EAORC BULLETIN 1,193 – 26 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 – IMHO: Inventing modern human origins

In Interrogating Human Origins: Decolonisation and the Deep Human Past, Martin Porr & Jacqueline Matthews(eds.), Routledge (2020).

IAIN DAVIDSON – IMHO: Inventing modern human origins

IDK is LOL-speak for I Don't Know. Knowledge of the past, like all knowledge, depends on the meanings of the words used in acquiring and maintaining it. Part of coming to know things is learning to name them. Too often we take for granted the definitions of the basic concepts, yet it turns out that often they derive from a prior history with quite political origins that impact what we think we know. As an example of this, my use of the first person is intended to show that I am aware of the subjectivity I bring to this piece. But it is also open to the criticism that I am writing as an old white male of certain education, privilege and background. My view is that it is better to be open about both of those things than to conceal them behind impersonal passive (aggressive) language.

There are two related but different issues in the study of human origins. On the one hand is biological evolution of humans and our ancestors, traditionally studied through the analysis of fossilised skeletal remains; on the other is the evolution of hominin and human behaviour, traditionally studied from archaeological evidence including stones and bones. It turns out that there are questions about classification in both domains, and these questions turn on the fact that both researchers studying skeletons and those studying behaviour use language composed of words, and hence classifications and concepts, defined by conventions. All of those classifications and concepts have history about how the conventions were originally defined: they derive from the history of the disciplines in the societies in which they arose, and from common usages among the general public of those societies. In most cases, those societies were actively engaged in colonialism during the period when the disciplines were developed, and the evidence was viewed through a corresponding cultural filter. The words and concepts of the discipline of archaeology carry the marks of colonialism. A modern approach to archaeohistory needs to look carefully at the colonial legacy in the interpretations that imbue our disciplines. At the same time, the concepts of postcolonialism and decolonisation can also be examined for their subjectivities and theoretical contexts.

https://www.academia.edu/165647667/Imho_Inventing_Modern_Human_Origins

NEWS

NATURE BRIEFING – The brain's 'secret subway system'

Brain cells called astrocytes form extensive networks in the mouse brain that are similar in some ways to those formed by neurons. Researchers have compiled a whole-brain 3D map of astrocyte networks — the first of its kind, they say. The atlas reveals how webs of these cells connect far-flung regions of the brain, allowing them to exchange molecules with each other over long distances. "It's a secret subway system we didn't know was there," says neuroscientist and study co-author Shane Liddelow. "This opens up a whole new avenue of investigation."

https://www.nature.com/articles/d41586-026-01338-6

NATURE BRIEFING – Monkeys eat dirt after junk-food binges

Barbary macaques (Macaca sylvanus) in Gibraltar have been spotted eating soil in what might be an attempt to settle their stomachs. Tourists often feed the monkeys high-fat, sugary foods, which could disrupt the animals' gut microbiomes. The soil could "buffer their digestive system", says primate researcher and study co-author Sylvain Lemoine, and the bacteria and minerals in it could help to rebalance the monkeys' microbiomes. But the behaviour might also be causing the monkeys harm. They often eat dirt from the roadside, which could contain harmful pollutants, says Lemoine.

https://www.theguardian.com/world/2026/apr/22/gibraltar-monkeys-eat-mud-avoid-upset-stomachs-tourists-junk-food

NEWS FROM SCIENCE – Early humans turned favored rock sites into toolmaking assembly lines

Such prescient planning started 50,000 years earlier than thought, study finds.

https://www.science.org/content/article/early-humans-turned-favored-rock-sites-toolmaking-assembly-lines

SCIENCEADVISER – An ancient assembly line comes to light

When it comes to ancient stone toolmaking, not all strategies were the same. Scientists believe that for millions of years our distant ancestors mostly grabbed rocks on the go while hunting and gathering, or migrating from place to place; they fashioned them into whatever was needed there on the spot. A different, arguably more advanced technique known as direct procurement—which involves humans seeking and repeatedly visiting choice rock outcrops for the specific purpose of obtaining materials—wasn't thought to have arisen until much later, perhaps around 166,000 years ago.

A study out this month in Nature Communications suggests that timeline may need to be rewritten. Archaeologists excavating a site called Jojosi in South Africa's eastern grasslands found rock fragments reflecting both the beginning and end products of the toolmaking process, in which makers chipped away small flakes to slowly shape and sculpt a smaller core. The abundance of these castoffs suggests the area was primarily a manufacturing site for "blanks," of partially knapped stones that could later be refined into a multitude of different tools.

