural cascades following a shock event

When facing disruptive events, such as epidemics, terrorist attacks or financial crises, individuals often exhibit protective behaviours, including mass escape movements and stockpiling essential goods. These collective responses are predominantly driven by a social amplification process, where an initial decision-maker is imitated by others, triggering large-scale behavioural cascades. However, the mechanisms shaping this phenomenon remain unclear. Here, we present an experiment examining the propagation of protective behaviours in dyadic transmissions involving 210 participants. Our research uncovers an asymmetric social response, where individuals tend to copy protective behaviours more strongly than inaction. This pattern causes large amplification cascades in simulated transmission chains and is more pronounced following a brief but intense shock compared to a longer, minor one. Furthermore, our results demonstrate an extended period of collective vigilance post-shock, suggesting that social transmission can facilitate rapid behavioural adjustment during crises. By examining the interplay between individual protective behaviours and group dynamics, our study contributes to a better understanding of how adaptive social responses emerge in uncertain and dynamic environments.
https://royalsocietypublishing.org/rstb/article/381/1948/20240451/481365/Asymmetrical-social-copying-drives-behavioural

TALIB EL AISSATI et al – Locals know more than it seems: a new method for revealing collective understanding, tested in three African communities

In the study of human cultural evolution, many theorists hold that technologies are transmitted and improved more through imitation rather than causal understanding. This view stems from results of studies that ask individuals in isolation about technologies they use, appearing to reveal a lack of causal understanding. Here, we introduce a new method to assess the knowledge of a group that allows individuals to view their neighbours' answers before deciding what the best answer might

be from among those provided by the group. We asked individuals in three farming communities from Morocco (n = 203), Mali (n = 198) and Ghana (n = 120) to explain the causal processes behind local technologies. Our method reveals that when participants can review the answers provided by their peers, the most popular final answer is more reliable than when individuals provide answers in isolation. This indicates a division of labour in how causal knowledge is stored in the community—while most individuals may have poor causal knowledge, they recognize and defer to the best answer in the group. This shows that collectively the community is more knowledgeable than methods used up to now have indicated.
https://royalsocietypublishing.org/rstb/article/381/1948/20240453/481366/Locals-know-more-than-it-seems-a-new-method-for

YOUNES JEDDI, JOSE SEGOVIA-MARTIN & EMILE SERVAN-SCHREIBER – Crowdsourced versus large language models forecasting: evidence for the accuracy–correlation effect

Over the past quarter century, crowdsourced forecasting has largely outperformed individual forecasters. Today, large language models (LLMs), aggregating human knowledge at scale, constitute a new form of collective intelligence (CI). A central question is how LLM predictive accuracy associates with human–AI correlation, and whether this relationship exceeds what would be expected if both merely track the same underlying truth. We investigate this through the accuracy–correlation effect (ACE), which posits that as algorithmic systems improve, they increasingly correlate with human predictions, potentially diminishing human value in hybrid ensembles. Using 76 model × prompt forecast sets from 16 LLMs on 580 resolved ForecastBench questions, we computed LLM accuracy and correlations with two human aggregates (superforecasters, general public), separately for databases (n = 526) and prediction markets (n = 54) questions. Linear mixed-effects models show a robust positive association between LLM accuracy and human–AI correlation that substantially exceeds independent-errors predictions. Correlations were lower for superforecasters than for the general public, and weaker for markets than for data questions. These results support ACE while indicating that increasing correlation reflects more than improved signal tracking alone, suggesting that simultaneous increases in accuracy and correlation may reduce optimal human weights in data-rich settings, while human judgement retains critical value in contextual reasoning scenarios.
https://royalsocietypublishing.org/rstb/article/381/1948/20240456/481367/Crowdsourced-versus-large-language-models

JAMES WINTERS & MATHIEU CHARBONNEAU – Modelling the emergence of open-ended cultural evolution

