EAORC BULLETIN 1,154 – 27 July 2025

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

JOHN TEMPLETON FOUNDATION – What if Fundamental Reality Is Mind, Not Matter?

David Bentley Hart is a scholar with wide-ranging interests in philosophy, theology, religions, and culture. He is the author of hundreds of literary essays and more than twenty books. In this podcast episode, our conversation focuses on two in particular; the first is The Experience of God: Being, Consciousness, and Bliss; and the second is David's most recent work entitled All Things Are Full of Gods: The Mysteries of Mind and Life. This book is playfully written in the form of a Platonic dialogue in which the characters explore questions of ultimate reality. David is also an avid fan of baseball, a subject that he eloquently praises in his popular essay "A Perfect Game."
{I don't think anyone has been killed by the idea of a falling brick – although several lives may have been saved by that idea.}
https://www.templeton.org/news/what-if-fundamental-reality-is-mind-not-matter

NATURE BRIEFING – Optimists are on the same wavelength

Optimistic people share patterns of brain activity, whereas pessimists have more varying, idiosyncratic ones, a brain-imaging study reveals. Optimists also make more of a distinction between positive and negative events than pessimists do. The findings could have implications in mental-health research, researchers say, because pessimism is linked to conditions such as depression. The "dramatic part of this research was seeing a very abstract, everyday feeling — the sense that some people think alike — become literally visible in the patterns of brain activity", says social psychologist and study co-author Kuniaki Yanagisawa.
https://www.nature.com/articles/d41586-025-02302-6

NATURE BRIEFING – Octopuses fall for 'rubber arm' illusion

If I cover your hand and then stroke a fake one placed nearby — for purely scientific reasons, I assure you — you will 'feel' the touch to the fake hand as if it's your own. This illusion demonstrates the link between vision, touch and proprioception — the ability to sense our body's position and movement. Now we know that octopuses have the same sense of body ownership. Researchers finagled a fake arm for a plain-body octopus (Callistoctopus aspilosomatis) and saw that the animal reacted to a gentle pinch in the same way it would to a tweak of the real thing.
https://www.science.org/content/article/octopuses-fall-rubber-arm-illusion-just-us

NEWS FROM SCIENCE – Octopuses fall for the 'rubber arm' illusion, just like us

Experiment shows octopuses feel body ownership, a trait previously seen only in mammals.
https://www.science.org/content/article/octopuses-fall-rubber-arm-illusion-just-us

NEWS FROM SCIENCE – Why do some moms have more boys than girls—or vice versa?

Researchers find that certain genetic variants and mother's age may have an impact on the sex of her children.
https://www.science.org/content/article/why-do-some-moms-have-more-boys-girls-or-vice-versa-new-study-provides-clues

NEWS FROM SCIENCE – Can portable headsets peer into the minds of hunter-gatherers and others?

Science chats with health economist Shailender Swaminathan about how compact EEGs could reveal the impact of culture and environment on the brain.
https://www.science.org/content/article/can-portable-headsets-peer-minds-hunter-gatherers-and-other-understudied-populations

NEWS FROM SCIENCE – Three ancient human relatives once shared the same valley

The world's greatest concentration of ancestral human remains, in South Africa, poses a 2-million-year-old riddle of coexistence.
https://www.science.org/content/article/three-ancient-human-relatives-once-shared-same-valley-did-they-meet-and-compete

SAPIENS – Important News about SAPIENS

Today, with a heavy heart, I write to share that SAPIENS is halting the publication of new content by the end of this year. The magazine is a program of the Wenner-Gren Foundation, which is facing unprecedented demands for its resources, in a world that is suffering extreme and layered crises.

Earlier this year SAPIENS lost its publishing partner, which provided essential administrative support. Despite an extensive search, we have been unable to find a new partner. At the same time, the political turmoil in the U.S. has created unprecedented pressures on anthropology's academic communities, university partners, and funding agencies. At the Foundation's most recent application deadline, it received a 40 percent increase in proposals for its core programs—and that demand will only continue to dramatically increase in the years ahead. You may find the Foundation's public letterhere.

Despite the magazine sunsetting under such circumstances, my heart is also full with the knowledge of what SAPIENS has achieved. When Leslie Aiello, then president of the Foundation, and I first started imagining what would become SAPIENS, we had no idea how far this experiment would go. Since launching in 2016, the magazine has collaborated with hundreds of contributors to publish articles read by more than 25 million people around the world. Our stories were republished far and wide, included in K-12 curricula, and translated into multiple languages. Our podcast has been downloaded 1 million times. We created and hosted dozens of training sessions. We earned and fulfilled the promise of more than $1.2 million in grants. The talents anthropologists acquired from SAPIENS helped them win prizes, receive book contracts, and secure media interviews.

None of this would have been possible without an extraordinary team, and I so appreciate that the Foundation is dedicated to smoothing the transition for SAPIENS' remaining staff in every way possible. I want to especially acknowledge the deep dedication and passion of my current colleagues: Bridget Alex, Amanda Lichtenstein, Ben Schacht, Emily Sekine, and Christine Weeber. Each of them has played an essential role in building SAPIENS into the vibrant, global platform it became, and no doubt they will continue to make lasting impacts on anthropology, journalism, and science communication.

The SAPIENS website and podcast archive will remain live and accessible. In the coming weeks, we'll be determining how many final pieces we can hopefully publish and the future of our newsletter and other digital assets.

To every author, editor, reader, listener, donor, and supporter—thank you for believing in the power of anthropology to illuminate the human experience. It has been an honor to share this journey with you.

I've seen firsthand the Foundation's commitment to advancing anthropological knowledge, amplifying the impact of anthropology, addressing anthropology's precarity, and fostering an inclusive vision of the field. Public anthropology figures prominently in transforming these goals into reality, and the Foundation's commitment to expanding the reach of anthropology remains unshaken. As a public anthropologist with two decades of experience bridging academic and public

communities, I have been invited to remain at the Foundation as Program Director for Public Anthropology. In this role, I will seek to foster public-facing scholarship across the Foundation's grant programs and build partnerships to help make anthropology relevant in a very different media landscape—and a very different world—than when SAPIENS was dreamed up a decade ago.