When the researchers dated the sediment layers in which these blanks were found, they discovered people visited the site frequently from about 220,000 years ago to 110,000 years ago, making it the earliest evidence of direct procurement yet uncovered. “The Jojosi research shows that humans were deliberate about their sourcing behaviors,” said archaeologist Matt Lotter. “This implies clear planning and intentionality.”
https://www.science.org/content/article/early-humans-turned-favored-rock-sites-toolmaking-assembly-lines

SCIENCEADVISER – Born to talk

The question of what makes us human can get philosophical pretty fast. But for those who point to our language capabilities, new genetics research will back you up.
Researchers built on past studies documenting the language abilities—and saliva—of 350 elementary school children. They wanted to analyze genetic regulatory sequences called Human Ancestor Quickly Evolved Regions (HAQERs), which influence how genes get expressed. The students’ DNA helped the team confirm HAQERs’ importance in processing and demonstrating language. Then, the researchers looked for the presence of HAQERs in regions of DNA known to have evolved in ancient primates and hominins.
They found that HAQERs evolved after hominins split from chimps but before Homo sapiens diverged from Neanderthals—meaning complex communication likely preceded our own species. This “sliver of the genome has remained relatively constant, even as other aspects have been going up and up and up to make modern humans smarter and smarter ,” author Jacob Michaelson said in a statement. “We can say humans at least had the ‘hardware’ for language earlier than what we previously thought.”
As for why the HAQERs didn’t continue to evolve much after the Neanderthal-human split, the researchers suggest it’s because they promote fetal development—and give babies bigger heads. That tradeoff would have quickly cost the lives of ancient mothers and infants.
https://www.science.org/doi/10.1126/sciadv.aed5260

SCIENCENEWS – How to invent a realistic language for fictional speakers

Theater buffs must have been amused by the sixth Star Trek movie when Chancellor Gorkon tells Spock "you have not experienced Shakespeare until you have read him in the original Klingon." But for hard-core sci-fi fans, there’s a drop of truth in that quip: You can in fact read The Tragedy of Khamlet, Son of the Emperor of Qo'noS entirely in Klingon, which is a famous example of a constructed language, or conlang. As Maria Temming reports, linguists have been inventing conlangs for fictional properties for decades, and studies of them today are offering clues to the nature of language and how humans process it.
How are conlangs invented? Linguists often draw from real languages to craft a conlang, deciding on the speech sounds and grammatical structures that fit their fictional world. Some, like Klingon, bundle sounds in ways that no real languages do in order to sound as alien as possible. Others, like Na’vi from the Avatar film franchise, borrow sounds from specific languages to create a particular “flavor” for their world-building.
What can conlangs teach us? Studies of people who learn conlangs have revealed some surprises about how easily people learn languages they don’t grow up speaking, and about how the brain processes language. For example, one study found that the brain seems to treat languages — real or constructed — differently from other forms of communication, like math or computer code.
https://www.sciencenews.org/article/conlang-fictional-languages-linguistics

PUBLICATIONS

Current Biology

ARTICLES

ZIV WILLIAMS – Neuroscience: A homotopic superhighway across the orbitofrontal cortex

Researchers have discovered a high speed neural ‘superhighway’ connecting the human orbitofrontal cortex’s two hemispheres. This connection could allow for rapid communication necessary for coordinating complex behavior and open a new window for treating disorders such as depression and epilepsy.
https://www.cell.com/current-biology/abstract/S0960-9822(26)00326-X

PAPERS

ANDREA PICIN et al with JANET KELSO & JEAN-JACQUES HUBLIN – First multi-individual Neanderthal mitogenomes from north of the Carpathians

Neanderthals of Central-Eastern Europe are well documented by a wealth of archaeological sites, but thus far they remain poorly represented by both fossil and genetic data. At Stajnia Cave (Poland), nine Neanderthal teeth have now been integrated into a single high-resolution study combining morphological assessment, radiocarbon dating, and complete mitochondrial (mt) genome sequencing. We report eight new mitogenomes, including from four never-before-analyzed teeth, that resolve a minimum of seven, and possibly eight individuals. Three of the specimens share identical mitochondrial

DNA (mtDNA), indicating that they are either from the same or maternally related individuals. Molecular branch shortening estimates place all samples in marine isotopic stage (MIS) 5, with point estimates of ~119,700–92,498 years ago, making this the oldest multi-individual Neanderthal genetic assemblage yet characterized in Central Europe. Other Neanderthals with similar haplotypes were present in southeastern France, Iberia, and the Caucasus, suggesting this mt lineage might have been widespread across Europe before being replaced with the mtDNA of the "late Neanderthal type." Our analysis of the Stajnia fossils positions Central-Eastern Europe not as a peripheral fringe, but as a pivotal area for tracing Neanderthal geographic distribution.
https://www.cell.com/current-biology/fulltext/S0960-9822(26)00389-1

KIM-LOUISE KRETTEK et al with DAVID REICH – The shared genomic history of Middle- to Late-Holocene populations from the Southern Cone of South America

