EAORC BULLETIN 1,173 – 7 December 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 – Life in the Pleistocene

Around 300,000 years ago, when anatomically modern humans first appeared, a half-dozen closely related populations were also running around Africa, Europe, Asia, and the Arabian Peninsula.
Pockets of Homo sapiens intermingled (and even procreated) with communities of Neanderthals, Denisovans, and as-yet unknown others. In southeastern Africa, the diminutive Homo naledi showed signs of cultural learning. On the islands of Indonesia, the long-legged Homo erectus crossed paths with the small-bodied Homo floresiensis (also known as "Hobbits"). The Earth was filled with an array of groups reminiscent of Tolkien's Middle Earth—different body shapes, different cultures, different tools.
And somehow, in the time since, every single human lineage but ours has gone extinct. In practically the blink of an eye, geologically speaking, a multitude of interacting communities shrank down to only Homo sapiens, creating one of the most fascinating and enduring mysteries in human evolution.
https://www.templeton.org/news/life-in-the-pleistocene

MIT NEWS – Researchers discover a shortcoming that makes LLMs less reliable

Large language models can learn to mistakenly link certain sentence patterns with specific topics — and may then repeat these patterns instead of reasoning.
https://news.mit.edu/2025/shortcoming-makes-llms-less-reliable-1126

SCIENCENEWS – A foot fossil suggests a second early human relative lived alongside Lucy

Foot bones and other fossils have been attributed to Australopithecus deyiremeda, a recently discovered species that may shake up the human family tree.
https://www.sciencenews.org/article/foot-fossil-early-human-relative-lucy

THE CONVERSATION – When did people first arrive in Australasia? New study dates it to 60,000 years ago

New research confirms humans first reached the Sahul super-continent by two different routes around 60,000 years ago.
https://theconversation.com/when-did-people-first-arrive-in-australasia-new-archaeogenetics-study-dates-it-to-60-000-years-ago-270959

THE CONVERSATION – Why our physical bodies may be a core part of conscious experience

The brain's sense of "this is my body" is tightly bound to conscious awareness – far more than many theories assume.
https://theconversation.com/why-our-physical-bodies-may-be-a-core-part-of-conscious-experience-new-research-270836

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

JESSE M. MARTIN et al – The StW 573 Little Foot Fossil Should Not Be Attributed to Australopithecus prometheus

We adopt the methods of classic morphology by comparing StW 573 to the type specimen of A. prometheus (MLD 1) and other consensus members of Australopithecus africanus. We utilize qualitative anatomical descriptions and comparisons, supplemented with the examination of selected relevant quantitative measurements.

We find that the morphology preserved by StW 573 does not support assigning that specimen to A. prometheus because it does not share a unique suite of primitive and derived traits in common with the A. prometheus type specimen, MLD 1. Specifically, StW 573 differs from MLD 1 in having a more pronounced external occipital protuberance, a sagittal crest at lambda, an asterionic notch, a long nuchal plane, and a smaller cranial capacity. Regarding these same areas of anatomy, MLD 1 more closely resembles Sts 5, and MLD 37/38, consensus members of A. africanus.

A. prometheus should remain a junior synonym for A. africanus based on the demonstrated morphological similarities between MLD 1 and the broader A. africanus sample. Conversely, while StW 573 cannot be attributed to A. prometheus, the results of this study indicate that it also differs in meaningful ways from specimens conventionally attributed to A. africanus.
https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.70177

Behavioral and Brain Sciences

COMMENTARIES

[ORIGINAL PAPER: R.I.M. DUNBAR – Structural and Cognitive Mechanisms of Group Cohesion in Primates. EAORC BULLETIN 1,090]
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/structural-and-cognitive-mechanisms-of-group-cohesion-in-primates/CAD5A879AE579178988DF5DE98531F48

CARSTEN K. W. DE DREU et al with ROMAN WITTIG – Group-mindedness as evolved solution to deal with group-living

Challenges of group-living include foundational problems of cooperation and coordination that extend beyond anthropoid primates and may potentially be managed through evolved group-mindedness rather than expanded neocortical size and enhanced capacities for executive functions.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/groupmindedness-as-evolved-solution-to-deal-with-groupliving/4799024E954AD7B160582C9D19C70BB0

ANGELICA KAUFMANN et al – What holds groups together? How interdependence shapes group-living

Dunbar's emphasis on dyadic relationships in group formation overlooks the roles of interdependence and joint commitment in social cohesion. We challenge his premise by highlighting the importance of group-level processes, particularly where top-down group pressures like cooperative breeding and out-group threat can induce joint commitment as an alternate means to sustain group cohesion.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/what-holds-groups-together-how-interdependence-shapes-groupliving/1A901026A0A1C699281B50499315D109

CATHERINE HOBAITER & NATHANIEL J. DOMINY – Flexible branches in the primate family tree?

Primate species deploy a suite of behavioural and cognitive adaptations to offset the costs of group-living. Dunbar uses species-level comparisons to posit a series of cumulative steps that describe large-scale phylogenetic patterns in the

evolution of sociality. Here, we highlight the value of population-level variation within species for empirically testing the predicted socio-ecological correlations that underpin Dunbar's hypothesis.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/flexible-branches-in-the-primate-family-tree/A74C23D41B52F9ED9D2A9CC0F8FFA5E5

PHYLLIS C. LEE & KAREN B. STRIER – Dynamic unpredictability in grouping
Dunbar presents an intriguing analysis of variance in primate group sizes, and social glue's (grooming) relationship to cognitive evolution. This focus on primates with consistent and stable grouping excludes perspectives on the evolution of grouping beyond predation and competition. The analysis raises important questions about variation, dynamic sizes, and the conservation implications of variance for primate population extinction vulnerabilities.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/dynamic-unpredictability-in-grouping/971F8FA85B75BACB764A12EE3214E02E

YI-FEI HU, ALICE XIA & ORIEL FELDMANHALL – Mental abstraction aids group cohesion in large social networks
Human social networks are far larger than those of nonhuman primates. Maintaining cohesion in large networks requires a robust mechanism that can accommodate the dense webs of connections within communities. A parsimonious account of how humans achieve social cohesion is mental abstraction, which enables individuals to construct fuzzy network representations that facilitate information flow tracking and mitigate conflict.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/mental-abstraction-aids-group-cohesion-in-large-social-networks/90244C51CE04BCD1382B8AED67FDEF17

CÉDRIC SUEUR & JEAN-LOUIS DENEUBOURG – Beyond individual selection: adaptive networks and collective social niche construction
Dunbar explains primates group cohesion through cognitive and structural mechanisms like grooming and social cognition. We extend this by highlighting collective social niche construction, where emergent social properties arise from feedback loops, selection pressures, and self-organisation. Adaptive social networks evolve through multilevel selection, cultural transmission, and ontogenetic changes, shaping survival, cognition, and collective intelligence across species.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/beyond-individual-selection-adaptive-networks-and-collective-social-niche-construction/A9F9C67996FBC94996504FDF845495AF