And so: the work goes on. If you have any questions or suggestions for what might wait ahead, please reach out as I'd love to hear from you.

Chip Colwell, PhD Editorial Director

SAPIENS – How Women Shaped Human Evolution Through Food Processing

An anthropologist highlights the revolutionary role of food processing and dietary diversity—practices often led by women—that were just as crucial to humans surviving and thriving as hunting.

https://www.sapiens.org/biology/human-evolution-food-processing-women-children/

SCIENCEADVISER – Having mostly boys or girls might run in families

We like to think that a child's sex is as simple as a coin toss, depending on the chromosome carried by the fertilizing sperm. But new research in Science Advances suggests that the coin may be weighted—associated with the mother's age during first pregnancy and the number of children she has.

The study has split outside experts, with some adding it to the growing research on sex ratios in families while others call the work "spurious." The paper looks at 58,007 women with almost 150,000 children and found that their children's sex does not follow what would be expected genetically. Instead, the more boys a family had, the greater chance they would have a boy again—and vice versa. Women who had their first child at 28 or older had 13% higher odds of having single-sex families, compared to women who had their first child at 22. After looking at the genomes of some of these mothers they also found genetic variants for having only girls or boys.

Researchers agree that the findings are not definitive, and more evidence is needed to confirm whether these genetic variants related to sex determination. In the end, however, humans will always be curious about themselves and their family structures, and interesting debates are part of finding the answer, Deborah Krakow, genetics professor at the University of California, Los Angeles tells ScienceAdviser.

https://www.science.org/content/article/why-do-some-moms-have-more-boys-girls-or-vice-versa-new-study-provides-clues

PUBLICATIONS

Academia Biology

PAPERS

CHARLES CAPADAY – From biology to physics and the unknown: What would it mean to understand consciousness?

The three main ideas of the relation between the brain and the mind, Cartesian dualism, epiphenomenalism and brain–mind identity theory are critically reviewed. The point is made that none of these ideas, or their numerous variants, are based on explicit biological, or physical, mechanisms and are therefore not scientific in nature. By contrast, the Penrose–Hameroff orchestrated objective reduction theory does make testable biological predictions. I do not discuss the theory per se, but review two of its recent experimental tests for the purpose of urging caution in the interpretation of their results. A brief review of the neural correlates of consciousness follows. It is concluded that such experiments neither support nor falsify any of the three main ideas on the relation between brain and mind. First and foremost, science is experimental. Consequently, to bring the mind–brain problem in the realm of science requires that we directly measure conscious states the way that we measure electric current, or blood pressure, as examples. The entity of conscious state measurements will be referred to as 'conscions', and these must be causally linked to neural activity. If this were ever realized, a deep gap of understanding would persist. This is because of what I will refer to as Tyndall's point. It can be summarized with a simple example as follows: if love were found to be associated with a right-handed turn of a given molecule and hate associated with its left-handed turn, then the question 'why we have these feelings' would remain unanswerable.

https://www.academia.edu/2837-4010/3/2/10.20935/AcadBiol7653

American Anthropologist

PAPERS

HOLLIS K. MILLER, ALLISON PESTRIKOFF & TAMARA SWENSON – Braided Storytelling as a Method in Archaeology: Reimagining the Sugpiaq Past Through Story

This article explores various storytelling methods in archaeology, as situated within a community-based project in Old Harbor, Alaska, a Sugpiaq village in the Kodiak Archipelago. We draw from both Indigenous and feminist writings to argue that storytelling is necessary in order to make sense of empirical data. Different methods of storytelling have a place in the practice of archaeology, from the initial formation of a research question to the sharing of results with community members and heritage professionals. Within our community-based work, it is crucial that we make our results and interpretations legible to the Old Harbor community. Here, we review existing information from historical accounts and archaeology to

construct story models that generate predictions for new archaeological research into the Russian colonial period at the Ing'yuq Village site. We then braid these story models together with an imagined narrative about the Sugpiaq experience of initial Russian arrival in their homelands and artistic interpretations of the Ing'yuq site. Taken together, these different storytelling strategies create a more nuanced picture of Sugpiaq lifeways at Ing'yuq—a picture that includes the historical, emotional, and experiential context of relations to this specific place on the land.
https://anthrosource.onlinelibrary.wiley.com/doi/10.1111/aman.28098

American Journal of Biological Anthropology

PAPERS

RASSINA FARASSI, JOÃO D'OLIVEIRA COELHO & SUSANA CARVALHO – Habitat Use and the Demographics of Object Manipulation by Wild Chacma Baboons

Studying object manipulation may offer insights about the emergence of habitual tool use in the hominin clade. Previous research on object manipulation has focused on habitual tool-using animals such as apes, capuchins, dolphins, and corvids. Investigating object manipulation in wild baboons, a highly social, ecologically adaptable, and terrestrial primate that is not a habitual tool user, can shed further light on the pressures favoring or inhibiting the use of technology. In this study, we investigate factors that influence object manipulation in the chacma baboons of Gorongosa National Park, across demographic and environmental conditions.

We collected data using focal and scan sampling, with the aid of the Animal Observer app, and recorded object use and other behaviors. We followed three focal troops: Chitengo, Montebelo, and Floodplain. A total of 2262 observations were recorded across 88 individuals (787 events involved object use).

Mixed-effects logistic regressions revealed that habitat, age, and substrate use significantly predicted object use among baboons. Object use was most likely in open forests. Adults are less likely to engage in object manipulation, and this behavior decreases with age, which is in line with previous results reported for bonobos. Interestingly, baboons spend more time manipulating objects arboreally than terrestrially.

