EAORC BULLETIN 1,218 – 18 October 2026

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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 – Heat treatment technique and fuelwood density shape silcrete flake-edge geometry

Journal of Archaeological Science: Reports 76, 106108 (2026).

JUSTIN PARGETER et al – Heat treatment technique and fuelwood density shape silcrete flake-edge geometry

Silcrete heat treatment was a transformative technological innovation in the Middle Stone Age, enabling toolmakers to improve the flaking properties of this raw material. Recent research has highlighted that silcrete heat treatment is not a uniform process, different silcrete sources and heating strategies can produce variable outcomes. Here we present experimental results testing how heat treatment affects the microscopic edge sharpness and geometry of silcrete flakes from the same source, comparing heated and unheated flakes and evaluating differences between two heating configurations:

sand-bath heating (slow, insulated heating beneath sediment) and open-ember heating (direct exposure to embers). We heated silcrete nodules from a controlled source using these two methods (with various fuel woods), then flaked them and analyzed the resulting flakes via micro-CT.
We used two complementary curvature methods: best-fit circle (BFC), which measures flake-edge curvature, and three-point stepping (TPS), which measures local curvature across the flake edge and adjoining surfaces. We compared heated flakes with unheated controls from the same silcrete source. Heat-treated flakes show sharper edges and smoother surrounding edges than unheated flakes. Within the heated sample, ember heating produced sharper edges than sand-bath heating. Fuelwood density moderated this effect mainly under sand-bath heating, where high-density wood fuels yielded sharper edges and smoother surrounding surfaces than low-density fuels, while ember-heated flakes were comparatively similar. These results show that heating technique and wood fuel properties impacted different components of silcrete flake edge geometry. Prehistoric toolmakers may therefore have balanced wood fuel availability, heat treatment preparation costs, nodule fracture risk, and desired flake edge form when selective among heat treatment strategies.
https://www.academia.edu/179023907/Heat_treatment_technique_and_fuelwood_density_shape_silcrete_flake_edge_geometry

NEWS

NATURE BRIEFING – Bouba–Kiki effect holds true in dogs

When presented with two shapes, one with spikes and one rounded, and asked to designate them 'bouba' and 'kiki', people tend to agree that kiki is the spiky one — and so do dogs. Researchers found that when presented with images of these shapes, domestic dogs (Canis familiaris) more often looked at and moved toward the round shape when the word 'bouba' was played from a speaker, and vice versa. The results could suggest that dogs make similar connections between visual information and sounds to humans.
https://royalsocietypublishing.org/rspb/article/293/2080/20261209/483619/Hearing-shapes-the-Bouba-Kiki-effect-in-adult

SCIENCEADVISER – Bones tell the tale of a loving, violent Neanderthal life

Shakespeare wrote that "violent delights have violent ends." That was probably all too true for Shanidar A, a Neanderthal that lived in what is now Iraq some 75,000 years ago. While their bones suggest they lived a long life surrounded by people who loved them, they also indicate a life that ended suddenly and tragically.
Finding the likely cause of death for an ancient person is somewhat serendipitous. After all, "there's a lot of ways to die that leave absolutely no mark on your skeleton," biological anthropologist Libby Cowgill told Science News , and all that scientists have found so far of Shanidar A is most of their right hand bones, two left ribs, a piece of a right rib, a left scapula, and six teeth. However, the scapula has a noticeable hole in it with no signs of healing, suggesting the wound occurred around the time of death. Further examination indicated it was made by a wooden spear—one that entered their body from the front and " penetrated all the way through the chest, including the lungs and potentially major blood vessels, likely leading to a rapid death," the team explained.
The remains not only tell the story of how this individual died, they also tell us a bit about how they lived. One of the teeth was a broken incisor, which remained in Shanidar A's mouth long enough to get coated with hardened plaque. The tooth would have been incredibly painful at first, and they would have likely required a lot of help to recover from such a severe facial injury. Plus in the end, their body was carefully buried. They clearly had people who cared deeply for them.
"What I find most striking about Shanidar is how it brings together two seemingly opposite sides of human behavior," anthropologist Palmira Saladié told New Scientist. "We have evidence of lethal violence, but also evidence of care for injured individuals and complex funerary practices."
https://www.nature.com/articles/s41598-026-69193-z