WEN ZHOU et al with BRIAN HARE – Tolerance as a key mechanism for large-scale social cohesion
Grooming and cognition support primate group cohesion but are insufficient for maintaining stability in large groups. We propose tolerance, the capacity to accommodate social stress, as an additional mechanism. Tolerance fosters flexible social skills and cooperation beyond small cliques. Shaped by hormonal adaptation and development, tolerance plays a foundational role in overcoming group size limits by sustaining complex social networks.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/tolerance-as-a-key-mechanism-for-largescale-social-cohesion/364752BD6A37F35DD981AEADF6DD983C

HENRIK JÖRNTELL – Cognitive perception of social stress as a critical mechanistic control of mood and mood-related brain signals
The paper of Dunbar (2025) on social stress is a strong demonstration that stress in itself can have a purely cognitive origin. The paper shows that the cognitive system can have profound impacts on the hypothalamus. As detailed in my commentary, this opens up new avenues of how to interpret psychiatric conditions, placebo, and other associations between perceptions and vegetative functions in the brain.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/cognitive-perception-of-social-stress-as-a-critical-mechanistic-control-of-mood-and-moodrelated-brain-signals/693F6BFCA730BBC5D25D3B5C40439595

MARCUS J. HAMILTON – What problem does a fractal social network solve?
Dunbar's framework highlights the challenge of maintaining large, stable social networks given cognitive constraints. Expanding on this, I propose that fractal social networks function as lossy compression algorithms, efficiently reducing the complexity of social storage and retrieval. Rather than tracking all relationships explicitly, individuals rely on hierarchical abstractions and transitive inference, shifting storage complexity from to . This insight suggests broader implications for cognitive evolution, institutional organization, and artificial intelligence.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/what-problem-does-a-fractal-social-network-solve/ED234F564664034BE29D5065715AC80B

CRISTINA ACEDO-CARMONA & ANTONI GOMILA – What human trust networks reveal about cognitive mechanisms of group cohesion in primates

Drawing on our previous work on human trust networks, we provide further evidence of how group structure can foster group cohesion. But this work also raises doubts about two central tenets of the target paper: (1) the role assigned to cognitive abilities in group cohesion and stabilization; and (2) the emphasis on group size as the critical variable.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/what-human-trust-networks-reveal-about-cognitive-mechanisms-of-group-cohesion-in-primates/8AF2A432B9FA635DB014080A7D5C67AE

IAN A. APPERLY – What makes social abilities sophisticated? Not recursive mentalising

To explain human social sophistication, and proximal phylogenetic steps leading to it, Dunbar claims that mentalising expands to increasingly high levels of recursion. However, the evidential basis for this claim is weak, exposing both a limitation in Dunbar's account and in the field's current understanding of social sophistication.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/what-makes-social-abilities-sophisticated-not-recursive-mentalising/C7810A807AC51F2236543743D9EE3AE0

ELISABETTA PALAGI, FAUSTO CARUANA & GORDON BURGHARDT – Play and laughter: overlooked pillars of social cohesion. Commentary proposal for structural and cognitive mechanisms of group cohesion in primates

While grooming and other forms of physical bonding are crucial for stress management, social play and laughter deserve equal recognition as tools for both stress relief and the reinforcement of social relationships. They play a pivotal role in the development of motor and social skills and serves as a foundational behavior in species that rely on cooperation and alliance-building.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/play-and-laughter-overlooked-pillars-of-social-cohesion-commentary-proposal-for-structural-and-cognitive-mechanisms-of-group-cohesion-in-primates/CEF9776DE6A52FCA8AE311DE2A69D75C

MARK W. MOFFETT – It's not just about allies – The role of identity in stable ingroup memberships

Dunbar exclusively sees groups as arising through the aggregate relationships between individuals and thereby makes the serious omission of not considering the capacity of those individuals to categorize one another as ingroup versus outgroup members.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/its-not-just-about-allies-the-role-of-identity-in-stable-ingroup-memberships/7783F38F50B17C5B9A468FD72FA7F9BA

PSYCHE LOUI & ELIZABETH H. MARGULIS – Meta-cognition for music as a solution to the fragmentation problem

Meta-cognition enhances the social bonding hypothesis for musicality, integrating imagination, episodic simulation, causal inference, and inhibition. Music fosters group cohesion by engaging the endogenous opioid system, supporting intergroup understanding through vivid mental imagery, and facilitating socio-affective fiction. Additionally, causal inference enables contextual interpretation of music, while inhibition refines musical coordination and executive function, reinforcing cognitive flexibility for cooperative social behavior.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/metacognition-for-music-as-a-solution-to-the-fragmentation-problem/D8B99180C8A411E2E4F373A24CCF4D57

WOUTER WOLF – Primates' social cognitive bonding mechanisms are more complex than we thought, yet not quite human–lessons from great ape triadic social bonding

The current manuscript rightly points out that non-human primates evolved complex social cognitive skills to maintain weaker social ties. However, these capacities are likely more expansive than currently proposed: research shows that apes behave more socially to those with whom they experience similar things, suggesting that they possess some precursor of humans' capacity to bond through shared experiences.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/primates-social-cognitive-bonding-mechanisms-are-more-complex-than-we-thought-yet-not-quite-humanlessons-from-great-ape-triadic-social-bonding/AFCE40988196294F27D3DF92DB345BBC

JULIA OSTNER & OLIVER SCHÜLKE – Spelling out the mechanism: functional support and modified stressor appraisal buffer a cost of increased group size

Dunbar suggests structural, behavioral, and cognitive mechanisms to mitigate the costs of living in large groups. While we generally concur with the notion of group size effects on female productivity, we call for a more explicit treatment of how functional support alleviates social costs and disagree with the outright dismissal of ecological drivers and phylogenetic inertia.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/spelling-out-the-mechanism-functional-support-and-modified-stressor-appraisal-buffer-a-cost-of-increased-group-size/8764DCD9E716E07C78C511022F0C0517

ANTONIO BENÍTEZ-BURRACO – Why not reduce reactive aggression too?
Grooming is one strong mechanism allowing primate groups to grow larger and more cohesive, but a reduction in reactive aggression responses can be expected to have contributed to this trend too. There is indeed a partial overlap between the neurobiology of grooming and the neurobiology of reactive aggression.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/why-not-reduce-reactive-aggression-too/5A41552032F39239780F7B92FD77D173

KARLIJN VAN HEIJST & MARISKA E. KRET – Core affective mechanisms maintaining group cohesion
As the third solution to group dispersion, Dunbar proposes primates use several higher order cognitive skills to especially manage 'weak ties' in a nuanced and fast-tracked way, therewith avoiding unnecessary conflicts. We here argue that subconscious, automatic processes including attention allocation and behavioral or neurophysiological state matching can serve a similar function in maintaining group cohesion.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/core-affective-mechanisms-maintaining-group-cohesion/1074F49F6568692A97AECCD0DA34D735