Our findings contribute to the current discussions about the contexts that promote tool use across the primate order. Further studies expanding on these results and assessing differential availability of resources can provide a more comprehensive understanding of the evolution of tool use.
https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.70094

Behavioral and Brain Sciences

PAPERS

FRANÇOIS STOCKART et al with AXEL CLEEREMANS – Studying unconscious processing: Contention and consensus

The scope of unconscious processing has long been, and still remains, a hotly debated issue. This is driven in part by the current diversity of methods to manipulate and measure perceptual consciousness. Here, we provide ten recommendations and nine outstanding issues about designing experimental paradigms, analyzing data, and reporting the results of studies on unconscious processing. These were formed through dialogue among a group of researchers representing a range of theoretical backgrounds. We acknowledge that some of these recommendations naturally do not align with some existing approaches and are likely to change following theoretical and methodological development. Nevertheless, we hold that at this stage of the field they are instrumental in evoking a much-needed discussion about the norms of studying unconscious processes and helping researchers make more informed decisions when designing experiments. In the long run, we aim for this paper and future discussions around the outstanding issues to lead to a more convergent corpus of knowledge about the extent – and limits – of unconscious processing.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/studying-unconscious-processing-contention-and-consensus/36A74876AEBF472BF7B3597FFB3A4DC4

Cell

ARTICLES

VANESSA VILLALBA-MOUCO & AREV PELIN SÜMER – Unmasking the Denisovans

The Harbin cranium, linked to Denisovans via mitochondrial DNA, broadens their known range and provides the first insights into Denisovan morphology. This discovery highlights the potential of biomolecular analysis from nontraditional sources, enhancing understanding of archaic human evolution in Asia and filling gaps in the scarce Denisovan fossil record.
https://www.cell.com/cell/fulltext/S0092-8674(25)00745-7

PAPERS

JEANETTE A.I. JOHNSON et al – Human interpretable grammar encodes multicellular systems biology models to democratize virtual cell laboratories

Cells interact as dynamically evolving ecosystems. While recent single-cell and spatial multi-omics technologies quantify individual cell characteristics, predicting their evolution requires mathematical modeling. We propose a conceptual framework—a cell behavior hypothesis grammar—that uses natural language statements (cell rules) to create mathematical

models. This enables systematic integration of biological knowledge and multi-omics data to generate in silico models, enabling virtual "thought experiments" that test and expand our understanding of multicellular systems and generate new testable hypotheses. This paper motivates and describes the grammar, offers a reference implementation, and demonstrates its use in developing both de novo mechanistic models and those informed by multi-omics data. We show its potential through examples in cancer and its broader applicability in simulating brain development. This approach bridges biological, clinical, and systems biology research for mathematical modeling at scale, allowing the community to predict emergent multicellular behavior.
https://www.cell.com/cell/fulltext/S0092-8674(25)00750-0

DANIELA C. SOTO et al – Human-specific gene expansions contribute to brain evolution
Duplicated genes expanded in the human lineage likely contributed to brain evolution, yet challenges exist in their discovery due to sequence-assembly errors. We used a complete telomere-to-telomere genome sequence to identify 213 human-specific gene families. From these, 362 paralogs were found in all modern human genomes tested and brain transcriptomes, making them top candidates contributing to human-universal brain features. Choosing a subset of paralogs, long-read DNA sequencing of hundreds of modern humans revealed previously hidden signatures of selection, including for T cell marker CD8B. To understand roles in brain development, we generated zebrafish CRISPR "knockout" models of nine orthologs and introduced mRNA-encoding paralogs, effectively "humanizing" larvae. Our findings implicate two genes in possibly contributing to hallmark features of the human brain: GPR89B in dosage-mediated brain expansion and FRMPD2B in altered synapse signaling. Our holistic approach provides insights and a comprehensive resource for studying gene expansion drivers of human brain evolution.
https://www.cell.com/cell/fulltext/S0092-8674(25)00739-1

Cell Reports

PAPERS

REBEKKA M. TENDERRA & STEPHANIE THEVES – Human intelligence relates to neural measures of cognitive map formation
Psychometric research on intelligence identifies latent factors underlying performance correlations across cognitive tasks, with one general factor explaining most variance and predicting life outcomes. Their biological basis is unresolved, particularly regarding the underlying neural information processing mechanisms. We tested whether interindividual differences in relational processing, supported by hippocampal cognitive maps, relate to fluid intelligence (gf), an approximation of the general factor. Using standardized cognitive tests and functional magnetic resonance imaging (fMRI) of different mnemonic tasks, we demonstrate a positive correlation between gf and map-like encoding of object-location associations learned piecemeal. Their representational geometry in the lower gf range was less consistent with any two-dimensional arrangement, congruent with less relational integration at encoding. Intelligence was not related to non-relational hippocampal item memory, further supporting the specificity of our finding to relational rather than mnemonic components of hippocampal processing. These results provide empirical support for a link between neural mechanisms of relational reasoning and general cognitive performance.
https://www.cell.com/cell-reports/fulltext/S2211-1247(25)00804-6

Current Biology

ARTICLES

CARLEE TODDES & SAM A. GOLDEN – Behavioral neuroscience: Dominance in the absence of competition
Mice infer dominance rank using chemosensory cues rather than physical competition. This sensory-based inference reshapes how we think about hierarchy learning, stability, and behavioral flexibility in social animals.
https://www.cell.com/current-biology/fulltext/S0960-9822(25)00674-8

PAPERS

SUMIRE KAWASHIMA & YUZURU IKEDA – Rubber arm illusion in octopus
We instinctively know our hands and legs belong to us when we see them. This perception, known as the sense of body ownership, is a fundamental aspect of self-consciousness. Although studies show that this sense exists in some mammals, such as humans, monkeys, and rodents, research on its existence in non-mammalian animals is still lacking. In this study, we used the rubber hand illusion to demonstrate that an octopus, an invertebrate (cephalopod mollusk), also experiences body ownership of its arms.
https://www.cell.com/current-biology/abstract/S0960-9822(25)00592-5

