EAORC BULLETIN 1,179 – 18 January 2026

CONTENTS

NOTICES

FORMATTED VERSION OF THIS BULLETIN

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

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.
If there is a journal you feel I should be tracking on a regular basis, let me know.
And if you have any other ideas for extending the "EAORC experience", please contact me.

EDITORIAL INTERJECTIONS

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

NEWS

NATURE BRIEFING – Same-sex sex is no big deal for primates

Sexual behaviour between primates of the same sex is part of the normal lives of some species and could play an important part in their long-term success. Researchers identified instances of same-sex sexual behaviour in 59 species of non-human primate, and suggest that it might be a response to harsh environments, predation and complex social hierarchies. "A lot of people have long regarded same-sex behaviour as an accident, or rare," says evolutionary biologist and study co-author Vincent Savolainen. But "it's part of the normal social life of primates".
https://www.nature.com/articles/s41559-025-02945-8.epdf

NATURE BRIEFING – Flowers hint at maths before numerals

Pottery made by people of the Halafian culture, who inhabited northern Mesopotamia between around 6200 and 5500 BC, is painted with flowers that have 4, 8, 16 or 32 petals, and some show arrangements of 64 flowers. These patterns show a clear understanding of symmetry and spatial division long before written numbers came into use around 3400 BC, argue scientists in a new study. The skill might have helped the Halafian people with tasks such as sharing harvests or dividing communal fields, the authors say.
https://link.springer.com/article/10.1007/s10963-025-09200-9

NEW SCIENTIST HUMAN STORY – Neanderthals took refuge in caves

It's early January and south-west Britain is painfully cold. Not that cold, obviously: my friends in Canada and Scandinavia are laughing at my pitiful attempts to deal with near-freezing conditions. But it's cold enough that I need to wrap up warmly or the chill seeps into my bones. Which brings me to the Neanderthals, our long-extinct cousins, who we have tended to imagine living in frigid environments. A lot of our imagery of the Neanderthals is decidedly Siberian: frozen tundra, driving winds, woolly mammoths plodding through the snow. They have often been described as cold-adapted hominins. Now, if you've been paying close attention to New Scientist over the past couple of months, you might remember a hint that that isn't quite right. In November, we published a story called "Neanderthals' hefty noses weren't well adapted to cold climates". In it, Chris Simms reported on the first study of a well-preserved nasal cavity, which belonged to a Neanderthal dubbed Altamura Man who lived in what is now Italy. It had previously been reported that Neanderthal nasal cavities contained specialised bony structures that helped them to warm up the air they had just breathed in. But these were not present in this spectacular specimen, suggesting they weren't a standard Neanderthal feature. Researcher Todd Rae said the idea of Neanderthals being cold-adapted was "complete nonsense" and that "they were probably struggling with the cold" just like we would. Likewise, in December we learned of the oldest evidence of ancient humans starting fires, by striking flint against pyrite. This was from southern England 400,000 years ago. Given that timeline, the Neanderthals may have been the fire-starters. Which would make sense: their bodies weren't adapted to the cold British climate, so they devised a new behaviour instead. (By the way, ancient humans probably had control over fire long before this: the new evidence is specifically of people deliberately starting fires.)Anyway, if Neanderthals weren't specifically adapted for cold climates, what kinds of environments were they living in? That's the question tackled by a new set of studies in the Journal of Archaeological Science: Reports. This research reveals a rich story of Neanderthal life.
https://www.sciencedirect.com/science/article/abs/pii/S2352409X25005760

NEW SCIENTIST HUMAN STORY – Lazaret cave in France was inhabited by Neanderthals

Of all the extinct hominins we know about, the Neanderthals are our closest relatives. They lived in Europe and western Asia for hundreds of thousands of years, before vanishing around 40,000 years ago – about when our species arrived in Europe in a big way. Neanderthals' long history meant they lived through a lot. They went through several glacial periods, when the climate cooled and ice sheets crept south, and warmer interglacial periods in which the ice sheets retreated. They also lived through periods when Earth's magnetic field wobbled significantly, which could have exposed them to more harmful ultraviolet radiation. There is growing evidence that Neanderthals produced art, and had cultural practices around death such as burial. Nevertheless, as time went on, their habitat shrank. For whatever reason, the Neanderthals retreated from Asia and northern Europe, until they were confined to southern Europe – especially the Iberian peninsula, which today makes

up Spain and Portugal. The new studies focus on southern Europe, because it's the place Neanderthals survived the longest. The papers look at a lot of different things. I'm going to try to draw a straight line through them; just be aware that this is necessarily a selective reading of a large body of work. Let's start with a study by Loïc Lebreton at the Catalan Institute of Human Paleoecology and Social Evolution in Spain and his colleagues. They looked at small mammals (adorably called "micromammals"), which they used as an indicator of the climate: warmer and wetter climates attract different mammals than colder and drier ones. This revealed that north-eastern Spain had a pretty stable climate between 215,000 and 10,000 years ago, thanks to a strong influence from the Mediterranean. It was warm and wet. In contrast, southern France and northern Italy had more variable climates. This may help explain why the Neanderthals in Spain survived so long. Many areas where they lived seem to have been wooded. A study led by Sarah Barakat at the University of Aberdeen in the UK focused on Lazaret cave in France, which was inhabited by Neanderthals between 190,000 and 130,000 years ago. The remains of aurochs, red deer, ibex and grey wolves have been found in the cave. Analyses of their teeth indicates that the herbivores were eating a lot of woody plants. The authors suggest the area was woodland, perhaps opening out into grasslands in places. The climate was a little cooler than it is today, but hardly frigid. The Neanderthals may have camped in the cave at certain times of the year. We can get a glimpse of the animals Neanderthals lived alongside from Cova del Gegant, a cave on the coast near Barcelona, Spain. It contains materials laid down between 145,000 and 24,700 years ago. This includes 1225 bird bones, from at least 319 individuals. They include common quails, red-legged partridges and corn buntings: species "typical of forest and shrub areas", the authors say. There were also some birds that today are only found much further north, like snowy owls and snow buntings. These may have migrated south to escape harsh Arctic winters during the cold glacial periods. There's no direct evidence of the Neanderthals hunting or eating the birds, and the authors say Neanderthals probably couldn't have hunted them. However, there may be two exceptions: red-billed and yellow-billed choughs. Both hide in the darkest regions of caves, camouflaged by their dark feathers. This might make them easy to capture: "no sophisticated weapons are needed, just a mere stick." Since they're small, the Neanderthals could just cook them and pull them apart – so we wouldn't find any telltale butchery marks. To find out if the Neanderthals did this, the bones will have to be examined for human toothmarks.
https://www.sciencedirect.com/science/article/pii/S2352409X25004894