Humans stand alone in terms of their potential to collectively and cumulatively change their culture in an open-ended manner. This open-endedness provides societies with the ability to continually expand their resources and to increase their capacity to store, transmit and process information at a collective level. Here, we propose that the production of resources arises from the interaction between cultural systems (a society's repertoire of interdependent techniques, artefacts, norms and knowledge) and search spaces (an ensemble of needs, problems and goals facing a society). Starting from this premise, we develop a macro-level model wherein both cultural systems and search spaces are subject to evolutionary dynamics. By manipulating the extent to which these dynamics are characterized by stochastic or selection-like processes, we demonstrate that open-ended growth is extremely rare, historically contingent and only possible when cultural systems and search spaces co-evolve. Here, stochastic factors must be strong enough to continually perturb the dynamics into a far-from-equilibrium state, whereas selection-like factors help maintain effectiveness and ensure the sustained production of resources. Only when this co-evolutionary dynamic maintains effective cultural systems, supports the ongoing expansion of the search space and leads to an increased provision of resources do we observe open-ended cultural evolution.
https://royalsocietypublishing.org/rstb/article/381/1948/20250255/481368/Modelling-the-emergence-of-open-ended-cultural

FRANZ DIETRICH & CHRISTIAN LIST – Collective intelligence through aggregation

Suppose a committee, expert panel or other group is making judgements on some issues, where these may be not just yes/no questions, such as whether a defendant is guilty, but also variables with many possible values, such as macroeconomic or meteorological variables or travel directions. Furthermore, there may be interconnections between different issues, as in the case of economic or climate variables. How can the group arrive at 'intelligent' collective judgements, based on the group members' individual judgements? We investigate three challenges raised by this judgement-aggregation problem. First, reasonable methods of aggregation (such as defining the collective judgement for each issue as the average or median judgement) can produce inconsistent collective judgements. Second, many methods of aggregation are manipulable by strategic voting. Finally, not all methods of aggregation are conducive to tracking the truth on the issues in question. We prove new impossibility or possibility theorems on all three challenges, identifying what it takes to produce collective judgements in a consistent, non-manipulable and truth-tracking manner and thereby to achieve collective intelligence through aggregation. Overall, the median method, though imperfect, performs reasonably well. We also note the relevance of our analysis for non-human group decisions.
https://royalsocietypublishing.org/rstb/article/381/1948/20240454/481371/Collective-intelligence-through-aggregation

GEOFF MULGAN – Global brains: the science and practice of collective intelligence at the level of whole systems

What is the science and practice of collective intelligence at the level of whole systems and at a global scale? How have attempts to organize intelligence at these scales evolved, and how might they evolve in the future? Recent research has

attempted to find universal patterns in the organization of intelligence at multiple scales, from atoms and cells to birds and other animals and whole societies. This work offers insights for the design of intelligence at global scales that can support governance, whether for pandemics or climate change, and that can integrate data, models, algorithms, evidence, tacit knowledge, foresight and innovation. This opinion piece argues for analysing common features of intelligence at multiple scales; it describes some important examples of 'intelligence assemblies' in technologies, cities, professions and global initiatives; and it advocates drawing on this framework for understanding intelligence at multiple scales to accelerate both research and design for large-scale intelligence. Questions of macro-cognition design are arguably as important as micro-cognition in terms of potential social impact but they have been less comprehensively researched, partly because they cut across so many disciplinary boundaries. However, a better understanding of these phenomena may be vital for tackling the big global challenges of the twenty-first century and for humanity's future evolution.
https://royalsocietypublishing.org/rstb/article/381/1948/20240452/481375/Global-brains-the-science-and-practice-of

PLoS Biology

PAPERS

DONGNING LIU, MUZHI WANG & HUAN LUO – Human brains construct individualized global rankings from identical few-shot learning input

This is an uncorrected proof.

Ranking—a ubiquitous relational structure—enables humans to organize complex information and overcome cognitive load, yet in real-world settings it is often inferred from sparse, few-shot learning of local pairwise relationships. How the human brain performs relational inference under such limited evidence remains unknown. We hypothesized that under few-shot learning, relational inference is shaped by inductive biases, such that individuals actively impose structured global relationships—often idiosyncratic—to constrain and unify limited local information. In a preregistered behavioral study combined with magnetoencephalography (MEG) recordings, we show that even after identical few-shot local pair learning, individuals construct stable and self-consistent, yet idiosyncratic, global rankings that diverge from the ground-truth order—a phenomenon not readily explained by classical computational models of transitive inference. MEG recordings further reveal that frontoparietal neural representations are reorganized to reflect each individual's subjective ranking rather than those of others. Together, these findings highlight the constructive and generative nature of human cognition: under sparse samples and limited computational resources, the human brain actively infers and imposes relational structure.
https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3003756