EDWARD RUOYANG SHI – Beyond the cortex–integrating hippocampal function into the Social Brain Hypothesis to explain advanced cognition
The Social Brain Hypothesis (SBH) connects primate brain size to social complexity but faces empirical limitations. We propose expanding the SBH by incorporating hippocampal functions across species, demonstrating how cognition emerges from both social and ecological pressures. This extended framework moves beyond cortical-centric models, providing a comprehensive understanding of brain evolution and the origins of human cognitive abilities, including language.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/beyond-the-cortexintegrating-hippocampal-function-into-the-social-brain-hypothesis-to-explain-advanced-cognition/3D3095DF9D8F5AADC6B0738347656465

CASEY L. TIMBS & HEATHER M. MARANGES – Behavioral ecology shapes structural, behavioral, and cognitive solutions
Life history strategies adaptively calibrated to levels of environmental harshness and unpredictability shape not only the fundamental issue of fertility but also whether and to what extent people engage in the structural, behavioral, and cognitive solutions proposed by Dunbar. Considering behavioral ecology can, therefore, add nuance to Dunbar's novel and important theory.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/behavioral-ecology-shapes-structural-behavioral-and-cognitive-solutions/391248E647C4D5606644BDBFBCB63D54

EDWIN J. C. VAN LEEUWEN & TOM S. ROTH – On the forces that bind us
Dunbar proposes strategies to solve the fragmentation problem experienced by group-living animals. We highlight that bondedness not only mitigates stress but also provides structural scaffolding for group stability. Furthermore, we posit tolerance as a complementary mechanism smoothing social interactions and argue that variation in cohesion-promoting traits reflects context-dependent socio-ecological pressures, challenging static models linking sociality to cognition. Finally, we propose two further mechanisms—cultural transmission and dominance dynamics—that can enhance social cohesion by aligning behaviour and reducing uncertainty.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/on-the-forces-that-bind-us/0527D453D2898F34F12E4E1188C73598

VALERY KRUPNIK – Metacognition serves allostasis and co-evolves with the social brain
In this commentary, I suggest a complementary view to the target paper's idea that primate social metacognition evolved as an adaptation to living in large groups. I present metacognition as a necessary step in the development of complex allostatic systems and suggest that intrinsic and social metacognition are dissociable, which can be studied in the mammalian default mode network.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/metacognition-serves-allostasis-and-coevolves-with-the-social-brain/442BE8C9CA788F02F8975C8967B36E2E

REDOUAN BSHARY & ZEGNI TRIKI – A fishy perspective on the social brain hypothesis
Ectotherms, particularly fish, challenge traditional brain evolution theories by exhibiting advanced cognitive abilities despite their smaller brains. While the social brain hypothesis may apply within clades, sensory-motor systems likely explain the brain size differences between average-brained ectotherms and endotherms. Evolved complex sensory-motor systems suggest that brain evolution models should expand to include sensory and motor systems, beyond cognitive processes alone.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/fishy-perspective-on-the-social-brain-hypothesis/04E644EDC36DC1FA83E2650BB48D4316

SAM G. B. ROBERTS & ANNA I. ROBERTS – Intentional communication reduces social stress by increasing the predictability of conspecifics' behaviour

Specialised forms of social cognition enable primates to manage the stresses of group living by allowing for flexible and intentional communication. This is used to increase the predictability of conspecifics' behaviour for both signallers and receivers. Intentional communication helps to overcome the stimulus-driven processing that may occur due to stress, enhancing attention allocation in receivers.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/intentional-communication-reduces-social-stress-by-increasing-the-predictability-of-conspecifics-behaviour/B00A93837EE5E960C333D44DC73A5F17

DENNIS PAPADOPOULOS, KRISTIN ANDREWS & JENNY MICHLICH – Removing the glass ceilings: diverse mechanisms for social cohesion

Dunbar suggests that social stressors set "glass ceilings" on the evolution of mammalian group size and cohesion. We argue that this glass ceiling narrative conceals three contentious anthropocentric assumptions. First, large stable groups would always be beneficial. Second, grooming is an indicator for maintaining group cohesion. Third, group size is primarily limited by cognitive or behavioral incapacity. We challenge all three assumptions.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/removing-the-glass-ceilings-diverse-mechanisms-for-social-cohesion/2B43C980A0DCFA8CBDAF4C2B2DCAA9C6

BRIDGET M. WALLER, JAMIE WHITEHOUSE & EITHNE KAVANAGH – Facial expression is a group cohesion solution

Facial expression has evolved as a solution to the primate group living problem. A growing body of empirical evidence suggests that the evolution of facial expression has been driven by the need to bond. Dunbar's theories of group cohesion are therefore key to understanding primate (including human) facial expression.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/facial-expression-is-a-group-cohesion-solution/BDE61E090BF79269E7E94053FA8CD752

ODED RITOV, COLIN R. JACOBS & JAN M. ENGELMANN – Fairness expectations scaffolded the evolution of larger groups

We propose that the emergence of relationship-based social expectations and their evolution into fairness expectations played a key role in the size and cohesion of hominin societies. One of the central challenges of group living is the need to create and sustain stable and mutually beneficial patterns of cooperation. By regulating collaborative interactions, social expectations make group living less stressful.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/fairness-expectations-scaffolded-the-evolution-of-larger-groups/4598CE6C0C108AE7667208F818DDE72F

ROBIN DUNBAR – Unpacking social complexity

I first summarise the argument in the target article so as to make the main points clear. I then address a number of major misunderstandings (mainly in relation to the social brain hypothesis), consider some specific issues that require clarification, and finally identify points that would merit more detailed consideration. I conclude with a list of possible future projects.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/unpacking-social-complexity/174EA205CD4B1E39BCC4ED5EE35270AB

Cell Genomics

PAPERS

ZIKUN YANG et al – Incomplete lineage sorting of segmental duplications defines the human chromosome 2 fusion site early during African great ape speciation

All great apes differ karyotypically from humans due to the fusion of chromosomes 2a and 2b, resulting in human chromosome 2. Here, we show that the fusion was associated with multiple pericentric inversions, segmental duplications (SDs), and the turnover of subterminal repetitive DNA. We characterized the fusion site at the single-base-pair resolution and identified three distinct SDs that originated more than 5 million years ago. These three distinct SDs were differentially distributed among African great apes as a result of incomplete lineage sorting (ILS) and lineage-specific duplication. One of these SDs shares homology to a hypomethylated SD spacer sequence present in the subterminal heterochromatin of Pan but is completely absent subtelomerically in both humans and orangutans. CRISPR-Cas9-mediated depletion of the fusion site in human neural progenitor cells alters the expression of genes, indicating a potential regulatory consequence to this human-specific karyotypic change. Overall, this study offers insights into how complex regions subject to ILS may contribute to speciation.
https://www.cell.com/cell-genomics/fulltext/S2666-979X(25)00335-0

