EAORC BULLETIN 1,127 – 19 January 2025

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NOTICES

FORMATTED VERSION OF THIS BULLETIN

A pdf formatted version if 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.

ACADEMIA.EDU – Rethinking the initial Upper Paleolithic

Quaternary International 347, 29-38 (2014).

STEVEN L. KUHN & NICOLAS ZWYNS – Rethinking the initial Upper Paleolithic

The term Initial Upper Paleolithic (IUP) was originally proposed to describe a specific assemblage from the site of Boker Tachtit (level 4). The use of the term was subsequently extended to cover the earliest Upper Paleolithic assemblages in the Levant, characterized by forms of blade production that combines elements of Levallois method (faceted platforms, hard hammer percussion, flat-faced cores) with features more typical of Upper Paleolithic blade technologies. More recently, the term IUP has been broadened again to include any early Upper Paleolithic assemblage with Levallois-like features in methods of blade production, irrespective of location. Artifact assemblages conforming to this broadest definition of the IUP have been reported from a vast area, stretching from the Levant through Central and Eastern Europe to the Siberian Altai and Northwest China. Whereas it is indisputable that similar lithic technologies can be found in all of these areas, it is not self-evident that they represent a unified cultural phenomenon. An alternative possibility is convergence, common responses to adapting Mousterian/MSA Levallois technology to the production of blade blanks, or some combination of multiple local origins with subsequent dispersal. In this paper, we suggest that the current definition of IUP has become too broad to address such issues, and that understanding the origins of this phenomenon requires a more explicit differentiation between analogies and homologies in lithic assemblages.

https://www.academia.edu/7607305/Rethinking_the_Initial_Upper_Paleolithic

NEWS

NATURE BRIEFING – How to test AI for human-level intelligence

OpenAI's latest experimental chatbot model, o3, scored exceptionally well on a test that marks progress towards artificial general intelligence. Researchers are impressed with the results, but also caution that it's hard to tell if the test really measures AI's capacity to reason, plan and learn skills as well as humans can. "There have been a lot of benchmarks that purport to measure something fundamental for intelligence, and it turns out they didn't," says AI-benchmarking researcher David Rein. The hunt continues for ever-better tests, he says. But as AI systems improve, it is becoming harder and harder to develop tests that highlight a difference between human and AI capabilities.

{One question: should it be a test that humans can fail? If no, does it tell us anything useful about AI? If yes, what does it tell us about humans?}

https://www.nature.com/articles/d41586-025-00110-6

NATURE BRIEFING – Celtic tribes were centred around women

Celtic communities in Britain were 'matriolocal' — women stayed with their families and their husbands came to them — according to genetic analysis. Investigations of 55 individuals found in an Iron Age burial site in the south of England associated with the Durotriges tribe showed that two-thirds of them shared mitochondrial DNA. This form of DNA is passed only through mothers — a sign that they all descended from the same female ancestor. Matriolocality doesn't necessarily equate to women's empowerment, but the findings could explain why archaeologists often find Celtic women buried with goods such as jewellery and combs, while men weren't afforded the same luxuries for the afterlife.

https://www.science.org/content/article/part-ancient-britain-was-woman-s-world-ancient-burials-reveal

SCIENCEADVISER – Kitty see, kitty do

Talk about a copycat. Kitties tend to mirror the faces of their companions, according to a new study, which may be key to helping them get along.

To make the find, researchers trained an artificial intelligence program on hours of videos of cat interactions at a Los Angeles cat café. The AI used 48 "landmarks"—digital dots placed virtually on strategic places on cats' faces—to capture 26 unique facial movements. These, in various combinations, create the hundreds of facial expressions cats make.

The felines mirrored each other about 20% of the time. The mirrored expressions were subtle, sometimes just a modest flattening of the ears paired with a small wrinkle of the nose or a tiny raising of the upper lip. But when they happened, the cats began a friendly interaction—playing together, grooming each other, or walking together—almost 60% of the time.

The work suggests that cats use rapid facial mimicry, a behavior that dogs, horses, and orangutans perform as a crucial part of social bonding. It may even be an evolutionary precursor to empathy. "Mimicking each other's facial expressions plays such an important social role," says Martina Francesconi, an ethologist who was not involved in the study. "And now thanks to this really interesting research, we know that cats—despite getting cast off as solitary and non-social—are doing this, too.

https://www.science.org/content/article/copy-cats-kitties-mirror-each-other-s-faces-get-along

SCIENCEADVISER – Melodious love?

In a new paper, a group of psychologists propose that musicality evolved to help us fall and stay in love. But while there is some supporting evidence for the idea, "there are some null or opposite results in the literature and much more investigation is still needed," one expert noted.

https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2024.1302548/full

SCIENCEADVISER – Meat wasn't on the menu for Lucy's kin

Our big brains gobble up about a fifth of the calories we consume despite accounting for only 2% or so of our body mass. So it's long been thought that our ancestors started to include much more meat in their diets to help fuel such hungry noggins. But which ancestors, and when? A new study looking at proteins in teeth finds the transition likely occurred after Lucy and her kin.

Scientists can't travel back in time millions of years to watch what ancient hominids like Lucy (Australopithecus afarensis) ate. But hidden in their teeth are clues to their diet: By comparing the kinds of isotopes in proteins to those in other animals with better known diets, scientists can suss out what kinds of foods our distant kin likely ate. Early attempts to examine such intel from tooth enamel weren't clear as to whether Australopithecus skewed vegetarian or ate herbivores. Now, new, more robust analyses—conducted on the remains of seven 3.5 million-year-old individuals and more than 40 other mammals from the time—are clearer: "These were plant eaters, mostly," lead author Tina Lüdecke tells NPR.

Of course, that doesn't exactly tell anthropologists when our branch of the evolutionary tree developed their taste for flesh. Paleoanthropologist Bernard Wood, who wasn't involved in the work, would like to see similar analyses of other human ancestors. "It would be great to know whether Homo habilis [2.4–1.5 million years ago] was eating as much meat as some people think it was," he told the outlet. "I have my doubts."

https://www.science.org/doi/10.1126/science.adq7315

SCIENCEADVISER – A 'woman's world' in ancient Britain

Researchers focused on cemeteries located in the far south of Britain near the town of Bournemouth. They belonged to the Durotriges tribe, which began burying its dead there around 100 BCE. While men were laid to rest with a joint of meat and perhaps a pot containing a beverage to sustain them on their journey into the afterlife, Durotriges women are often found with elaborate offerings including mirrors, combs, jewelry, and even swords.

DNA from dozens of Durotriges suggests that the tribe practiced "matrilocality": Family structure–and perhaps property inheritance—appears to have been based on kinship between mothers and daughters. Men, meanwhile, left home to live with their wives' families, a practice that has never been seen before in European prehistory.

The work—reported in Nature—could help explain finds elsewhere in the Celtic world, where women were sometimes buried with rich grave goods or even chariots. "We're thinking this could have been quite widespread," says geneticist Lara Cassidy, the study's lead author.

https://www.science.org/content/article/part-ancient-britain-was-woman-s-world-ancient-burials-reveal

SCIENCE DAILY – Betrayal doesn't necessarily make someone less trustworthy if we benefit

Both intuition and past research suggest that whether people deem someone trustworthy depends on that person's past behavior and reputation for betrayal. In a series of experiments, psychologists found that subjects regarded those who previously exhibited that behavior as less trustworthy. However, when the betrayal benefited them or had no effect on them, participants regarded the betrayer as trustworthy. This pattern was largely consistent across the types of relationships studied: friendships, romantic relationships and professional relationships.

https://www.sciencedaily.com/releases/2025/01/250109183332.htm

SCIENCE DAILY – Volcanic eruption caused Neolithic people to sacrifice unique 'sun stones'

4,900 years ago, a Neolithic people on the Danish island Bornholm sacrificed hundreds of stones engraved with sun and field motifs. Archaeologists and climate scientists can now show that these ritual sacrifices coincided with a large volcanic eruption that made the sun disappear throughout Northern Europe.