YOUTUBE NEWS – The First Skeletons Found at Göbekli Tepe

Several bodies identified, with evidence of deliberate inhumation.
https://www.youtube.com/watch?v=mWZ0Jq0OqAE

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

AMMIE K. KALAN et al – Sticks and Stones: Hand Preference and Grip in Wild Chimpanzee Tool-Use

Humans exhibit a near-universal right-handed bias, linked to hemispheric brain lateralization, yet its evolutionary origins remain unclear. Wild chimpanzees, one of our closest living relatives, show diverse tool-use behaviors and substantial variability, providing an appropriate context to investigate the emergence and functional significance of handedness in ecologically relevant settings. This study aimed to assess chimpanzee handedness and grip at both the individual and behavioral levels to determine whether specific tool-use tasks elicit consistent preferences.

We investigated hand preferences and grasping patterns in wild chimpanzees for three tool-use behaviors observed in three different communities: accumulative stone throwing, algae fishing, and nut cracking. Our dataset consisted of camera-trap videos of unhabituated wild chimpanzees with individuals identified across videos.
We found 20/21 individual chimpanzees were consistent in their hand preference during primary tool-use actions: fishing, hammering, or throwing. Insufficient observations of a further 16 chimpanzees prevented assessment of their hand preference. We found no evidence for behavior- or population-level biases in hand preference. Grips were only possible to code for algae fishing, where we found pronounced inter-individual variability in grasping, with notable trends between left- and right-handed chimpanzees. Also, right-handed individuals appeared to fish for longer durations, although the implications for tool-use performance remain unclear.
This study highlights challenges and complexity associated with plant-based precision-grasping tool-use behaviors like algae fishing. During the early stages of hominin evolution, the efficient execution of such manual behaviors likely benefited from key evolutionary adaptations favoring improved dexterity, motor skills, and enhanced brain-hand coordination.
https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.70364

Biology Letters

PAPERS

FRANÇOIS DRUELLE, JEAN-PASCAL GUÉRY & VICTOR NARAT – Energy expenditure of bonobos across their locomotor repertoire

Unlike quadrupedal mammals, primates use diverse locomotor modes adapted to arboreal environments. Such diversity of movements challenges allometric models, which underestimate energetic costs by focusing on steady-state walking. To address this, we combined ethological and biomechanical approaches to estimate the net metabolic cost of transport in bonobos (Pan paniscus). Using three-dimensional tracking and a point-mass model, we derived this estimate from net mechanical power and muscle efficiency across locomotor modes. Our results show that quadrupedalism in bonobos (10–12 J kg^{-1} m^{-1}) exceeds mammalian predictions (approx. 3 J kg^{-1} m^{-1}), whereas vertical ascent (26–32 J kg^{-1} m^{-1}) is the most costly mode. However, arboreal locomotion incurs no major energetic penalty, given the high potential for energy recovery via kinetic/potential energy exchange during vertical descent and suspensory locomotion. By integrating these data with field-derived locomotor repertoires, we estimate that daily travel distances (0.4–6 km) account for 3–53% of bonobos' daily energy expenditure. Reversing quadrupedal/bipedal proportions in this model shifts costs to 4–62%. Notably, even with 35% bipedalism, 2 km daily travel remains energetically feasible for bonobos. This suggests that early hominins could have incorporated bipedalism into diverse repertoires without facing energetic constraints, and that increased travel distance may have driven selective pressure for greater bipedal efficiency.
https://royalsocietypublishing.org/rsbl/article/22/10/20260427/483646/Energy-expenditure-of-bonobos-across-their

Cell

PAPERS

FEI CHEN & EVAN Z. MACOSKO – Cellular scaling laws in the mammalian brain

Recent whole-brain cell atlases have uncovered a consistent cytoarchitectural feature: the greatest diversity of discrete neuronal cell types resides not in the regions with the most neurons (e.g., the cortex and cerebellum) but rather in deep subcortical structures like the hypothalamus and brain stem. We propose that this discrepancy reflects a fundamental algorithmic division in the vertebrate brain between a "learning subsystem" and a "steering subsystem." The learning subsystem (cortex, striatum, and cerebellum) scales via the replication of repetitive modules to maximize computational capacity, analogous to scaling up parameters in machine learning models. By contrast, the steering subsystem (hypothalamus, pallidum, and brainstem) scales via diversification of bespoke cell types to encode innate drives and reflexes, functioning as a high-dimensional biological "reward function." This framework explains the divergence in how evolution has influenced these subsystems and offers a unified lens for understanding brain architecture and the etiology of brain disease; furthermore, it may inform model designs for artificial intelligence.
https://www.cell.com/cell/fulltext/S0092-8674(26)01017-2