NEW SCIENTIST HUMAN STORY – La Ferrassie rock shelter and Neanderthal burial site in France

Even when the Neanderthals' time drew to a close, they continued to adapt. Rosa Albert at the Catalan Institution for Research and Advanced Studies and her colleagues studied the Riparo l'Oscurusciuto site in the Ginosa Ravine, southern Italy, where Neanderthal activity is recorded between 55,000 and 42,800 years ago. The site has clearly preserved layers, showing how conditions changed over that period. At first, the area was a forest or semi-open woodland, but over time it shifted to a more open woodland and steppe. Preserved hearths reveal that the Neanderthals started burning more grass in their fires, neatly adapting to the decline in wood. As late as 41,000 years ago, some Neanderthal groups were still doing well – even as their fellows had vanished from much of Eurasia. At Cova Eirós in north-west Spain, Hugo Bal-García at the University of Santiago de Compostela, Spain, and his colleagues reconstructed the animals the Neanderthals who camped there ate. The researchers found 3353 specimens, 787 of which they were able to identify. This enabled them to spot 31 species that lived in the area, including large numbers of red deer and cave bears. The team found that 5.5 per cent of the bones had traces of Neanderthal use, such as cut marks and evidence of heating. Most of these bones couldn't be identified, but they did find such traces on 15 red deer bones – indicating the Neanderthals were eating them – and on two cave bear bones. Cave bears were intimidating opponents, but it's previously been suggested that Neanderthals ambushed them when they awoke from hibernation. Alicia Sanz-Royo at the University of Aberdeen and her colleagues found a similar pattern at Covalejos, another cave in northern Spain. There, red deer, horse and bovids (cow-like animals) were being eaten by hominins, including Neanderthals and the modern humans that arrived later. What about the very last Neanderthals? A study by Liz Charton at the Institute of Human Palaeontology in France and her colleagues suggests they faced some environmental challenges. Charton's team studied a core from the western Mediterranean seabed, which contains pollen from between 41,000 and 34,000 years ago. Around 39,000 years ago, steppe and semi-desert vegetation became much more widespread. This is in line with previous evidence suggesting that the climate became significantly drier at this time. The team mapped known hominin sites for the entire period and found that after the drying, there were fewer sites with Neanderthal-type tools and a growing preponderance of sites with tools linked to modern humans. The Neanderthals may have clung on in the most southern parts of Europe, like the south of Spain – but even there, modern humans were also becoming widespread. This isn't to say that the drying killed off the Neanderthals: they had faced many similar climatic challenges before and survived. But perhaps it was one factor among many. Finally, let's try to get a glimpse into the Neanderthals' culture. Nohemi Sala at the National Research Center on Human Evolution in Spain and her colleagues compiled data from 46 sites on the Iberian peninsula, to see how the Iberian Neanderthals treated their dead. In other places, like Shanidar in Iraq and La Ferrassie in France, there is evidence of deliberate burial. But there are no such cases in Spain and Portugal. Does this mean the Iberian Neanderthals didn't perform mortuary practices or otherwise honour their dead? Not necessarily. They may simply have had different ideas about the best way to mourn. At Sima de las Palomas in south-east Spain, there are several Neanderthals in vertical cave shafts. One, an adult female, was found lying on her right side, with her arms bent and her hands near her face. She may have been intentionally placed there, along with the others. Perhaps those shafts served as a natural cemetery. The team says some other Spanish sites look similar. Elsewhere, Neanderthals may have performed

funerary cannibalism: that is, eating parts of the dead person. Cannibalism is taboo in many modern societies, but as I wrote in a feature in 2024, some cultures regard it as a sign of respect or even love, a way of keeping the dead person alive inside you. Curiously, the Iberian Neanderthals' mortuary practices seem to have become more varied in their final 10,000 years. Sala suggests this might be due to a wave of migration, with Neanderthals moving in from elsewhere and bringing in new practices. If that's true, it's a melancholy thought: the Neanderthals were innovating and changing, but their time on Earth was almost up. However, there's another way to look at it. Neanderthals interbred with modern humans, so their genetic legacy lives on in many of us today – and it may be that our ancestors picked up a few ideas from them as well.
https://www.sciencedirect.com/science/article/abs/pii/S2352409X25003499

NEWS FROM SCIENCE – The earliest Homo species did not look human, partial skeleton shows

Homo habilis, 2 million years old, was known mainly from teeth and jaw bones.
https://www.science.org/content/article/earliest-homo-species-did-not-look-human-partial-skeleton-shows

NEWS FROM SCIENCE – World's oldest whale harpoons discovered in Brazil

Far from the icy Arctic, ancient South Americans hunted whales using whalebone tools.
https://www.science.org/content/article/world-s-oldest-whale-harpoons-discovered-brazil

SCIENCEADVISER – An ancient human body comes into focus

Long considered one of the oldest members of the Homo genus—and therefore one of the earliest humans—Homo habilis has held a place of honor near the roots of the human family tree. It lived in Africa about 2.4 million to 1.4 million years ago. Yet while scientists have found skull and jaw bones from this early human, there were only scant clues to what it looked like from the neck down.