AUDREY DUREUX et al – Functional organization of voice patches in marmosets and cross-species comparisons with macaques and humans
We recently identified voice-selective patches in the marmoset auditory cortex, but whether these regions specifically encode conspecific vocalizations over heterospecific ones—and whether they share a similar functional organization with

those of humans and macaques—remains unknown. In this study, we used ultra-high-field functional magnetic resonance imaging (fMRI) in awake marmosets to characterize the cortical organization of vocalization processing and directly compare it with prior human and macaque data. Using an established auditory stimulus set designed for cross-species comparisons—including conspecific, heterospecific (macaque and human), and non-vocal sounds—we identified voice-selective patches showing preferential responses to conspecific calls. Robust responses were found in three temporal voice patches (anterior, middle, and posterior) and in the pregenual anterior cingulate cortex (pgACC), all showing significantly stronger responses to conspecific vocalizations than to other sound categories. A key finding was that, while the temporal patches also showed weak responses to heterospecific calls, the pgACC responded exclusively to conspecific vocalizations. Representational similarity analysis (RSA) revealed that dissimilarity patterns across these patches aligned exclusively with the marmoset-specific categorical model, indicating species-selective representational structure. Cross-species RSA comparisons revealed conserved representational geometry in the primary auditory cortex (A1) but species-specific organization in anterior temporal areas. These findings highlight shared principles of vocal communication processing across primates.
https://www.cell.com/current-biology/fulltext/S0960-9822(25)00874-7

HANJA B. BRANDL et al – The physiological cost of leadership in collective movements

Individuals can gain substantial benefits from collective actions. However, collective behaviors introduce new challenges, like coordinating actions, maintaining cohesion, and meeting the needs of different individuals. When making collective movements, leaders are typically thought to gain disproportionate benefits through the choice of more beneficial resources and/or earlier access to resources. However, reaping these benefits can also come with costs. Attempting to influence group movements can increase energy expenditure and predation exposure. Moreover, leadership involves a process of negotiation in many animal groups. Within-group differences in directional preferences are typically resolved by some individuals initiating directional movements, after which they are either followed (if they are successful in leading) or return to the group (if they fail). By combining data on movement initiations (using whole-group global positioning system [GPS] tracking) and individual heart rate (from implanted electrocardiogram [ECG] loggers) in wild vulturine guineafowl, we found significant increases in heart rate (and decreases in heart rate variability) during collective movements. Further, we found that attempting—and failing—to initiate directional movement was physiologically costly, especially for leadership attempts when consensus among group members was low and when potential leaders acted against the majority. The scale of these costs far outweighed those arising from increased movement speeds alone, suggesting that leadership can induce physiological stress, entailing increased energy expenditure and potential physiological damage. These results suggest that behaviors often thought beneficial to individuals (by influencing group behaviors) are also physiologically costly, representing a constraint on group-living and explaining why sometimes individuals opt out of contributing to leadership.
https://www.cell.com/current-biology/fulltext/S0960-9822(25)00825-5

eLife

PAPERS

JIE LIN et al – Human-specific lncRNAs contributed critically to human evolution by distinctly regulating gene expression

Reviewed Preprint.

What genes and regulatory sequences make humans and apes that share substantial genes but show distinct phenotypes has puzzled researchers for decades. Genomic studies have examined species-specific genes and regulatory sequences (e.g., transcription factor binding sites, TFBS); birth, loss, and changes in these genes and sequences can greatly drive speciation and evolution. However, those involved in epigenetic regulation - species-specific lncRNA genes and regulatory sequences - remain poorly explored. We identified human-specific (HS) lncRNAs from GENCODE-annotated human lncRNAs, predicted their DNA binding domains (DBDs) and binding sites (DBSs) genome-wide, analyzed DBSs in modern humans (CEU, CHB, and YRI), archaic humans (Altai Neanderthals, Denisovans, and Vindija Neanderthals), and their counterparts in chimpanzees, and analyzed how DBSs influence gene expression in modern and archaic humans. Our results suggest that HS lncRNAs and their DBSs have substantially rewired gene expression human-specifically, the rewiring has evolved continuously from archaic to modern humans, and rewired gene expression has promoted brain development, made humans adapt to new environments and lifestyles, and caused differences in modern humans.
https://elifesciences.org/reviewed-preprints/89001

SEBASTIAN ISBANER et al – Dyadic Interaction Platform: A novel tool to study transparent social interactions

Reviewed Preprint

Studies of social cognition examine how organisms process and act on the presence, intentions, actions, and behavioural outcomes of others in social contexts. Many real-life social interactions unfold during direct face-to-face contact and rely on immediate, time-continuous feedback about mutual behaviour and changes in the shared environment. Yet, essential aspects of these naturalistic conditions are often lacking in experimental laboratory settings for direct dyadic interactions, i.e., interactions between two people. Here, we describe a novel experimental setting, the Dyadic Interaction Platform (DIP), designed to investigate the behavioural and neural mechanisms of real-time social interactions. Based on a transparent, touch-sensitive, bi-directional visual display, this design allows two participants to observe visual stimuli and each other

simultaneously, allowing face-to-face interaction in a shared vertical workspace. Different implementations of the DIP facilitate interactions between two human adults, adults and children, two children, nonhuman primates and in mixed nonhuman-human dyads. The platforms allow for diverse manipulations of interactive contexts and synchronized recordings of both participants' behavioural, physiological, and neural measures. This approach enables us to integrate economic game theory with time-continuous sensorimotor and perceptual decision-making, social signalling and learning, in an intuitive and socially salient setting that affords precise control over stimuli, task timing, and behavioural responses. We demonstrate the applications and advantages of DIPs in several classes of transparent interactions, ranging from value-based strategic coordination games and dyadic foraging to social cue integration, information seeking, and social learning.
https://elifesciences.org/reviewed-preprints/106757

LEE R BERGER et al with AGUSTÍN FUENTES – An initial report of circa 241,000- to 335,000-year-old rock engravings and their relation to Homo naledi in the Rising Star cave system, South Africa

The production of painted, etched, or engraved designs on cave walls or other surfaces is recognized as a major cognitive step in human evolution. Such intentional designs, which are widely interpreted as signifying, recording, and transmitting information in a durable manner, were once considered exclusive to Late Pleistocene Homo sapiens. Here we present observations of what appear to be engraved abstract patterns and shapes within the Dinaledi Subsystem of the Rising Star cave system in South Africa, incised into the dolomitic limestone walls of the cave. The markings described here are found on a pillar in the Hill Antechamber that extends into the natural fissure corridor that links the two chambers, and we associate them with Homo naledi. They include deeply impressed lines, cross-hatchings, percussion marks, and other geometric shapes on flat wall surfaces and in and around existing cracks and grooves in the dolomitic limestone walls, found in one specific location of the Dinaledi Subsystem. Remains of multiple H. naledi are found in this part of the cave system, and evidence of mortuary behavior appears in both the Dinaledi Chamber and adjacent Hill Antechamber dated to between 241 and 335 ka (Dirks et al., 2017; Robbins et al., 2021; Berger et al., 2025).
https://elifesciences.org/articles/89102