The Southern Cone represents the southernmost region of South America settled by humans. Although ancient genomes from southern Patagonia have been sequenced, genomes from the central Southern Cone (CSC) remain temporally and spatially sparse. Archaeology documents major cultural transformations during the Middle and Late Holocene, yet their relationship with demographic processes has been debated. We present genome-wide data from 52 individuals spanning 6,000 years, originating from four regions of the CSC in present-day Argentina and Uruguay: the central and southern Pampas, Northwest Patagonia, the Paraná River Delta and Lower Uruguay River, and the eastern lowlands of Uruguay. Genomic evidence from the Pampas reveals the presence of at least three distinct ancestries during the Middle Holocene. Although genetic contacts with southern Patagonian groups were sporadic, we identified the expansion of an ancestry of unknown geographic origin by 5,500 years ago (ya), which increased during the Late Holocene. This ancestry arrived in Northwest Patagonia by at least 600 ya and co-existed locally with a southern Andean genetic profile until colonial times. Genetic structure differentiates populations along the Paraná River Delta and Lower Uruguay River by 1,500 ya. Individuals from the eastern lowlands of Uruguay show genetic links with Sambaqui-associated populations from the southern coast of Brazil, suggesting the role of human dispersals in connecting tropical lowland cultural traditions. Our work documents the diffusion of genetically distinct groups across all studied regions and provides compelling evidence that large-scale human movements contributed to the remarkable cultural diversity of CSC populations during the Middle and Late Holocene.
https://www.cell.com/current-biology/fulltext/S0960-9822(26)00429-X

eLife

ARTICLES

JÜRGEN GERMANN – Neuroanatomy: Hidden folds reveal brain organization

As the brain grows during development, its outermost region – the cerebral cortex – folds to form a distinctive pattern of grooves and ridges (Chi et al., 1977). Although all human brains look slightly different, there are consistent features that have guided neuroscientists for more than a century. The largest folds, known as primary sulci, form during mid-gestation and are relatively consistent across individuals, while smaller folds develop later and are more variable (Demirci et al., 2023). This combination of consistency and variation is a defining feature of brain organization.
https://elifesciences.org/articles/111265

PAPERS

JACOB BOWMAN et al – Pervasive relaxed selection on spermatogenesis genes coincident with the evolution of polygyny in gorillas

Reviewed Preprint

Gorillas have a polygynous social system in which the highest-ranking male has almost exclusive access to females and sires most of the offspring in the troop. Such behavior results in a dramatic reduction of sperm competition, which is ultimately associated with numerous traits that cause low efficacy of gorilla spermatogenesis. However, the molecular basis behind the remarkable erosion of the gorilla male reproductive system remains unknown. Here, we explored the genetic implications of the polygynous social system in gorillas by testing for altered selection intensity across 13,310 orthologous protein-coding genes from 261 Eutherian mammals. We identified 578 genes with relaxed purifying selection in the gorilla lineage, compared with only 96 that were positively selected. Genes under relaxed purifying selection in gorillas have accumulated numerous deleterious amino acid substitutions, their expression is biased towards male germ cells and are enriched in functions related to meiosis and sperm biology. We tested the role of gorilla relaxed genes previously not implicated in male reproductive function using the Drosophila model system and identified 41 novel spermatogenesis genes required for normal fertility. Furthermore, by exploring exome/genome sequencing data of infertile men with severe spermatogenic impairment, we found that the human orthologs of the gorilla relaxed genes are enriched for loss-of-function variants in infertile men. These data provide compelling evidence that reduced sperm competition in gorillas is associated with relaxed purifying selection on genes related to male reproductive function. The accumulation of deleterious mutations in these genes likely provides the mechanistic basis behind the low efficacy of gorilla spermatogenesis and uncovers new candidate genes for human male infertility.
https://elifesciences.org/reviewed-preprints/94563

Evolutionary Human Sciences

PAPERS

OLEG SOBCHUK & MASON YOUNGBLOOD – Cultural Evolution – of the Arts

Accepted manuscript. Accepted Manuscripts are early, peer-reviewed versions that have not yet been copyedited, typeset, or formally published and may not meet all accessibility standards. A fully formatted accessible version will follow.

In this paper, we chart an emerging academic terrain: cultural evolution of the arts, which is a theory-driven exploration of artistic dynamics, often done with large datasets of music, literature, movies, paintings, or games. This field has grown on the intersection of cultural evolution theory and several academic fields: computational humanities, anthropology, network science, and others, and poses interesting challenges for each of them. What constitutes artistic transmission in the first place? Is it possible to find recurring patterns in artistic history – and how much data is needed for that? What makes the evolution of the arts different from the evolution of other forms of knowledge? We discuss all these problems in this paper. Additionally, we perform a bibliographic analysis of this field and explore a co-citation network of the works on artistic evolution. Finally, we highlight major challenges for this field in the future, as the arts are rapidly evolving in the digital age.
https://www.cambridge.org/core/journals/evolutionary-human-sciences/article/cultural-evolution-of-the-arts/018C2418F37CC343CDAC5528D8DB20CB

Frontiers in Psychology

PAPERS

LIN GUO, ZHENYAO QUAN & CHENGYU NAN – Patterns of emotional expression during the formation of egocentric awareness in early childhood: a case study