https://www.sciencedaily.com/releases/2025/01/250116134101.htm

SCIENCE DAILY – Early humans adapted to harsh conditions more than a million years ago

A long-standing question about when archaic members of the genus Homo adapted to harsh environments such as deserts and rainforests has been answered in a new research paper.

https://www.sciencedaily.com/releases/2025/01/250116133302.htm

SCIENCE DAILY – From caring touch to cooperative communities

An international research team concludes that gentle touch is not only good for mental health, but also for the evolution of cooperation.

https://www.sciencedaily.com/releases/2025/01/250115125413.htm

SCIENCE DAILY – Three million years ago, our ancestors were vegetarian

Human ancestors like Australopithecus -- which lived around 3.5 million years ago in southern Africa -- ate very little to no meat, according to new research. This conclusion comes from an analysis of nitrogen isotope isotopes in the fossilized tooth enamel of seven Australopithecus individuals. The data revealed that these early hominins primarily relied on plant-based diets, with little to no evidence of meat consumption.
https://www.sciencedaily.com/releases/2025/01/250117112232.htm

SCIENCE DAILY – Songbirds socialize on the wing during migration

Evidence from over 18,300 hours of recorded flight calls suggests songbirds may 'talk' to other species as they migrate, forming social connections and -- just maybe -- exchanging information about the journey.
{"And we can certainly speculate that these flight calls could relate to navigation or finding suitable stopover habitat". Says it all, really.}
https://www.sciencedaily.com/releases/2025/01/250115125116.htm

SCIENCENEWS – Early human ancestors didn't regularly eat meat

Chemicals in the tooth enamel of Australopithecus suggest the early human ancestors ate very little meat, dining on vegetation instead.
https://www.sciencenews.org/article/early-human-ancestors-didnt-eat-meat

SCIENCENEWS – Ancient, engraved stones may have been buried to summon the sun

Members of a Stone Age culture in Denmark may have ritually buried stones to counter the effects of a volcanic eruption.
https://www.sciencenews.org/article/ancient-engrave-stones-bury-summon-sun

SCIENCENEWS – Iron Age Celtic women's social and political power just got a boost

Ancient DNA indicates women stayed in their home communities and married partners from outside the area.
https://www.sciencenews.org/article/iron-age-celtic-women-power-dna

SCIENCE.ORG NEWS – People who can't picture images in their 'mind's eye' still model them cognitively

Imaging study of people with aphantasia reveals differences—but not a complete deficit—in visual processing area.
https://www.science.org/content/article/people-who-can-t-picture-images-their-mind-s-eye-still-represent-them-their-brains

SCIENCE.ORG NEWS – Part of ancient Britain was a woman's world, burials reveal

2000-year-old graves suggest women wielded as much—and sometimes more—power than men in some Celtic tribes.
https://www.science.org/content/article/part-ancient-britain-was-woman-s-world-ancient-burials-reveal

PUBLICATIONS

Acta Linguistica Hafniensia

PAPERS

ANDREAS WIDOFF &JOHAN BLOMBERG – Motion in event structure

According to a localist theory of event semantics, event types such as state changes and realisation of actions are based on motion events, which are taken to be the primary type of event. The present paper investigates some claims of this theory, their consequences and conceptual foundations. It argues that the theory suffers from two flaws. First, the theory proposes parallels between event types that, upon closer scrutiny, appear to be absent. Second, it purports to derive time from motion, which is conceptually dubious, because motion presupposes time, while time does not presuppose motion. We propose that a more promising basis for a theory of events that attempts to generalise over event types is to ground event structure in the temporal domain. The foundational contrast between events would then not be motion and stationariness but rather the presence or absence of change, which is a ubiquitous, domain-neutral condition that is made possible by time.
https://www.tandfonline.com/doi/full/10.1080/03740463.2024.2427520

Animal Behaviour

PAPERS

RACHAEL MILLER et al – Social attention across development in common ravens and carrion/hooded crows

Social attention involves individuals attending to the presence, identity and/or behaviour of others, which may facilitate cooperation, communication and social learning. Individuals may be selective in when and to which individuals they attend, which may be influenced by social context (e.g. observer identity) and development. In 10 carrion/hooded crows, Corvus

corone corone/C. c. cornix, and nine common ravens, Corvus corax, we tested the influence of social context (alone, sibling/affiliate, nonsibling/nonaffiliate, heterospecific) on behavioural responses (item manipulation, caching and 'head and body out of sight', i.e. barrier use) with familiar food and objects. We tested subjects during development at fledging (1–2 months), juvenile (3–8 months) and subadult (14–18 months old) stages. Subjects were hand reared and housed in comparable conditions. These two species are closely related, generalist corvids, which will routinely cache (i.e. hide food and other items for later recovery) and engage in cache-pilfering (stealing) strategies. Item manipulation and caching may contribute to the development of physical and/or social skills. Subject behaviour was influenced by social context, with birds showing higher frequency of 'head and body out of sight' (barrier use) behaviour with (any) observer present than when alone. Observer identity had no effect, suggesting item interaction may have facilitated development of physical (rather than influencing social) skills in this setting. There were developmental effects, including increased manipulation and use of barriers as juveniles, and increased caching with age. Ravens cached more than crows. Objects were manipulated more frequently than food. Barriers were used more with food, indicating food was more actively hidden, while object manipulation may promote low-risk interaction and learning. We discuss our findings in relation to social and developmental influences on behaviour, in relation to social attention across ontogeny in animals.
https://www.sciencedirect.com/science/article/abs/pii/S000334722400349X

ELISA DEMURU et al – Are you serious? Relaxed open mouth may unveil the competitive/cooperative nature of play fighting in two feline species

Play fighting is a multifunctional behaviour allowing the development of both cooperative and competitive skills. During play fighting, animals perform 'competitive' actions that are typical of the agonistic context and/or 'cooperative' actions to avoid escalation into aggression. Several structural features of play fighting (asymmetry, duration, variability and repetition) provide information on whether a session is more, or less, competitive. In many mammalian species, the relaxed open mouth (ROM) is a metasignal that communicates that the interaction is playful. In the Felidae family, play fighting has been poorly investigated and it is challenging to tell whether play fights are cooperative or competitive. Here, we explored whether the ROM could provide information about the cooperative/competitive nature of play fighting in felines. To do so, we videorecorded and analysed dyadic play-fighting interactions in kittens of domestic cats, Felis silvestris catus, and Asian leopard cats, Prionailurus bengalensis. For both species, we found that play-fighting sessions with ROM were more symmetric, lasted longer, were less variable and showed lower evenness and repetition than those without ROM. As a whole, our results suggest that in both species ROM may help manage unpredictable play-fighting sessions and therefore this signal can be used to increase cooperation during the playful interaction, thus prolonging it.
https://www.sciencedirect.com/science/article/pii/S0003347224003531

Behavioral and Brain Sciences

PAPERS

DUNCAN N.E. STIBBARD-HAWKES – Reconsidering the link between past material culture and cognition in light of contemporary hunter–gatherer material use

Many have interpreted symbolic material culture in the deep past as evidencing the origins sophisticated, modern cognition. Scholars from across the behavioural and cognitive sciences, including linguists, psychologists, philosophers, neuroscientists, primatologists, archaeologists, and palaeoanthropologists have used such artefacts to assess the capacities of extinct human species, and to set benchmarks, milestones, or otherwise chart the course of human cognitive evolution. To better calibrate our expectations, the present paper instead explores the material culture of three contemporary African forager groups. Results show that, although these groups are unequivocally behaviourally modern, they would leave scant long-lasting evidence of symbolic behaviour. Artefact sets are typically small, perhaps as a consequence of residential mobility. When traded materials are excluded, few artefacts have components with moderate–to–strong taphonomic signatures. The present analyses show that artefact function influences preservation probability, such that utilitarian tools for the processing of materials and the preparation of food are disproportionately likely to contain archaeologically traceable components. There are substantial differences in material use among populations, which create important population-level variation in preservation probability, independent of cognitive differences. I discuss the factors – cultural, ecological, and practical – that influence material choice. In so doing, I highlight the difficulties of using past material culture as an evolutionary or cognitive yardstick.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/reconsidering-the-link-between-past-material-culture-and-cognition-in-light-of-contemporary-huntergatherer-material-use/A121ADFA3627FE054641F13FA2E20E05

