

EAORC BULLETIN 1,105 – 18 August 2024

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NOTICES

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 – Language as a Critical Factor in the Emergence of Human Cognition

Humana.Mente Journal of Philosophical Studies, Vol. 27, 185-199 (2014).

IAN TATTERSALL – Language as a Critical Factor in the Emergence of Human Cognition

Modern human beings are most sharply distinguished from all other organisms alive today by their possession of symbolic reasoning, the cognitive capacity that makes possible the mental construction of alternative versions of the world. Scrutiny of the human fossil and archaeological records reveals that, while brain sizes expanded independently in several hominid lineages over the course of the Pleistocene, this qualitatively distinctive symbolic faculty only emerged in our own. What is more, this acquisition was made remarkably recently: well within the 200,000-year tenure on Earth of our anatomically distinctive species *Homo sapiens*. The earliest anatomical *Homo sapiens* appear to have behaved in much the same manner as their non-symbolic contemporaries, although it is highly likely that they had acquired the neural wiring necessary for symbolic thought in the same event of developmental reorganization that gave *Homo sapiens* its strikingly derived bony morphology. Only subsequent to about 100,000 years ago do archaeological traces suggest that our forebears had actually begun to think symbolically. This implies that the new capacity was released by a purely cultural stimulus (after all, the biology was necessarily already in place). I suggest that cultural trigger involved was the spontaneous invention of language by members of a small population isolate of *Homo sapiens* in Africa, at some time after about 100,000 years ago. Structured, rule-bound language is intricately intertwined with symbolic thought as we experience it today; and it is possible to conceive at least in principle how each could have fed back into the other to create a new dynamic.

[https://www.academia.edu/23412967/Language as a Critical Factor in the Emergence of Human Cognition](https://www.academia.edu/23412967/Language_as_a_Critical_Factor_in_the_Emergence_of_Human_Cognition)

ACADEMIA.EDU – Behavioural complexity in Eurasian Neanderthal populations

Cambridge Archaeological Journal 18:3, 289-307 (2008).

MICHELLE C. LANGLEY, CHRISTOPHER CLARKSON & SEAN ULM – Behavioural complexity in Eurasian Neanderthal populations: A chronological examination of the archaeological evidence

Whether Neanderthals were capable of behaviours commonly held to be the exclusive preserve of modern humans — such as abstract thought, language, forward planning, art, reverence of the dead, complex technology, etc. — has remained a fundamental question in human evolutionary studies since their discovery more than a hundred years ago. A lack of quantitative data on Neanderthal symbolism and complex behaviour is a key obstacle to the resolution of this question, with temporal analyses usually confined to single regions or short time periods. Here we present an approach to the issue of symbolism and complex behaviours among Neanderthals that examines the frequency of key proxies for symbolic and complex behaviours through time, including burials, modified raw materials, use of pigments, use of composite technology and body modification. Our analysis demonstrates that the number and diversity of complex Neanderthal behaviours increases between 160,000 and 40,000 years ago. Whether this pattern derives from preservation factors, the evolution of cognitive and behavioural complexity, cumulative learning, or population size is discussed. We take the view that it is not the apparent sophistication of a single specific item, nor the presence or absence of particular types in the archaeological record that is important. Instead, we believe that it is the overall abundance of artefacts and features indicative of complex behaviours within the Neanderthal archaeological record as a whole that should provide the mark of Neanderthal capabilities and cultural evolutionary potential.

https://www.academia.edu/412485/Behavioural_complexity_in_Eurasian_Neanderthal_populations_A_chronological_examination_of_the_archaeological_evidence

ACADEMIA.EDU – Controlled comparative tensile tests of backed versus non-backed edges' adhesion *Archaeometry*, 1-17. (2024).