eLife

PAPERS

HIROYOSHI YAMASAKI, PHILIPPE BLACHE & DANIELE SCHÖN – Two Interacting Neural Processes Support Speech Planning during Naturalistic Conversation

Conversation requires speakers to plan their responses while still listening to their partner, yet the neural dynamics supporting this overlap remain unclear. In particular, competing accounts differ on whether behaviourally relevant preparation emerges early during comprehension or only close to speech onset. Here, we recorded EEG from pairs of participants engaged in natural, face-to-face conversation and tested whether neural activity during listening predicts both when speakers begin their response (latency) and how long they speak (duration). Using event-related potentials, oscillatory analyses, and multivariate decoding, we show that pre-speech neural activity carries robust information about upcoming behaviour more than one second before articulation. The strongest and earliest effects tracked response duration, with

sustained ERP components and alpha/beta power modulations predicting how long participants would speak, even after controlling for behavioural variables. In contrast, neural predictors of response latency were more temporally restricted and partly aligned with partner turn boundaries. Temporal generalisation analyses further revealed stable neural patterns linking early and late stages of preparation. Together, these findings indicate that conversational planning unfolds during listening and that early neural activity reflects the maintained specification of response extent, followed by later processes related to commitment and initiation. This supports a temporally structured account of turn taking in which preparation involves both early maintenance and late motor engagement.
https://elifesciences.org/reviewed-preprints/112046

Frontiers in Ecology and Evolution

PAPERS

CAROLINE BETTRIDGE & R.I.M. DUNBAR – Reconstructing early hominin behavioural ecology: a modelling approach
We use a reverse engineering approach to develop a linear programming model for the behavioural ecology of early hominins (australopithecines).
Our models are based on a recently developed family of empirical models that use climate to predict how animals allocate time to core activities and, from this, whether or not they can balance their activity budget at a specific location as a guide to whether they could survive there. We first use models developed for baboons and chimpanzees to predict whether australopithecines could have survived at sites where they are known to have been present, had they been ecological baboons or ecological chimpanzees. We show that none of the hominins behaved ecologically like either baboons or chimpanzees: the models for these genera fail to predict their known distribution. We then use the equations from the baboon and chimpanzee models to build a model that predicts the known distribution of the australopithecines more precisely.
The results suggest that they had evolved their own distinctive response to environmental parameters that seems to be related to exploiting a habitat (lacustrine and riverine flood plains) that no other living primate exploits. Our analysis suggests that, in exploiting open flood plain habitats, australopithecines likely foraged as a single group for protection against predators rather than living in fission-fusion communities like modern chimpanzees. The models indicate that climate change post 2.4 Ma resulted in declining group sizes leading to eventual extinction, associated with the appearance of early Homo with novel adaptations for coping with a warmer, drier climate.
Our analyses suggest that exploiting quantitative models can offer novel insights into the behavioural biology of extinct species, thereby providing rich insights into the forces that drove evolution within particular lineages.
https://www.frontiersin.org/journals/ecology-and-evolution/articles/10.3389/fevo.2026.1891539/full

Frontiers in Sociology

PAPERS

MICHELA LUZI – Reflections on the concept of subject
In contemporary society, new social movements with a cultural focus have emerged, addressing themes such as sexuality, information, ecology, and gender equality. These movements represent a new form of protest, distinct from the revolutionary and conflict-driven tendencies of traditional movements. For these new social movements to become effective agents of societal transformation, collaboration is essential, along with the support of the “Soggetto,” which represents individuals upheld by rights and institutions. Advocating human rights can be a powerful strategy if it serves as a framework to restore meaning in society, fighting the persistent socio-cultural drift that enforces standardized and homogenized roles. This approach, coupled with an understanding of complex interdependence, can help mitigate the effects of disintegrative imperialism and address social crises.
https://www.frontiersin.org/journals/sociology/articles/10.3389/fsoc.2026.1874290/full