COMMENTARIES

LLUÍS BARCELÓ-COBLIJN – The Mbuti people still reproduce a 75,000 years old recursive pattern

reveal their modern cognitive capacity. They create geometric and musical structures requiring specific working memory seen in modern Homo sapiens. Evidence from Blombos Cave suggests these skills existed 75,000 years ago, underscoring shared cognitive abilities among all modern human populations.

https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/mbuti-people-still-reproduce-a-75000-years-old-recursive-pattern/5D10735DC1273971EFB0E9482CA7FEAD

MATTEO BEDETTI & COLIN ALLEN – Advancing paleoanthropology beyond default nulls
While we are sympathetic with Stibbard-Hawkes' approach, we disagree with the proposal to switch to a "cognitively modern" null for all Homo species. We argue in favor of a more evidence-driven approach, inspired by recent debates in comparative cognition. Ultimately, parsing the contributions of different genetic and extra-genetic factors in human evolution is more promising than setting a priori nulls.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/advancing-paleoanthropology-beyond-default-nulls/3A39C867075580D74E7374AC87E11A3B

YOTAM BEN-OREN et al with ERELLA HOVERS – Cultural innovation is not only a product of cognition but also of cultural context
Innovations, such as symbolic artifacts, are a product of cognitive abilities but also of cultural context. Factors that may determine the emergence and retention of an innovation include the population's pre-existing cultural repertoire, exposure to relevant ways of thinking, and the invention's utility. Thus, we suggest that the production of symbolic artifacts is not guaranteed even in cognitively advanced societies.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/cultural-innovation-is-not-only-a-product-of-cognition-but-also-of-cultural-context/597F92DF42791293B68BA07B7913B0A6

MATTHIAS A. BLESSING – Behavioural modernity is dead: Long live behavioural modernity
Using Neanderthal symbolism, I extend on Stibbard-Hawkes to show that reconsidering the link between cognitive capacity and material culture extends beyond matters of preservation. A reconceptualization of behavioural modernity inclusive of both extant and extinct populations must begin with an honest theoretical separation of biological and behavioural modernity, which requires to critically engage with how we frame the underlying questions.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/behavioural-modernity-is-dead-long-live-behavioural-modernity/47231289012E07AEAA6DB0339FB8FCC5

NICHOLAS BLURTON JONES – What would be pre-modern human cognition?
Stibbard-Hawkes's detailed demonstration that in the case of hunter-gatherer artifacts, absence of evidence is not evidence of absence must never be forgotten. The belief that there is a single coherent "human cognitive capacity" difference between modern humans and some unspecified earlier form should be rigorously re-examined.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/what-would-be-premodern-human-cognition/69FDFF901D9E25724A84D8ACD3D5888E

LAURA DESIRÈE DI PAOLO et al with ANDY CLARK – Material culture both reflects and causes human cognitive evolution
Our commentary suggests that different materialities (fragile, enduring, and mixed) may influence cognitive evolution. Building on Stibbard-Hawkes, we propose that predictive brains minimise errors and seek information, actively structuring environments for epistemic benefits. This perspective complements Stibbard-Hawkes' view.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/material-culture-both-reflects-and-causes-human-cognitive-evolution/8AD3CE9B489F27F42F00C7BCCB9D939F

DEAN FALK – Don't ignore cognitive evolution during the three million years that preceded the archaeological record of material culture!
The target article rightly questions whether the archaeological record is useful for identifying sea changes in hominin cognitive abilities. This commentary suggests an alternative approach of synthesizing findings from primatology, evolutionary developmental biology, and paleoanthropology to formulate hypotheses about cognitive evolution in hominins that lived during the three million years that preceded the record of material culture (the Botanic Age).
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/dont-ignore-cognitive-evolution-during-the-three-million-years-that-preceded-the-archaeological-record-of-material-culture/0F38DBF06B8E61BECBCE8979A850B546

ANDREW C. GALLUP & OMAR TONSI ELDAKAR – Sports, team games, and physical skill competitions as an important source of symbolic material culture with low preservation probability
Sports, team games, and physical skill competitions appear to be a human universal and may have been prevalent throughout the hominin lineage. These activities are cognitively complex and can be associated with a distinctive and symbolic material culture. Yet, many of the artifacts used by foraging groups for sports, team games, and athletic competitions often have a low preservation probability.

https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/sports-team-games-and-physical-skill-competitions-as-an-important-source-of-symbolic-material-culture-with-low-preservation-probability/60DC6CCA24EC2188758AC3274963AF5A

DAVID J. GRÜNING & LUKAS J. GRÜNING – Proposing the DN(C)-model of material evidence for well-calibrated claims about past cultures

Stibbard-Hawkes presents a much-needed case for distinguishing between different types of evidence for cognition in past cultures. However, he does not outline an applicable approach for moving forward in making claims about the cognition of past cultures. We present an initial model for calibrating both absolute and comparative claims about past cultures' cognition and other traits.

https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/proposing-the-dncmodel-of-material-evidence-for-wellcalibrated-claims-about-past-cultures/906CE9873D64B233F9FD9281F66B123E

ARITZ IRURTZUN – Negative priors and inferences from absence of evidence in cognitive and linguistic archaeology: Epistemically sound and scientifically strategic

The article provides an important warning but its general conclusions should be nuanced: (i) When there is no evidence for it, we should depart from the hypothesis that a species lacks a particular cognitive capacity, and (ii) inferences from absence of evidence can be epistemically sound and scientifically strategic in cognitive and linguistic archaeology.

https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/negative-priors-and-inferences-from-absence-of-evidence-in-cognitive-and-linguistic-archaeology-epistemically-sound-and-scientifically-strategic/D2C6589C93A1EC4C11E66DC4BFAE4A83

SVETLANA KULESHOVA et al with MICHAEL PLEYER & SŁAWOMIR WACEWICZ – Revising the null model in language evolution research

We comment on the consequences of the target article for language evolution research. We propose that the default assumption should be that of language-readiness in extinct hominins, and the integration of different types of available evidence from multiple disciplines should be used to assess the likely extent of the realization of this readiness. The role of archaeological evidence should be reconsidered.

https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/revising-the-null-model-in-language-evolution-research/DECC848D10B000A7522E5123D5762F55

CHENG LIU & DIETRICH STOUT – Beyond the binary: Inferential challenges and solutions in cognitive archaeology

We welcome Stibbard-Hawkes's empirical contributions and discussion of interpretive challenges for archaeology, but question some of his characterizations and conclusions. Moving beyond critique, it is time to develop new research methods that eschew simplistic modern/premodern binaries. We advocate an inductive, probabilistic approach using multiple lines of evidence to infer the causes and consequences of behavioral variability across time and space.

https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/beyond-the-binary-inferential-challenges-and-solutions-in-cognitive-archaeology/A09B8B1BEA2AF9D67F68BAF1C50F8EF2

ANNEMIEKE MILKS – Not just symbolism: Technologies may also have a less than direct connection with cognition

I expand Stibbard-Hawkes' exploration of symbolism and cognition to suggest that we also ought to reconsider the strength of connections between cognition and technological complexity. Using early weaponry as a case study I suggest that complexity may be “hidden” in early tools, and further highlight that assessments of technologies as linear and progressive have roots in Western colonial thought.

https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/not-just-symbolism-technologies-may-also-have-a-less-than-direct-connection-with-cognition/CA698130EF3BA975430120BAAACC5E61

JOHN PROTZKO – Are we jingling modern hunter-gatherers and early Homo sapiens?