MICHAEL WILSON et al – Controlled comparative tensile tests of backed versus non-backed edges' adhesion: Inferences into stone tool functional properties

Backing is a procedure for retouching a stone tool edge to an angle of or near 90 degrees. Archaeologists have recorded backed lithic specimens in the Pleistocene and Holocene around the world. One prominent hypothesis for the occurrence of backing is that it increases a stone tool's adhesion relative to what it would have otherwise been with unmodified, sharp edges. We conducted a highly controlled semi-static tensile test in which we assessed lithic specimens that possessed both a backed and a non-backed edge, opposing each other. We hafted each specimen's backed and non-backed edges to wood, and the bi-hafted stone implement was then pulled apart using an Universal Instron Materials Tester, allowing for a direct 'head-to-head' comparison of the two edge types' adhesive properties. Our tensile test results suggested no significant difference between backed and non-backed edges in terms of adhesion, which does not support the hypothesis that backing increases a lithic specimen's adhesion.

https://www.academia.edu/122930856/Controlled_comparative_tensile_tests_of_backed_versus_non_backed_edges_adhesion_Inferences_into_stone_tool_functional_properties

NEWS

GUARDIAN SCIENCE – Stonehenge megalith came from Scotland, not Wales, 'jaw-dropping' study finds

Monument's largest 'bluestone' moved more than 450 miles – a discovery researchers say rewrites relationships between Neolithic populations.

<https://www.theguardian.com/uk-news/article/2024/aug/14/stonehenge-megalith-came-from-scotland-not-wales-jaw-dropping-study-finds>

NATURE BRIEFING – Stonehenge's altar is surprisingly Scottish

Chemical analysis of tiny crystals in Stonehenge's central Altar Stone suggest that it came from Scotland — and not from Wales as previously thought. The fingerprint of zircon, rutile and apatite crystals in the stone allowed it to be traced to the Orcadian Basin, which includes parts of northeastern Scotland and the Orkney Islands. Whether the six-tonne monolith was transported by land or by sea is hotly debated.

<https://www.nature.com/articles/d41586-024-02584-2>

SAPIENS – How Allocating Work Aided Our Evolutionary Success

Societies divide labor by gender and age. A biological anthropologist considers when and why this behavior arose.

<https://www.sapiens.org/biology/labor-division-gender-human-orgins/>

SCIENCEADVISER – No more nonsense

"The first and most important step" towards avoiding nonsense correlations, the common statistical error where data line up because of incorrect assumptions rather than actual relationships, "is to actually care," writes neuroscientist Kenneth Harris.

<https://www.thetransmitter.org/behavioral-neuroscience/nonsense-correlations-and-how-to-avoid-them/>

SCIENCEADVISER – Contrary to dogma, we have a lot to learn about speech from apes

Language is uniquely human. And while we communicate in many ways, understanding the evolution of language necessitates having a sense of how and when people began talking—or if, indeed, it was people at all.

Anthropologists have long considered the vocalizations nonhuman primates make irrelevant to human speech. That's an error that's thankfully been corrected in recent years, writes Steffen Hage in a Perspective for Science. "This dichotomous view of human language and primate vocalizations has greatly hindered research about the origins of human speech," he says.

Now, thanks to more open-minded research, scientists are beginning to draw connections between the anatomical and neurological underpinnings of primate sounds and our own verbal communications. Such work has revealed that "contrary to decades-old assumptions, the morphology of the vocal apparatus as well as the neuroanatomical and neurophysiological characteristics of primates are actually speech-ready, having the capacity to evolve a speech-like communication system." The fact that they haven't learned to talk—and indeed, struggle to be trained to communicate with verbal or sign language—indicates that other factors, such as social structures, drove the emergence of human speech. "The focus should be on understanding the kind of evolutionary pressure that led to the evolution of human speech in a speech-ready primate brain," he says.

<https://www.science.org/doi/10.1126/science.ado4341>

SCIENCE DAILY – Bacteria encode hidden genes outside their genome--do we?

A 'loopy' discovery in bacteria is raising fundamental questions about the makeup of our own genome -- and revealing a potential wellspring of material for new genetic therapies.

<https://www.sciencedaily.com/releases/2024/08/240809135927.htm>

SCIENCE DAILY – Carvings at ancient monument may be world's oldest calendars

Markings on a stone pillar at a 12,000 year-old archaeological site in Turkey likely represent the world's oldest solar calendar, created as a memorial to a devastating comet strike, experts suggest.

<https://www.sciencedaily.com/releases/2024/08/240806131238.htm>

SCIENCE DAILY – Sometimes it hurts to think

If somebody complains that it hurts to think, they may be onto something, as mental exertion appears to be associated with unpleasant feelings in many situations, according to new research.