Now, a new report in Anatomical Record finally sheds light on the body of this key member of our evolutionary story. In 2012, at Kenya's storied Koobi Fora site, Arbollo Aike uncovered a tooth. Soon, researchers located a nearly complete set of lower teeth. The dentition bore unmistakable hallmarks of having come from a member of H. habilis. Nearby, they found nearly 100 fossil arm bones, clavicle bones, and fragmentary pelvic bones. Geochemical evidence supports the idea that all had come from a single specimen.

With the skeleton assembled, scientists finally had a good look at the body of one of the earliest humans. It was about the size of a female chimp and had long arms that may have meant it spent a significant amount of time climbing trees. Yet its pelvis suggests it was also adapted to upright walking.

Overall, the evidence suggests that a more modern-looking human body plan, with a bigger body and longer legs, didn't arise until the emergence of a different hominin, Homo erectus, around 2 million years ago.
https://www.science.org/content/article/earliest-homo-species-did-not-look-human-partial-skeleton-shows

SCIENCEADVISER – When sames attract

Same-sex sexual behavior is seen in a wide variety of animals, including other primates. Indeed, evidence suggests these behaviors play an important role in the survival—and reproduction—of nearly 500 non-human primate species. "A lot of people have long regarded same-sex behaviour as an accident, or rare, or only in zoo animals," said one researcher. But "it's part of the normal social life of primates.
https://www.nature.com/articles/s41559-025-02945-8

SCIENCEADVISER – A whale of an ancient meal

Nearly 5000-year-old harpoons carved from whale bones appear to be the oldest evidence of whale hunting in the world. But they aren't from the chilly lands in the north—they're from Brazil. "The consensus was the people living along the Brazilian coast were just collecting animals that were stranded, because no one had ever found large harpoons before," explained one researcher. But the evidence now speaks for itself. "It seems extraordinary, but people do incredible things."
https://www.nature.com/articles/s41467-025-67530-w

SCIENCEADVISER – Don't be afraid: Human emotional odours influence horses

Horses are notoriously anxious creatures. A sudden noise, a minor change in routine, even a stray plastic bag can make the most majestic steed startle and bolt. But these nervous beasts don't just have their own fear to worry about: New experiments suggest they can smell yours, too.

Scientists began by showing a group of volunteers—all of whom wore cotton pads under their armpits—scenes from the movies Singin' in the Rain and Grease, designed to evoke a sense of joy, then a 20-minute clip from the horror film Sinister to produce fear. The team stapled the sweaty, smelly pads to a custom muzzle, ensuring close contact with the horses' nostrils. Horses exposed to sweat from scared humans, the researchers found, had higher heart rates, made less contact with their handlers, were less likely to interact with unfamiliar objects, and reacted more fearfully to an umbrella suddenly being opened near a bucket of food.

The findings may indicate that fear is contagious between humans and horses, which could have important consequences for riders and trainers. “This study shows how closely connected animals and humans are,” study corresponding author Léa Lansade told The Guardian. “Unconsciously, we can transmit our emotions to animals, with quite important effects on their own emotions in return.”
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0337948

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

VICTORIA A. LOCKWOOD et al – A New Experimental Protocol for Assessing Hominoid Assisted Arboreal Bipedalism
Arboreal bipedalism is suggested as a precursor and adaptive locomotor mode for the immediate ancestor of hominin terrestrial bipedalism, yet detailed investigation of its locomotor biomechanics is hindered by its low frequency and observation difficulties in free-ranging hominoids. Further difficulties are faced in the creation and installation of a suitable experimental setup in natural settings. Captive studies may potentially reduce logistical issues, but data on arboreal bipedalism are scarce. We present an experimental design and protocol for collecting video data on arboreal bipedalism in captive primates, from which qualitative and quantitative gait data can be extracted. Our protocol increases the frequency of this rare behavior. Data were collected on six adult chimpanzees (three males, three females) at La Vallée des Singes, Romagne, France. The chimpanzees voluntarily engaged with a simulated arboreal foraging scenario consisting of two parallel PVC tubes and a high-value food reward. Five GoPro cameras recorded interactions with the experimental equipment. For validation of the effectiveness of our experimental design, protocol interactions were identified as successful (activity completed) or unsuccessful. All age and sex classes had successful interactions. Full strides were observed alongside the identification of two forms of arboreal bipedalism, forward-facing and sideways. This highlights the variation within the arboreal bipedalism locomotor category and the capacity for our experimental design to provide suitable data for gait parameter analysis and interspecies comparisons. Our protocol thus permits detailed investigation of arboreal bipedalism's role in the evolution of hominin bipedalism.
https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.70189

Cell Genomics

ARTICLES

JEFFREY ROGERS – Resolution of a human chromosomal mystery: Evolutionary complexity revealed
The human complement of chromosomes differs from our closest primate relatives by virtue of a unique chromosome fusion event. In this issue of Cell Genomics, Yang et al. provide the first detailed analysis of the site of chromosome fusion and reconstruct the complex evolutionary relationships among the genomic elements within the human fusion site and their related sequences in our great ape relatives.
https://www.cell.com/cell-genomics/fulltext/S2666-979X(25)00391-X