Using modern hunter-gatherers to infer about early Homo sapiens only works if at least (a) modern hunter-gatherers represent an unbiased sample of humanity, and (b) modern hunter-gatherers act in ways similar to the behavior of early Homo sapiens. Both of these are false, leading to the problem of whether we can draw conclusions about early Homo sapiens from modern hunter-gatherers.

https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/are-we-jingling-modern-huntergatherers-and-early-homo-sapiens/EC49D12502B43EE5F7BFDC054A1284AC

ANDONI S. E. SERGIOU & LIANE GABORA – The cognitive and evolutionary science of behavioural modernity goes beyond material chronology

Stibbard-Hawkes' taphonomic findings are valuable, and his call for caution warranted, but the hazards he raises are being mitigated by a multi-pronged approach; current research on behavioural/cognitive modernity is not based solely on material

chronology. Theories synthesize data from archaeology, anthropology, psychology, neuroscience, and genetics, and predictions arising from these theories are tested with mathematical and agent-based models.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/cognitive-and-evolutionary-science-of-behavioural-modernity-goes-beyond-material-chronology/873DBEA6D8E171437021AFA7B729CB07

KIM STERELNY – Inferences from absences
Stibbard-Hawkes shows that cultures using material symbols might well not leave traces of that practice in the archaeological record. The paper thus poses an important challenge: When is absence of evidence evidence of absence? This commentary uses behavioural ecology to make modest progress on this problem.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/inferences-from-absences/46DD869D5A1CC28205ECA09440BE7F67

CLAUDIO TENNIE & RONALD J. PLANER – All that glitters is not gold: The false-symbol problem in archaeology
Stibbard-Hawkes forcefully alerts us to the pitfall of false-negative reasoning in symbolic archaeology. We highlight the twin problem of false-positive reasoning in what we call the "false-symbol problem." False symbols are intuitively special entities that, owing to their non-utilitarian nature, invite symbolic interpretation. But they are not symbolic. We link the false-symbol problem to work in comparative primate cognition, taking "primate art" as our main example.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/all-that-glitters-is-not-gold-the-falsesymbol-problem-in-archaeology/55477373767D6DA32EE27B715C2E12B8

ELPIDA TZAFESTAS – Perishable material choice indicates symbolic and representational capacities
The absence of symbolic material cultural objects in the archaeological record does not prove absence of symbolic cognition. Sometimes perishable materials are selected for symbolic roles, for practical concerns or to indicate a temporary condition. Also some symbolic functions may predate the use of durable materials. Finally, child play and artisan experimentations usually involve cheap and perishable materials. These are symbolic and representational activities that do not leave a material trace.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/perishable-material-choice-indicates-symbolic-and-representational-capacities/92CFE0D28D469AD52D8AE52E46025C5C

JARED VASIL – Shared intentionality may have been favored by persistence hunting in Homo erectus
Shared intentionality is the derived hominin motivation and skills to align mental states. Research on the role of interdependence in the phylogeny of shared intentionality has only considered the archeological record of Homo heidelbergensis. But ethnographic and fossil data must be considered, too. Doing so suggests that shared intentionality may have been favored in Homo erectus to support persistence hunting.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/shared-intentionality-may-have-been-favored-by-persistence-hunting-in-homo-erectus/D4702E0914F9DFEE1134FA3274786B87

JAN VERPOOTEN & ALEXIS DE TIÈGE – Animal artefacts challenge archaeological standards for tracing human symbolic cognition
Stibbard-Hawkes challenges the link between symbolic material evidence and behavioural modernity. Extending this to non-human species, we find that personal adornment, decoration, figurative art, and musical instruments may not uniquely distinguish human cognition. These common criteria may ineffectively distinguish symbolic from non-symbolic cognition or symbolic cognition is not uniquely human. It highlights the need for broader comparative perspectives.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/animal-artefacts-challenge-archaeological-standards-for-tracing-human-symbolic-cognition/9519EA0865054A8E3875FA685C065065

MANUEL WILL – Archaeology retains a central role for studying the behavioral and cognitive evolution of our species and genus
Our species' behavioral and cognitive evolution constitute a key research topic across many scientific disciplines. Based on ethnographic hunter-gatherer data, Stibbard-Hawkes challenges the common link made between past material culture and cognitive capacities. Despite this adequate criticism, archaeology must retain a central role for studying these issues due to its unique access to relevant empirical evidence in deep time.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/archaeology-retains-a-central-role-for-studying-the-behavioral-and-cognitive-evolution-of-our-species-and-genus/86808DA2F1738923482BEC4B0357DCBA

DUNCAN N.E. STIBBARD-HAWKES – Hominin cognition: The null hypothesis [Author Response]
The target article explores material culture datasets from three African forager groups. After demonstrating that these modern, contemporary human populations would leave scant evidence of symbolic behaviour or material complexity, it cautioned against using material culture as a barometer for human cognition in the deep past. Twenty-one commentaries broadly support or expand these conclusions. A minority offer targeted demurrals, highlighting (1) the soundness of

reasoning from absence; and questioning (2) the "cognitively modern" null; (3) the role of hunter-gatherer ethnography; and (4) the pertinence of the inferential issues identified in the target article. In synthesising these discussions, this reply addresses all four points of demurral in turn, and concludes that there is much to be gained from shifting our null assumptions and reconsidering the probabilistic inferential links between past material culture and cognition.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/hominin-cognition-the-null-hypothesis/7BDE0D701A7496D70B42805D326161F2

Current Biology

PAPERS

EKIN TÜNÇOK, LYNNE KIORPES & MARISA CARRASCO – Opposite asymmetry in visual perception of humans and macaques

In human adults, visual perception varies throughout the visual field. Performance decreases with eccentricity and varies around polar angle. At isoeccentric locations, performance is typically higher along the horizontal than vertical meridian (horizontal-vertical asymmetry [HVA]) and along the lower than the upper vertical meridian (vertical meridian asymmetry [VMA]). It is unknown whether the macaque visual system, the leading animal model for understanding human vision, also exhibits these performance asymmetries. Here, we investigated whether and how visual field asymmetries differ between these two groups. Human adults and adult macaque monkeys (Macaca nemestrina) performed a two-alternative forced choice (2AFC) motion direction discrimination task for a target presented among distractors at isoeccentric locations. Both groups showed heterogeneous visual sensitivity around the visual field, but there were striking differences between them. Human observers showed a large VMA—their sensitivity was poorest at the upper vertical meridian—a weak horizontal-vertical asymmetry, and lower sensitivity at intercardinal locations. Macaque performance revealed an inverted VMA—their sensitivity was poorest in the lower vertical meridian. The opposite pattern of VMA in macaques and humans revealed in this study may reflect adaptive behavior by increasing discriminability at locations with greater relevance for visuomotor integration. This study reveals that performance also varies as a function of polar angle for monkeys, but in a different manner than in humans, and highlights the need to investigate species-specific similarities and differences in brain and behavior to constrain models of vision and brain function.
https://www.cell.com/current-biology/abstract/S0960-9822(24)01692-0

CORRECTIONS

ROBERTA BIANCO et al – Neural encoding of musical expectations in a non-human primate

(Current Biology 34, 444–450.e1–e5; January 22, 2024)
[EAORC Bulletin 1,073]
Since publication, we have noticed an error in Figure 1C, where the x-axis label incorrectly displayed "s" (seconds) instead of "ms" (milliseconds). This error has now been corrected online.
https://www.cell.com/current-biology/fulltext/S0960-9822(25)00015-6

eLife

PAPERS

ANA FLÓ et al with GHISLAINE DEHAENE-LAMBERTZ – Statistical learning beyond words in human neonates