Emotional expression is a fundamental dimension of children's social development and is closely linked to psychological processes, language competence, and self-awareness. Drawing on developmental psychology and cognitive linguistics, this study traces how a two-year-old Mandarin-speaking child develops self-recognition and egocentric awareness. Through naturalistic observation and discourse analysis, this study delineates the developmental stages of emotional expression, examines the dynamic interplay between self-awareness and language awareness across stages, and further explores how affective dialogue fosters the differentiated development of egocentric awareness. The findings indicate that egocentric awareness unfolds along a developmental continuum from affective monologue to affective dialogue. In the monologue stage, self-recognition and language awareness emerge concurrently; in the dialogue stage, egocentric awareness co-develops with language-mediated embodied thinking and an increasing demand for interpersonal feedback. Bidirectional affective expression at this stage appears to promote the development of children's general cognitive abilities. Grounded in authentic linguistic and behavioral data, this study offers a preliminary exploration of emotional expression patterns during children's mental maturation and provides tentative insights for constructing an "emotion-language" co-development model.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2026.1756750/full

JING CAO & TIANLI ZHOU – Human or machine? Do source beliefs shape cognitive bias in post-editing?

As artificial intelligence (AI) translation becomes increasingly integrated into professional and educational contexts, perceptions of "machine vs. human" translation may shape translators' cognitive and evaluative and post-editing behaviors. This study investigates the role of cognitive bias in post-editing, examining how translators' beliefs about translation sources—human or AI—trigger systematic deviations in evaluation and revision behavior. Sixty master students in Translation and Interpreting participated in a between-subjects experiment: the experimental group received mislabeled texts (human translations labeled as AI, AI translations labeled as human), while the control group was informed of the true sources. Participants evaluated two English-to-Chinese translations on fidelity, fluency, and completeness (5-point Likert scales) and performed post-editing, with modifications recorded for type and rationale. Quantitative analyses (revision counts, quality ratings) and qualitative reflections were examined to explore how cognitive preconceptions modulate linguistic judgment and editing behavior. Findings indicate that perceived AI labels elicited lower trust, increased post-editing intensity, heightened error sensitivity, and more conservative quality ratings, even when translation quality was equivalent. This reveals a subtle form of language-related cognitive bias, in which perceived source identity, rather than objective quality, drives evaluation and modification decisions. By bridging translation studies and cognitive psychology, the study provides empirical insight into human–AI interaction and offers pedagogical implications for fostering critical post-editing literacy and inclusive attitudes toward AI-mediated communication.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2026.1819659/full

Frontiers in Sociology

PAPERS

SHAGOR RAHMAN & ANDREW PASHEA – Transcendental model selection: a computational account of symbolic cognition and general intelligence through morality and culture

General intelligence enables flexible problem solving across diverse contexts by minimizing uncertainty. Symbolic systems such as language extend this capacity, allowing humans to build social groups and construct world models beyond typical biological constraints. Previous research on linguistic communication within active inference has emphasized deep

hierarchical models that ensure shared semantics between communicators. We argue that these models, while powerful, require extension to account for symbolic genesis, specifically using morality not only as uncertainty minimization across cultural niches, but also as the mechanism that created the virtual space enabling symbolic cognition. Our ancestors transcended dyadic modeling by implementing cultural layers through novel model selection, enabling in-group signaling and hierarchical social organization through psychological typing. This rendered the generative process endogenous (self-referential). Our emotional and impulsive tendency toward morality, we argue, enabled the deeper level of abstraction and the stable third-party triangulated perspective necessary for symbolic thought. This framework can be evaluated through simulations similar to recent active inference literature and provides a foundation for building generally intelligent systems aligned with human cultural values.
https://www.frontiersin.org/journals/sociology/articles/10.3389/fsoc.2026.1646503/full

Journal of Linguistics

PAPERS

SARAH SCHWELLENBACH – Revising and extending Gricean maxims: The TRICS-Principles
Grice's foundational conversation model has inspired a range of influential developments, with various approaches to merging the maxims. This paper addresses unresolved controversies and circular dependencies that have fuelled assumptions of interdependence among the principles. It provides a revision of both Grice's cooperative principle and the principles of truthfulness, relevance, informativeness and clarity, and extends them to include a principle of social conformity, which I collectively refer to as the TRICS-Principles. I demonstrate that the TRICS-Principles operate independently of each other at different levels and show the extent to which the other principles may function under the umbrella of a flouted principle of truthfulness. Furthermore, I distinguish the principle of social conformity from the concept of politeness, offering a nuanced perspective on their relationship. Finally, I provide new insights into factors influencing shifts in the prioritisation of the TRICS-Principles.
https://www.cambridge.org/core/journals/journal-of-linguistics/article/revising-and-extending-gricean-maxims-the-tricsprinciples/60ED925352FAFB956A3041A3D8F2371C

Nature

ARTICLES

JIABIN WU – Human cooperation undergoes constant breakdown and repair
Real-world data reveal that cooperation continually falls and rebounds. Motivation to cooperate must therefore be actively renewed rather than assumed to sustain itself.
https://www.nature.com/articles/d41586-026-01048-z