Evolutionary Anthropology

PAPERS

SVEN M. KASSER et al with MARCUS W. FELDMAN – Not by Selection Alone: Expanding the Scope of Gene-Culture Coevolution

Gene-culture coevolution (GCC)—an ambitious synthesis of biological and social sciences is often used to explain the evolution of key human traits. Despite the framework's broad conceptual appeal however, empirical evidence is often perceived as limited to a few key examples like lactase persistence. We argue this apparent gap between theoretical appeal and empirical evidence stems from conceptual ambiguities regarding the scope of relevant gene-culture interactions. Drawing on recent work in animal gene-culture coevolution and human genomics, we propose a "broad" approach that formally incorporates drift and migration alongside natural selection. This builds upon and subsumes the existing "narrow" framework focused on selection. Through case studies of skin pigmentation evolution and gift-exchange network influences on genetic variation in Melanesia, we demonstrate how cultural factors shape both adaptive and neutral genetic variation and population structure. This integrative perspective accommodates diverse empirical findings while opening new avenues for research in human evolution.
https://onlinelibrary.wiley.com/doi/full/10.1002/evan.70007

Evolutionary Human Sciences

PAPERS

VERENA BEHRINGER et al with BARBARA FRUTH & TRACY L. KIVELL – Wild bonobos experience unusually low bone resorption during early lactation relative to humans and other mammals

In mammals, pregnancy and lactation are marked by calcium stress and bone resorption, leading to reduced bone mineral density. In humans, these periods may partly explain the higher prevalence of osteoporosis in older women compared with men, but lactation patterns in modern humans may reflect cultural influences rather than natural conditions. The extent to which these findings apply to wild-living mammals remains unknown. We measured urinary C-terminal crosslinking telopeptide of Type I collagen (CTX-I) levels, a bone resorption marker, during pregnancy in wild and zoo-housed bonobos (Pan paniscus) and during lactation in wild bonobos. Studying wild-living primates such as bonobos can provide insights into ancestral reproductive adaptations. We found an increase in CTX-I levels towards the end of pregnancy in zoo-housed and primiparous wild females. Contrary to expectations, CTX-I levels during early lactation are lower than in other reproductive phases. This pattern diverges from the assumption that lactation increases bone resorption. Our findings suggest that wild bonobos may use physiological or behavioral strategies to modulate bone metabolism during lactation. These adaptations, shaped in natural environments, provide insight into evolutionary pressures on skeletal health and may inform strategies to mitigate bone loss in humans.
https://www.cambridge.org/core/journals/evolutionary-human-sciences/article/wild-bonobos-experience-unusually-low-bone-resorption-during-early-lactation-relative-to-humans-and-other-mammals/E819AFD9F17034D21F2F39FC9817C35E

ANNE-MARIA FEHN et al – Tracing contact and migration in pre-Bantu southern Africa through lexical borrowing
Lexical borrowing may provide valuable clues about the sociohistorical context of language contact. Here we explore patterns of vocabulary transfer between languages from three families (Kx'a, Tuu, Khoe-Kwadi) comprising the linguistic unit commonly referred to as Southern African Khoisan. In our dataset, 20% of 1,706 roots are shared between at least two families. By applying a carefully chosen set of linguistic and extralinguistic criteria, we were able to trace the origin of 71% of shared roots, with the remaining 29% constituting good candidates for ancient contact or shared common ancestry of the forager families Kx'a and Tuu. More than half of the shared roots for which an origin could be determined trace back to Khoe-Kwadi and were borrowed into languages of other families within two major confluence zones with different sociohistorical profiles: i) the Central Kalahari characterized by egalitarian interaction between languages of all three families, and ii) the southern and southwestern Kalahari Basin fringes showing unilateral transfer from Khoe-Kwadi-speaking herders into resident forager groups. The findings of this study complement genetic and archaeological research on southern Africa and testify to the value of linguistics in the multidisciplinary inference of contact and migration scenarios.
https://www.cambridge.org/core/journals/evolutionary-human-sciences/article/tracing-contact-and-migration-in-prebantu-southern-africa-through-lexical-borrowing/0E21FE2D0B2AF609FBCC1F4A6F0FE8B5

Frontiers in Psychology

PAPERS

XIAOJUAN YANG – Enhancing generosity through movement: association between physical exercise and charitable donation behavior
This study explores the relationship between physical exercise and charitable donation behavior in the context of China's pursuit of common prosperity. Specifically, it examines whether individuals who regularly engage in physical activity are more likely to donate to charitable causes and in greater amounts, as well as the psychological mechanisms underlying this relationship.
Using nationally representative data from the Chinese General Social Survey (CGSS2012), we conducted multivariate regression analyses to estimate the association between physical exercise and donation behavior. To ensure the robustness of the results, we performed a series of sensitivity analyses, including propensity score matching, alternative outcome measures, and different model specifications. Mediation analyses were also conducted to test the potential mediating roles of social responsibility and subjective well-being, drawing on theories of altruism and reciprocity.
The findings indicate a significant positive association between participation in physical exercise and both the likelihood of charitable donation and the amount donated. Robustness checks confirmed the stability of these results. Furthermore, heterogeneity analyses revealed that this relationship does not vary significantly across gender, age, or household registration status. Mediation analysis showed that both social responsibility and subjective well-being partially mediate the relationship between exercise and donation behavior.
The findings of this study underscore the potential societal benefits of promoting mass participation in physical exercise. By fostering a sense of social responsibility and enhancing subjective well-being, physical exercise may serve as a pathway to broader civic engagement. Promoting mass sports participation could thus support societal goals such as advancing common prosperity in China.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2025.1606795/full