Interest in statistical learning in developmental studies stems from the observation that 8-month-olds were able to extract words from a monotone speech stream solely using the transition probabilities (TP) between syllables (Saffran et al., 1996). A simple mechanism was thus part of the human infant's toolbox for discovering regularities in language. Since this seminal study, observations on statistical learning capabilities have multiplied across domains and species, challenging the hypothesis of a dedicated mechanism for language acquisition. Here, we leverage the two dimensions conveyed by speech –speaker identity and phonemes– to examine (1) whether neonates can compute TPs on one dimension despite irrelevant variation on the other and (2) whether the linguistic dimension enjoys an advantage over the voice dimension. In two experiments, we exposed neonates to artificial speech streams constructed by concatenating syllables while recording EEG. The sequence had a statistical structure based either on the phonetic content, while the voices varied randomly (Experiment 1) or on voices with random phonetic content (Experiment 2). After familiarisation, neonates heard isolated duplets adhering, or not, to the structure they were familiarised with. In both experiments, we observed neural entrainment at the frequency of the regularity and distinct Event-Related Potentials (ERP) to correct and incorrect duplets, highlighting the universality of statistical learning mechanisms and suggesting it operates on virtually any dimension the input is factorised. However, only linguistic duplets elicited a specific ERP component, potentially an N400 precursor, suggesting a lexical stage triggered by phonetic regularities already at birth. These results show that, from birth, multiple input regularities can be processed in parallel and feed different higher-order networks.
https://elifesciences.org/reviewed-preprints/101802

Frontiers in Artificial Intelligence

PAPERS

JACK GRIEVE et al with BODO WINTER – The sociolinguistic foundations of language modeling

In this article, we introduce a sociolinguistic perspective on language modeling. We claim that language models in general are inherently modeling varieties of language, and we consider how this insight can inform the development and deployment of language models. We begin by presenting a technical definition of the concept of a variety of language as developed in sociolinguistics. We then discuss how this perspective could help us better understand five basic challenges in language modeling: social bias, domain adaptation, alignment, language change, and scale. We argue that to maximize the performance and societal value of language models it is important to carefully compile training corpora that accurately represent the specific varieties of language being modeled, drawing on theories, methods, and descriptions from the field of sociolinguistics.

https://www.frontiersin.org/journals/artificial-intelligence/articles/10.3389/frai.2024.1472411/full

Frontiers in Psychology

PAPERS

JOSHUA S. BAMFORD et al – Love songs and serenades: a theoretical review of music and romantic relationships

In this theoretical review, we examine how the roles of music in mate choice and social bonding are expressed in romantic relationships. Darwin's Descent of Man originally proposed the idea that musicality might have evolved as a sexually selected trait. This proposition, coupled with the portrayal of popular musicians as sex symbols and the prevalence of love-themed lyrics in music, suggests a possible link between music and attraction. However, recent scientific exploration of the evolutionary functions of music has predominantly focused on theories of social bonding and group signaling, with limited research addressing the sexual selection hypothesis. We identify two distinct types of music-making for these different functions: music for attraction, which would be virtuosic in nature to display physical and cognitive fitness to potential mates; and music for connection, which would facilitate synchrony between partners and likely engage the same reward mechanisms seen in the general synchrony-bonding effect, enhancing perceived interpersonal intimacy as a facet of love. Linking these two musical functions to social psychological theories of relationship development and the components of love, we present a model that outlines the potential roles of music in romantic relationships, from initial attraction to ongoing relationship maintenance. In addition to synthesizing the existing literature, our model serves as a roadmap for empirical research aimed at rigorously investigating the possible functions of music for romantic relationships.

{I think they may have missed half of the sexual selection equation. Yes, there must be something which the attractor is good at, but there must also be a reason why the attractee sees that something as attractive – which we usually represent as enhancing the attractee's fitness. Music is not "for" attraction, it is "because of" the advantage it gives the attractee – whatever that might be.}

https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2024.1302548/full

ANTONIO BENÍTEZ-BURRACO – How (and why) languages became more complex as we evolved more prosocial: the human self-domestication view

This paper aims to re-examine the problem of the emergence of present-day languages from the specific perspective of the self-domestication account of human evolution. According to this view, our species went through an evolutionary process that parallels the changes experienced by domesticated mammals. Relying on evidence of diverse kind (from paleogenetic to clinical), the paper argues that our self-domestication might have potentiated the cognitive and behavioral features of the human phenotype with an impact on language acquisition and use. Specifically, it might have facilitated the creation of the cultural niche that favors the complexification of languages via a cultural mechanism. The paper further proposes a model of language complexification in the past under the effects of human self-domestication, including the complexification of the structural aspects of language (grammar, prosody, and semantics) and the potentiation of its functional properties (pragmatics). The paper concludes with some suggestions for any future research aimed to test and improve this view.

https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2024.1499994/full

iScience

PAPERS

LUDWIG HUBER et al – Canine perspective-taking: anticipating the behavior of an unseen human

Although dogs exhibit remarkable capabilities for interacting with humans, the underlying cognitive mechanisms remain insufficiently understood. Here, we investigated canine perspective taking by challenging dogs to decide whether and where to steal food in the absence of a human who had prohibited them from doing so. The dogs could only infer the experimenter's presence through a sound (carrot-chopping) they had perceived during a prior exploration phase, in which they had also had the opportunity to observe from which locations in the room the human was visible. In the test, the majority of dogs preferred to steal from a plate that was not visible from the location where the human had chopped carrots before when they heard a playback of the chopping sound, but not when they heard a control sound (street noise). These findings provide evidence that dogs anticipate the behavior of humans without relying on observable visual cues.

https://www.cell.com/iscience/fulltext/S2589-0042(25)00071-9

Journal of Linguistics

PAPERS

PHILIP MILLER & PETER W. CULICOVER – Lexical be

We explore the surprising lexical be construction in English (e.g. Why don't you be quiet?). After an overview of previous discussions, an investigation of the use of lexical be in the COCA and SOAP corpora is provided. It is shown that its distribution is highly skewed and that it is completely felicitous only under a very limited set of conditions. An account of lexical be is then provided showing that the conditions that license it are inherited from more general constructions, most importantly the negative imperative construction and the 'Why don't you' construction. In this light, it is suggested that the lexical be construction, with its special properties, provides strong evidence for a constructional approach to linguistic competence along the lines of Goldberg (1995), Culicover and Jackendoff (2005), Sag (2012).
https://www.cambridge.org/core/journals/journal-of-linguistics/article/lexical-be/2A5EFE82FEF339443AC2FE59C105DDD4

Language and Cognition

PAPERS

ANNA SZALA et al with SŁAWOMIR WACEWICZ, PRZEMYSŁAW ŻYWICZYŃSKI & ROBIN I.M. DUNBAR – How much conversation content is actually social: human conversational behaviour revisited

Our study explores aspects of human conversation within the framework of evolutionary psychology, focusing on the proportion of 'social' to 'non-social' content in casual conversation. Building upon the seminal study by Dunbar et al. (1997, Human Nature, 8, 231–246), which posited that two-thirds of conversation gravitates around social matters, our findings indicate an even larger portion, approximately 85% being of a social nature. Additionally, we provide a nuanced categorisation of 'social' rooted in the principles of evolutionary psychology. Similarly to Dunbar et al.'s findings, our results support theories of human evolution that highlight the importance of social interactions and information exchange and the importance of the exchange of social information in human interactions across various contexts.
https://www.cambridge.org/core/journals/language-and-cognition/article/how-much-conversation-content-is-actually-social-human-conversational-behaviour-revisited/61BF5C91583F04053BE9471ED96FAE1D

DOROTA K. GASKINS – Frequency-based salience of dual meanings in conventional metaphor acquisition: Evidence from toddlers in Urban England

This study investigates claims that metaphor acquisition is rooted in the words' concrete meanings: to be able to use metaphors and other non-literal languages, the child needs to 'go beyond' meanings that are conventional and so presumably concrete (e.g., Falkum, 2022: 97). To test if metaphor-related words emerge via their concrete senses and how this reflects child-directed speech, I examined 594 hours of interactional data for three English-speaking toddlers from urban middle-class England, whose speech was densely sampled between the ages of 2;00 and 3;01. The data show that 75%–82% conventional metaphors were acquired via their concrete senses and that the order of acquisition of concrete and abstract senses corresponded with their input frequencies. Overall, when hearing conventional metaphors, 81%–89% of the time children were exposed to their concrete meanings. Contrary to the generic argument that children's pragmatic reasoning with non-literal uses is impeded by meaning conventionality (Falkum, 2022), my preliminary data suggest that it is influenced by the frequency of exposure to the concrete meanings of conventional metaphors, which leads to a generalised prediction that the most probable interpretation of any new metaphor is concrete (literal). Qualitative analyses further reveal that abstract meanings, when acquired first, were learned in highly emotive contexts.
https://www.cambridge.org/core/journals/language-and-cognition/article/frequencybased-salience-of-dual-meanings-in-conventional-metaphor-acquisition-evidence-from-toddlers-in-urban-england/04968C59F7F2A3E6BF98E8E5459412D1