Cell Reports

PAPERS

ARELY CRUZ-SANCHEZ et al – Maturation of hippocampus-medial prefrontal cortex projections defines a pathway-specific sensitive period for cognitive flexibility
The septotemporal axis of the hippocampus separates it into domains with unique molecular, cellular, downstream connectivity, and behavioral profiles, and yet very little is known about the ontogenesis of these highly specialized subcircuits. Here, we use viral tracing, optogenetic-assisted patch clamping, chemogenetics, and behavior in mice to examine changes in domain-defined hippocampus efferent projections from postnatal day (P)10 to P60. We find distinct anatomical and synaptic developmental signatures in ventral and intermediate CA1 downstream connectivity, with unique contributions to the prelimbic and infralimbic subregions of the medial prefrontal cortex (mPFC). Juvenile inhibition of the ventral and intermediate CA1-mPFC pathways leads to opposing modulation of adult cognitive flexibility, establishing a sex- and pathway-specific sensitive period preceding the stabilization of CA1-mPFC synaptic transmission. Our data elucidate domain- and target-defined postnatal maturation of hippocampus efferents, indicating juvenility as a CA1-mPFC sensitive period with crucial implications for early life influences on adult cognition.
https://www.cell.com/cell-reports/fulltext/S2211-1247(25)01584-0

NINH B. LE et al – Differentiation in the human urothelia is defined by distinct alternative polyadenylation
Distinct epithelial cell states arise during differentiation, but mechanisms generating transcriptomic diversity among them remain poorly defined. The human ureter urothelium contains basal progenitor, intermediate cells, and terminally differentiated umbrella cells. Prior single-cell RNA sequencing revealed similar global gene expression profiles across these states, raising the question of how distinct identities emerge. Here, we show that alternative cleavage and polyadenylation (APA) introduces a major layer of transcriptomic diversity during urothelial differentiation, largely independent of changes in

mRNA levels. Analysis of 13,544 urothelial cells identified hundreds of differentiation-associated APA events. Single-cell imaging revealed spatially specific APA patterns, and reporter assays demonstrated gene- and context-dependent control of protein expression by alternative 3′ untranslated regions (3′ UTRs), consistent with in situ protein patterns. Conserved motifs in APA-regulated 3′ UTRs, including transcription factor binding sites and Alu elements, suggest mechanisms for polyadenylation site selection. Our study establishes APA as a key contributor to transcriptomic complexity in the human urothelium.
https://www.cell.com/cell-reports/fulltext/S2211-1247(25)01611-0

Current Biology

PAPERS

JUAN SEBASTIÁN CALDERÓN-GARCÍA et al – Interplay between syllable duration and pitch during whistle matching in wild nightingales

During complex vocal interactions, different features of acoustic stimuli are integrated to produce appropriate vocal responses, such as copying sounds during vocal matching behavior in some animals. However, little is known about the interplay and possible trade-offs between the different temporal and spectral acoustic features during these vocal exchanges. Nightingales can flexibly match the pitch of their tonal "whistle songs" in real time during counter-singing duels. Here, we show that the syllable duration of whistle playbacks could alter the song responses of wild nightingales, causing their whistle duration distribution to shift toward the presented stimulus duration. When exposed to whistle playbacks featuring unnatural combinations of pitch and duration, nightingales demonstrate a flexible trade-off between pitch matching and temporal imitation, yet they are constrained by their vocal repertoire. They selectively adapted their vocal responses to approximate these novel stimuli, aligning them with their natural whistle repertoire. We developed a computational model of nightingale whistle-matching behavior that revealed a hierarchical organization of acoustic feature production. During whistle matching, the feature integration process is constrained by the duration of syllables, and pitch matching follows within this temporal framework, forcing a trade-off between the two features. Our findings reveal a complex interplay between the spectral and temporal domains that shapes song-matching behavior.
https://www.cell.com/current-biology/fulltext/S0960-9822(25)01673-2

eLife

PAPERS

SARAH SILVÈRE et al – Toward neuroanatomical and cognitive foundations of macaque social tolerance grades

The macaque genus includes 25 species with diverse social systems, ranging from low to high social tolerance grades. Such interspecific behavioral variability provides a unique model to tackle the evolutionary foundation of primate social brain. Yet, the neuroanatomical correlates of these social tolerance grades remain unknown. To address this question, we expressed social tolerance grades within a novel cognitive framework and analyzed post-mortem structural scans from 12 macaque species. Our results show that amygdala volume is a subcortical predictor of macaques' social tolerance, with high tolerance species exhibiting larger amygdala than low tolerance ones. We further investigated the developmental trajectory of amygdala across social grades and found that intolerant species showed a gradual increase in relative amygdala volume across the lifespan. Unexpectedly, tolerant species exhibited a decrease in relative amygdala volume across the lifespan, contrasting with the age-related increase observed in intolerant species—a developmental pattern previously undescribed in primates. Taken together, these findings provide valuable insights into the cognitive, neuroanatomical and evolutionary basis of primates' social behaviors.
https://elifesciences.org/reviewed-preprints/106424

MATHIAS SABLÉ-MEYER et al with STANISLAS DEHAENE – A geometric shape regularity effect in the human brain

The perception and production of regular geometric shapes, a characteristic trait of human cultures since prehistory, has unknown neural mechanisms. Behavioral studies suggest that humans are attuned to discrete regularities such as symmetries and parallelism and rely on their combinations to encode regular geometric shapes in a compressed form. To identify the brain systems underlying this ability, as well as their dynamics, we collected functional MRI in both adults and 6-year-olds, and magnetoencephalography data in adults, during the perception of simple shapes such as hexagons, triangles, and quadrilaterals. The results revealed that geometric shapes, relative to other visual categories, induce a hypoactivation of ventral visual areas and an overactivation of the intraparietal and inferior temporal regions also involved in mathematical processing, whose activation is modulated by geometric regularity. While convolutional neural networks captured the early visual activity evoked by geometric shapes, they failed to account for subsequent dorsal parietal and prefrontal signals, which could only be captured by discrete geometric features or by bigger deep-learning models of vision. We propose that the perception of abstract geometric regularities engages an additional symbolic mode of visual perception.
https://elifesciences.org/articles/106464