PAPERS

NICHOLAS SABIN, DAVID KLINOWSKI & FELIX REED-TSOCHAS – Punctuated decline of human cooperation
Human cooperation is dynamic and often declines even under favourable conditions. Many prevailing theories explain the decrease of cooperation in terms of strategic behaviour or learning, framed as evidence of rational behaviour or progression towards rationality. Here we show that a key source of long-term decline derives from deviations from rational behaviour that systematically vary over time. We analyse a natural social dilemma in the field—that is, group lending in Sierra Leone—tracking cooperative dynamics over a five-year period. Borrowers enter a joint-liability contract, structured so that if the group loan is not repaid in full, all members lose access to future credit. This produces a threshold social dilemma with incentives to free-ride. The dataset includes 47,931 group payments made by 7,108 borrowers, augmented with a two-stage cluster sample of semi-structured interviews. We find a statistically robust pattern of punctuated decline driven by behavioural mechanisms. Cooperation rates start out high but gradually decline due to decreases in group members' cooperative motivation and effort. Sharp rebounds occur when loans are restarted and clients resensitized to their cooperative responsibilities, even though the group membership and dilemma structure are largely unchanged. This pattern persists over the five-year observation window, but with each successive restart the subsequent decline is more rapid. The findings have direct implications for preventing behavioural decline in cooperative programmes and institutions.
https://www.nature.com/articles/s41586-026-10380-3

MELISSA L. COOPER et al – Astrocytes connect specific brain regions through plastic networks
Neuronal axons have traditionally been considered to be the primary mediators of functional connectivity among brain regions. However, the role of astrocyte-mediated communication has been largely underappreciated. Astrocytes communicate with one another through gap junctions, but the extent and specificity of this communication remain poorly understood. Astrocyte gap junctions are necessary for memory formation1,2, synaptic plasticity3,4,5, coordination of neuronal signalling6, and closing the visual and motor critical periods7,8. These findings indicate that this form of communication is essential for proper central nervous system development and function. Despite the importance of astrocyte gap junctional networks, studying them has been challenging. Current methods such as slice electrophysiology disrupt network connectivity and introduce artefacts due to tissue damage. Here, we developed a vector-based approach

that labels molecules as they are fluxed by astrocyte gap junctions in awake, behaving animals to overcome these limitations. We then used whole-brain tissue clearing9,10 to image these intact, three-dimensional astrocyte networks. We show that multiple astrocyte networks traverse the mouse brain. These networks selectively connect specific regions, rather than diffusing indiscriminately, and vary in size and organization. We observe local networks that are confined to single brain regions and long-range networks that robustly interconnect multiple regions across hemispheres, often exhibiting patterns distinct from known neuronal networks. We also demonstrate that astrocyte networks undergo structural reorganization in the adult brain after sensory deprivation. These findings reveal a mode of communication between distant brain regions that is mediated by plastic networks of gap junction-coupled astrocytes.
https://www.nature.com/articles/s41586-026-10426-6

MARCOS ARAÚJO CASTRO E SILVA et mul – The evolutionary history and unique genetic diversity of Indigenous Americans

Indigenous peoples of America represent the last principal expansion of humans across the globe1, yet their genetic history remains one of the least explored2. Although these populations have inhabited the continent for thousands of years3, their evolutionary history remains largely unresolved4,5, owing to the limited availability of genomic data. Here we present data on 128 high-coverage Indigenous American genomes and show they harbour extensive and previously uncharacterized genetic diversity, reflecting at least three dispersals into South America, followed by regional differentiation and long-term continuity. We identified widespread natural selection signals in genes associated with immunity, metabolism, reproduction and development, which were shaped by adaptation to diverse environmental conditions. Notably, several genomic regions exhibit a remarkable allele sharing with Australasian populations, probably originating from an ancient admixture event and partly maintained by selection for more than 10,000 years. We also detected distinct contributions from archaic humans with adaptive introgression affecting key biological functions. The limited overlap between the regions of Australasian affinity and archaic ancestry indicates independent evolutionary origins of these signals. These findings challenge simplified models of continental settlements and show a more dynamic and complex evolutionary history for the Indigenous peoples in America.
https://www.nature.com/articles/s41586-026-10406-w

Nature Communications Biology

PAPERS

KELLY J. HIERSCHE, DAVID E. OSHER & ZEYNEP M. SAYGIN – Functional dissociation of language and theory of mind in the developing superior temporal lobe

Language and theory of mind (ToM; the ability to infer others' mental states) are both crucial for human communication, and yet their developmental origins are unclear. Are their neural substrates distinct within the superior temporal lobe (STL) but with opposing lateralization, as in adults? Or do they emerge from common neural substrates during development, perhaps in homologous regions originally involved in more basic social processing? Here we investigate the development of this functional dissociation, and the dissociation of their underlying connectivity fingerprints in a large cohort of children (ages 3-9 years, n = 54 sessions, n = 42 subjects) and adults (n = 28). We demonstrate that children show distinct patterns of neural specificity for language and ToM in STL, just like adults. Children show no evidence of developmental 'disentangling' cross-sectionally or longitudinally. Finally, children's connectivity fingerprints predicting future language or ToM activation are almost identical to concurrent fingerprints and are largely non-overlapping across domains. While linguistic and ToM processing undergo continued neural specialization to reach the mature adult-like state, they are remarkably distinct early in human development. Our results challenge the idea that language develops from neural processors common for social communication and instead support distinct neural origins of these mental domains.
https://www.nature.com/articles/s42003-026-10040-2

ALEKSANDRA MITINA et al – Comparative analysis of milk and brain fatty acids reveals human-specific signatures in brain development

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.