Current Biology

ARTICLES

CHRISTOF KOCH – Consciousness: Moving forward by going backward

Conscious experiences are reflected in the activity of neocortical neurons. A novel imaging study implicates higher-order auditory cortices in posterior cortex in hearing sounds, with comparatively weak frontal activity in the absence of reports.
https://www.cell.com/current-biology/abstract/S0960-9822(25)01454-X

Frontiers in Psychology

PAPERS

LUKAS NEMESTOTHY, VITA V. KOGAN & SUSANNE MARIA REITERER – The phoenix of phonaesthetics: the rise of an old-new research paradigm on the beauty of language sound

This review traces the historical, cultural, psychological, and neuroscientific dimensions of phonaesthetics—the study of beauty in language sound. Once considered too subjective or ideologically charged for serious inquiry, the aesthetics of language is now re-emerging as a vibrant interdisciplinary field that draws on linguistics, psychology, cognitive science, neuroscience, aesthetics, and literary studies. This review offers a structured synthesis of current debates, theories, and empirical findings, while also outlining methodological innovations, including bibliometric mapping. Contemporary research demonstrates that sound is not merely a transparent medium for meaning but an aesthetic phenomenon in its own right, shaping how language is learned, remembered, and valued. Advances in cognitive science, neuroaesthetics and psycholinguistics have given new empirical grounding to questions once considered marginal. From David Crystal's early discussions to modern work on sound symbolism, memory, and brand naming, evidence consistently points to the interplay between inherent linguistic values and culturally imposed norms. While aesthetic preferences differ across speakers and contexts, recurring patterns—such as the appeal of sonorous or rhythmic structures—suggest shared cognitive and emotional mechanisms. At the same time, language ideologies and the familiarity effect continue to modulate responses, underscoring the multifaceted reasons for aesthetic judgment. Reviving phonaesthetics therefore means more than cataloguing pleasant sounds. It invites renewed inquiry into why sound matters, how it contributes to identity, shapes evaluations of linguistic varieties, and allows speech to be experienced as art. In this light, language deserves recognition alongside music, painting, and literature as a legitimate subject of aesthetic appreciation. This review aims to highlight that speech sound can elicit emotion as powerfully as melody or color. The "phoenix" of phonaesthetics thus rises again—not merely as a study of linguistic beauty, but as a call to reimagine language as one of the arts.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2025.1720029/full

Language and Cognition

PAPERS

EMMA KRANE MATHISEN, NICHOLAS ALLOTT & CAMILO R. RONDEROS – Cognitive mechanisms in simile and metaphor comprehension

This study investigates whether metaphors and similes are processed the same way or not. Comparison accounts of metaphor claim that metaphors and similes use the same cognitive mechanisms because metaphors are implicit similes, while Categorization accounts claim that the two figures of speech require different cognitive mechanisms. It is unclear which position has the most support. We address this by introducing the distinction between single and extended metaphors to this debate. Several experiments have shown that a metaphor preceded by another metaphor is read faster than a single metaphor. If similes in extended and non-extended contexts display a similar processing difference, this would support views saying that metaphors and similes are processed the same way. If not, it would be more in line with the view that they are processed differently. Using an eye-tracking reading paradigm, we find that the difference between processing single and extended metaphors does not hold in the case of simile comprehension. This is more compatible with Categorization accounts than with Comparison accounts; if the cognitive mechanism behind metaphor and simile processing is the same, we would expect there to be a comparable processing difference between metaphors and similes in the single and extended conditions.
https://www.cambridge.org/core/journals/language-and-cognition/article/cognitive-mechanisms-in-simile-and-metaphor-comprehension/2817598543517A038646D74DF2C75AF9

Language Sciences

PAPERS

MARTINA GIOVINE – Reconciling inclusion and accessibility: Solutions for non-binary linguistic strategies in grammatical gender languages

The ongoing debate concerning gender-fair language in grammatical gender languages reveals a profound philosophical tension between the principles of inclusivity and accessibility. Specifically, certain linguistic strategies designed to ensure equity for non-binary individuals appear to impede accessibility, raising questions about potential trade-offs between these two ideals. This article investigates the nature of this apparent conflict by exploring the conceptual foundations of both accessibility and inclusion. I analyse specific linguistic strategies as a case study and argue that, although they may pose

obstacles to accessibility, these tensions are not insurmountable. I conclude that, to reconcile accessibility and inclusion, it is crucial to understand the nature of accessibility challenges. Once these challenges are identified, appropriate solutions can be implemented to overcome them.
https://www.sciencedirect.com/science/article/pii/S0388000125000737

ALEXANDER V. KRAVCHENKO – Problematizing language
The article is a follow-up on the previously raised issue of the lack of language awareness on the part of both the general public and professional linguists of various theoretical strands. The different senses of the terms “language” and “natural language” used in linguistics and everyday life are discussed from the point of view of their empirical adequacy. It is argued that the arbitrariness and inconsistency of these terms issue from failure on the part of orthodox linguistics to understand the nature of language as a biological adaptation and its evolutionary function as a manner of living of human organism-environment systems. Such an understanding becomes possible by using Humberto Maturana's systems approach to language and cognition in the framework of radical constructivist epistemology. Such an approach may, finally, rescue language from the “blind zone” of linguistics, laying the ground for a new comprehensive transdisciplinary paradigm in the language sciences.
https://www.sciencedirect.com/science/article/pii/S0388000125000531

Nature

NEWS

We are all mosaics: vast genetic diversity found between cells in a single person
Technical advances allow researchers to trace the genetic changes that occur over time.
https://www.nature.com/articles/d41586-025-03768-0

ARTICLES

ALISON ABBOTT – The ‘silent’ brain cells that shape our behaviour, memory and health
Astrocytes make up one-quarter of the brain, but researchers are only now realizing their true value.
https://www.nature.com/articles/d41586-025-03912-w

PAPERS

MATTIAS JAKOBSSON et al – Homo sapiens-specific evolution unveiled by ancient southern African genomes
Homo sapiens evolved hundreds of thousands of years ago in Africa, later spreading across the globe, but the early evolutionary process is debated. Here we present whole-genome sequencing data for 28 ancient southern African individuals, including six individuals with 25× to 7.2× genome coverage, dated to between 10,200 and 150 calibrated years before present (cal. bp). All ancient southern Africans dated to more than 1,400 cal. bp show a genetic make-up that is outside the range of genetic variation in modern-day humans (including southern African Khoe-San people, although some retain up to 80% ancient southern African ancestry), manifesting in a large fraction of Homo sapiens-specific variants that are unique to ancient southern Africans. Homo sapiens-specific variants at amino acid-altering sites fixed for all humans—which are likely to have evolved rapidly on the Homo sapiens branch—were enriched for genes associated with kidney function. Some Homo sapiens-specific variants fixed in ancient southern Africans—which are likely to have adapted rapidly on the southern African branch—were enriched for genes associated with protection against ultraviolet light. The ancient southern Africans show little spatiotemporal stratification for 9,000 years, consistent with a large, stable Holocene population transcending archaeological phases. While southern Africa served as a long-standing geographical refugium, there is outward gene flow over 8,000 years ago; however, inward gene flow manifests only after around 1,400 years ago. The ancient genomes reported here are therefore key to the evolution of Homo sapiens, and are important for advancing our understanding of human genomic variation.
https://www.nature.com/articles/s41586-025-09811-4

