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NOTICES

FORMATTED VERSION OF THIS BULLETIN

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

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.

If there is a journal you feel I should be tracking on a regular basis, let me know.

And if you have any other ideas for extending the “EAORC experience”, please contact me.

EDITORIAL INTERJECTIONS

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

NEWS

NATURE BRIEFING – Podcast: How co-operation built the world

Togetherness, a new book by science journalist Rowan Hooper, argues that collaboration in nature has often been overlooked in favour of competition, and that organisms working together have played a vital role in making the world the way it is. “There’s a great example of the bobtail squid,” Hooper tells the Nature Podcast. “This is a very cute little squid that grows very intimately with these specialized bacteria that it sequesters from the ocean around it. It literally wouldn’t grow the same without these bacteria.”

<https://www.nature.com/articles/d41586-026-02067-6>

SCIENCEADVISER – LOLOLOLOL

Tickling makes people laugh, even if they hate it. Turns out it makes chimpanzees and gorillas laugh the same way—which may hint at a deep root for the beginnings of how we control our voices. The finding “falls in line with an emerging body of data now that suggest that our closest living relatives, the primates, and particularly the great apes, have more control over their vocal system than previously thought,” one expert noted.

<https://www.nature.com/articles/s42003-026-10499-z>

SCIENCEADVISER – Childbirth hurts for other primates, too

It’s no secret that childbirth is one of the most painful human experiences. And we’ve long thought our suffering is unique—that it comes from the unfortunate convergence of early hominids evolving narrow pelvises for walking and large heads for holding big brains. But newer evidence has cast doubt on this “obstetrical dilemma,” and now, a study has found that our birthing misery has plenty of company.

Researchers collected anatomical data on 29 mammal species, and conducted 3D modelling into how their births occur. They took into account the positions in which babies are born, as well as the narrowest parts of different species’ birth canals, which don’t always mimic our own.

Among smaller primate species such as bushbabies and squirrel monkeys, the team found that babies are also a very tight squeeze. In some cases, the infant’s heads can be twice as big as its mother’s pelvic space (in humans, the size is roughly matched; pink box)—though, those species have evolved clever anatomical coping strategies. Squirrel monkeys (genus *Saimari*; brown box), for example, can fully dislodge their pelvis during birth to make room.

But even if humans can’t deploy such nifty tricks to help us through delivery, “from a grand evolutionary perspective, our species has done a pretty good job,” anthropologist Anna Warrener, who was not involved in the study, told The Atlantic, noting the importance of monitoring births and intervening with medical care when necessary. “There wouldn’t be eight billion of us if we hadn’t cracked the code.”

<https://www.nature.com/articles/s41559-026-03102-5>

THE CONVERSATION – Consciousness: how ‘working memory’ may mysteriously give rise to it

The ‘doorway effect’ suggests that when information is removed from working memory, it immediately seems to leave consciousness.

<https://theconversation.com/consciousness-how-working-memory-may-mysteriously-give-rise-to-it-283823>

THE CONVERSATION – Prehistoric plague could have caused population collapse in stone age Europe

A new study reveals that plague was lethal thousands of years ago, during the Neolithic.

<https://theconversation.com/prehistoric-plague-could-have-caused-population-collapse-in-stone-age-europe-285854>

PUBLICATIONS

Current Biology

PAPERS

YOUNGJAI PARK et al – Sub-second fluctuations between top-down and bottom-up modes distinguish diverse human brain states

Information continuously flows between regions of the human brain, forming patterns that shift across states of consciousness, cognitive modes, and neuropsychiatric conditions. While functional magnetic resonance imaging (fMRI) reveals large-scale activity changes over seconds, the electrophysiological dynamics governing sub-second reconfiguration remain poorly understood. Here, relative phase analysis (RPA), a method leveraging phase lead/lag relationships, is introduced to capture whole-brain dynamics with millisecond precision in real time from electroencephalography (EEG). RPA reveals sub-second alternations, occurring approximately every 200 ms, between two dominant modes of information flow: a top-down mode, where anterior regions drive posterior activity, and a bottom-up mode, characterized by reverse directionality. These dynamics are most prominent during wakefulness, gradually diminish under anesthesia, and exhibit pathological imbalance in attention-deficit/hyperactivity disorder (ADHD). Simultaneous EEG-fMRI recordings demonstrate

that top-down dynamics coincide with increased activity of higher-order cognitive networks, whereas bottom-up dynamics correspond to heightened activity in sensory networks. A connectome-based coupled-oscillator model reproduces these transitions, indicating that sub-second fluctuations emerge naturally from inter-regional interactions shaped by underlying structural connectivity. This study establishes RPA as a framework for tracking whole-brain dynamics precisely in real time and identifies sub-second top-down/bottom-up alternations as a fundamental organizing principle of human brain function and consciousness.