Lipids constitute the majority of brain dry weight and play essential structural and signaling roles. During early life, their supply depends largely on breast milk, yet how milk composition aligns with brain fatty acids (FA) across species has not been systematically explored. We analyzed 837 milk samples from seven mammalian species and 194 brain samples from five species using LC-MS. We identified 81 FA in milk and 33 in brain, with 31 shared across both tissues. FA composition in milk and brain was strongly correlated, particularly in humans and macaques, with the strongest associations observed in the prefrontal cortex and during the first four weeks postpartum. Humans were uniquely enriched in very- and ultra-long-chain unsaturated FAs (≥24 carbons) in both milk and brain, suggesting a role in species-specific neurodevelopment. Infant formula clustered closer to bovids than to human milk, underscoring compositional differences of potential nutritional relevance. These findings reveal conserved and human-specific features of milk and brain FAs, highlight the importance of early milk supply for neurodevelopment, and provide evolutionary and translational insights into infant nutrition.
https://www.nature.com/articles/s42003-025-09401-0

NADIA BLOSTEIN et al with CHET C. SHERWOOD & WILLIAM D. HOPKINS – Morphological and anatomical variations in subcortical anatomy between humans and chimpanzees associated with heritability patterns related to human behavioral traits

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There has been significant research on cortical reorganization in human evolution, but much less is known about the reorganization of subcortical circuits, key partners of the cortex. Here, using advanced image analysis and comparative neuroimaging, we systematically map organizational differences in striatal, pallidal, and thalamic anatomy between humans and chimpanzees. We relate interspecies differences—proxies for evolutionary change—to genetics and behavioral correlates in humans. We show highly heritable morphological measures are expanded across species, contrasting previous cortical findings. Multivariate techniques identified morphological-cognitive latent variables linked to striatal expansion and affective variables specifically associated with conserved thalamic and pallidal regions. Our results confirm that regions tied to higher-order cognitive functions are expanded in humans, whereas regions linked to lower-order limbic functions are conserved. These findings provide new insights into subcortical architecture. Additionally, we developed tools to map neuroimaging data across species, a prerequisite for quantitatively translating animal neuroanatomy to humans.
https://www.nature.com/articles/s42003-026-10066-6

Nature Neuroscience

PAPERS

JANET H. T. SONG et al with DAVID REICH – Genomic approaches for understanding the evolution of the human brain

Human cognitive and social behaviors differ from those of other mammals, but the molecular, cellular and circuit-level changes that underlie these behavioral differences are poorly understood. The recent availability of thousands of mammalian, non-human primate, ancient human and modern human genomes now makes it possible to use quantitative approaches to identify genomic regions with signatures of selection in humans, which, when combined with comparative experimental approaches, can provide precise insights into the phenotypes that were the targets of adaptation across different evolutionary timescales. This Review presents a progress report on a ‘genome-up’ approach to understanding human brain evolution and lays out a framework for further advancement. Additional progress will require cohort expansion to improve the identification of genetic loci under selection, the application of comparative experimental approaches to additional milieus and the functional dissection of specific human-evolved loci.
https://www.nature.com/articles/s41593-026-02277-1

JIAJIE ZOU (邹家杰), DAVID POEPPEL & NAI DING (丁鼐) – Constituent-constrained word prediction during language comprehension

Next-word prediction has been hypothesized as the central computational objective of the human language system, akin to that of current large language models. Here we put this conjecture to the test, investigating whether the brain predicts each upcoming word as precisely as possible when listening to connected speech. In three magnetoencephalography experiments with Mandarin Chinese speakers, we demonstrate that the response related to word unpredictability, that is, word surprisal calculated using large language models, is significantly stronger for words within an ongoing constituent than words across a major constituent boundary, and this effect is further modulated by the certainty of a constituent boundary. This constituent-boundary effect is also observed behaviorally unless speech is very slowly presented, and it is confirmed by analyzing a dataset of electrocorticography responses to natural English narratives. The constituent-boundary effect demonstrates that the language system does not solely optimize word-prediction precision; rather, it balances word-prediction contributions by constituent-constrained management of linguistic contextual representations.
https://www.nature.com/articles/s41593-026-02272-6