Nature Communications Biology

PAPERS

CHARLES VERSTRAETE et al – The prefrontal operculum, a human-specific hub for the cognitive control of speech
Current theories fail to explain why the ability to control speech is unique to humans. We recently identified one unique feature in the human frontal cortex that may hold the key to this question: the Prefrontal Operculum (PFO). Here we aim to identify 1) its anatomo-functional organization to elucidate its potential function and 2) whether it has a homolog in the macaque brain. Functional connectivity (FC) results in humans, revealed that PFO is subdivided in two regions (aPFO and pPFO), displaying strong interactions but distinct whole brain FC profiles with respectively the language and the cognitive control networks, and thus suggesting an important role of PFO in the cognitive control of speech. Connectivity fingerprint analyses in macaques revealed similarities with pPFO, but we found no macaque homolog of human aPFO. Altogether, this study points toward the emergence of aPFO as an evolutionary advantage in hominids for modern speech abilities.
https://www.nature.com/articles/s42003-025-09110-8

Nature Human Behaviour

PAPERS

DAVID ROSE et al – How children map causal verbs to different causes across development

Although collision-like causes are fundamental in philosophical and psychological theories of causation, humans conceptualize many events as causes that lack direct contact. Here we argue that how people think and talk about different causes is deeply connected, and investigate how children learn this mapping. If Andy hits Suzy with his bike, Suzy falls into a fence and it breaks, Andy 'caused' the fence to break but Suzy 'broke' it. If Suzy forgets sunscreen and gets sunburned, the absence of sunscreen 'caused' Suzy's sunburn, but the sun 'burned' her skin. We tested 691 children and 270 adults. Four-year-old children mapped 'caused' to distal causes and 'broke' to proximal causes (Experiment 1). Although 4-year-old children did not map 'caused' to absences until later (Experiment 2), they already referred to absences when asked 'why' an outcome occurred (Experiment 3). Our findings highlight the role of semantics and pragmatics in developing these mappings.
https://www.nature.com/articles/s41562-025-02345-9

Nature Humanities & Social Sciences Communications

PAPERS

RUI WANG & QINGSHUN HE – A corpus-based dependency study of the correlation between nominal group complexity and clause complexity in English academic writing

Linguistic complexity can be analyzed from two perspectives: group complexity and clause complexity. Complex nominal groups (NGs) are widely recognized as a defining characteristic of English academic writing. This study investigates the relationship between NG complexity and clause complexity across three disciplinary groups— Social Sciences (SS), Humanities and Natural Sciences (NS)—through the lens of dependency distance (DD). The results show that participant NGs are most complex in NS texts, whereas clauses exhibit the greatest complexity in Humanities texts. In general, there is a tendency to minimize the insertion of other clausal constituents between the verbal group and its object NG. Among the few inserted constituents, those with shorter DDs from the head verbs (HVs) to the object NGs are more frequent in Humanities texts, while those with longer DDs are more common in NS texts. Shorter in-between constituents typically form phrasal verbs with the HVs, while longer ones are mostly prepositional phrases functioning as circumstantial adjuncts. These findings suggest that NG complexity and clause complexity are not necessarily negatively correlated, both contributing to the overall linguistic complexity of English academic writing, and that adverbial groups functioning as comment adjuncts or intensifiers are not encouraged in English academic writing.
https://www.nature.com/articles/s41599-025-06360-z

YULU LI et al – Social hierarchy modulates Who Does Whom: ERP evidence from Chinese sentence processing

Social hierarchy as a social ranking system is conveyed verbally, nonverbally, or conjointly in communication. From a linguistic perspective, hierarchy concept is encoded via words, hierarchical or non-hierarchical when it is embedded in different contexts. However, few studies have explored how hierarchy is represented in the mental lexicon and processed neurocognitively. Backgrounded by this situation, we conducted two ERP experiments to investigate whether social hierarchy can be subcategorized into implicit and explicit forms and whether a word's social hierarchy is processed similarly to its semantic knowledge relating to Who Does Whom neurologically. Experiment 1 compared the processing of three types of Chinese verbs with different degree of hierarchy (strong hierarchical verbs; weak hierarchical verbs; non-hierarchical verbs) in SVO sentences. Experiment 2 examined whether the dichotomy of hierarchical verbs was modulated by context type (neutral context or biased context) in processing. The results revealed three major findings: First, strong hierarchical verbs relative to non-hierarchical verbs elicited greater posterior-P600 at the verb and AN at the noun position; Second, weak hierarchical verbs relative to strong hierarchical verbs elicited enhanced AN and posterior-P600 effects at the verb and noun positions, while as compared to non-hierarchical verbs, weak hierarchical verbs elicited stronger P600 and AN effect at the verb and noun positions, respectively; Third, this hierarchy difference was much affected by context type. Specifically, in biased contexts, weak hierarchical verbs and strong hierarchical verbs became indistinguishable, while in neutral contexts, strong hierarchical verbs sentences were harder to process than weak hierarchical verbs, as indicated by the larger P600 effect at the verb position. These findings converge to suggest a unique neurocognitive mechanism underlying the processing of Chinese social hierarchy verbs and highlight the concept that a word's social hierarchy is distinct from its lexical semantics. This study provides insights into how social hierarchy is decoded in language comprehension and offers implications for future research on linguistic structures and social cognition.
https://www.nature.com/articles/s41599-025-06281-x

MARKUS APPEL et al – I, ChatGPT: linguistic properties and human experiences of human- versus AI-generated stories

Generative AI is increasingly used to create texts, including fictional stories. Do stories generated by AI differ from stories created by humans regarding linguistic properties and recipients' experiences? To answer these questions, we first asked ChatGPT and 100 non-professional human authors (i.e., students) to create stories based on similar prompts (Study 1). Linguistic analyses showed that ChatGPT stories included fewer personal pronouns and fewer descriptions of relativity than

human stories, but more positive emotions. In Study 2 (N = 380), naïve participants were randomly assigned to read an AI-generated or a human story from the pool of 200 stories from Study 1. No differences in novelty or entertainment experiences were found, but the readers of AI stories were less transported into the story world. Mediation analyses show that this difference can be attributed to ChatGPT's use of fewer personal pronouns. Differences in the use of literary techniques between AI and humans are discussed.
https://www.nature.com/articles/s41599-025-06341-2

Nature Machine Intelligence

ARTICLES

BINXU WANG & CARLOS R. PONCE – Structure as an inductive bias for brain–model alignment

[This is a preview of subscription content, access via your institution]

Even before training, convolutional neural networks may reflect the brain's visual processing principles. A study now shows how structure alone can help to explain the alignment between brains and models.
https://www.nature.com/articles/s42256-025-01155-y

Nature Reviews Neuroscience

PAPERS

MATTHEW C. ROSEN & DAVID J. FREEDMAN – How distributed is the brain-wide network that is recruited for cognition?