[https://www.cell.com/current-biology/abstract/S0960-9822\(26\)00725-6](https://www.cell.com/current-biology/abstract/S0960-9822(26)00725-6)

eLife

PAPERS

GUO ZHENG & SHIHUI HAN – Neural categorization of visual words of alphabetic and non-alphabetic languages

Reviewed Preprint

Languages provide social-category markers that tag people as one or another social group. How does the brain sort words into different language categories as a basis of the social-categorization function of language? We addressed this issue by testing neural categorization of visual words of different writing systems in nine studies using electroencephalography, magnetoencephalography, and a repetition suppression paradigm. We showed that a neural network, including the anterior temporal, insular, orbital frontal, and ventral occipito-temporal cortices in both hemispheres, was engaged in computations of correlation distances between two words to represent intra-language similarity and inter-language difference during categorization of visual words of alphabetic and non-alphabetic languages. These processes occurred as early as 150 ms post-stimulus, recruited within-hemisphere functional connections, operated independently of words' semantic meanings and pronunciations, and exhibited consistently across individuals with diverse language backgrounds. These findings highlight the neural mechanisms of language-based spontaneous neural categorization of visual words as a basis of the social-categorization function of language.

<https://elifesciences.org/reviewed-preprints/110320>

JUAN VIDAL-PEREZ, RAYMOND J DOLAN & RANI MORAN – Disinformation elicits learning biases

In open societies, disinformation is often considered a threat to the very fabric of democracy. However, we know little about how disinformation exerts its impact, especially its influence on individual learning processes. Guided by the notion that disinformation exerts its pernicious effects by capitalizing on learning biases, we ask which aspects of learning from potential disinformation align with ideal 'Bayesian' principles, and which exhibit biases deviating from these standards. To this end, we harnessed a reinforcement learning framework, offering computationally tractable models capable of estimating latent aspects of a learning process as well as identifying biases in learning. In two experiments, participants completed a two-armed bandit task, where they repeatedly chose between two lotteries and received outcome-feedback from sources of varying credibility, who occasionally disseminated disinformation by lying about true choice outcome (e.g., reporting non-reward when a reward was truly earned or vice versa). Computational modelling indicated that learning increased in tandem with source credibility, consistent with ideal-Bayesian principles. However, we also observed striking biases reflecting divergence from idealized Bayesian learning patterns. Notably, in one experiment individuals learned from sources that should have been ignored, as these were known to be fully unreliable. Additionally, the presence of disinformation elicited exaggerated learning from trustworthy information (akin to jumping to conclusions) and exacerbated a normalized measure of 'positivity bias' whereby individuals self-servingly boost their learning from positive, relative to negative, choice feedback. Thus, in the face of disinformation we identify specific cognitive mechanisms underlying learning biases, with potential implications for societal strategies aimed at mitigating its harmful impacts.

<https://elifesciences.org/articles/106073>

Frontiers in Systems Neuroscience

PAPERS

PAUL J. WERBOS & DAVID S. WACK – Beyond scaling: how brains reorganize to support higher intelligence

Systems neuroscience—from Lashley's distributed engrams through Pribram's field-based processing to Freeman's oscillatory dynamics—has long argued that intelligence is a whole-brain property requiring feedback-driven computation. We formalize this tradition using Reinforcement Learning and Approximate Dynamic Programming (RLADP) and propose that vertebrate intelligence falls into four qualitatively distinct levels—rodent, primate, human, cetacean—each defined by a different architecture for generating and propagating backpropagated feedback signals. The transition between levels is not parametric but architectural, and each architecture demands a different energy strategy. A conserved allometric rule for cortical ion channels holds across nine of 10 mammalian species, fixing the biophysical cost of computation per unit volume; human neurons uniquely violate this rule, reducing channel density to redirect energy toward long-range white matter connectivity. We show that white matter is an active communication system whose superlinear scaling creates a geometric cost trap, that the corticothalamic loop provides master timing for forward-backward cortical processing cycles, and that timing degradation causes qualitative intelligence failure. The biological strategies cataloged here—from selective

connectivity reduction to cellular energy reallocation to cortical reorganization—have parallels with the communication-energy wall now constraining artificial intelligence.