<https://www.sciencedaily.com/releases/2024/08/240805134153.htm>

SCIENCE DAILY – Babbling babies need timely responses to learn language, social norms

New research shows the timing of others' reactions to their babbling is key to how babies begin learning language and social norms -- a process evident in infants' interactions with a robot.

<https://www.sciencedaily.com/releases/2024/08/240812123214.htm>

SCIENCE DAILY – Parents who use humor have better relationships with their children

In a pilot study, most people viewed humor as an effective parenting tool and that a parent or caregiver's use of humor affected the quality of their relationship with their children, according to new research. Among those whose parents used humor, the majority viewed their relationship with their parents and the way they were parented in a positive light.

<https://www.sciencedaily.com/releases/2024/08/240812123148.htm>

SCIENCE DAILY – Dark rituals: Understanding society's fascination with death and disaster

Understanding why the popularity of organized events steeped in themes of death, disaster and suffering, such as the well-known Dia de los Muertos (Day of the Dead), Jack the Ripper Walking Tours and Remembrance Sunday, could be key to a deeper understanding of society, say researchers.

<https://www.sciencedaily.com/releases/2024/08/240814160709.htm>

SCIENCE DAILY – Rare archaeological site reveals 'surprising' Neanderthal behaviour at Pyrenees foothills

An uncharted area in the foothills of the Southern Pyrenees in Spain is providing insights into a poorly known period of Neanderthal history, offering clues that could help archaeologists uncover the mystery of their downfall, according to new research.

<https://www.sciencedaily.com/releases/2024/08/240814124635.htm>

SCIENCE DAILY – Impact of 700 years of Inuvialuit subsistence hunting on beluga whales

An international team of researchers analyzed beluga whale bones retrieved from archaeological sites in the Mackenzie Delta, Northwest Territories, Canada, to shed light on the sustainability of centuries of Inuvialuit beluga whale subsistence harvests.

<https://www.sciencedaily.com/releases/2024/08/240814124601.htm>

SCIENCE DAILY – Great Scott! Stonehenge's Altar Stone origins reveal advanced ancient Britain

New research has revealed Stonehenge's monumental six-ton Altar Stone, long believed to originate from Wales, actually hails from Scotland.

<https://www.sciencedaily.com/releases/2024/08/240814124502.htm>

SOCIETY FOR SCIENCE – Stonehenge's mysterious Altar Stone had roots in Scotland

New analyses indicate that this weighty piece of the site's architecture, once thought to come from Wales, was somehow moved at least 750 kilometers.

<https://www.sciencenews.org/article/stonehenge-altar-stone-scotland-roots>

THE CONVERSATION – Stonehenge's giant Altar Stone came all the way from north-east Scotland

This is the longest known journey for any stone used in a Neolithic monument.

<https://theconversation.com/stonehenges-giant-altar-stone-came-all-the-way-from-north-east-scotland-heres-how-we-worked-out-this-astonishing-new-finding-236630>

PUBLICATIONS

eLife

PAPERS

SEBASTIEN BOURET et al – Linking the evolution of two prefrontal brain regions to social and foraging challenges in primates

The diversity of cognitive skills across primates remains both a fascinating and a controversial issue. Recent comparative studies provided conflicting results regarding the contribution of social vs ecological constraints to the evolution of cognition. Here, we used an interdisciplinary approach combining comparative cognitive neurosciences and behavioral ecology. Using brain imaging data from 16 primate species, we measured the size of two prefrontal brain regions, the frontal pole (FP) and the dorso-lateral prefrontal cortex (DLPFC), respectively involved in metacognition and working memory, and examined their relation to a combination of socio-ecological variables. The size of these prefrontal regions, as well as the whole brain, was best explained by three variables: body mass, daily traveled distance (an index of ecological constraints) and population density (an index of social constraints). The strong influence of ecological constraints on FP and DLPFC volumes suggests that both metacognition and working memory are critical for foraging in primates. Interestingly, FP volume was much more sensitive to social constraints than DLPFC volume, in line with laboratory studies showing an implication of FP in complex social interactions. Thus, our data highlights the relative weight of social vs ecological constraints on the evolution of specific prefrontal brain regions and their associated cognitive operations in primates.