Half a century of neurophysiological recordings from single electrodes established a 'localized' viewpoint on function in the brain — that complex behaviour results from computations that are carried out and representations that occur across distinct brain areas, each of which has a specialized role. Data generated from new techniques for specific, high-throughput measurement of neuronal activity and behaviour in rodents have prompted an alternative viewpoint, which posits that neural encoding of behavioural variables is distributed across a wide range of areas: 'everything, everywhere, all at once'. After briefly introducing these paradigms, we evaluate which of them better describes cognition — the manipulation of internal variables that enables flexible behaviour. Measurements of neuronal activity in both rodents and primates suggest that cognitive variables are reflected broadly but not ubiquitously across the brain, including, to a surprising degree, in regions engaged in controlling movement. We close by discussing why cognitive signals may appear in such areas, as well as the factors that affect the breadth of the brain-wide network that is recruited for cognition.
https://www.nature.com/articles/s41583-025-00992-5

Nature Scientific Reports

PAPERS

LUC DOYON et al with FRANCESCO D'ERRICO – A bone tool used by neanderthal for flaying carcasses at the Abri du Maras (France)

Bone tool use is a hallmark of hominin behavioral evolution, yet its significance in Pleistocene contexts remains underexplored. We present a multi-method analysis of a bone fragment from Abri du Maras (Marine Isotope Stage 5, France), integrating qualitative use-wear assessment with quantitative 3D surface texture analysis via confocal microscopy and discriminant modeling. Results indicate that smoothing on the tool's tip is anthropogenic in origin rather than taphonomic, and originated from repeated contact with soft tissues, consistent with carcass flaying. This function diverges from the commonly proposed interpretation of similar tools being used for hide processing and aligns with ethnographic analogs. Its presence at a Neanderthal seasonal campsite suggests strategic technological planning in subsistence practices. Our findings demonstrate the diagnostic value of quantitative use-wear analysis and call for re-evaluation of osseous tools, offering refined insights into Neanderthal cognition and cultural complexity.
https://www.nature.com/articles/s41598-025-30264-2

JIHEN MAJDOUBI et al – Self-attention bidirectional long Short-Term memory assisted natural language processing on sarcasm detection and classification in social media platforms

[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.]

Sarcasm is a form of irony that expresses negative opinions. Sarcasm poses a linguistic problem owing to its symbolic nature, where deliberate meaning challenges correct understanding. Sarcasm is more common on social media and in day-to-day life. Sarcasm detection in written text is a challenge that has attracted the attention of several researchers. Therefore, sarcasm is an essential process in natural language processing (NLP). This study discusses the ideas of sarcasm and its significance in present sarcasm research. The automated model of sarcasm recognition includes selecting appropriate approaches, selecting a dataset, and preprocessing steps involving Transformer architectures, a rule-based approach, deep learning (DL), and machine learning (ML) models. This manuscript proposes a Sarcasm Classification and Detection using NLP on Social Media Platforms (SDCNLP-SM) technique. The objective of the SDCNLP-SM technique is to effectively and automatically recognise sarcastic text. To accomplish this, the SDCNLP-SM technique performs data preprocessing and a

Word2Vec-based word-embedding step. Finally, the Self-Attention with Bidirectional Long Short-Term Memory (SA-BLSTM) model is employed for sarcasm classification. The comparison analysis of the SDCNLP-SM model showed a superior accuracy of 94.45% compared to existing models on the headline dataset.
https://www.nature.com/articles/s41598-025-31093-z

New Scientist

ARTICLES

CHRIS SIMMS – Easily taxed grains were crucial to the birth of the first states
The cultivation of wheat, barley and maize, which are easily stored and taxed, seems to have led to the emergence of large societies, rather than agriculture generally.
https://www.newscientist.com/article/2505641-easily-taxed-grains-were-crucial-to-the-birth-of-the-first-states/

CARISSA WONG – Your brain undergoes four dramatic periods of change from age 0 to 90
Our brain wiring seems to undergo four major turning points at ages 9, 32, 66 and 83, which could influence our capacity to learn and our risk of certain conditions.
https://www.newscientist.com/article/2505656-your-brain-undergoes-four-dramatic-periods-of-change-from-age-0-to-90/

JAMES WOODFORD – Ancient human foot bones shed light on how two species coexisted
Scientists have finally assigned foot bones found in 2009 to an ancient human species, and the move suggests that different types of hominins lived close by in harmony.
https://www.newscientist.com/article/2505923-ancient-human-foot-bones-shed-light-on-how-two-species-coexisted/

PeerJ

PAPERS

HOLLY G. MOLINARO & CLIVE D.L. WYNNE – Paw-spective shift: how our mood alters the way we read dog emotions
This study explored the influence of people's mood on their perception of dog emotions in order to expand our understanding of how mood biases may shape emotional interpretation. Across two experiments, participants were primed into positive, neutral, or negative moods using validated visual stimuli before they evaluated video clips of dogs displaying positive, neutral, or negative emotional states. Participants were asked to rate valence and arousal of the dogs in the videos. Experiment 1 utilized visual primes unrelated to animals, while Experiment 2 employed dog-specific primes. Although mood priming significantly influenced participants' self-reported emotions in Experiment 1, it did not affect their interpretation of the dogs' emotional states. Dog-specific primes influenced participants' interpretation of dog emotions in Experiment 2; however, the effect was a contrasting one, in that participants in the positively induced group rated dogs as sadder and those in the negative group rated dogs as happier. These findings challenge previous assumptions about mood-congruence effects in cross-species emotional perception, suggesting a more complex interplay of factors than anticipated. The study underscores the need for further research to disentangle the mechanisms governing how humans perceive and respond to animals' emotional cues, with implications for improving animal welfare and human-animal interactions.
https://peerj.com/articles/20411/

DONNA SIMON et al – Bornean orangutan nest identification using computer vision and deep learning models to improve conservation strategies
Regular population surveys are crucial for the evaluation of conservation measures and the management of critically endangered species such as the Bornean orangutans. Uncrewed aerial vehicles (UAV) are useful for monitoring orangutans by capturing images of the canopy, including nests, to monitor their population. However, manually detecting and counting nests from UAV imagery is time-consuming and requires trained experts. Computer vision and deep learning (DL) models for image classification offer an excellent alternative for orangutan nest identification.
This study investigated DL for nest recognition from UAV imagery. A binary dataset ("with nest" and "without nest") was created from UAV imagery from Sabah, Malaysian Borneo. The images were captured using a fixed-wing UAV with a complementary metal-oxide semiconductor camera. After image augmentation, 1,624 images were used for the dataset and further split into 70% training, 15% testing and 15% validation for model performance evaluation, i.e., accuracy, precision, recall and F1-score. Four DL models (InceptionV3, MobileNetV2, VGG19 and Xception) were trained to learn from the labeled dataset and predict the presence of nests in new images.
The results show that out of four DL models, Inception V3 has the best model performance with more than 99% accuracy and precision, while VGG19 has the lowest performance. In addition, gradient-weighted class activation maps were used to interpret the results, allowing visualization of the regions used by InceptionV3 and VGG19 for classification. This study shows the potential of integrating DL into orangutan conservation, particularly in monitoring the orangutan population in the protected environment. Future research should focus on the automatic detection of nests to improve UAV-based monitoring of orangutans.
https://peerj.com/articles/20333/

Philosophical Transactions of the Royal Society B

PAPERS

ALEX MESOUDI et al – From information free-riding to information sharing: how have humans solved the cooperative dilemma at the heart of cumulative cultural evolution?