<https://www.frontiersin.org/journals/systems-neuroscience/articles/10.3389/fnsys.2026.1847194/full>

iScience

PAPERS

JOSÉ J. MARTÍNEZ-MAGAÑA et al with the TRAUMATIC STRESS BRAIN RESEARCH GROUP – Decoding the role of transcriptomic clocks in the human prefrontal cortex

Aging is characterized by interindividual variability quantified through aging clocks, informed by biological data and are linked to diverse health outcomes. In this study, we comprehensively profiled several transcriptomic clocks, characterize their stochastic components, compare their predictive accuracy, perform associations with mental disorders, and elucidate their functional implications in three human prefrontal cortex (PFC) datasets. Our analysis revealed substantial heterogeneity in transcriptomic age prediction across different clock signatures. Notably, deep learning models capture a greater proportion of stochastic variation compared to linear methods, suggesting they may be sensitive to non-deterministic components. We identified a consistent relationship between transcriptomic age and alcohol use. Using network analysis, we identified convergent biological mechanisms across different clocks despite limited gene-level overlaps, specifically, immune-related signaling and extracellular matrix remodeling. Our findings reveal associations between psychiatric traits and identify convergent biological pathways and networks in the human PFC that may influence aging and health risks.

[https://www.cell.com/iscience/fulltext/S2589-0042\(26\)01814-6](https://www.cell.com/iscience/fulltext/S2589-0042(26)01814-6)

KIRAN BASAVA et al – Ecological not social factors explain brain size in cephalopods

Social factors have been argued to be the main selection pressure for the evolution of large brains and complex behavior, but many cephalopods live largely solitary, semelparous, short lives. This suggests that the large brains found in cephalopods are not the result of social selection pressures. Here, we derive specific, preregistered predictions from the “Asocial Brain Hypothesis” (ABH; an untested extension of the cultural brain hypothesis formal model), and evaluate those predicted associations using a new comparative dataset on brain size alongside social, ecological, and life history factors. Consistent with the ABH and other hypotheses predicting that ecological factors should be the primary selection pressure with larger brains in more calorie-rich complex ecologies, we find that shallower and benthic (seafloor) habitats are associated with larger brain sizes, and that measures of sociality are not. Our findings are not interpreted as causal, but are consistent with ecological hypotheses for brain evolution.

[https://www.cell.com/iscience/fulltext/S2589-0042\(26\)01699-8](https://www.cell.com/iscience/fulltext/S2589-0042(26)01699-8)

HUIGANG SUN – Decoding of fine hand motor control for kinematic acupuncture needling manipulation

Manual acupuncture depends on precise thumb-index finger coordination, yet the biomechanical principles governing this dexterity remain unresolved. Here, we establish a non-contact, video-based platform integrating marker-labeled motion capture with nonlinear dynamic and multi-modal coupling analyses to decode fine finger coordination across standardized training, animal models, and clinical observation. Tracking eight anatomical joints reveals an asymmetric motor architecture: the distal index finger acts as a temporal pacemaker with high rhythmic stability, whereas the distal thumb functions as an amplitude modulator. Multi-modal coupling resolves two biomechanical modules—an index finger chain with hierarchical phase propagation and a thumb chain with strong intra-module synchronization—linked by millisecond-scale temporal offsets. These patterns are encoded as operator-specific “Acupuncture Kinematic Fingerprints,” stratifying practitioners into index-dominant and thumb-dominant strategies. This framework transforms subjective manipulation styles into quantitative kinematic signatures for objective skill assessment, standardized training, and mechanistic studies.

[https://www.cell.com/iscience/fulltext/S2589-0042\(26\)01960-7](https://www.cell.com/iscience/fulltext/S2589-0042(26)01960-7)

Mind & Language

PAPERS

EDWARD B. ROYZMAN & SAMUEL H. BORISLOW – Conventions and morals—less distinct than you think: The unacknowledged role of effective consent

An influential account of moral judgment suggests there are two distinctive domains: that of conventional wrongs (a breach of social norms that can be changed/“modified” by an authority figure) and moral wrongs (that are viewed as breaching “natural law” and cannot be “modified”). However, pertinent tests conflate behaviors' content (for instance, theft vs. rudeness) with victims' proper consent. Initial studies suggest that this (victims' consent) is integral to the process whereby conventional wrongs are modified or de-wronged; we then demonstrate that this process also applies in the moral domain. The two “domains”, thus, appear far more alike than is claimed.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.70048>

Nature

ARTICLES

ZIV WILLIAMS & JING CAI – Listening in on the human brain cells that produce speech

By combining recordings from single neurons with artificial-intelligence techniques, specific brain cells have been identified that could enable humans to generate language. These cells, which are distributed broadly across the human brain, encode specific aspects of meaning and grammar and reflect how words are assembled into phrases and sentences.