iScience

PAPERS

EUN JUNG CHOI et al – Longitudinal associations of screen time with brain development and expressive language skills in early childhood
Screen-based media may reduce reciprocal social interactions that support expressive language development, but little is known about how early language abilities, later screen use, and brain structure are related during toddlerhood. We examined 70 toddlers with structural magnetic resonance imaging and standardized developmental assessments at age 2, along with parent-reported screen time at ages 2 and 3. Greater weekday and weekend screen time at age 2 were associated with poorer concurrent expressive language skills. Right pars triangularis volume did not explain additional variance in these cross-sectional associations. Longitudinally, right pars triangularis volume moderated the association between expressive language skills at age 2 and screen time at age 3. Among toddlers with relatively smaller right pars triangularis volumes, poorer expressive language skills were associated with greater subsequent weekday and weekend screen time. These findings support guidance to limit screen use during toddlerhood, a sensitive window for language and brain development.
https://www.cell.com/iscience/fulltext/S2589-0042(26)03241-4

ELISA CASTALDI et al – Symbolic and non-symbolic geometric abilities across development and in individuals with dyscalculia and dyslexia

Geometry is fundamental to mathematical thinking, yet its foundations and difficulties in learning disorders remain poorly understood. Here, we investigated the development of geometric abilities and their relationship with developmental dyscalculia and dyslexia. Seventy-nine children and adults, including individuals with and without learning difficulties, completed behavioral measures of non-symbolic geometry and a paper-and-pencil assessment of symbolic geometry. Geometric abilities continued to develop from early adolescence into young adulthood and non-symbolic geometry predicted symbolic geometry independently of age, verbal reasoning, non-verbal reasoning and visuospatial working memory. Adults with dyscalculia, most of whom also had dyslexia, showed impairments in both non-symbolic and symbolic geometry that persisted after controlling for visuospatial working memory, whereas individuals with dyslexia without dyscalculia performed comparably to controls. These findings suggest that non-symbolic geometry contributes to formal geometric competence and that geometric difficulties may be a persistent feature of developmental dyscalculia, with implications for education and clinical assessment.
https://www.cell.com/iscience/fulltext/S2589-0042(26)03222-0

Language and Cognition

PAPERS

KEITH O'DONNELL, SEAN COMMINS & PATRICIA M. GOUGH – Age of acquisition and language embodiment across the lifespan

Embodied language theories propose that language and action are inter-related. Age of Acquisition (AoA) effects refer to findings that early learned words, phrases and concepts are responded to more quickly than later learned stimuli, but this factor is often not considered in embodiment studies. Using lexical decision tasks (LDTs), the current study tested the effect of AoA on motor responses to hand-related words across younger (aged 18–44, N = 40, Experiment 1) and older adults (aged 50–65, N = 40, Experiment 2). Experiment 1 found no significant main effect for hand relatedness but significant main effects for AoA and frequency. Early learned words and higher frequency words elicited quicker hand responses than late learned and lower frequency words. Similar effects were observed in Experiment 2 – no significant main effect for hand relatedness but significant main effects for AoA and frequency. The implications of these findings for language embodiment theories are discussed.
https://www.cambridge.org/core/journals/language-and-cognition/article/age-of-acquisition-and-language-embodiment-across-the-lifespan/04DE5738205CF100C87A1DE543E484F2

ANA MILOSAVLJEVIC, NAUSICAA POUSCOULOUS & DIANA MAZZARELLA – When irony is (mis)understood: Vigilance cues affect irony comprehension in written discourse