Cumulative cultural evolution, where populations accumulate ever-improving knowledge, technologies and social customs, is arguably a unique feature of human sociality and responsible for our species' ecological dominance of the planet. However, at the heart of cumulative cultural evolution is a cooperative dilemma. Assuming asocial learning is more costly than social learning, social learners can act as 'information free-riders' by copying innovations from asocial learners without paying the cost. This cost asymmetry will reduce innovation, inhibiting cumulative culture. Innovators might respond by protecting their knowledge and keeping the benefits to themselves—'information hoarding'—but then others cannot build on their discoveries and again cumulative culture is inhibited. Here we formally model information free-riding and information hoarding within a cumulative cultural evolution framework using both analytical and agent-based models. Model 1 identifies the conditions under which information sharing can evolve in the face of information free-riding and hoarding. Models 2–4 then show how three mechanisms known to favour cooperation in non-informational contexts—kin selection, partner choice and cultural group selection—can also solve the informational cooperative dilemma and facilitate cumulative cultural evolution, each with distinct signatures potentially detectable in historical, ethnographic and other empirical data.
https://royalsocietypublishing.org/rstb/article/380/1940/20240258/363307/From-information-free-riding-to-information

Physics of Life Reviews

PAPERS

LUIZ PESSOA – Beyond Networks: Toward Adaptive Models of Biological Complexity

Network science models have transformed our understanding of complex systems across biology, technology, and society, proving valuable in neuroscience. However, modeling biological complexity poses specific challenges, calling for expansions of traditional network frameworks. This paper explores constructive ways to enhance models, highlighting opportunities such as incorporating time-varying connections, adaptive topologies, and multilayer structures to better represent the temporal dynamics and multilevel interactions characteristic of biological systems. Additionally, it addresses deeper conceptual challenges, notably the substantial context dependence, open-endedness, and history sensitivity often observed in biology. By reviewing concepts such as Kauffman's "adjacent possible," the discussion emphasizes how biological state spaces themselves may dynamically evolve, suggesting the need for modeling strategies beyond static or pre-specified assumptions. Rather than undermining network science, these considerations highlight areas where traditional formalisms can fruitfully adapt and grow, ultimately deepening their explanatory power. The paper advocates integrating data-driven approaches that dynamically infer system properties from empirical observations, balancing modeling generality with biological specificity. Overall, this synthesis provides an assessment of both the strengths of network science and the challenges it faces, proposing constructive avenues for methodological and conceptual innovation that advance our ability to capture the nuanced complexity inherent in biological phenomena.
https://www.sciencedirect.com/science/article/pii/S1571064525001666

PLoS One

PAPERS

JAMES C. MELLODY – Whether groups value agreement or dissent depends on the strength of consensus

I investigate the conditions under which groups value agreement versus dissent in collective decision-making processes. I argue that which kind of contribution a group values more will depend on the strength of the consensus. As a consensus evolves from weak to moderate to strong, I predict that groups will prefer agreement, dissent, and then agreement again. These predictions are in line with a multi-phase decision-making process in which groups pursue sequential goals reflected in the evolving consensus: establishing an initial consensus, exploring alternative perspectives, and settling on a final decision. I test these predictions with data from the Reddit community r/AmItheAsshole, in which people make normative judgments of social situations. I find support for the predicted pattern, with one caveat: when the consensus is strong, groups exhibit no preference for agreement or dissent.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0334850

THERESA MATZINGER & DAVID KOŠIĆ – Phonemic composition influences words' aesthetic appeal and memorability

Positive emotional responses from pleasant experiences are known to enhance memory, yet the relationship between aesthetic appeal and linguistic memory remains understudied. To investigate this relationship, we designed pseudowords of varying appeal based on Crystal's [1] phoneme rankings. Native English-speaking participants actively memorized these pseudowords and completed a free recall test, followed by two rounds of appeal ratings. Our results showed that, contrary to our predictions, pseudowords designed to be of intermediate appeal were rated as more appealing than those designed to be highly appealing or unappealing. Nevertheless, pseudowords designed to be highly appealing were recalled most frequently – even though participants themselves did not rate them as highly appealing. Also, overall, recalled words

received higher appeal ratings from participants than non-recalled ones. These findings suggest that the phonemic and phonotactic composition of words may, indeed, have aesthetic value that correlates with words' memorability. This encourages further exploration into how appeal interacts with other factors influencing linguistic cognition, including occurrence frequency or complexity. Our findings can inform applications in language learning, teaching, and marketing, while also offering theoretical contributions to our understanding of language evolution and change.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0336597

VICTOR NERY et al – Testing the taxonomy of Dmanisi hominin fossils through dental crown area

The Dmanisi paleoanthropological assemblage from Georgia is among the most debated collections of hominin fossils due to its early age and extreme morphological diversity relative to other Homo assemblages. This variability has been interpreted as a result of sexual dimorphism in the Homo erectus clade, in which Dmanisi hominins were traditionally classified. However, this hypothesis has been challenged by the proposal that the Dmanisi fossils represent more than one Homo species. Taxonomic assessments of the Pleistocene Georgian hominins have focused primarily on craniometric analyses, with fewer studies addressing dental morphology through metric approaches. Considering the value of dental crown area in reconstructing evolutionary relationships, a comparative sample of fossil hominins, consisting of 51 maxillary and 71 mandibular specimens (583 teeth in total), was analyzed using Linear Discriminant Analysis (LDA) to evaluate the diversity in the Dmanisi fossil assemblage. Morphological affinities were examined visually through the first two discriminant functions, and taxonomic relationships were tested via classification analyses based on posterior probabilities. The analyses show a strong association of the D4500-D2600 specimen with australopiths, and of the D2282-D211 and D2700-D2735 specimens with Homo species. The sexual dimorphism hypothesis was tested by comparing the ratios of mandibular postcanine dentition of Dmanisi specimens with male and female gorillas and chimpanzees, which suggests that dental crown area of the Pleistocene Georgian hominins could be the product of sexual dimorphism only if they came from species with similar levels of dimorphism than these great apes. We conclude that differences in crown dimensions support the hypothesis of two distinct taxa coexistent at the Dmanisi site, previously proposed to be Homo georgicus and Homo caucasi. This proposal has important implications for the dispersal of Homo out of Africa at the beginning of Pleistocene.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0336484