<https://www.nature.com/articles/d41586-026-02004-7>

Nature Communications Biology

PAPERS

INAKI C. MUNDINANO et al – Highly consistent anatomical asymmetry in a small primate brain: left is always larger in the marmoset monkey

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.

Although lateralisation of brain function is relatively common in animals, this is rarely accompanied by overt anatomical asymmetries. Morphological differences between the cerebral hemispheres are well established in Hominoids and other large primate species, but regarded as subtler, or inconsistent, in other primates. We demonstrate that the left hemisphere is reproducibly larger than the right hemisphere in one of the smallest primates, the marmoset. Among 208 adult marmosets the left hemisphere was on average 2.31% larger than the right (range: 0.22%- 4.37%). This asymmetry develops during early postnatal life, persists throughout adulthood, and is primarily due to differences in the volume of cortex associated with social cognition, including in the lateral and inferior temporal lobe areas and ventral premotor areas. These results challenge the notion that the morphological asymmetry between the hemispheres is linked to the evolution of large brains and progressive reduction in the relative connectivity between hemispheres.

<https://www.nature.com/articles/s42003-026-10576-3>

Nature Ecology & Evolution

PAPERS

NICOLE TORRES-TAMAYO et al – Comparative primate analysis shows that humans are not unique in having a tight cephalopelvic fit at birth

Human childbirth is regarded as uniquely difficult among primates, due to a tight cephalopelvic fit thought to result from an evolutionary trade-off between adaptations to bipedal locomotion and increasing brain size. This impression, however, may be an artefact of past adoption of anthropocentric measurements that underestimate birth challenges in non-human primates. Here we re-evaluate cephalopelvic proportions using species-specific three-dimensional data of the pelvic inlet along with neonatal cranial dimensions from a broad sample of extant primates. Results reveal that maternal body size is a key factor to consider. A tight cephalopelvic fit occurs in species with proportionately larger neonates, smaller pelves or a combination of both. The latter is the case in humans, producing the tightest fit among extant apes, but a similar combination of factors explains much more extreme cephalopelvic proportions in other species. Our findings reveal a diversity of obstetrical dilemmas across primates.

<https://www.nature.com/articles/s41559-026-03102-5>

Nature Humanities & Social Sciences Communications

PAPERS

YUNHUI ZHAO et al – What kind of corporate social responsibility reduces idiosyncratic risk: reciprocity or altruism?

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

Research on corporate social responsibility (CSR) and idiosyncratic risk has become a topic of considerable interest in academia, yet a unified conclusion has not been reached. This paper uses A-share listed enterprises in Shanghai and Shenzhen from 2017 to 2023 as the research sample, categorically explores the impacts of reciprocal CSR and altruistic CSR on corporate idiosyncratic risk, and discusses the boundary effect of media sentiment. The research findings are as follows: (1) Altruistic CSR can reduce idiosyncratic risk, while reciprocal CSR increases it; (2) Positive media coverage positively strengthens the relationship between two kinds of CSR and idiosyncratic risk, while negative media coverage negatively strengthens this relationship; (3) There are heterogeneities in corporate performance, heavy-pollution situations, and corporate scale for different types of CSR. The research conclusions offer new theoretical support for the prevention of idiosyncratic risk and have significant theoretical and practical implications for a deeper understanding of the economic consequences of CSR under different motivations.

<https://www.nature.com/articles/s41599-026-08177-w>

Nature Neuroscience

PAPERS

JAROD LÉVY et al – Noninvasive decoding of typed sentences from human brain activity

Modern neuroprostheses can now restore communication in patients who have lost the ability to speak or move. However, implanting these invasive devices comes with risks inherent to neurosurgery. Here we introduce a noninvasive method to decode the production of sentences from brain activity and demonstrate its efficacy in a cohort of 35 healthy volunteers. For this, we present Brain2Qwerty, a new deep learning architecture trained to decode sentences from either electro- or magnetoencephalography, while participants typed briefly memorized sentences on a QWERTY keyboard. With magnetoencephalography, Brain2Qwerty reaches, on average, a character error rate of 29% and substantially outperforms electroencephalography (character error rate: 65%). For the best participants, the model achieves a character error rate of 18%, and can perfectly decode a variety of sentences outside of the training set. Overall, these results narrow the gap between invasive and noninvasive methods and thus open the path for developing safe brain–computer interfaces for noncommunicating patients.

<https://www.nature.com/articles/s41593-026-02303-2>

Nature Scientific Reports

PAPERS

ANA PANTOJA-PÉREZ et al – A taphonomic reassessment of Qafzeh 25 and its implications for violence, health and funerary practices

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.