PLoS One

PAPERS

LAURYN BENEDICT et al – Name use by companion parrots

Humans organize social interactions in part by referring to others using proper names (hereafter "names"). Names might also facilitate the complex social lives of animals. Several animal species produce name-like signature sounds in nature and can vocally target interaction partners, but researchers hesitate to equate these sounds with the human linguistic concept of a name. A more direct way to ask if diverse species can learn names and use them appropriately is with animals that learn human words and phrases. Accordingly, we used survey data to determine whether parrots that live with humans regularly learn names and can potentially use them as individual vocal labels for people and animals. Survey takers were asked about word and phrase use by companion parrots; 47% of reports on 884 birds included examples of name use, with those 413 parrots speaking 802 phrases that included names. For a subset of these individuals, survey-takers provided contextual information that allowed us to assess whether parrots used names in ways consistent with vocal labeling. Parrots used names in a range of social situations, including greetings, separations, and when seeking attention. Reports on 88 different birds of 30 species suggested that parrots applied names appropriately as vocal labels for humans and animals, with strong evidence that some birds applied names only to single individuals and not as category labels. At the same time, many parrots used names in contexts outside of typical human linguistic conventions, such as seeking attention by vocalizing their own name. Results indicate that captive parrots learn and use names in a variety of situations, sometimes applying them as vocal labels when communicating with or about others. This suggests that parrots have the cognitive and vocal capacity to use names but leaves many open questions about how animals label individuals using vocal signals.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0346830

LI LIU et al – Unveiling bast fiber production in Upper Paleolithic North China: Microfibers and usewear traces on stone tools from Shizitan

Fiber technology—including the making of cordages, mats, baskets, and textiles—holds a crucial place in human history. However, uncovering archaeological evidence of early fiber products proves challenging due to their rapid decay. To address preservation hurdles, we employ a multi-disciplinary approach to interpret microfiber remains, drawing on microfossil remains, usewear traces, ethnographic observation, and experimental archaeology, to study artifacts from two Upper Paleolithic Shizitan (SZT) site localities on the North China Loess Plateau, dating 28,000–18,000 cal BP, encompassing the Last Glacial Maximum (LGM), on which we identify microremains of hemp and flax. Analyses of microfossil remains (microfibers,

phytoliths, and fungi) and usewear traces on stone tools potentially reveal stages of bast fiber production, such as cutting stalks, retting, pounding fiber ribbons, and scraping to remove impurities. Such pounding and scraping are commonly associated with textile production in ethnographic accounts, and parallel evidence has also been observed on Neolithic stone tools in North China. Observations of colored fibers suggest SZT people may have extracted plant-based dyes and hematite pigment to color fibers. The cold-dry conditions of the LGM, which likely led to the depopulation of regions north of SZT, also may have driven increased fiber production, aligning with previously recognized shifts toward microblade production, broader interregional interactions, ritual activities, and broad-spectrum subsistence, including early wild millet use. This research provides new evidence for the deep history of fiber production in Upper Paleolithic China and demonstrates the value of usewear and microfossil analyses for studying ancient fiber technology.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0346767

CORRECTIONS

TSENKA TSANOVA et al with JEAN-JACQUES HUBLIN – Correction: Curated character of the Initial Upper Palaeolithic lithic artefact assemblages in Bacho Kiro Cave (Bulgaria)
[see EAORC Bulletin 1,108]
In Fig 9, the legend of the fourth group in yellow should be “EPA bipolar cores” instead of “Exterior platform angle (degree)”. Please see the correct Fig 9 here.
In Fig 10, the legend of the fourth group in yellow should be “Flake platforms thickness” instead of “mm”. Please see the correct Fig 10 here.
In Fig 12, the legend of the sixth group in green should be “Non-retouched blades thickness” instead of “mm”. Please see the correct Fig 12 here.
In the Stratigraphic context subsection of Results, there is an error in the third sentence of the first paragraph. The correct sentence is: The Main Sector (MS) had 246 piece-plotted (cut-off size 1.5 cm) lithics across ca. 3m2, for 6417 liters of sediments, while Niche 1 yielded 2435 lithics across ca. 10 m2 for 9765 liters of sediments. This numbers can be verified in S1 Table (MS has 713 buckets x 9 liter = 6417 l. while Niche 1 has 1085 buckets x 9 liter = 9765 l).
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0347680