Language Sciences

PAPERS

FERNANDO BERMÚDEZ – Grammaticalization of prosodic configurations? The case of evidential interrogative in Spanish

This study investigates how prosodic evidentials (i. e. evidential markers constituted solely by prosodic configurations, regardless of their lexical and grammatical content) can emerge and develop. This is exemplified by a type of interrogative intonation used to convey assertions presented as shared knowledge, a prosodic configuration that we call evidential interrogative. The conclusion drawn is that prosodic configurations marking evidential meaning develop analogously to lexical or morphological evidentials, thus undergoing a process comparable to grammaticalization (Traugott, 2003; Narrog and Heine, 2021). This entails a reconsideration of grammaticalization as a broader form of linguistic change, encompassing not only lexical items and constructions but also, for instance, prosodic configurations.
https://www.sciencedirect.com/science/article/pii/S0388000124000809

ULISES RODRÍGUEZ JORDÁ & EZEQUIEL A. DI PAOLO – Linguistic relativity from an enactive perspective: the entanglement of language and cognition
We seek to relate the fields of linguistic relativity (LR) and the enactive approach in cognitive science. We distinguish contemporary research on LR, starting after the mid-1990s, from earlier approaches to the field. Current studies are characterised by a nuanced methodology rooted in the psycholinguistics tradition. While improving on earlier research, they also move away from philosophically oriented discussions about the relation between language and cognition and focus instead on experimentally testing relativistic effects for specific cognitive domains. We claim that this procedure retains some fundamental assumptions from classical cognitive science, precisely those that are challenged by an enactive perspective. These include a commitment to the modularity of mind and a computational understanding of the interactions between cognitive domains. We contend that contemporary LR research is, in fact, compatible with these classical cognitivist ideas, despite superficial points of tension. We then survey recent post-cognitivist approaches to language in cognitive science and explore ways in which LR and the enactive framework could be mutually enriched. Whereas the structural or categorial aspects of language are central for LR research, these are usually downplayed in post-cognitivist approaches, often influenced by the integrationist distinction between first-order linguistic practices and second-order constructs. We advance a specifically enactive perspective that seeks to preserve the systematic features of language while also integrating them within a dynamical understanding of the relation between language and cognition at multiple timescales.
https://www.sciencedirect.com/science/article/pii/S0388000124000913

Nature

REVIEWS

EVA JABLONKA – A new vision for how evolution works is long overdue
The idea that evolution is driven by an organism's development — not just the natural selection of its genes — challenges a dearly held orthodoxy among evolutionary biologists.
Review of 'Evolution Evolving: The Developmental Origins of Adaptation and Biodiversity' by Kevin Lala et al, Viking Books (2024).
https://www.nature.com/articles/d41586-025-00054-x

Nature Africa

ARTICLES

GILBERT NAKWEYA – Two hominid species lived side by side in Kenya 1.5 million years ago
First physical evidence of species coexistence
https://www.nature.com/articles/d44148-025-00008-5

Nature Communications

PAPERS

REFAEL TIKOCHINSKI et al – Incremental accumulation of linguistic context in artificial and biological neural networks
Large Language Models (LLMs) have shown success in predicting neural signals associated with narrative processing, but their approach to integrating context over large timescales differs fundamentally from that of the human brain. In this study, we show how the brain, unlike LLMs that process large text windows in parallel, integrates short-term and long-term contextual information through an incremental mechanism. Using fMRI data from 219 participants listening to spoken narratives, we first demonstrate that LLMs predict brain activity effectively only when using short contextual windows of up to a few dozen words. Next, we introduce an alternative LLM-based incremental-context model that combines incoming short-term context with an aggregated, dynamically updated summary of prior context. This model significantly enhances the prediction of neural activity in higher-order regions involved in long-timescale processing. Our findings reveal how the brain's hierarchical temporal processing mechanisms enable the flexible integration of information over time, providing valuable insights for both cognitive neuroscience and AI development.
https://www.nature.com/articles/s41467-025-56162-9

XIANGLING FENG et al – Cortical arealization of interneurons defines shared and distinct molecular programs in developing human and macaque brains
Cortical interneurons generated from ganglionic eminence via a long-distance journey of tangential migration display evident cellular and molecular differences across brain regions, which seeds the heterogeneous cortical circuitry in primates. However, whether such regional specifications in interneurons are intrinsically encoded or gained through interactions with the local milieu remains elusive. Here, we recruit 685,692 interneurons from cerebral cortex and subcortex including ganglionic eminence within the developing human and macaque species. Our integrative and comparative analyses reveal that less transcriptomic alteration is accompanied by interneuron migration within the ganglionic eminence subdivisions, in contrast to the dramatic changes observed in cortical tangential migration, which mostly characterize the transcriptomic specification for different destinations and for species divergence. Moreover, the in-depth survey of temporal regulation illustrates species differences in the developmental dynamics of cell types, e.g., the employment of CRH in primate

interneurons during late-fetal stage distinguishes from their postnatal emergence in mice, and our entropy quantifications manifest the interneuron diversities gradually increase along the developmental ages in human and macaque cerebral cortices. Overall, our analyses depict the spatiotemporal features appended to cortical interneurons, providing a new proxy for understanding the relationship between cellular diversity and functional progression.
https://www.nature.com/articles/s41467-025-56058-8

Nature Communications Biology

PAPERS

MARINA MELCHIONNA et al – Cortical areas associated to higher cognition drove primate brain evolution
Although intense research effort is seeking to address which brain areas fire and connect to each other to produce complex behaviors in a few living primates, little is known about their evolution, and which brain areas or facets of cognition were favored by natural selection. By developing statistical tools to study the evolution of the brain cortex at the fine scale, we found that rapid cortical expansion in the prefrontal region took place early on during the evolution of primates. In anthropoids, fast-expanding cortical areas extended to the posterior parietal cortex. In Homo, further expansion affected the medial temporal lobe and the posteroinferior region of the parietal lobe. Collectively, the fast-expanding cortical areas in anthropoids are known to form a brain network producing mind reading abilities and other higher-order cognitive functions. These results indicate that pursuing complex cognition drove the evolution of Primate brains.
{After the cover-up scandals involving the Archbishops of Canterbury and York, I'm not sure that complex cognition goes on in Primate brains; it probably goes on in primate brains, though. English is a trap even for the wary.}
https://www.nature.com/articles/s42003-025-07505-1

Nature Communications Earth & Environment

PAPERS

JULIO MERCADER et al with MICHAEL PETRAGLIA – Homo erectus adapted to steppe-desert climate extremes one million years ago
Questions about when early members of the genus Homo adapted to extreme environments like deserts and rainforests have traditionally focused on Homo sapiens. Here, we present multidisciplinary evidence from Engaji Nanyori in Tanzania's Oldupai Gorge, revealing that Homo erectus thrived in hyperarid landscapes one million years ago. Using biogeochemical analyses, precise chronometric dating, palaeoclimate simulations, biome modeling, fire history reconstructions, palaeobotanical studies, faunal assemblages, and archeological evidence, we reconstruct an environment dominated by semidesert shrubland. Despite these challenges, Homo erectus repeatedly occupied fluvial landscapes, leveraging water sources and ecological focal points to mitigate risk. These findings suggest archaic humans possessed an ecological flexibility previously attributed only to later hominins. This adaptability likely facilitated the expansion of Homo erectus into the arid regions of Africa and Eurasia, redefining their role as ecological generalists thriving in some of the most challenging landscapes of the Middle Pleistocene.
https://www.nature.com/articles/s43247-024-01919-1