The Qafzeh cave preserves one of the most significant Middle Paleolithic human assemblages, offering key insights into health, possible violence, and funerary behavior among human Middle Paleolithic samples. In this study, we present new evidence of sharp-force trauma in the individual Qafzeh-25. The integrated macro-, microscopic, and micro-computed tomography analysis revealed a linear lesion affecting the left mandible and third premolar, consistent with an injury caused by a sharp object. Localized bone porosity and marginal thickening consistent with remodeling indicate that the lesion underwent a healing process, suggesting that the individual survived for a period of time after the injury. This case may represent one of the earliest documented examples of sharp-force trauma in the archaeological record and contributes to the limited evidence of possible interpersonal violence during the Middle Paleolithic. The taphonomic study conducted here confirms that Qafzeh-25 was deliberately buried, reinforcing previous interpretations of the site as a place of formal burials in the early Late Pleistocene. Additionally, we identified additional dental pathologies, including new carious lesion and enamel defects. These findings add to the previous recorded evidence of caries and dental anomalies in the Qafzeh sample, highlighting both biological vulnerability and possible hereditary or environmental factors. Together, the trauma, oral pathologies, and funerary context illuminate the complexity of health, social support, and culture of death in the Pleistocene human fossil record.

<https://www.nature.com/articles/s41598-026-58670-0>

GIUSEPPE BRIATICO et al – Seasonal-to-interannual hydroclimatic variability in Afromontane environments during the late Early Pleistocene hominin occupations on the Southeastern Ethiopian Highlands

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.

Climate variability is a key factor influencing the distribution and adaptive response of mammalian species, including hominins. Here, we investigate seasonal and interannual hydroclimatic and environmental variability associated with the late Early Pleistocene hominin occupations on the Southeastern Ethiopian Highlands. We present stable carbon and oxygen isotope analyses of sequentially sampled tooth enamel from herbivores recovered from the archaeological contexts of Melka Wakena and Gadeb (2300–2400 m a.s.l.) and dated between 1.6 and ~ 1.0 Ma. Carbon isotope data indicate predominantly C₄ and mixed C₃–C₄ diets, consistent with mosaic vegetation as part of the Dry evergreen Afromontane Forest and grassland complex (DAF). Intra-tooth oxygen isotope profiles suggest seasonal variability and interannual fluctuations in water balance, reflecting changes in precipitation, evaporation, and local hydrology. Although the temporal resolution of individual tooth records precludes identification of specific climatic drivers, the isotopic data document recurring hydroclimatic variability within high-elevation environments characterized by broadly comparable ecological conditions. Herbivore diets show limited long-term change, suggesting sustained resource availability across seasons and over hundreds of thousands of years. These results indicate that the Ethiopian Highlands repeatedly supported mammalian communities and recurrent Acheulean hominin occupations during the late Early Pleistocene, providing sustained access to water and vegetation resources within an Afromontane environmental framework.

<https://www.nature.com/articles/s41598-026-60484-z>

FILIPA ABREU et al with SIMONE PIKA – Hallmarks of social action in the vocal turn-taking of wild common marmosets (*Callithrix jacchus*)

Conversational turn-taking, the orderly exchange of signals between individuals, is considered an important component of human communication and language. Comparative studies of vocal turn-taking have often been biased toward a limited number of model species and have usually examined only single call types, restricted features of human conversational turn-taking, or captive animals, thereby limiting broader understanding of turn-taking complexity and its evolutionary trajectory. Here we show that wild common marmosets engage in structured vocal exchanges that share several basic features with human conversational turn-taking. We analyzed 1,245 natural vocal interactions and found that individuals can produce multi-turn exchanges with matched call types. Marmosets used different vocalizations when interacting with group members compared to neighboring groups. These interactions were characterized by flexible turn organization, recurring call sequences, relatively short gaps between turns (approximately 1,300 ms), and structured participation involving specific individuals. Altogether, our findings highlight the complexity of vocal interaction in wild common marmosets, providing a broader view of coordination across the whole vocal repertoire and suggesting that elements of human conversational turn-taking may be present in this species and may be shared, at least in part, with other primates.

<https://www.nature.com/articles/s41598-026-60403-2>

New Scientist**NEWS****Some of the last Neanderthals were surprisingly genetically diverse**

Genetic analysis of Neanderthals in north-western Europe reveals that this population was surprisingly genetically diverse, hinting that inbreeding didn't lead to the species' demise.

<https://www.newscientist.com/article/2531732-some-of-the-last-neanderthals-were-surprisingly-genetically-diverse/>

We've uncovered a master gene that switches on human development

We have identified the gene that, when activated, initiates the developmental programme that results in cells forming a human body.