Proceedings of the Royal Society B

PAPERS

GAŠPER BEGUŠ et al – The phonology of sperm whale coda vowels
Sperm whales (Physeter macro-cephalus) communicate using series of clicks known as codas. In previous research, sperm whale codas have been shown to resemble human vowels acoustically. Based on the number of formants, two different coda quality categories have been described: a-codas and i-codas. In the present paper, we demonstrate that sperm whale codas not only resemble human vowels acoustically but also pattern like them along several linguistic dimensions. First, traditional count- and timing-based coda types interact with coda ‘vowel’ quality (a versus i). Second, a-codas are generally longer than i-codas. Third, the duration of i-codas has a bimodal distribution, showing a contrast between short i-codas and long ī-codas. Fourth, the baseline coda length differs across whales. And fifth, edge clicks mismatching their coda often match an adjacent coda, a phenomenon that resembles human coarticulation. All five properties have close parallels in the phonetics and phonology of human languages, suggesting independent evolution. Sperm whale coda vocalizations are thus highly complex and represent one of the closest parallels to human phonology of any analysed animal communication system.
https://royalsocietypublishing.org/rspb/article/293/2069/20252994/481340/The-phonology-of-sperm-whale-coda-vowels

Science

NEWS

Ten thousand years ago, human evolution went into overdrive
Ancient DNA reveals “massive” genetic shifts tied to rise of farming, wheels, and metal tools.
https://www.science.org/content/article/ten-thousand-years-ago-human-evolution-went-overdrive

ARTICLES

JESSICA TOLLKUHN & S. MARC BREEDLOVE – Express yourself: The brain’s expression of more than 3000 genes differs between men and women
Men and women show striking differences in risk, prevalence, and progression of many psychiatric and neurological disorders. For example, schizophrenia, attention deficit hyperactivity disorder (ADHD), and Parkinson’s disease are more common in men, whereas mood disorders and Alzheimer’s disease affect women more frequently. Understanding the molecular mechanisms underlying such sex differences could help to identify the pathways that promote resilience to disease and thus might be targeted therapeutically. On page 274 of this issue, DeCasien et. al. (1) report a systematic examination of how sex influences neural gene expression at the single-cell level. They found that more than 3000 genes show sex-biased expression in at least one of six cortical regions. Most of these genes were not located on the sex chromosomes. The findings provide a resource for understanding why the sexes differ in susceptibility to many brain disorders.

https://www.science.org/doi/10.1126/science.aeh0064

PAPERS

ALEX R. DECASIEN et al – Sex effects on gene expression across the human cerebral cortex at cell type resolution

Sex differences in brain-related health outcomes may be a consequence of differences in gene expression, which are likely to be influenced by both sex chromosome complement and circulating hormone levels.

Most current knowledge of molecular brain sex differences relies on studies of bulk tissue or isolated brain regions. We present a large-scale single-cell analysis of transcriptomic sex differences in the adult human brain, using 169 samples from 15 females (age 26 to 71 years) and 15 males (age 27 to 78 years) across six cortical regions, selected on the basis of in vivo neuroimaging measures of sex-biased volume.

We found that sex effects on gene expression are highly patterned across cortical regions, cell types, and genes. They are most pronounced in (i) multiple cell types in the fusiform cortex (linked to male-biased volume and sex-biased behaviors); (ii) oligodendrocytes, astrocytes, and excitatory neurons across regions; and (iii) a subset of sex chromosome and autosomal genes. More than 3000 distinct genes exhibit sex-biased expression, with 133 genes (119 autosomal) showing consistent sex differences across all region × cell type combinations. Sex chromosome genes show the largest sex differences in expression, driven by conserved X-Y gametologs, cell type–specific biases in certain X- and Y-linked genes, and escape from X-inactivation—with the list of known escapees substantially expanded through our single-cell allele-specific expression analysis. Broader effects of sex on autosomal expression are captured in 13 core signatures with varying cell type versus region specificity. These signatures are (i) shaped by regional differences in cortical metabolism and laminar architecture, (ii) enriched for diverse cellular compartments and biological processes, (iii) regulated by sex steroids and X-linked transcription factors, and (iv) linked to sex-specific genetic risk factors in sex-biased neuropsychiatric and neurodegenerative diseases. This study substantially advances the breadth, depth, and granularity of knowledge on sex differences in the human brain and provides a new open data resource to support future research. Future studies will be needed to illuminate when sex differences emerge during development and whether they are consistent across populations.