SANGYUB KIM & KICHUN NAM – Interhemispheric interactions in visual word recognition: the role of multiple meanings
The current study investigated the influence of the number of meanings on visual word recognition, with a particular focus on hemispheric dynamics.
By reanalyzing parafoveal Korean lexical decision data, we examined how words with a high versus low number of meanings affect right visual field advantage (RVFA) and bilateral redundancy gain (BRG).
The words with a greater number of meanings exhibited a stronger RVFA and reduced BRG compared to words with fewer meanings.
The findings suggest that the facilitatory effects associated with multiple meanings are more pronounced in the left hemisphere (LH) than in the right hemisphere (RH). Furthermore, the increased lateralization of processing within the LH appears to diminish the need for interhemispheric interactions, leading to decreased coordination between the hemispheres. These results imply that the number of meanings in words shapes interhemispheric dynamics during visual word recognition. The implications of these findings are discussed in relation to theoretical models of visual word recognition and hemispheric differences in language processing.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2025.1591311/full

Frontiers in Sleep

PAPERS

LORENZO BERTOLINI, SERGIO CONSOLI & JULIE WEEDS – Dreams are more "predictable" than you think

A growing body of work has used machine learning and AI tools to analyse dream reports, and compare them to other textual content. Since these tools are usually trained on text from the web, researchers have speculated they might not be suited to model dreams reports, often labeled as "unusual" and "bizarre" content.

We used a set of large language models (LLMs) to encode dream reports from DreamBank and Wikipedia. To estimate the ability of LLMs to model and predict textual reports we adopted perplexity, a measure based on entropy, formally, the exponentiated log-likelihood of a sequence. Intuitively, perplexity indicates how "surprising" a sequence of words is to a model.

In most models, perplexity scores for dream reports were significantly lower than those for Wikipedia articles. Moreover, we found that perplexity scores were significantly different in reports produced by male vs female participants, and between blind and normally sighted individuals. In one case, we found this difference to be significant between clinical and healthy subjects.

Dream reports were found to be generally easier to model and predict than Wikipedia articles. LLMs were also found to implicitly encode group differences previously observed in the literature based on gender, visual impairment, and clinical population.

https://www.frontiersin.org/journals/sleep/articles/10.3389/frsle.2025.1625185/full

iScience

PAPERS

SONIA KLEINDORFER et al – Personality predicts collective behavior in greylag geese: influencers are bold and followers are exploratory

Simple interaction rules describe the coordination of individual behavior into collective behavior. However, we lack long-term tests of individually tagged individuals in the wild to understand fitness payoffs of different social roles during collective movement. Here, we interrogate leader-follower roles in greylag geese (Anser anser) in relation to personality traits (boldness, aggressiveness, exploration). We calculated an influencer score based on the number of followers for sub-group movement events across four years. Influencer score was weakly but significantly repeatable over time, and all three personality traits were repeatable. Greylag geese with higher influencer scores were bolder, and geese that were first to follow a non-partner influencer goose were more exploratory and likely to look behind the mirror during a mirror stimulation test. In light of these findings, we discuss potential individual-level benefits of following a bold individual and the presumed group-level benefits of new information spread via followers open to novelty.

https://www.cell.com/iscience/fulltext/S2589-0042(25)01431-2

Language and Cognition

PAPERS

TSHERING YANZOM DORJI & FRANK H. DURGIN – Figurative language is (implicitly) more dynamic and emotionally deeper than literal language

Two experiments investigated the nature of the emotional differences between figurative language and literal counterparts. The semantic differential method was used with principal component analysis as a data-driven implicit method for distinguishing emotional variables. The first experiment found that metaphoric stories were reliably different in emotionality than their literal counterparts along three different data-defined dimensions. The second experiment extended the conclusions to the evaluation of individual words used figuratively (including simile and metaphor). In both studies, principal component analysis revealed three distinct underlying sources of variance implicit in the ratings of experimental items including the dimensions of dynamism and depth, as well as an evaluation scale in each case. Notably, all three implicit scales, though orthogonal to each other, were found to correlate with explicit judgments of emotional valence of the stories in Experiment 1. Data-derived implicit measures are an effective way of discriminating among affective dimensions in figurative linguistic stimuli.

https://www.cambridge.org/core/journals/language-and-cognition/article/figurative-language-is-implicitly-more-dynamic-and-emotionally-deeper-than-literal-language/A6236B4007A45D0B46B51A0EB5BC2BA0

Linguistic Anthropology

PAPERS

ALEXANDRA DIAMOND – Young children's language socialization to kinship vocatives and some of their indexicalities in an Indo-Fijian community

This article explores young children's language socialization to kinship vocatives and some of their indexicalities in "Dovubaravi," a rural Indo-Fijian community in Fiji. The investigation engaged 11 young Dovubaravi children and their extended families in qualitative ethnographic data generation across 2 years. Findings (i) demonstrate participation in culturally approved discourse in Dovubaravi requires apposite deployment of kinship vocatives indexing elder respect, lines

of kinship, familial roles, asymmetrically reciprocal obligations between family members, consanguinity taboos, and ethno-cultural identities, and (ii) suggest how multiparty talk supports Dovubaravi children's language socialization to kinship vocatives and their indexicalities, and to a culturally authorized curiosity.
https://anthrosource.onlinelibrary.wiley.com/doi/full/10.1111/jola.70011

Mind & Language

PAPERS

İSA KEREM BAYIRLI – Uniquely human temporal thoughts
Life on Earth will eventually come to an end. The thought expressed in the previous sentence is about a point in time that is not known to the individual entertaining the thought. This paper is concerned with the nature of such temporal thoughts. We propose that the capacity to mentally represent thoughts about non-specific temporal intervals is a unique aspect of human cognition. We suggest that this capacity is a consequence of the fact that human grammar defines/generates sentences involving binding of temporal variables and quantification over intervals. This leads to a view of language evolution as a transition between logics.
https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12565

COMMENTARIES

MONA-MARIE WANDREY & MARTA HALINA – Sentience and society: Towards a more values-informed approach to policy
In The edge of sentience, Jonathan Birch proposes a democratically inclusive framework for protecting potentially sentient beings. While experts assess and communicate evidence of sentience, the public deliberates on proportionate policy responses to avoid causing gratuitous suffering. While we think there are many virtues to Birch's analysis and approach, in this commentary, we raise the concern that the proposed framework fails to sufficiently account for the presence of non-epistemic values in science. We discuss strategies from the values in science literature for evaluating and managing these values in a democratic and inclusive way.
https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12541