Nature Scientific Reports

PAPERS

J. FRATER et al – Geophagy in Gibraltar Barbary macaques is a primate tradition anthropogenically induced

We report, for the first time, geophagy – the deliberate consumption of earth – in the Barbary macaque (Macaca sylvanus) population living at the human-primate interface in Gibraltar. We evaluate potential adaptive functions of this behavior in an anthropogenic context, drawing on predictions from the protection and supplementation hypotheses. Geophagy occurred at exceptionally high rates compared to other macaque species and locations, and it was more common in summer when tourist numbers peak. It was also more likely when macaques consumed greater amounts of tourist-derived food, supporting a protective function. Local ecological factors contributed as well, with the distribution of red soil (terra rossa) influencing geophagy frequency. Although the behavior was not linked to female reproductive status, supplementation cannot be fully dismissed given the very limited insectivory in this population. We propose that tourist-derived foods may disrupt gut microbiome composition, producing discomfort that individuals mitigate through soil ingestion. Geophagy is likely socially

learned, as groups showed consistent preferences for specific soil types, and its practice in presence of conspecifics offered opportunities for social learning. Reports from other sites indicate that geophagy is not unique to Gibraltar, but in this population it appears to be anthropogenically induced and socially transmitted, forming a locally maintained tradition.
https://www.nature.com/articles/s41598-026-44607-0

New Scientist

ARTICLES

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/

MICHAEL MARSHALL – Are Neanderthals descendants of modern humans?
The gap between genetics and archaeology leaves us with an unclear picture of where the Neanderthals originated. A surprising new hypothesis that suggests they may have come from us.
https://www.newscientist.com/article/2522913-are-neanderthals-descendants-of-modern-humans/

DAVID ROBSON- Why is it so hard to change your mind?
Changing your opinion can be difficult, and it's sometimes even seen as a flaw. But research shows being open-minded has a host of benefits. There are a few simple ways to encourage yourself to withstand the discomfort that gets in the way of mental flexibility.
https://www.newscientist.com/article/2522927-why-is-it-so-hard-to-change-your-mind/

PLoS One

PAPERS

ANA CAROLINE BINI DE LIMA et al – Social enrichment mitigates facial expressions and physiological indicators of short-term stress in horses
This study aimed to evaluate the ability of social noncontact environmental enrichment to facilitate social buffering and to characterize the emotional experience of horses subjected to restraint in stock by assessing physiological parameters and facial expressions. Pantaneiro horses (n = 11) were evaluated in a crossover design with two treatments: social noncontact enrichment during stock restraint and social isolation during stock restraint. Physiological parameters (heart rate, heart rate variability, respiratory rate, ocular temperature by infrared thermography, and auricular temperature by infrared thermometer) and facial expressions (EquiFACS) were assessed throughout the 24-minute restraint period. When horses were accompanied by a conspecific, heart rate, respiratory rate, and eye temperature were lower ($p < 0.05$) than when they were socially isolated. The frequency of facial expressions associated with stress responses, such as nostril dilator (AD38), inner brow raiser (AU101), upper eyelid raiser (AU5), eye white increase (AD1), ears forward (EAD101), and ears back (EAD104), was also lower ($p < 0.05$) in social noncontact enrichment compared to social isolation. The combined assessment of facial expressions and physiological parameters provides robust evidence that, during this intervention, the animals experience an emotional state characterized by high arousal and negative valence. In this context, social noncontact environmental enrichment can facilitate social buffering, leading to a reduction in stress indicators associated with high arousal and negative valence.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0347571

MONIQUE QUINN et al – Who belongs? Co-creating an assessment to measure belonging in a community space
It is inherent to human nature to want to belong, and a strong sense of belonging has been closely correlated with multiple metrics of wellbeing on an individual and community level. Ensuring improvement in sense of belonging requires accurate measurement of belonging within the community of interest, an effort that has previously been constrained to primarily education and employment spaces and often lacking community voice. In this paper, we describe a novel approach to survey development, wherein we combine community voice with existent validated survey tools to develop a measure of a construct – sense of belonging in this instance – within a timeframe that better fits community desired pace for progress and change. In partnership with the YMCA of Greater Cincinnati, we worked within a Community Based Participatory Research (CBPR) approach to measure sense of belonging using a combination of literature review, extraction and qualitative research methods. External member checking and a Cronbach alpha analysis illustrate success in measuring the construct of interest: sense of belonging within the context of YMCA membership.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0345864

Proceedings of the Royal Society B

PAPERS

SOFIA MAFALDA PEREIRA et al – Complex modulation of visual attention to 3rd-person interactions in wild macaques
Social animals rely on socio-cognitive skills to monitor their social environment and make informed decisions. Yet, visual attention to others' interactions in real-life scenes remains understudied, despite evidence for dedicated neuronal networks for the processing of real-life social information and for social interactions in particular. Here, we ask how subject characteristics, interaction valence and social relationships between subject and stimuli interact to guide overt attention of 56 wild male Assamese macaques to 962 third-person social scenes that unfolded spontaneously in their vicinity. Social interactions drew more and longer attention than social control scenes lacking the interaction, highlighting the relevance of interaction. The effect of both social bond strength and dominance relations between subject and stimulus on the probability to attend was independently modulated by scene valence. Moreover, beyond reacting to the affordances of the social scene and independent of their social status, males differed in how long they observed the interactions of others. These findings suggest that visual attention is guided by the value an individual associates with different aspects of the social scene based on previous experience in both the agonistic and the affiliative realms and by current threat indicative of complex information integration in the brain.
https://royalsocietypublishing.org/rspb/article/293/2069/20252943/481425/Complex-modulation-of-visual-attention-to-3rd