Frontiers in Human Neuroscience

PAPERS

JINYI ZHANG, YE SONG & LI-HAI TAN – Investigating the role of the left inferior frontal gyrus in language evolution: insights from comparative neuroscience

The evolutionary adaptation of the left inferior frontal gyrus is considered a crucial neural specialization supporting the emergence of human language. As a central node in the language network, it is linked to the temporoparietal cortex via both the ventral and dorsal pathways. These connections enable humans to combine a limited set of vocal elements into infinitely diverse, hierarchically structured sequences. Although homologous brain structures are also present in non-human primates, language remains a uniquely human faculty. This review synthesizes anatomical, functional, and connectivity evidence across species to trace the evolution of the left inferior frontal gyrus in support of language. We argue that language did not emerge from novel cortical areas, but through the gradual repurposing, expansion, and optimization of pre-existing fronto-temporal circuits. Human-specific innovations include vocal neuron specialization, volumetric expansion, strengthened connectivity of the arcuate fasciculus, and a functional shift within the left inferior frontal gyrus from motor control to syntactic processing. Finally, we discuss how lesion studies contribute to our understanding of the brain's potential for language acquisition and its neurobiological constraints.

https://www.frontiersin.org/journals/human-neuroscience/articles/10.3389/fnhum.2025.1726577/full

Frontiers in Language Sciences

PAPERS

YOKO SUGITANI, TAKU TOGAWA & MINORU KARASAWA – Language structure shapes visual cognition: the effect of zoom-in vs. zoom-out presentation on visual preferences

This study provides initial evidence that grammatical structure in language can shape cognitive preferences for sequential visual stimuli. Linguists classify languages as head-initial or head-final based on their syntactic headedness. Building on this typology, we propose two cognitive styles: head-initial or "zoom-out" cognition, which tends to process more specific, detailed information before focusing on broader perspectives, and head-final or "zoom-in" cognition, which focuses on information from comprehensive to specific. We hypothesized that people's cognitive styles (zoom-in vs. zoom-out) are contingent on their language type (zoom-in or zoom-out language), which determines their cognitive preferences for the order of sequential visual stimuli.

We conducted three experiments (N = 823) involving speakers of zoom-in and zoom-out languages to test our hypotheses using a single sequential visual item and questionnaire-based assessments of processing fluency. This design allowed us to isolate the cognitive effect while acknowledging limits on generalizability.

Across studies, speakers of zoom-in (zoom-out) languages tended to experience higher processing fluency and more favorable evaluations when sequential visual stimuli were presented in a zoom-in (zoom-out) style.

These findings offer preliminary evidence linking language structure to visual cognition and highlight opportunities for future research on cross-linguistic variation in cognitive style.

https://www.frontiersin.org/journals/language-sciences/articles/10.3389/flang.2025.1637387/full

Frontiers in Virtual Reality

PAPERS

SAMANTHA B. LORENZO & LEILA OKAHATA – Empathy in action: cultivating altruism through immersive game experiences

Immersive digital games are increasingly explored as tools for fostering empathy and prosocial behavior, yet limited research examines how these effects unfold in virtual reality (VR). This mixed-methods research examined Empathy in Action, a narrative-driven VR game developed for this study that engages players in assisting a distressed child through both physical tasks and moral decision-making.

Sixty-four adult participants completed pre- and post-surveys measuring empathy, altruism, immersion, and gameplay effects, followed by semi-structured interviews.

Results revealed a significant increase in altruistic attitudes but a significant decrease in self-reported empathy, suggesting that altruism can be reinforced through immersive decision-making even when emotional resonance tapers post-play. Regression analyses indicated that perceived gameplay effect was the strongest predictor of altruistic outcomes, surpassing demographic or gaming background variables. Qualitative reflections supported these findings, with participants linking in-game helping behaviors to real-life relationships and envisioning applications in education, therapy, and rehabilitation.

These results complicate assumptions that empathy and altruism rise in tandem, underscoring the role of reinforcement, moral agency, and reflective engagement in prosocial outcomes. The study advances theory by decoupling empathy and altruism within immersive contexts and highlights the broader potential of VR games as tools for cultivating moral action and social change.

https://www.frontiersin.org/journals/virtual-reality/articles/10.3389/frvir.2025.1716138/full

iScience

PAPERS

ZIXIAN WANG et al – Transcriptomics and functional genomics implicate WNT3 in hemispheric lateralization of speech production

Human speech and language depend on hemispheric specialization across cortical regions and cortico-striatal circuits. We profiled 125 human cortical samples from 13 Brodmann areas, bilaterally, across five donors to generate a hemisphere-resolved transcriptomic atlas and quantify region-specific lateralization. Integrating genome-wide association signals for speech-, language-, and reading-related traits with brain cis-expression quantitative trait loci and enhancer maps prioritized a regulatory axis linking rs62060948 to MYC binding and WNT3 expression. WNT3 was higher in right Brodmann area 44 than left, and cellular assays supported MYC occupancy and showed reduced WNT3 after MYC knockdown. In mice, unilateral Wnt3 overexpression in the dorsal striatum selectively altered ultrasonic vocalizations, locomotor activity, and myelin basic protein expression. These results connect regulatory variation to lateralized gene control and circuit function relevant to vocal communication, and provide a multiregional resource to support mechanistic studies in human tissue and animal models.

https://www.cell.com/iscience/fulltext/S2589-0042(26)00067-2

Nature

NEWS

Same-sex sexual behaviour can help primates to survive — and reproduce

Bonds between same-sex individuals help apes and monkeys to manage conflict and strengthen alliances, especially in dry habitats and predator-rich landscapes.

https://www.nature.com/articles/d41586-026-00119-5

Oldest known poison arrows show Stone Age humans' technological talents

Traces of a toxic chemical found on 60,000-year-old arrowheads hint at advanced planning by Palaeolithic hunters.

https://www.nature.com/articles/d41586-026-00051-8

ARTICLES

SÉGOLÈNE VANDEVELDE – Oldest known evidence of the controlled ignition of fire

Uncovering convincing evidence for the identification of ancient traces of fire is a real challenge. Writing in Nature, Davis et al. report success on this front. Using diverse techniques and a contextual approach, this multidisciplinary team presents a set of consistent evidence for the oldest known controlled use of fire, including signs of deliberate ignition of flames. The traces of fire are dated to 400,000 years ago in Barnham in southern England.

https://www.nature.com/articles/d41586-025-03735-9

ADAM LEVY – Campus protests and civil disobedience: does academia have a problem with activism?