TIM BAYNE – Deference, development, and large language models: Issues at the edge of sentience
This article is a commentary on Jonathan Birch's The edge of sentience. It considers the role of deference to consciousness experts in the citizens' assemblies that he calls for; evaluates his claim that the human fetus is a sentience candidate from 12 weeks' gestation; and explores some of the issues raised by his approach to sentience in large language models and other AI systems.
https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12537

JONATHAN BIRCH – Sentience and the science–policy nexus: Replies to Wandrey and Halina, and Bayne
The edge of sentience is a book about what we should do when a decision problem forces us to draw a pragmatic line between the sentient and the non-sentient. The commentaries from Wandrey and Halina and from Bayne analyse both my precautionary framework and my claims about specific cases. My responses start with the case of large language models (LLMs), zoom out to general issues about the science–policy relationship, then zoom in again on the case of fetuses.
https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12552
BOOK WEBPAGE: https://www.edgeofsentience.com/

Nature

NEWS

The optimistic brain: scans reveal thought patterns shared by positive thinkers
Insights from brain imaging could have implications for mental-health research.
https://www.nature.com/articles/d41586-025-02302-6

Mystery food in Neanderthal diet might be maggots
Study of rotting human cadavers hints that a puzzling chemical marker in Neanderthal remains could be from eating the larvae.
https://www.nature.com/articles/d41586-025-02334-y

Nature Communications

PAPERS

SHURAN HUANG, SETH D. POLLAK & WANZE XIE – Conceptual knowledge increasingly supports emotion understanding as perceptual contribution declines with age
Human's abilities to reason about what others may be feeling undergo prolonged development throughout childhood and adolescence, yet the mechanisms driving the emergence of these skills remain elusive. This set of studies, conducted within

the same sample of 5- to 10-year-old children, examines how spontaneous perceptual discrimination of facial configurations and activation of conceptual knowledge about emotions become integrated across development. Perceptual discrimination is measured using an EEG frequency tagging paradigm (Study 1). Conceptual knowledge is evaluated with a conceptual similarity rating task (Study 2). Two behavioral tasks (sorting and matching) are employed to assess emotion understanding (Study 3). Representational similarity analysis assesses the predictive effects of perceptual discrimination and conceptual knowledge on children's behavioral judgments. Here we show that while the ability to discriminate stereotypical facial configurations emerges by preschool age, its influence diminishes with age. In contrast, children's inferences about other people's emotions come to rely more on conceptual knowledge with increasing age (and, presumably, social experience).
https://www.nature.com/articles/s41467-025-62210-1

Nature Ecology & Evolution

PAPERS

ANDREW SILLEN, CHRISTOPHER DEAN & VINCENT BALTER – Geochemical chronologies in Paranthropus robustus teeth inform habitat and life histories

Radiogenic strontium isotopes (87Sr/86Sr) and the alkaline earth ratios (AERs) Sr/Ca and Ba/Ca in fossil dental enamel can inform the habitat, residence and life histories of early hominins recovered from the Pleistocene cradle-of-humankind sites of Gauteng, South Africa. Key questions, which may be addressed with these indices, are the relative exploitation of wet versus dry botanic regimes and whether early hominins dispersed in a manner similar to that of chimpanzees (characterized by male philopatry and female dispersal at puberty) or to that of humans (who are not so characterized). Here we developed 28 new dental chronologies in 20 Paranthropus robustus teeth from Swartkrans and Kromdraai. Resulting geochemical time series demonstrate that, while maternal 87Sr/86Sr in earlier-forming teeth varies widely, third molar 87Sr/86Sr, derived from postweaning solid foods, progressively converges to 0.7306 ± 0.0035 (± 2 s.d.), which we express as the local isotopically delineated exploitation area (LIDEA). The spatial resolution of LIDEA is determined using a bioavailable 87Sr/86Sr isoscape. In this environmental context, we interpret LIDEA as a quantifiable signal indicating eurytopy (generalization), with some 30% of Sr deriving from riparian woodland habitats. With regard to residence, many individuals arrived at the site after second molar mineralization, while some matured locally, demonstrating both male and female dispersal as well as lifelong local residence. Analysis of both 87Sr/86Sr and the AERs further highlights concomitant patterns, as well as numerous periodicities that may be related to resource depletion, seasonality or lunar cycles.
https://www.nature.com/articles/s41559-025-02798-1

Neuron

PAPERS

XINYUAN LIANG et mul with ALZHEIMER'S DISEASE NEUROIMAGING INITIATIVE (ADNI), MULTI-CENTER ALZHEIMER'S DISEASE IMAGING (MCADI) CONSORTIUM & DISEASE IMAGING DATA ARCHIVING – MAJOR DEPRESSIVE DISORDER (DIDA-MDD) WORKING GROUP – Dissecting human cortical similarity networks across the lifespan

The human cortex exhibits remarkable morphometric similarity between regions; however, the form and extent of lifespan network remodeling remain unknown. Here, we show the spatiotemporal maturation of morphometric brain networks, using multimodal neuroimaging data from 33,937 healthy participants aged 0–80 years. Global architecture matures from birth to early adulthood through enhanced modularity and small worldness. Early development features cytoarchitecturally distinct remodeling: sensory cortices exhibit increased morphometric differentiation, paralimbic cortices show increased morphometric similarity, and association cortices retain stable hub roles. Morphology-function coupling peaks in early adolescence and then decreases, supporting protracted functional maturation. These growth patterns of morphometric networks are correlated with gene expression related to synaptic signaling, neurodevelopment, and metabolism. Normative models based on morphometric networks identify person-specific, connectivity-phenotypic deviations in 1,202 patients with brain disorders. These data provide a blueprint for elucidating the principle of cortical network reconfiguration and a benchmark for quantifying interindividual network variations.
https://www.cell.com/neuron/fulltext/S0896-6273(25)00476-3

New Scientist

ARTICLES

COLIN BARRAS – What were ancient humans thinking when they began to bury their dead?