<https://www.newscientist.com/article/2531950-weve-uncovered-a-master-gene-that-switches-on-human-development/>

Ancient human DNA found on cave art for the first time

DNA from ancient humans has been found on a prehistoric cave painting and on cave walls, demonstrating the potential to one day identify individual artists and resolve the debate over Neanderthals' artistic abilities.

<https://www.newscientist.com/article/2532130-ancient-human-dna-found-on-cave-art-for-the-first-time/>

All known *Homo naledi* skeletons seem to be female

An analysis of tooth proteins suggests all 23 *Homo naledi* individuals found in the Rising Star cave in South Africa were female, which strengthens the case that they were placed there deliberately.

<https://www.newscientist.com/article/2531654-all-known-homo-naledi-skeletons-seem-to-be-female/>

ARTICLES**DAVID SAMSON – Humans sleep the least of all apes – is it the secret to our success?**

Sleep is essential, yet humans have evolved to need so little of it. When evolutionary anthropologist David Samson delved into our ancient past to find the reasons why, he discovered surprising ways to get a better night's rest.

<https://www.newscientist.com/article/2530704-humans-sleep-the-least-of-all-apes-is-it-the-secret-to-our-success/>

PeerJ**PAPERS****ALICE BEAUD et al – Are Tonkean macaques able to make intuitive statistical inferences?**

In a changing environment, making predictions about probabilistic events from few observational facts has ecological relevance for many species. Recent research has shown that preverbal infants, great apes, and capuchins (*Sapajus* spp.) were able to use proportions to predict the nature of a single item randomly sampled from two populations. However, studies involving macaques (*Macaca fascicularis* and *M. mulatta*) brought contradictory results about whether macaques relied on proportions or other choice heuristics to make intuitive inferences. To provide additional information on the evolutionary origins of this skill and overcome methodological concerns from previous studies, we assessed the ability of Tonkean macaques (*M. tonkeana*) to consider proportions in intuitive statistical inferences.

In a series of eight experimental conditions, 10 Tonkean macaques had to choose which of two jars, that differed in their relative distributions of a preferred and non-preferred food item, conferred a greater chance of obtaining one preferred item. During each test, the experimenter hid in their hands an item drawn pseudo-randomly from each of the two jars for the subject to make its choice.

Our results highlighted both between and within individual variations in their decisional framework. According to experimental conditions, while few individuals relied on proportions to make statistical inferences, most individuals relied on quantities of preferred items or other heuristics to predict the drawing outcome. Altogether, our results brought some evidence that the ability to perform intuitive statistical inferences may be shared amongst primates, but that the underlying high cognitive demands of this capacity may motivate the use of simpler heuristics in some animals' everyday decisions.

<https://peerj.com/articles/21377/>

Physics of Life Reviews

PAPERS

RAINER POLAK et al – Culture in psychology and neuroscience: Concepts, relevance, and empirical evidence in rhythm perception

Perceptual systems adapt through individual experience across the lifespan, an ability referred to as plasticity. To understand perceptual plasticity, a promising avenue is to investigate how perception is shaped by cultural experience, as a process deeply embedded within collective practices of cultural production and social learning. The current review synthesizes findings from recent behavioral experiments investigating cross-cultural variation in rhythm perception. Specifically, these studies show that fundamental perceptual processes, such as event timing and rhythm categorization, display shared features but also systematic differences across cultural groups. Critically, these differences correlate with statistically prominent and socially relevant features of cultural production, revealing how perceptual systems are tuned to their music-cultural environments. Yet, how can cross-cultural differences in perception be related back to the collective practices that produce the diversity of cultural environments in the first place? To bridge this gap, we propose perceptual niche construction as an evolutionary approach that positions culture as both a source and a product of perceptual plasticity. That is, cultural experience tunes individual perception, yielding culturally diverse perceptual processes. These processes, in turn, function as cultural selection pressures shaping collective practices across nested timescales, thus contributing back to the diversity of cultural environments in which perception is tuned. Notably, this approach has important implications for research in psychology and neuroscience: it operationalizes culture as communities of practice, highlights the relevance of contextually situated research, and accounts for the coevolutionary nature of culture-driven perceptual plasticity.