Nature Neuroscience

ARTICLES

AMY L. ORSBORN – Neural populations are dynamic but constrained
Our brains evolved to help us rapidly learn new things. But anyone who has put in hours of practice to perfect their tennis serve, only to reach a plateau, can attest that our brains aren't infinitely flexible. New work shows that patterns of neural activity over time — the temporal dynamics of neural populations — cannot change rapidly, suggesting that neural activity dynamics may both reflect and constrain how the brain performs computations.
https://www.nature.com/articles/s41593-024-01793-2

Nature Scientific Data

PAPERS

RUNNAN CAO et al – A human single-neuron dataset for object recognition
Object recognition is fundamental to how we interact with and interpret the world around us. The human amygdala and hippocampus play a key role in object recognition, contributing to both the encoding and retrieval of visual information. Here, we recorded single-neuron activity from the human amygdala and hippocampus when neurosurgical epilepsy patients performed a one-back task using naturalistic object stimuli. We employed two sets of naturalistic object images from leading datasets extensively used in primate neural recordings and computer vision models: we recorded 1204 neurons using the ImageNet stimuli, which included broader object categories (10 different images per category for 50 categories), and we recorded 512 neurons using the Microsoft COCO stimuli, which featured a higher number of images per category (50 different images per category for 10 categories). Together, our extensive dataset, offering the highest spatial and temporal

resolution currently available in humans, will not only facilitate a comprehensive analysis of the neural correlates of object recognition but also provide valuable opportunities for training and validating computational models.
https://www.nature.com/articles/s41597-024-04265-1

Nature Scientific Reports

PAPERS

BENJAMIN SCHÜRCH, NICHOLAS J. CONARD & PATRICK SCHMIDT – Examining Gravettian and Magdalenian mobility and technological organization with IR spectroscopy

Archaeologists can use the provenance of lithic raw materials to examine the movements, territories, and settlement dynamics of hunter-gatherers. Several studies have used macroscopic analyses to propose the long-distance transport of raw material during the Gravettian and the Magdalenian of the Swabian Jura in Central Europe. Until now hypotheses about raw material transport in this region were not based on reproducible analyses. This study aims to test some of the hypotheses about the origins of lithic raw materials during the Gravettian and Magdalenian, using infrared spectroscopic measurements. These analyses are based on differences and similarities in the mineralogy and crystallography of rocks. Using this method, we test for long-distance raw-material transport between the sites of the Swabian Jura and the Freiburg basin, 200 km to the south-west, and the region of the Altmühl Valley, 150 km to the north-east. For this, we created a reference database of 114 lithic raw material outcrops from Southern Germany and compared these specimens with artifacts from eleven archeological sites. Our study reconstructs the raw-material procurement and transport during the Gravettian and Magdalenian and reveals settlement patterns and territories that span over more than 300 km in Central Germany.
https://www.nature.com/articles/s41598-024-84302-6

BRIGITTE M. WEIß et al – Chemical signatures of social information in Barbary macaques

Primates are well-known for their complex social lives and intricate social relationships, which requires them to obtain and update social knowledge about conspecifics. The sense of smell may provide access to social information that is unavailable in other sensory domains or enhance the precision and reliability of other sensory cues. However, the cognition of social information in catarrhine primates has been studied primarily in the visual and auditory domain. We assessed the social information content of body odor in a catarrhine primate, the Barbary macaque (Macaca sylvanus), in three semi-free ranging groups at Affenberg Salem, Germany. In particular, we related socially relevant attributes (identity, genetic relatedness, rank, sex, age, group membership) to chemical profiles of body odor. We applied non-invasive active sampling via thermal desorption tubes and analyzed samples by gas chromatography–mass spectrometry. We found robust evidence for individual odor signatures and limited support for kin signatures. Chemical profiles were also related to group membership, but little to rank, sex or age. The detected associations between chemical profiles and socially relevant attributes form the theoretical foundations for olfactory information transfer, highlighting the potential of body odor to provide valuable social information in this highly visually oriented primate.
https://www.nature.com/articles/s41598-024-84619-2

KRZYSZTOF PYTEL – Fuzzy logic applied to tunning mutation size in evolutionary algorithms

Tuning of parameters is a very important but complex issue in the Evolutionary Algorithms' design. The paper discusses the new, based on the Fuzzy Logic concept of tuning mutation size in these algorithms. Data on evolution collected in prior generations are used to tune the size of mutations. A Fuzzy Logic Part uses this historical data to improve the algorithm's convergence to a global optimum. The Fuzzy Logic Part keeps a desirable relation of exploration and exploitation, so the algorithm's resistance to getting stuck in a local optimum is improved too. Several tests on Function Optimization Problems were performed to prove the suitability of the proposed method. A set of data and functions with different difficulties, recommended in the commonly used benchmarks are used for experiments. The results of these experiments suggest that the proposed method is efficient and could be used for a wide range of similar problems of optimization.
https://www.nature.com/articles/s41598-025-86349-5

PeerJ

PAPERS

SAHAL ALOTAIBI et al – The role of fMRI in the mind decoding process in adults: a systematic review

Functional magnetic resonance imaging (fMRI) has revolutionized our understanding of brain activity by non-invasively detecting changes in blood oxygen levels. This review explores how fMRI is used to study mind-reading processes in adults. A systematic search was conducted across Web of Science, PubMed, and Google Scholar. Studies were selected based on strict inclusion and exclusion criteria: peer-reviewed; published between 2000 and 2024 (in English); focused on adults; investigated mind-reading (mental state decoding, brain-computer interfaces) or related processes; and employed various mind-reading techniques (pattern classification, multivariate analysis, decoding algorithms).
This review highlights the critical role of fMRI in uncovering the neural mechanisms of mind-reading. Key brain regions involved include the superior temporal sulcus (STS), medial prefrontal cortex (mPFC), and temporoparietal junction (TPJ), all crucial for mentalizing (understanding others' mental states).

This review emphasizes the importance of fMRI in advancing our knowledge of how the brain interprets and processes mental states. It offers valuable insights into the current state of mind-reading research in adults and paves the way for future exploration in this field.
https://peerj.com/articles/18795/

TENG YU, XUE SUI & YU TONG LI – Social presence effect in language comprehension: evidence from event-related potential (ERP) research
This study aimed to examine the impact of social presence on Chinese reading comprehension and associated neural responses.
Participants tasked with reading Chinese sentences either alone or in the presence of others and subsequently assessing the accuracy of the sentences' meanings. Concurrently, we recorded the participants' electrical brain responses to critical word processing.
Behavioral results indicated no significant effect of social presence on the judgment of sentence accuracy.
Electroencephalogram (EEG) results, however, revealed that reading in the presence of others elicited more pronounced left anterior negativity (LAN) components in the left front of the scalp compared to reading alone. Additionally, incorrect meanings triggered larger N400 and P600 amplitudes in the mid-parietal region than correct meanings.
Social presence intensifies early neural responses during the reading of Chinese sentences, although it does not influence semantic integration or conflict resolution. These findings support the notion that social context affects language processing.
https://peerj.com/articles/18798/

Physics of Life Reviews

PAPERS

CHRIS FIELDS & MICHAEL LEVIN – Thoughts and thinkers: On the complementarity between objects and processes
We argue that "processes v/s objects" is not a useful dichotomy. There is, instead, substantial theoretical utility in viewing "objects" and "processes" as complementary ways of describing persistence through time, and hence the possibility of observation and manipulation. This way of thinking highlights the role of memory as an essential resource for observation, and makes it clear that "memory" and "time" are also mutually inter-defined, complementary concepts. We formulate our approach in terms of the Free Energy Principle (FEP) of Friston and colleagues and the fundamental idea from quantum theory that physical interactions can be represented by linear operators. Following Levin (Self-improvising memory: A perspective on memories as agential, dynamically reinterpreting cognitive glue. Entropy 26 (2024) 481), we emphasize that memory is, first and foremost, an interpretative function, from which the idea of memory as a record, at some level of accuracy, of past events is derivative. We conclude that the distinction between objects and processes is always contrived, and always misleading, and that science would be better served by abandoning it entirely.
https://www.sciencedirect.com/science/article/abs/pii/S1571064525000089