Irony comprehension requires going beyond literal meaning to infer a speaker's dissociative stance. Pragmatic accounts propose that this entails evaluating a speaker's vigilance towards the falsity or irrelevance of the literal proposition, a cognitively demanding process even for adults. Yet, previous research often presupposes successful irony comprehension, focusing on processing measures rather than directly testing interpretive accuracy. This study adopts a theory-driven approach by manipulating speaker cues as pragmatic markers of epistemic vigilance and assessing their impact on irony processing and comprehension. Participants read vignettes with ironical or literal utterances produced by speakers described as epistemically vigilant or non-vigilant. Online processing was assessed through reading times, while irony understanding was measured with polar questions probing interpretations of the speaker's belief and communicative intent. Results showed that participants often misinterpreted ironical statements but were significantly more accurate when speakers were described as vigilant, indicating that speaker-based epistemic cues guide pragmatic interpretation. This effect emerged in comprehension but not in online processing, suggesting that evaluations of speaker intent occur later during more reflective stages of interpretation. These findings underscore the interpretive complexity of irony, challenge assumptions about its automatic understanding in adults, and highlight the socially situated nature of pragmatic inference, with implications for theories of communication and language processing.
https://www.cambridge.org/core/journals/language-and-cognition/article/when-irony-is-misunderstood-vigilance-cues-affect-irony-comprehension-in-written-discourse/74EBA5AA3B8045F05BE330614482FDD3

Nature Scientific Reports

PAPERS

EMMA POMEROY et al – Evidence for funerary behaviour and lethal trauma in a new Neanderthal individual from Shanidar Cave

Shanidar Cave has long featured in debates concerning Neanderthal cognitive capacity and behaviour, including evidence for care and intentional burial. By identifying additional individuals, including Shanidar A reported here, new excavations have expanded a burial cluster first identified in 1960. Shanidar A, an older adult, was deposited around 75,000 years ago, decayed, and their skeletal remains were subsequently disturbed by a flash flood. Our findings raise the minimum number of

individuals in this unparalleled cluster to five, supporting interpretations of complex, potentially meaningful Neanderthal mortuary behaviour. Shanidar A also demonstrates major non-fatal trauma to the face and rare evidence of perimortem penetrating trauma among Neanderthals. Trauma among Middle and Upper Palaeolithic Neanderthals and modern humans, and subsequent survival, is common. However, the facial injury was severe and unusual. It suggests care from group members, the evolutionary origins of which are also contentious. The nature of the perimortem penetrating traumatic injury adds to a small corpus of such injuries in the hominin fossil record. The morphology of this scapula perforation is consistent with injury from a wooden spear, providing valuable (albeit indirect) evidence for the use of wooden implements in the Middle Palaeolithic, which is often difficult to demonstrate given the rare preservation of organic materials.
https://www.nature.com/articles/s41598-026-69193-z

New Scientist

ARTICLES

JAMES WOODFORD – Neanderthal Europe was as much a wooden age as a stone age
When Neanderthals dominated Europe, it was likely that wood was at least as important to them as stone for working into tools.
https://www.newscientist.com/article/2592417-neanderthal-europe-was-as-much-a-wooden-age-as-a-stone-age/

Patterns

PAPERS

CHENGCHENG DU et al – Cross-species dendritic computation for biologically inspired decision-making
Dendrites, the branch-like part of neurons, help nerve cells combine information in complex ways. Since it is difficult to analyze dendritic mechanisms during complex behaviors, computational models can help by generating testable predictions. Highly detailed neuron models, however, are often too complex for practical use in artificial neural networks. We designed a simpler, multi-compartment spiking neuron model inspired by shared dendritic principles observed across mice, macaques, and humans. The model represents two complementary operations: linear integration, which combines inputs, and nonlinear modulation, which allows some inputs to influence how others are processed. We also incorporated these principles into a model that we tested on experiments on Atari tasks. The model, called TNLP-LIF, improved information integration. Overall, our findings suggest that abstracting common computational principles from dendrites, not necessarily copying their biology in detail, may help design more capable and robust artificial neural networks.
https://www.cell.com/patterns/fulltext/S2666-3899(26)00200-X

PeerJ

PAPERS

LUONG VUONG NGUYEN et al – Deep learning-based profanity detection in social media: a survey in the context of toxic language detection
The spread of toxic and profane language across online platforms has necessitated the development of advanced automated detection systems to maintain safe online environments. This survey comprehensively explores the progression of profanity language detection techniques, focusing on datasets, feature extraction methods, and model architectures. Through a thorough examination of key developments in the field, the study outlines the evolution of detection systems across four distinct phases. It offers a taxonomy of approaches that have shaped the current landscape. We review various high-performing models, highlighting their effectiveness in addressing challenges such as context understanding, multilingual data, and identifying subtle forms of toxicity. The article further explores the strengths of these models, including their ability to capture long-range dependencies and nuanced features, while also discussing their limitations, such as computational efficiency and generalization across datasets. By analyzing the current state of toxic language detection and the latest advancements in feature extraction and modeling techniques, we provide valuable insights for researchers and practitioners. Additionally, the article outlines future research directions, emphasizing the importance of lightweight, adaptive models and real-time optimization techniques to enable scalable, practical deployment across diverse platforms and environments.
https://peerj.com/articles/cs-4127/