Scientists who join protest movements often find themselves at the centre of a media and political firestorm, causing tensions with some employers.

https://www.nature.com/articles/d41586-026-00152-4

PAPERS

ROB DAVIS et al with CHRIS STRINGER – Earliest evidence of making fire

Fire-making is a uniquely human innovation that stands apart from other complex behaviours such as tool production, symbolic culture and social communication. Controlled fire use provided adaptive opportunities that had profound effects on human evolution. Benefits included warmth, protection from predators, cooking and creation of illuminated spaces that became focal points for social interaction. Fire use developed over a million years, progressing from harvesting natural fire to maintaining and ultimately making fire. However, determining when and how fire use evolved is challenging because natural and anthropogenic burning are hard to distinguish. Although geochemical methods have improved interpretations of heated deposits, unequivocal evidence of deliberate fire-making has remained elusive. Here we present evidence of fire-making on a 400,000-year-old buried landsurface at Barnham (UK), where heated sediments and fire-cracked flint handaxes were found alongside two fragments of iron pyrite—a mineral used in later periods to strike sparks with flint. Geological studies show that pyrite is locally rare, suggesting it was brought deliberately to the site for fire-making. The emergence of this technological capability provided important social and adaptive benefits, including the ability to cook food on demand—particularly meat—thereby enhancing digestibility and energy availability, which may have been crucial for hominin brain evolution.

https://www.nature.com/articles/s41586-025-09855-6

Nature Communications

PAPERS

CHARLES KEMP – Symmetry in category systems across languages

Language reflects how people organize experience into categories, and cross-linguistic comparison can help to identify general principles that shape categorization. Here we argue that symmetry is one such principle, and present a symmetry-based theory that predicts whether category systems for a given domain tend to include an even or an odd number of categories. We test the theory against cross-linguistic data previously compiled for a range of domains and find that deictic day-naming and tense-marking systems tend to have an odd number of categories, but that systems for domains including seasons, phases of the moon, kinship, and cardinal directions tend to have an even number of categories. Our results therefore provide evidence of the widespread influence of symmetry on categorization across languages and domains.
https://www.nature.com/articles/s41467-025-67463-4

Nature Communications Psychology

PAPERS

KIRSTEN SUTHERLAND, DANIEL HAUN & ALEJANDRO SÁNCHEZ-AMARO – Chimpanzee groups achieve sustainable resource use in a common-pool resource dilemma

Common-pool resource dilemmas are group resource sustainability problems that are sensitive to over-extraction. While human strategies for overcoming common-pool resource dilemmas are well studied, the comparative evolutionary perspective has received little attention. Here, we compare resource management of chimpanzees (N = 15) grouped as dyads and quartets using an original experimental paradigm. The participants could use sticks to feed from a pool of yoghurt. The number of sticks equalled the number of players, and removing all of the sticks triggered resource collapse, thereby creating a social dilemma. Quartets were found to maintain the resource longer than dyads. Quartets', but not dyads', success was positively associated with social tolerance. Furthermore, quartets were more successful when the dominant ape acquired the relative lowest payoff. These results suggest that chimpanzees respond differently to cooperative sustainability problems depending on group size, with social tolerance playing an important role. The findings have implications for studying the evolution and diversity of hominid cooperation, in particular, highlighting that group size should be carefully considered in the design of non-human primate cooperation experiments.
https://www.nature.com/articles/s44271-025-00390-8

Nature Ecology & Evolution

ARTICLES

ISABELLE C. WINDER – Drivers of same same-sex sexual behaviour

A clade-wide study of non-human primates shows that same-sex sexual behaviour typically appears in long-lived, sexually dimorphic species with complex social structures that experience predation, resource scarcity or environmental challenge.
https://www.nature.com/articles/s41559-025-02940-z

PAPERS

CHLOË COXSHALL et al – Ecological and social pressures drive same-sex sexual behaviour in non-human primates

Same-sex sexual behaviour (SSB) is widespread across animal species; however, its evolutionary origins and ecological underpinnings remain poorly understood. In social animals, SSB is probably shaped by both genetic and environmental factors. For instance, a recent study in rhesus macaques indicates that while SSB is partially heritable and genetically based, it is also strongly influenced by environmental and social conditions. Here we compiled species-level data on 491 non-human primate species, documenting SSB occurrence and prevalence in 59 species, and examined its associations with 15 environmental, life history and social traits using phylogenetic regression and structural equation modelling. SSB occurrence was more likely in species inhabiting drier environments with increased food scarcity and predation pressure, in species with greater size dimorphism and longer lifespans and in those with more complex social structures and hierarchies. Structural equation modelling further indicated that environmental and life history traits influence SSB mainly indirectly, whereas social complexity directly promotes its occurrence. Together, these findings highlight SSB as a context-dependent behaviour shaped by interactions among ecological, life history and social factors, offering insights into the sexual diversity and social evolution of primates.
https://www.nature.com/articles/s41559-025-02945-8