<https://www.sciencedirect.com/science/article/pii/S1571064526000564>

PLoS One

PAPERS

R.I.M. DUNBAR – Evolutionary lags in the primate brain size/body size relationship revisited

The original brain lag hypothesis proposed that primate brain evolution depended on spare energy derivative of savings of scale enabled by first increasing body size. However, in a seminal analysis, Deaner & Nunn concluded that there was no evidence for a brain lag. I revisit their analysis and show that using statistically more appropriate analyses and updated data yields a significant brain lag effect. However, contrary to the original brain lag hypothesis, the brain/body ratio does not converge back on the allometric regression line, but continues to evolve beyond it. Increases in brain size are correlated with exploiting large group size rather than large body size as the principal defence against predation risk, with significant growth in brain size (but not body size) only being possible if species adopt a more frugivorous diet. I then use these findings to show that hominins followed a similar trajectory from an australopithecine baseline on the relevant allometric regression. In sum, the brain lag effect is much more complicated than the original hypothesis proposed, with a distinctive switch from emphasising body size to brain size (hence group size) as a solution to ecological challenges.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0351073>

AWOUN JUNG & IZUMI UEHARA – Emotional understanding in Japanese children 3–6 years: Language ability mediates the relations between theory of mind and executive function

Previous research has documented associations between children's emotional understanding (EU) and social-cognitive abilities such as theory of mind (ToM) and executive function (EF); however, findings in preschool-aged children remain inconsistent. One potential explanation is that language ability, which develops rapidly during early childhood, has often not been examined concurrently with these abilities. The present study focused on individual differences in EU and examined how ToM, EF, and language ability relate to EU in Japanese preschool children, with particular attention to the mediating role of language. Participants were 90 children aged 3–6 years ($M = 60.34$ months, $SD = 10.82$). Children completed a false belief task, emotional understanding tasks, executive function tasks assessing cognitive flexibility and working memory, and a receptive vocabulary test. Correlational analyses, hierarchical multiple regression analyses, and bootstrapped mediation analyses were conducted. EU was positively associated with ToM, EF, and language ability. Language ability accounted for significant variance in EU beyond age and gender. When language ability was included in the model, the association between ToM and EU was no longer significant, whereas the association between EF and EU remained significant but was attenuated. Mediation analyses revealed significant indirect effects of both ToM and EF on EU through language ability, indicating that the association between ToM and EU was accounted for by language ability, whereas EF showed both direct and indirect associations with EU. These findings suggest that language ability plays a central role in linking social-cognitive abilities to

emotional understanding in early childhood. Theory of mind was associated with emotional understanding primarily through language, whereas executive function showed both direct and indirect associations via language ability. By modeling multiple predictors simultaneously, this study provides an integrated account of individual differences in emotional understanding and elucidates the distinct pathways through which cognitive and social-cognitive skills are associated with emotional development.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0346175>

Proceedings of the Royal Society B

PAPERS

MATTHEW S. FULLMER, BRAM VAN DIJK & NOBUTO TAKEUCHI – Interaction range of common goods shapes Black Queen dynamics beyond the cheater–cooperator narrative

Dependencies among microorganisms often appear mutualistic, as microbes grow faster together than alone. However, the Black Queen hypothesis (BQH) posits that these dependencies are underpinned by benefits from ‘cheating’ when others supply necessary common goods (CGs). The BQH often describes the evolution of a pair of ecotypes, a cooperator producing a CG and a cheater free-riding upon it. With multiple goods, their production can be centralized, with one ecotype producing everything and others cheating. We previously proposed an alternative BQH endpoint describing a community of ‘mutual cheating’, with production distributed over multiple interdependent ecotypes. Here, we present an individual-based eco-evolutionary model that predicts BQH dynamics resulting in various endpoints, including both distributed and centralized production, and novel intermediate ecosystems involving apparent functional redundancy. These endpoints critically depend on the interaction range, the number of beneficiaries a producer can locally support. The intermediate ecosystems involve stable coexistence among ecotypes partially distributing production, with this coexistence punctuated by rare evolutionary transitions resulting in further distribution. These punctuated dynamics arise from cheaters stalling the division of labour by occupying the limited space within the producers’ interaction ranges. Overall, our findings unveil complex evolutionary dynamics beyond the simple cheater–cooperator narrative, broadening the predictions of BQH.

<https://royalsocietypublishing.org/rspb/article/293/2074/20260911/482379/Interaction-range-of-common-goods-shapes-Black>

Royal Society Open Science

PAPERS

LACHLAN VON PEIN, THOMAS SUDDENDORF & BRENDAN P. ZIETSCH – Can the parochial cooperation hypothesis explain the evolution of human cooperation? Quantifying cooperative investments in an agent-based model

The parochial cooperation hypothesis posits that violent conflict between ancestral groups played a key role in the evolution of human cooperation. To date, this controversial idea has been supported by several computational models illustrating potential mechanisms through which costly cooperation could be sustained by intergroup conflict. However, it remains unclear whether the cooperative costs these models impose constitute meaningful fitness investments; therefore, it could be that the evolutionary dynamics being described are inconsequential in the context of human evolution. Here, we take the most famous of these models and demonstrate that if analysed with this consideration in mind, the model’s support for the parochial cooperation hypothesis becomes tenuous. Specifically, we show that this model can only sustain trivial levels of cooperative investment under most conditions, suggesting that intergroup conflict did not impose meaningful selection for cooperation throughout human evolution. While these findings challenge the theoretical underpinnings of the parochial cooperation hypothesis, our method for quantifying cooperative investments offers avenues to better test these kinds of ideas moving forward.