PLoS Biology

PAPERS

STEVEN MORAN et al – Interindividual vocal tract diversity influences the phonetic diversification of spoken languages
Human vocal tracts, like other physical traits, exhibit extensive interindividual variation. However, little is known about how this variation translates into phonetic diversity between speakers, and ultimately, across languages. Here we develop a biocultural model of phonetic evolution, analogous to Russell Lande's model of multivariate phenotypic evolution. We show that individual vocal tract morphologies and associated articulatory strategies leave consistent acoustic signatures, resulting in a characteristic pattern of phonetic variation within speaker groups that correlates with the pattern observed between groups. Recalling a central tenet of evolutionary biology—that within-group variation feeds between-group diversification—

our findings suggest that phonologically similar vowel systems can attain phonetically diverse realizations according to a neutral-like evolutionary process. Our model serves as a null hypothesis for disentangling the biological versus cultural mechanisms underlying phonetic diversification, where deviations from the neutral expectation may indicate culturally mediated language change.
https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3004003

PLoS One

PAPERS

ROBERT J. BISCHOFF & CECILIA PADILLA-IGLESIAS – Bridging material culture networks and social networks in archaeology

This study examines whether material culture can serve as a proxy for past social interaction. Using the ArchMatNet agent-based model, we simulate social behavior in small-scale communities and resulting material culture production, then compare social and material culture networks. We compare networks using graph correlation and the quadratic assignment procedure, evaluate parameter effects with generalized additive models, and assess underlying structures with exponential random graph models. Within this simulated system, results show strong correlations between social interaction networks and material culture networks, especially when material culture traits are sufficiently variable. However, correlations weaken under some conditions, particularly low material culture variation, indicating limits to archaeological network inference. Key factors include interaction frequency, learning strategy, and trait visibility. These results characterize hypothetical relationships generated under the model's assumptions; they do not constitute empirical validation. They highlight both the promise and the constraints of using material culture as a proxy for social networks and underscore the need for empirical testing and careful attention to network structure.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0358860

PNAS

PAPERS

ROBERT G. TAGUE – Pelvis shows Neanderthals differed from humans in locomotion but not in birth
https://www.pnas.org/doi/abs/10.1073/pnas.2626806123

Proceedings of the Prehistoric Society

PAPERS

TREVOR WATKINS – The deep Palaeolithic Roots of the South-west Asian Neolithic

This paper sets out to see an aspect of the Neolithic of south-west Asia in the context of its cultural evolutionary history: essential components of the architecture of Neolithic communities – hearth and home, and intramural burial – were present as architectural components of social life tens and hundreds of thousands of years before they were accommodated within Neolithic houses. There are two bases that underpin the paper. One is the general view of cultural evolution and cultural niche construction theory that has emerged over recent decades, emphasising human ultra-sociality and capacity for altruism and cooperation; the other is the understanding of architecture as more than built structures, encompassing objects in, on and around buildings, associated meanings and values, and behaviours. We may trace the development of the architecture of social life as it fostered the intensity of social relations, effectively the roots of Neolithic social life. The process begins at least three quarters of a million years ago with the control of fire, cooking, and eating together around the hearth. The evolution of the human cultural niche continues with the emergence around half a million years ago of the idea of the base camp. That is followed about one hundred thousand years ago by the burying of the body of a member of the group below the base camp floor, binding place and belonging into social memory. The Epipalaeolithic–Neolithic transformation represents a quickening of the pace of cultural cumulation in the specific environment of the hilly flanks of the Fertile Crescent in south-west Asia, with the extension of the group's stay for at least a season, and the growth in size of the group. The first large, co-resident communities designed and built permanent settlements, houses with hearths, communal buildings, and ritualised intramural burials, forming a new and meaningful architecture of social life embedded in social memory.
https://www.cambridge.org/core/journals/proceedings-of-the-prehistoric-society/article/deep-palaeolithic-roots-of-the-southwest-asian-neolithic/294D6A33BDB28514EFB80DE1C4927EE6