Nature Reviews Biodiversity

PAPERS

R. ALEXANDER PYRON et al – The species problem evolving in the Anthropocene

The species problem dates to antiquity and encompasses three aspects since the modern synthesis: what species are, how they originate, and how they are delimited. Species are frequently thought of as evolutionary entities with real but fuzzy boundaries in space and time, but this concept struggles to constrain groups such as prokaryotes or lichens that push

conventional notions of genealogy. Speciation is increasingly well understood, but questions remain regarding the origin, prevalence, and strength of reproductive isolation and genomic divergence of lineages. Delimitation is facilitated by sophisticated algorithms, but additional axes such as geography, ecology, and phenotype should be sampled, with speciation hypotheses tying those attributes to evolutionary processes. In this Review, we survey these topics, outline major open questions, and identify two new dimensions of the species problem: how these three dimensions are altered in the Anthropocene, and whether species have intrinsic value in themselves. Global change alters the intensity and trajectory of natural processes such as hybridization, and introduces new niches through urbanization and domestication, and new species are even being created in the laboratory. In the realm of conservation, it is unclear whether species stand apart from other facets of biodiversity in having a unique intrinsic value of their own.
https://www.nature.com/articles/s44358-025-00125-x

New Scientist

NEWS

Hunting with poison arrows may have begun 60,000 years ago in Africa
A collection of arrow points excavated in South Africa has provided the oldest direct evidence of hunters deploying plant-based poisons on their weapons, a practice that has continued into modern times in some traditional cultures.
https://www.newscientist.com/article/2510462-hunting-with-poison-arrows-may-have-begun-60000-years-ago-in-africa/

Hominin fossils from Morocco may be close ancestors of modern humans
The jawbones and vertebrae of a hominin that lived 773,000 years ago have been found in North Africa and could represent a common ancestor of Homo sapiens, Neanderthals and Denisovans.
https://www.newscientist.com/article/2510396-hominin-fossils-from-morocco-may-be-close-ancestors-of-modern-humans/

Early humans may have begun butchering elephants 1.8 million years ago
A 1.78-million-year-old partial elephant skeleton found in Tanzania associated with stone tools may represent the oldest known evidence of butchery of the giant herbivores.
https://www.newscientist.com/article/2510274-early-humans-may-have-begun-butchering-elephants-1-8-million-years-ago/

ARTICLES

ALEX WILKINS – We're about to simulate a human brain on a supercomputer
The world's most powerful supercomputers can now run simulations of billions of neurons, and researchers hope such models will offer unprecedented insights into how our brains work.
https://www.newscientist.com/article/2510892-were-about-to-simulate-a-human-brain-on-a-supercomputer/

PHILIPPA BRAKES & MARC BEKOFF – Why non-human culture should change how we see nature
Our growing understanding of how other animals also share skills and knowledge will help us chip away at the folly of human exceptionalism.
https://www.newscientist.com/article/mg26935783-900-why-non-human-culture-should-change-how-we-see-nature/

PLoS Biology

PAPERS

FABIAN SCHNEIDER & HELEN BLANK – Sensory sharpening and semantic prediction errors unify competing models of predictive processing in human speech comprehension
The human brain makes abundant predictions in speech comprehension that, in real-world conversations, depend on conversational partners. Yet, tested models of predictive processing diverge on how such predictions are integrated with incoming speech: The brain may emphasise either expected information through sharpening or unexpected information through prediction error. We reconcile these views through direct neural evidence from electroencephalography showing that both mechanisms operate at different hierarchical levels during speech perception. Across multiple experiments, participants heard identical ambiguous speech in different speaker contexts. Using speech decoding, we show that listeners learn speaker-specific semantic priors, which sharpen sensory representations by pulling them toward expected acoustic signals. In contrast, encoding models leveraging pretrained transformers reveal that prediction errors emerge at higher linguistic levels. These findings support a unified model of predictive processing, wherein sharpening and prediction errors coexist at distinct hierarchical levels to facilitate both robust perception and adaptive world models.
https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3003588

PLoS One

PAPERS

PLOTINE JARDAT et al – Human emotional odours influence horses' behaviour and physiology

Olfaction is the most widespread sensory modality animals use to communicate, yet much remains to be discovered about its role. While most studies focused on intraspecific interactions and reproduction, new evidence suggests chemosignals may influence interspecific interactions and emotional communication. This study explores this possibility, investigating the potential role of olfactory signals in human-horse interactions. Cotton pads carrying human odours from fear and joy contexts, or unused pads (control odour) were applied to 43 horses' nostrils during fear tests (suddenness and novelty tests) and human interaction tests (grooming and approach tests). Principal component analysis showed that overall, when exposed to fear-related human odours, horses exhibited significantly heightened fear responses and reduced interaction with humans compared to joy-related and control odours. More precisely, when exposed to fear-related odours, horses touched the human less in the human approach test (effect size: Rate Ratio(RR)=0.60 ± 0.24), gazed more at the novel object (RR = 1.32 ± 0.14), and were more startled (startle intensity – Cohen's d = −0.88 ± 0.39; and maximum heart rate – Cohen's d = 1.16 ± 0.47) by a sudden event. These results highlight the significance of chemosignals in interspecific interactions and provide insights into questions about the impact of domestication on emotional communication. Moreover, these findings have practical implications regarding the significance of handlers' emotional states and its transmission through odours during human-horse interactions.