PLoS One

PAPERS

SPENCER KIESEL & SHARIF AMLANI – Affective polarization in a word: Open-ended and self-coded evaluations of partisan affect
The literature finds that partisanship drives negative emotional evaluations of out-partisans. Yet, scholars base these insights on measures–like thermometers, candidate evaluations, and social-distance measures–that discount the sentiment attached to individuals' negative attitudes. We introduce a unique measure of affect capturing the motivation underpinning partisans' attitudes. Our measure asks respondents for one-word to describe voters in their party and the opposing party. Then respondents code the sentiment behind their word choice themselves. Together, our measure produces qualitative and quantitative measures of respondents' affect. We find that our self-coded open-ended measure has strong face validity and correlates strongly with existing affect measures. This measure advances our understating of partisan affect by allowing scholars a window into respondents' state of mind. Scholars can easily apply our measure's procedure beyond partisanship to other groups of interest.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0310772

VALENTINA MARTINOIA et al – High-resolution isotope dietary analysis of Mesolithic and Neolithic humans from Franchthi Cave, Greece
Franchthi Cave, in the Greek Peloponnese, is a well-known Paleolithic, Mesolithic and Neolithic site, with several human burials. In many parts of Europe there is clear evidence from archaeological and isotopic studies for a diet change between the Mesolithic and Neolithic periods. This is especially the case in coastal contexts where there is often a shift from predominantly marine food diets in the Mesolithic to terrestrial (presumably domesticated) foods in the Neolithic. However, at Franchthi Cave previous isotope research did not show changes in diets between these two periods, and also showed relatively little input from marine foods in diets in either time period, despite the coastal location of the site and the presence of marine shellfish and fish, including tuna. High-resolution compound specific amino acid isotope analysis reported

here from humans from the Lower Mesolithic and Middle Neolithic periods confirms the previous bulk isotope results in showing little or no consumption of marine foods in either time period. However, it is important to note that our isotopic sample does not come from episodes when tuna is abundant and therefore do not cover the whole range of known diets from the site. Conversely, in our sample there is some evidence of marine food consumption (likely seaweed) by sheep in the Neolithic period. We also report here five direct AMS radiocarbon dates for the five analyzed humans from the site.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0310834

VANESSA FORTE et al – Neural plasticity in early potters: Shape analysis and TMS-EEG co-registration trace the rise of a new motor skill

In this study, we explored the biocultural mechanisms underlying ancient craft behaviours. Archaeological methods were integrated with neuroscience techniques to explore the impact on neuroplasticity resulting from the introduction of early pottery techniques. The advent of ceramic marked a profound change in the economy and socio-cultural dynamics of past societies. It may have also played a central role in developing new craft skills that influenced the neural plasticity of the potters. Coiling, one of the most widespread neolithic techniques, requires precise hand movements and the ability to regulate finger pressure to shape the clay without deformation. In a pilot study involving intensive training in neolithic pottery, we used TMS-EEG co-registration to monitor a group of participants and we examined the shape of the artefacts they made before and after training. Our findings suggest changes in the functional properties of the primary motor cortex (M1) responsible for the control and execution of actions. We also observed an improvement in symmetry and consistency of the artefacts and a significant reduction in errors. This multidisciplinary approach sheds light on the mechanisms of material culture's variation in the archaeological field and provides promising insights into the co-evolution of technology and human skill.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0316545

Royal Society Open Science

PAPERS

RACHEL M. THOMPSON, LAUREN K. SALIG & L. ROBERT SLEVC – Is musical ability related to second-language acquisition? A meta-analysis

In our multicultural and interconnected world, the ability to learn new languages is important. However, there are significant differences in how successfully adults can learn aspects of non-native languages. Given robust relationships between musical ability and native-language processing, musical ability might also contribute to successful second-language acquisition. However, while several studies have assessed this relationship in various ways, the consistency and robustness of the relationship between musical ability and second-language learning remains unclear. Thus, we synthesized 184 effects across 57 independent studies (n =3181) with a robust variance estimation multivariate meta-analysis, and we narratively summarized partial correlation effects across 12 studies. The available evidence suggests that musical ability is indeed positively related to second-language learning, even after factoring in publication bias revealed by the meta-analysis. Although future work with more diverse participant populations and methodologies is needed to further disentangle this relationship, it is apparent that individuals with better musical ability are generally more successful at second-language learning.
https://royalsocietypublishing.org/doi/10.1098/rsos.241193

JACOB A. FEDER et al with ROBERT M. SEYFARTH & JOAN B. SILK – Female reproductive ageing persists despite high infanticide risk in chacma baboons and geladas

Across mammals, fertility and offspring survival are often lowest at the beginning and end of females' reproductive careers. However, extrinsic drivers of reproductive success—including infanticide by males—could stochastically obscure these expected age-related trends. Here, we modelled reproductive ageing trajectories in two cercopithecine primates that experience high rates of male infanticide: the chacma baboon (Papio ursinus) and the gelada (Theropithecus gelada). We found that middle-aged mothers generally achieved the shortest interbirth intervals in chacma baboons. By contrast, old gelada females often showed shorter interbirth intervals than their younger group-mates with one exception: the oldest females typically failed to produce additional offspring before their deaths. Infant survival peaked in middle-aged mothers in chacma baboons but in young mothers in geladas. While infant mortality linked with maternal death increased as mothers aged in both species, infanticide risk did not predictably shift with maternal age. Thus, infanticide patterns cannot explain the surprising young mother advantage observed in geladas. Instead, we argue that this could be a product of their graminivorous diets, which might remove some energetic constraints on early reproduction. In sum, our data suggest that reproductive ageing is widespread but may be differentially shaped by ecological pressures.
https://royalsocietypublishing.org/doi/10.1098/rsos.241210

MOLLY A. CLARK & CHRISTOS C. IOANNOU – Quantifying animal social behaviour with ecological field methods

Field studies of social behaviour are challenging due to the need to record or infer interactions between multiple individuals, often under suboptimal environmental conditions or with potential disturbance by observers. Due to the limited field techniques available, we present a novel method to quantify social behaviours in the field by comparing the counts of

individuals caught in traps across multiple locations sampled simultaneously. The distribution of individuals between traps gives the extent of aggregation, and phenotypic data allow for inference of non-random assortment. As a case study, we applied this method to populations of three-spined sticklebacks (Gasterosteus aculeatus) in freshwater ponds, using minnow traps. As expected, we observed a strong trend for aggregation. We were able to describe the ecological drivers of aggregation, comparing environmental and phenotypic conditions across sites. Aggregation was not related to environmental parameters, but was negatively associated with the proportion of breeding males caught during the breeding season. No evidence for phenotypic assortment based on body size was found. These results demonstrate that widely available ecological equipment can address questions related to social behaviour. This cost-effective approach, avoiding the tagging of individuals and minimizing extended observer disturbance, can be applied across various habitats and species.
https://royalsocietypublishing.org/doi/10.1098/rsos.241299

Trends in Cognitive Sciences

PAPERS

SHARNA D. JAMADAR et al – The metabolic costs of cognition

Cognition and behavior are emergent properties of brain systems that seek to maximize complex and adaptive behaviors while minimizing energy utilization. Different species reconcile this trade-off in different ways, but in humans the outcome is biased towards complex behaviors and hence relatively high energy use. However, even in energy-intensive brains, numerous parsimonious processes operate to optimize energy use. We review how this balance manifests in both homeostatic processes and task-associated cognition. We also consider the perturbations and disruptions of metabolism in neurocognitive diseases.
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(24)00319-X

Trends in Neurosciences

PAPERS

YONGLING LIN & MARCO K. WITTMANN – Multiple predictions of others' actions in the human brain

The success of our actions often depends on what others are doing. How does the brain discern predictions of others' actions when situations are ambiguous? Recent work by Ma and colleagues suggests that the brain solves this problem by entertaining multiple predictions of others' actions, ranked by their likelihood.
https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(24)00218-2

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