Proceedings of the Royal Society B

PAPERS

ELEONORA BIFFI et al – Hearing shapes: the Bouba–Kiki effect in adult domestic dogs

The 'Bouba–Kiki effect' is an example of spontaneous association between auditory and visual stimuli, described in humans as a case of sound symbolism, a predisposition linked to language. Recent evidence showed that 3-day-old chicks also exhibit a spontaneous association between round and spiky shapes and the sounds 'Bouba' and 'Kiki,' respectively, thus suggesting that the effect may rather be an instance of a more widespread cross-modal correspondence. We investigated whether the Bouba–Kiki effect is present in adult domestic dogs (Canis familiaris) by investigating dogs' spontaneous tendency to

associate a spiky or a rounded shape to the 'Bouba' and 'Kiki' sounds. Dogs looked significantly more at the rounded shape while 'Bouba' was played, and they looked at and explored the spiky shape when 'Kiki' was played. Our results suggest that a spontaneous sound–shape association akin to that of humans is also present in adult domestic dogs. Further studies are needed to investigate the function and ontogenesis of this cognitive process.
https://royalsocietypublishing.org/rspb/article/293/2080/20261209/483619/Hearing-shapes-the-Bouba-Kiki-effect-in-adult

ALASTAIR KEY – The co-evolution of hominins and Stone Age culture
Human biological and cultural evolution are tightly intertwined; the two display dependent relationships and each influences the trajectory of the other. Archaeological evidence for hominin culture first emerges ca 3.3 million years ago, but increasing data attests to an earlier, deeply rooted onset of gene-culture co-evolution in our lineage. Diverse phenotypic traits are linked to Stone Age culture via the latter's impact on the survival and success of early human populations. Hominin cognitive and language capabilities, along with the anatomy of the hand, are key examples. Similarly, variation in Stone Age culture can be linked to the biological traits of the populations from which it derives; important examples concern stone technologies, hunting strategies and social organization. The co-evolution of hominins and Stone Age culture is, therefore, complex, multi-factorial and one of the major stories in human origins research. Here, current understanding of hominin cultural and biological co-evolution prior to the advent of agriculture is reviewed, and new links between the fossil and archaeological records are drawn.
https://royalsocietypublishing.org/rspb/article/293/2080/20260772/483651/The-co-evolution-of-hominins-and-Stone-Age

DIANA A. LIAO, FELIX KÜRBLE & ANDREAS NIEDER – Switch costs reveal vocal-specific executive demands during flexible action selection in crows
Crows and other corvids exhibit remarkable cognitive flexibility, exercising volitional control that allows them to select, initiate and withhold actions based on deliberate decisions rather than reflex. Among these behaviours, vocalizations are especially demanding, yet crows perform them with exceptional precision, paralleling core building blocks of human speech. Despite this, the executive mechanisms supporting intentional vocal control, and how they differ from those governing other voluntary actions, remain largely unknown. We trained carrion crows to produce either vocalizations or pecking responses to arbitrary visual cues presented in randomized, alternating or blocked sequences that controlled how often response modalities switched across trials. While crows performed both actions with high accuracy, vocalizations were consistently slower and more variable than pecking. Notably, vocalizations showed clear switch costs; transitions into vocal responses caused slower reaction times and occasional errors, whereas pecking was largely unaffected. These results show that crows can flexibly switch between motor modalities and that volitional vocalizations carry specific cognitive control demands, previously undescribed in birds. Crows thus stand out as a rare non-primate species in which volitional vocalizations integrate speed, accuracy and executive control.
https://royalsocietypublishing.org/rspb/article/293/2080/20261105/483640/Switch-costs-reveal-vocal-specific-executive