JONATHAN EDWARD ROBINSON et al with ANIL K. SETH & TWCF: INTREPID CONSORTIUM – The role of active inference in conscious awareness

Active inference, a first-principles framework for modelling the behaviour of sentient agents, is beginning to be applied in consciousness research. One hypothesis arising from the framework is that active inference is necessary for changes in conscious content. As one component of an extensive adversarial collaboration among competing theories of consciousness, active inference will be contrasted with two other theories of consciousness, neither of which posit that active inference is necessary for consciousness. Here, we thus present a Study Protocol designed to test the active inference hypothesis using a carefully controlled adaptation of the motion-induced blindness paradigm, where an 'active' condition with richer active inference is contrasted with a 'passive' condition. In the active condition, participants direct their gaze towards a target stimulus following its disappearance from consciousness, and report on its subsequent reappearance. In the passive condition, participants maintain central fixation, while the stimulus array is moved across the visual field (in a replay of the active condition based on eye-tracking data acquired during active trials). In two experiments, we plan to investigate target reappearance across active and passive conditions to evaluate the contribution of active inference to conscious awareness. Results will eventually be considered in the context of all the experiments conducted as part of the overall adversarial collaboration.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0328836

LAURA SCREPANTI et al – Acoustic analysis of bottlenose dolphin vocalizations for behavioral classification in controlled settings

Understanding how bottlenose dolphins adjust their vocal behavior in response to daily routines can provide insights into social communication and welfare assessment in managed care environments. This study presents a detailed analysis of bottlenose dolphin (Tursiops truncatus) vocal behavior in relation to different daily activities within a controlled environment at Oltremare Marine Park (Riccione, Italy). 24 hours of continuous acoustic recordings were collected from seven dolphins during a typical day at the marine park, including training, feeding, playing, and unstructured activities. Signals were analyzed to quantify the variations in type and number of vocalizations in relation to dolphin activity. 3,111 whistles were manually extracted and stored as both normalized audio files and high-resolution spectrograms. Additionally, an automated algorithm identified 1,277 pulsed vocalizations, classified into echolocation click trains, burst-pulse sounds, and feeding buzzes, using signal-to-noise ratio (SNR) and inter-click interval criteria. Results revealed a significant increase in vocalization rates during structured activities compared to unstructured periods ($p < 0.001$). This trend was consistently observed across all four vocalization types. Notably, play sessions elicited the highest rates of pulsed vocalizations ($p < 0.01$), suggesting enhanced social and exploratory behaviors, i.e., interactions with conspecifics as well as curiosity-driven engagement with the environment. To test dataset reliability and usability, signal quality was analyzed by evaluating SNR. To support future

research in marine mammal bioacoustics, behavioral ecology, and Artificial-Intelligence-based acoustic monitoring, the full annotated dataset was released as an open-access resource.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0336419

Trends in Cognitive Sciences

PAPERS

ELI STARK-ELSTER & MANVIR SINGH – How experience shapes extraordinary beliefs

The ubiquity of extraordinary beliefs across human societies, such as conspiracy theories, pseudoscience, and supernatural beliefs, is a long-standing puzzle in cognitive science. Prevailing accounts emphasize cognitive biases and social dynamics but often neglect a key factor: experience. We synthesize recent evidence and identify three pathways by which experience can shape these convictions: by filtering which beliefs feel perceptually plausible, by sparking new beliefs through anomalous and emotionally charged events, and by being engineered through immersive cultural technologies that simulate sensory evidence. These pathways function alongside cognitive biases and social processes, helping explain why certain extraordinary beliefs recur, why they often accompany vivid rituals, and why they can feel convincing despite evidence that challenges their veracity.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(25)00310-9

ROHAN RAO et al – Orbitofrontal-sensory cortical interactions in learning and adaptive decision-making

The orbitofrontal cortex (OFC) is a hub for value-guided decision-making, linked reciprocally with both cortical and subcortical regions. While projections from sensory areas to the OFC – and vice versa – are known to support goal-directed learning, these projections have often been studied in isolation, and their joint effect remains poorly understood. Here, we revisit these circuits through a unifying computational framework. We propose that sensory cortices send compressed task knowledge to the OFC to build abstract task models, while OFC feedback provides teaching signals that reshape sensory representations within the cortical hierarchy. This bidirectional exchange equips sensory areas with cognitive functions that extend well beyond passive feature detection, with significant implications for our understanding of learning, cognitive models, and artificial neural networks.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(25)00292-X

Trends in Ecology and Evolution

PAPERS

TANYA T. SHOOT et al – Is cognition at the root of plant behavior?

Information processing underlies the behavior of many species, including plants. However, there remains uncertainty about how plants integrate and use information, and whether this is analogous to animal cognition. We propose a conceptual and experimental framework, Plant Information Processing (PIP), that draws from advances in comparative psychology. Our framework challenges plants with increasingly complex processing tasks designed to reveal algorithmic patterns of information use. The PIP framework emphasizes not only behavioral outcomes, but also the associated errors, limitations, and biases, which reveal how information processing occurs in plants. This sequential, evidence-based strategy sidesteps semantic debates and facilitates meaningful cross-taxa comparisons that could advance the broader discipline of cognition.
{I suppose it depends on whether you see cognition as an emergent process of reactivity or as reliant on a cognitive organ. Plants react – but so do rocks. However, plants have a limited capacity to directionally adjust their environment to be more favourable, while rocks only adjust their environment. Or perhaps it's April already?}
https://www.cell.com/trends/ecology-evolution/abstract/S0169-5347(25)00322-2

Trends in Neurosciences

PAPERS

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

The human brain's long-range axonal connections are the scaffolding for communication across functionally distinct areas. Yet knowledge of the human brain's wiring diagram remains limited, largely due to longstanding technological challenges. Recent innovations in microscopy may now enable mapping human brain connectivity at the mesoscale (groups of neurons and their axons). In this review we describe the challenges of generating the wiring diagrams of the human brain, avenues forward, and reasons why such an effort is so important. We argue for building a human mesoscale connectome via a multimodal, multi-species, axon-centric approach, focusing on where axons begin and end to reconstruct connectivity across spatial resolutions. Finally, we consider the utility of a potential exemplar connectome for both clinical applications and research.
{The three rock-solid things we know about human brains are (1) the causes of human differences are largely encoded in brains, (2) they generate a vast range of different humans, and so (3) human brains are differentiated. The amount of generalisation possible in any generic human brain map is therefore probably quite limited and possibly quite banal.}
https://www.cell.com/trends/neurosciences/abstract/S0166-2236(25)00238-3

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