Claims that a small-brained hominin called Homo naledi buried its dead raise intriguing questions about ancient minds and why we engage in this peculiar practice.
https://www.newscientist.com/article/2487980-what-were-ancient-humans-thinking-when-they-began-to-bury-their-dead/

CHRIS SIMMS – Neanderthal groups had their own local food culture

A comparison of cut marks on bones reveals that Neanderthal groups living fairly close to each other had their own distinct ways of butchering animals.
https://www.newscientist.com/article/2488544-neanderthal-groups-had-their-own-local-food-culture/

Patterns

PAPERS

JULI BAKAGIANNI et al – A systematic survey of natural language processing for the Greek language
Natural language processing (NLP) methods have advanced rapidly, yet research remains centered on English, followed by a handful of well-supported languages, while many others receive only moderate, limited, or no support. This imbalance affects the adaptability of language technologies across diverse linguistic and cultural contexts. Comprehensive monolingual NLP surveys—those covering the full spectrum of NLP tasks—offer a structured way to assess language-specific challenges, resource availability, and methodological trends, yet no standardized framework exists for conducting these surveys. We introduce a generalizable methodology for systematic monolingual NLP surveys, which ensures transparency and reproducibility. The method can be extended to other languages with similar challenges, ultimately contributing to a more inclusive and equitable NLP landscape.
https://www.cell.com/patterns/fulltext/S2666-3899(25)00161-8

PLoS One

PAPERS

SOTA KIKUCHI, NORIKO KONDO & HIROKI KODA – Temporal regularities of vocal exchange in Java sparrows
In human turn-taking, speakers alternate at very short intervals while avoiding overlaps. If speakers do not receive a vocal response from another party, they often repeat their utterance after the expected response time has elapsed to elicit a reply. Intra-individual intervals tend to be longer than inter-individual intervals. Such temporal regularity in vocal exchanges has also been observed in social mammals, such as non-human primates. In contrast, vocal exchanges in birds have been studied primarily in the context of songs, with limited research on call-based vocal exchanges. Studies specifically examining intra-individual call intervals are even scarcer. In this study, we investigated vocal exchanges and their temporal patterns in Java sparrows placed face-to-face. The results revealed that they vocalized at very short intervals following the calls of the other individual. However, no significant differences were observed between the inter- and intra-individual intervals. This contrasts with the temporal characteristics of vocal exchanges observed in social mammals that have been studied to date. We propose that a possible explanation for this difference lies in the variation in social group structures between birds and mammals.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0327024

Proceedings of the Royal Society A

PAPERS

ÄMIN BAUMELER, BORIVOJE DAKIĆ & FLAVIO DEL SANTO – The axiom of choice and the no-signalling principle
We show that the axiom of choice, a basic yet controversial postulate of set theory, together with one of the pillars of our best physical theories, namely the no-signalling principle, may point to a limitation in modelling physical problems using standard mathematics. While it is well known that probabilistic no-signalling resources (such as quantum non-locality) are stronger than deterministic ones, we show—by invoking the axiom of choice—the opposite: functional (deterministic) no-signalling resources can be stronger than probabilistic ones (e.g. stronger than quantum entanglement or non-locality in general). To prove this, we devise a Bell-like game that shows a systematic advantage of functional no-signalling with respect to any probabilistic no-signalling resource.
https://royalsocietypublishing.org/doi/10.1098/rspa.2024.0601

Science

ARTICLES

ANN GIBBONS – The riddle of coexistence
Two million years ago, three kinds of hominins walked the same valley in South Africa. Did they meet—and compete?
https://www.science.org/content/article/three-ancient-human-relatives-once-shared-same-valley-did-they-meet-and-compete

REVIEWS

PATRICK E. MCGOVERN – Sensing early civilizations
Armchair archaeologists summon ancient tastes, sights, and sounds to understand the past. Review of “Dinner with King Tut” by Sam Kean; Little Brown, 2025.
https://www.science.org/doi/10.1126/science.ady4803

Science Advances

PAPERS

SIWEN WANG et al – Is sex at birth a biological coin toss? Insights from a longitudinal and GWAS analysis
Some families consistently have offspring of only one sex, raising questions about whether sex at birth is truly random. This study investigated whether offspring sex follows a simple binomial distribution within families and identified maternal factors associated with unisexual sibships. We analyzed 58,007 US women with two or more singleton live births (146,064 pregnancies, 1956–2015). Offspring sex followed a beta-binomial rather than a simple binomial distribution, indicating that each family may have a unique probability of male or female births, akin to a weighted coin toss. Deviations from simple binomial distribution were more pronounced when we excluded each woman's last birth to reduce the influence of sex-based stopping behavior. After excluding the last birth, older maternal age at first birth was associated with higher odds of having offspring of only one sex. A genome-wide association study identified maternal SNPs linked to having female-only (NSUN6) and male-only (TSHZ1) offspring. Our findings suggest maternal factors influence offspring sex distributions.
https://www.science.org/doi/10.1126/sciadv.adu7402

Trends in Cognitive Sciences

PAPERS

DAVID SCHULTNER, LUCAS MOLLEMAN & BJÖRN LINDSTRÖM – Reward is enough for social learning
Adaptive behaviour relies on selective social learning, yet the mechanisms underlying this capacity remain debated. A new account demonstrates that key strategies can emerge through reward-based learning of social features, explaining the widely observed flexibility of social learning and illuminating the cognitive basis of cultural evolution.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(25)00158-5

CODY V. DONG et al – Towards large language models with human-like episodic memory
Cognitive neuroscience research has made tremendous progress over the past decade in addressing how episodic memory (EM; memory for unique past experiences) supports our ability to understand real-world events. Despite this progress, we still lack a computational modeling framework that is able to generate precise predictions regarding how EM will be used when processing high-dimensional naturalistic stimuli. Recent work in machine learning that augments large language models (LLMs) with external memory could potentially accomplish this, but current popular approaches are misaligned with human memory in various ways. This review surveys these differences, suggests criteria for benchmark tasks to promote alignment with human EM, and ends with potential methods to evaluate predictions from memory-augmented models using neuroimaging techniques.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(25)00179-2

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