Science Advances

PAPERS

LUCAS G. CASTEN et al – Ancient regulatory evolution shapes individual language abilities in present-day humans
Language is a defining feature of our species, yet the genomic changes enabling it remain poorly understood. Despite decades of work since FOXP2's discovery, we still lack a clear picture of which regions shaped language evolution and how variation contributes to present-day phenotypic differences. Using an evolutionary stratified polygenic score approach, we find that human ancestor quickly evolved regions (HAQERs) are associated with spoken language abilities (discovery N = 350, total replication N > 100,000). HAQERs evolved before the human-Neanderthal split, giving hominins increased binding of Forkhead and Homeobox transcription factors, and show evidence of balancing selection across the past 20,000 years. Language-associated variants in HAQERs appear more prevalent in Neanderthals, and HAQER-like sequences show convergent evolution across vocal-learning mammals. Our results reveal how ancient innovations continue shaping human language.
https://www.science.org/doi/10.1126/sciadv.aed5260

ZHENG WANG et al – Thalamocortical regulation of prefrontal stability enables abstract rule generalization
Our ability to generalize abstract rules to new situations is a cognitive hallmark, yet its neural basis is unclear. We identified a thalamocortical circuit essential for this process in mice. During a cross-modal rule transfer task, medial prefrontal cortex (mPFC) neurons encoded task rules across sensory modalities to enable generalization. Crucially, mediodorsal thalamus (MD) projections to mPFC were causally required: Inhibiting this pathway destabilized mPFC representations and impaired rule transfer, whereas enhancing it improved performance. Without MD input, mPFC recruited distinct populations for each task, losing cross-context stability. Direct mPFC excitation impaired generalization, underscoring the specificity of thalamic regulation. Thus, the MD stabilizes mPFC activity for flexible rule transfer—a mechanism with implications for cognitive disorders and artificial intelligence.
https://www.science.org/doi/10.1126/sciadv.aec6201

Trends in Cognitive Sciences

PAPERS

RICHARD J. ALLEN, ALAN D. BADDELEY & GRAHAM J. HITCH – Awareness as the heart of working memory
The assumption that attention and short-term memory combine to play a crucial role in cognition continues to influence cognitive modeling. We trace the development of the multicomponent model of working memory, initially consisting of a limited-capacity central executive controlling two domain-specific systems: the phonological loop and the visuospatial sketchpad. The later introduction of the episodic buffer addressed the need to explain how information from different sources is bound into unified episodes. Subsequent developments suggest that the buffer functions as a consciously accessible, multidimensional interface combining storage with executive manipulation and attentional control. These developments lead to a reformulation of the model in which the episodic buffer, renamed the 'awareness buffer', is placed at the focal point of working memory.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(26)00075-6

HALEY WEAVER, JENNY SAFFRAN & SUDHA ARUNACHALAM – Looking forward: eye-gaze methods in vocabulary development research
Human multimodal processing abilities have provided researchers with an invaluable set of methods for interrogating language understanding. Even young infants fixate on visual stimuli that match incoming auditory information. Experimental

paradigms have harnessed this behavior to demonstrate early language comprehension abilities. Researchers have since adapted these paradigms to address new questions, such as studying individual differences in vocabulary size and structure, identifying which words are learned earlier or later, and assessing language in populations with disabilities. However, fundamental questions persist about the assumptions linking eye gaze with underlying linguistic competence. We aim to articulate these assumptions and outline what we know about whether they are met. By making these issues explicit, we highlight considerations for language development research across different populations.
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(26)00076-8

Trends in Ecology and Evolution

PAPERS

CÉDRIC SUEUR & JEAN-LOUIS DENEUBOURG – Collective social niche construction shaping adaptive social networks
Understanding how social networks form and change is key to explaining the adaptability of human and nonhuman societies. Collective social niche construction describes how individuals actively shape their social environment through interactions, generating network structures that influence cooperation, pathogen transmission, and information flow. Recent advances reveal that network adaptability emerges through distinct mechanisms: self-organisation and phase transitions enable rapid topological changes in response to environmental pressures, while behavioural flexibility—central to the Cumulative Cultural Brain Hypothesis—supports enhanced social learning and cultural accumulation in high-intelligence species. Both pathways exemplify how feedback loops between individual strategies and emergent network properties generate adaptive, resilient social structures. This perspective positions social networks as dynamic biological structures shaped by plasticity at multiple hierarchical levels.
https://www.cell.com/trends/ecology-evolution/abstract/S0169-5347(26)00074-1

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