Royal Society Open Science

PAPERS

HASSAN AL-RAZI et al – Microclimatic effects on activity patterns in a montane chimpanzee population
Climatic variation can shape primate activity budgets by altering the energetic and thermoregulatory costs of feeding, resting, locomotion and social behaviour. However, little is known about how chimpanzees that inhabit cool, wet montane forests adjust their activity in response to fine-scale meteorological conditions. We examined the effects of temperature, absolute humidity (water vapour pressure (WVP)), wind speed and rainfall on eastern chimpanzees (Pan troglodytes schweinfurthii) in Nyungwe National Park, Rwanda, one of the highest-elevation chimpanzee habitats. From March 2024 to February 2025, we collected 1933 party scans and 5661 individual scans, together with scan-level microclimatic measurements. Rainfall showed the clearest behavioural association: feeding probability declined during rainfall, whereas resting increased. Wind speed was negatively associated with both locomotion and grooming, suggesting that windier conditions may constrain movement and social behaviour. Temperature, WVP and fruit availability showed no clear association with any of the four behaviours. Feeding probability was higher and resting probability lower in the wet season than in the dry season. Harmonic beta-binomial generalized linear mixed-effects models revealed pronounced daily rhythmicity in feeding and resting. Overall, Nyungwe chimpanzees maintained broadly conserved daily activity rhythms while selectively adjusting behavioural allocation in response to immediate meteorological conditions.
https://royalsocietypublishing.org/rsos/article/13/10/261020/483608/Microclimatic-effects-on-activity-patterns-in-a

Science Advances

PAPERS

DONGDONG LI, SUWEI GUO & XINGCAN CHEN – How inequality became durable before states: Evidence from 6000 years in the Central Plain of China
How did durable inequality emerge before the rise of states? Drawing on a synthesis of previously published mortuary data from more than 2300 burials, together with isotopic, zooarchaeological, and osteological data spanning nearly 6000 years

(7000 to 1500 BCE) in the prehistoric Central Plain of China, we reconstruct long-term patterns of relational mortuary inequality. We show that inequality followed a strongly nonlinear trajectory and cannot be explained primarily by agricultural intensification or population scale. Instead, substantial disparities were structured by differential positions within social-relational networks that mediated access to labor, resources, and symbolic capital. Transformations in subsistence, the rise of mobile and appropriable wealth, and escalating conflict reorganized these networks, concentrating ritual and political-military power and technological control. Early states stabilized rather than created these preexisting disparities by institutionalizing control over resources, violence, and network-based access. These findings highlight the central role of social networks in shaping durable inequality before formal state institutions.
https://www.science.org/doi/10.1126/sciadv.ady6737

SOFIA RAGLIO et al – Learning to infer transitively on a mental line in premotor cortex
Transitive inference (TI) is a form of deductive reasoning that enables the derivation of unknown relationships among premises. It is hypothesized that this cognitive process relies on mapping stimuli onto a "mental line," a linear workspace organized by arbitrarily assigned ranks. However, its neural basis remains unclear: Does this mental line have a neural correlate and how is it learned? This study investigates the role of dorsal premotor cortex (PMd) in encoding the hypothesized mental line as monkeys acquire item relationships for motor decisions. Findings reveal that PMd multiunit activity organizes along a theoretically predicted direction, supporting a geometrical model that explains behavior. Moreover, a learning process is observed, where the mental line rotates to align with motor planning.
https://www.science.org/doi/10.1126/sciadv.aec2068

Trends in Cognitive Sciences

PAPERS

LAURA VOIGT et al – Beyond attention: performance pressure shifts information-processing complexity
Why does performance pressure sometimes cause choking but sometimes elicit exceptional performance? We propose that pressure shifts the complexity of information-processing rules that guide action. Performance improves when shifts move processing toward task-matched complexity and deteriorates when they promote maladaptive simplification, overcomplexification, or the use of rules that exceed available processing resources.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(26)00213-5

Trends Open

PAPERS

ROXANE S. HOYER et al – Temporal horizons of moral consciousness
Moral processing runs continuously in the brain, yet only part of it reaches consciousness and guides deliberate judgment. Moral consciousness turns separate evaluations of harm, fairness, and obligation into a unified sense of moral significance. This transformation is modeled as conscious access: moral content becomes conscious when evidence, weighted by its reliability and integrated across three temporal horizons (immediate events, short-term context, and long-term values), crosses a capacity-limited threshold. Brain systems for emotion, cognitive control, and self-related thought supply competing or aligning signals, explaining why some cues stay implicit while others become conscious. By treating the horizons as dissociable and their reliability estimable, this model predicts when a moral signal gains conscious access and identifies the experiment that would falsify it.
https://www.cell.com/trends-open/fulltext/S3117-3470(26)00149-5

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