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0337948

Science

ARTICLES

ANTONELA BONAFINA & LAURENT NGUYEN – A new cell type drove human brain complexity

Responsible for higher cognitive functions, the cerebral cortex of the mammalian brain has undergone pronounced evolutionary remodeling. In the primate brain, this arises from an increase in cell numbers, tangential and radial expansion, and often the emergence of pronounced gyrification. These morphogenetic adaptations provided the structural basis necessary to support greater computational capacity and likely contributed to distinctly human behaviors. The evolutionary expansion of excitatory projection neuron populations—those that extend long-range axons to distant regions in the central nervous system—is a well-established hallmark of primate cortical evolution. However, emerging evidence indicates that lineages of inhibitory neurons (interneurons), which repress the activity of other neurons, have also undergone an expansion, accompanied by the overall increased connectivity within cortical neuronal circuits. Furthermore, the human cortex displays a relative increase in the proportion of interneurons compared with that of the rodent (1), suggesting their role in enhancing circuit flexibility and computational power. On page 265 of this issue, Jia et al. (2) report the discovery of an evolutionarily distinct progenitor cell type that sustains the production of inhibitory neurons and glia cells throughout human brain development.

https://www.science.org/doi/10.1126/science.aee0974

PAPERS

LONGZHONG JIA et al – Subventricular zone radial glial cells maintain inhibitory neuron production in the human brain

The expansive human cerebral cortex, with its 16 billion neurons, is ranked the highest in the number of cortical neurons among all species. Such expansion is accompanied by an increase in the number of not only glutamatergic excitatory neurons and γ-aminobutyric acid–expressing but also GABAergic inhibitory neurons in evolutionary history. The greater number and diversity of GABAergic inhibitory neurons shape the signature properties of circuit assemblies in the human cerebral cortex, which potentially contribute to humans having the highest cognitive capacity among all species. However, how the human brain generates its vast repertoire of GABAergic inhibitory neuron remains unclear.

Cortical outer radial glia (oRG, also known as bRG), a primate-enriched progenitor population in the cortical outer subventricular zone, has been identified as a key driver of the expanded production of excitatory neurons through prolonged neurogenesis. By contrast, most cortical GABAergic inhibitory neurons originate from the subpallium, specifically the medial ganglionic eminence (MGE), an important progenitor domain in the developing brain. Notably, the MGE in primates—particularly in the human species—shows increased complexity through the evolutionarily expanded subventricular zone (SVZ). This raises a pivotal question: Is there a subpallial progenitor population, akin to oRG cells, that amplifies inhibitory neuron production?

In this study, we combined spatial and single-cell transcriptomics to depict a comprehensive cellular and molecular landscape of human MGE (hMGE) development from gestational week (GW) 9 to 39. We identified spatiotemporally and molecularly segregated progenitor populations that were fated to produce distinct types of GABAergic and cholinergic inhibitory neurons, indicating that the emergence of neuronal diversity was linked to spatial and temporal specification of progenitor cells in the hMGE. Notably, we uncovered an evolutionarily distinct SVZ radial glial cell (SVZ RGC) population in the hMGE, which had homologous cell type in macaques but not in mice. The SVZ RGC exhibits distinct molecular features, spatiotemporal distribution, cellular morphology, and mitotic behavior. By reconstructing the developmental trajectory of hMGE cells, we demonstrated that SVZ RGCs maintain the production of GABAergic inhibitory neurons and glial cells throughout human

brain development and thus provide a cellular basis for the extended production of human inhibitory neurons in an evolutionary context.
Our study reveals evolutionarily distinct features of human inhibitory neuron generation and shed light on the mechanisms underlying human brain development. Notably, the hMGE SVZ RGC is a new addition to the pantheon of neural progenitor cell types, marking an important cytogenic source in the human brain.
https://www.science.org/doi/10.1126/science.adw1803

Trends in Cognitive Sciences

PAPERS

CHRISTIAN BESTE et al – Moving intentions from brains to machines

Brain–computer interface (BCI) research has achieved remarkable technical progress but remains limited in scope, typically relying on motor and visual cortex signals in limited patient populations. We propose a paradigm shift in BCI design rooted in ideomotor theory, which conceptualizes voluntary action as driven by internally represented sensory outcomes. This underused framework offers a principled basis for next-generation BCIs that align closely with the brain's natural intentional and action-planning architecture. We suggest a more intuitive, generalizable, and scalable path by reorienting BCIs around the 'what for' of action—user goals and anticipated effects. This shift is timely and feasible, enabled by advances in neural recording and artificial intelligence–based decoding of sensory representations. It may help resolve challenges of usability and generalizability in BCI design.
{I'm not so sure. A computer trying to impose logic on my data searches based on what it believes I'm actually searching for? First, there are more things in Heaven and Earth, H0RA710, than are dreamt of in your philosophy. Second, do they really want to see a computer have a nervous breakdown?}
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(25)00352-3

Trends in Neurosciences

PAPERS

SARAH R. HEILBRONNER et al – Reconstructing the human brain's wiring diagram from axons up

The human brain's long-range axonal connections are the scaffolding for communication across functionally distinct areas. Yet knowledge of the human brain's wiring diagram remains limited, largely due to longstanding technological challenges. Recent innovations in microscopy may now enable mapping human brain connectivity at the mesoscale (groups of neurons and their axons). In this review we describe the challenges of generating the wiring diagrams of the human brain, avenues forward, and reasons why such an effort is so important. We argue for building a human mesoscale connectome via a multimodal, multi-species, axon-centric approach, focusing on where axons begin and end to reconstruct connectivity across spatial resolutions. Finally, we consider the utility of a potential exemplar connectome for both clinical applications and research.
https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(25)00238-3

SUBSCRIBE to the EAORC Bulletin

If you would like to subscribe to this free weekly newsletter, please contact martin.edwardes@btopenworld.com.

UNSUBSCRIBE from the EAORC Bulletin

Send an email to martin.edwardes@btopenworld.com with the subject "EAORC unsubscribe".

PRODUCED BY AND FOR THE EAORC EMAIL GROUP

EAORC is a fee-free academic internet news service and has no commercial sponsorship or other commercial interests.
EAORC website information is at http://martinedwardes.me.uk/eaorc/
If you have received this bulletin, and are unhappy about receiving it, please contact martin.edwardes@btopenworld.com.