<https://royalsocietypublishing.org/rsos/article/13/7/260311/482369/Can-the-parochial-cooperation-hypothesis-explain>

Science Advances

PAPERS

E. GRACE VEATCH et al – Taphonomic analysis at Liang Bua reveals the behavioral and technological capabilities of *Homo floresiensis*

Since its discovery, *Homo floresiensis*—an extinct, short-statured, and small-brained hominin species from Flores, Indonesia—has often been ascribed unexpectedly advanced behaviors, such as hunting large game and using fire. Here, we report the results of a systematic taphonomic study sampling the proboscidean bone assemblage at Liang Bua where the frequency and locations of predatory marks, along with skeletal part profiles, show that Komodo dragons likely had primary access to these remains leaving behind only low-utility elements for *H. floresiensis* to scavenge. Moreover, no signs of intentional use of fire are present in the stratigraphic units associated with *H. floresiensis*. Together, these results suggest that *H. floresiensis* was not as behaviorally advanced as originally suggested and provides critical insights into the behavioral repertoire of *H. floresiensis*, raising important questions about its ancestry.

<https://www.science.org/doi/10.1126/sciadv.aeb7219>

DIDHITI MUKHERJEE, CHIH-TING CHEN & PATRICK O. KANOLD – Self-vocalizations activate the developing auditory cortex via an intracortical pathway

The development of the sensory brain relies on early periphery-generated spontaneous neural activity and later sensory-evoked activity. To investigate activity sources in the auditory cortex (ACTx) during development, we performed in vivo imaging in neonatal mouse pups. We found self-vocalization-associated ACTx activity even before ear opening and that this activity was stronger than tone-evoked activity. Self-vocalization-associated activity also existed in deaf pups, suggesting a top-down activity source. We revealed projections from the anterior cingulate cortex (ACC) and secondary motor cortex (M2) to the ACTx and that ACC/M2 showed vocalization-driven activity correlated with ACTx activity. ACC/M2 inactivation reduced self-vocalization and ACTx activity. Thus, self-vocalizations activate the developing ACTx even before ear opening, potentially via ACC/M2 motor commands. Our results reveal a previously unidentified early ACTx activity source that can shape development.

<https://www.science.org/doi/10.1126/sciadv.aea2814>

Trends in Cognitive Sciences**PAPERS****ULLRICH K.H. ECKER et al – Misinformation as strategy: Epistemic consequences and the undermining of shared truth**

Misinformation influences cognition—shaping memory, beliefs, attitudes, reasoning, and decision-making. While intentionally disseminated misinformation (i.e., disinformation) has long served persuasive functions, its strategic use to generate epistemic uncertainty has grown in prominence. Such strategic manipulation by incentivised actors serves to construct ‘alternative realities’ that undermine shared truth and institutional trust. This review analyses recent evidence on the direct cognitive and behavioural impacts of misinformation, examines the transformative roles of social media and generative AI, and considers broader epistemological consequences, including the erosion of truth norms and implications for democratic discourse. Addressing these challenges requires coordinated individual and systemic interventions that integrate psychological, technological, educational, and regulatory approaches to strengthen epistemic resilience and safeguard evidence-informed public reasoning and decision-making.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(26\)00136-1](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(26)00136-1)

Trends in Neurosciences**PAPERS****KARRI LAMSA & VIKTOR SZEGEDI – A large brain adds new types of neurons: Molecular and functional signatures of spindle neurons in the human neocortex**

Although mammalian brains share a common structural plan, expanded neocortices contain specialized neuron types absent from smaller brains. Using human neurosurgical tissue, Ke and colleagues combined multimodal analyses to establish spindle neurons as a molecularly distinct and functionally specialized cortical cell population. Their findings highlight how brain evolution increases circuit complexity beyond simply adding neurons.

[https://www.cell.com/trends/neurosciences/abstract/S0166-2236\(26\)00119-0](https://www.cell.com/trends/neurosciences/abstract/S0166-2236(26)00119-0)

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