https://www.science.org/doi/10.1126/science.aea9063

Science Advances

PAPERS

SHANES C. ABEYWARDENA et al – Peaceful queen succession in the naked mole rat

The eusocial naked mole rat exhibits extreme reproductive skew, with a single queen monopolizing breeding through behavioral dominance. When the queen is removed or dies, reproductive suppression is lifted, leading to aggression and intracolony conflict. While this may be advantageous under stable conditions, reliance on a single breeder may create vulnerabilities during environmental stress. Here, we report a longitudinal study of a captive colony identifying a mechanistically distinct, nonviolent mode of queen succession. Elevated colony density impaired pup survival but did not alleviate reproductive suppression or trigger aggression. In contrast, relocating the colony to a new facility caused a prolonged pause in the queen's reproduction, without social disturbance. During this period, her daughters sequentially emerged as additional breeders, resulting in a period of peaceful plural breeding before one daughter ultimately assumed the primary reproductive status. Thus, reproductive ascension can be socially tolerated when queen reproduction declines, expanding the mechanistic framework of naked mole rat eusociality to include peaceful, fertility-based succession.

https://www.science.org/doi/10.1126/sciadv.aef4157

LUCIA MARIA SACHELI et al – An evolutionary conserved neural mechanism for interpersonal coordination in primates

Interpersonal coordination is fundamental to social evolution. We investigate its phenomenology and neural underpinnings in humans and macaques, examining the behavioral adaptations required for mutual coordination during motor interactions and the extent to which the underlying brain mechanisms are shared across species. Using a common interpersonal coordination paradigm, we conducted functional magnetic resonance imaging (fMRI) in humans and intracranial local field potential (LFP) recordings in macaques. Despite between-species behavioral discrepancies, both monkeys and humans coordinate through adjustments that proved to be based on proactive adaptation of motor planning and execution. Evidence from fMRI and time-resolved decoding analysis of LFPs converged to show modulation of premotor brain activity associated with interpersonal coordination and its effectiveness. Moreover, a dynamic sequential coding emerged, whereby the action context is represented early during planning, and coordination features near movement onset. Our findings reveal an evolutionarily conserved cortical architecture across primates that supports cooperative motor behavior.

https://www.science.org/doi/10.1126/sciadv.aea1927

Scientific American

ARTICLES

JACKIE FLYNN MOGENSEN – Ancient art could hold clues to the origins of written language

Thousands of markings on objects made around 40,000 years ago may have been more than just doodles, a new analysis suggests.

https://www.scientificamerican.com/article/stone-age-art-may-reveal-40-000-year-old-precursor-to-writing/

Trends in Cognitive Sciences

PAPERS

THOMAS L. GRIFFITHS et al – Whither symbols in the era of advanced neural networks?

Some of the strongest evidence that human minds should be thought of in terms of symbolic systems has been the way they combine ideas, produce novelty, and learn quickly. We argue that modern neural networks—and the artificial intelligence systems built upon them—exhibit similar abilities. This potentially undermines the argument that the cognitive processes and representations used by human minds are symbolic. We consider possible interpretations of these results—that modern neural networks implement symbolic systems, or that they approximate them subsymbolically—and the theoretical consequences of these two possibilities for explanations of human cognition at different levels of analysis. This consideration leads us to offer a new agenda for research on the symbolic basis of the mind.
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(26)00028-8

EDWARD GIBSON – Dependency syntax as the simplest theory of grammar

The syntax of human languages has long been argued to be complex and even unlearnable from the input alone. However, the success of large language models (LLMs) has challenged this idea. I argue for a simple view of syntax, where the syntax of a language is just the set of dependency rules, with no phrase structure or transformation rules—constructs central to Chomsky's transformational grammar. This approach accounts for diverse phenomena in human language processing and explains crosslinguistic word order universals. Moreover, it better explains human data for cases that differentiate these accounts and eliminates the syntax learnability problem. I speculate that LLMs, similar to children, learn the dependency grammar from linguistic patterns, leading to their impressive syntactic competence.
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(26)00052-5

ROBERT HEPACH & ELLA DANIEL – How developing prosocial motivations shape children's altruism

Developmental perspectives are crucial to harnessing the human potential for altruism. We synthesise and highlight recent research on the motivations underlying children's (costly) prosocial behaviour. The order in which children develop intrinsic, extrinsic, and strategic motivations to benefit others has implications for efforts to positively impact young people's lives.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(26)00072-0

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