<https://elifesciences.org/reviewed-preprints/87780>

Evolutionary Anthropology

PAPERS

DAVIDE DELPIANO, BRAD GRAVINA & MARCO PERESANI – Back(s) to basics: The concept of backing in stone tool technologies for tracing hominins' technical innovations

The evolution of Paleolithic stone tool technologies is characterized by gradual increase in technical complexity along with changes in the composition of assemblages. In this respect, the emergence of retouched-backed tools is an important step and, for some, a proxy for “modern” behavior. However, backed tools emerge relatively early and develop together with major changes in Middle-Upper Pleistocene stone tool technologies. We provide an updated review of the emergence and development of the “backing” concept across multiple chrono-cultural contexts and discuss its relationship to both the emergence of hafting and major evolutionary steps in the ergonomics of stone tool use. Finally, we address potential mechanisms of context-specific re-invention of backing based primarily on data from the late Middle Paleolithic of Western Europe.

<https://onlinelibrary.wiley.com/doi/full/10.1002/evan.22045>

Frontiers in Communication

PAPERS

PETER MUNTIGL et al – Trust in interaction studies

Trust is argued to be essential in fostering cooperative communication, whereas a lack of trust is seen as detrimental to these aims. Over the years, there has been a slow but steady stream of research that has aimed to shed light on how trust is accomplished or broken down through discursive-interactional practices. In this mini review, we examine existing studies that take trust as a topic of investigation using micro-analytic, interactional methods, in order to provide readers with an up-to-date overview on new developments in this important field of research. From this review, we conclude that there exist two different, yet complementary, views on trust: Trust as an interactional principle and trust as a discursively accomplished phenomenon. We not only summarize important discursive work that provides a unique lens on how trust may be established and maintained through verbal and non-verbal resources, but also suggest some of the challenges interactional trust research still faces and some important areas for further investigation in which trust is a major concern.

<https://www.frontiersin.org/journals/communication/articles/10.3389/fcomm.2024.1448110/full>

Frontiers in Developmental Psychology

PAPERS

JEDEDIAH W. P. ALLEN, ROBERT MIRSKI & MARK H. BICKHARD – Beyond the mirror: an action-based model of knowing through reflection

Epistemic reflection involves the creation of qualitatively new knowledge. Different models have been proposed to account for new knowing through reflection that have typically been grounded in an information-processing framework. However, there are in-principle arguments that information-processing approaches preclude the emergence of new representation altogether. Accordingly, any information-processing account of knowing through reflection is plagued by emergence issues.

After discussing some of these emergence issues for four prominent models in the cognitive science literature, an alternative action-based model of representation and reflection is presented called interactivism. Interactivism's model of representation, as grounded in action anticipations, serves as the foundational emergence needed to account for subsequent knowing through reflection. After introducing the interactivist models of representation and reflection through knowing levels, some of the implications for consciousness, enculturation, language, and developmental methodology are discussed. <https://www.frontiersin.org/journals/developmental-psychology/articles/10.3389/fdpys.2024.1449705/full>

Heliyon

PAPERS

SHOKO OKUZUMI et al – Roles of empathy in altruistic cooperation in adults with and without autism spectrum disorder

Altruistic cooperation (AC) is essential in human social interactions. Previous studies have investigated AC-related behavior in children with autism spectrum disorder (ASD), revealing that there is considerable individual variability in the behavior. However, this issue is still largely unexplored especially in the adult population.

To investigate individual differences in AC-related behavior, we conducted the resource allocation task (RAT) and modified version of the ultimatum game (mUG) among adults with and without ASD.

The study employed a cross-sectional design, involving 27 adults with ASD (mean age 29.1 ± 4.3 years; three females) and 27 adults with typical development (TD) (mean age 25.8 ± 6.7 years; two females), who completed the RAT and mUG tasks. Beyond clinical characteristics, we assessed three primary psychological metrics: the interpersonal reactivity index (IRI), Barratt impulsiveness scale, and the behavioral inhibition and activation systems.

No significant differences were observed in the proportions of participants with high AC when assessed by RAT ($p = 0.15$) and mUG ($p = 0.59$) between the TD and ASD groups. Participants with high AC from the RAT demonstrated higher perspective-taking scores on the IRI than those with low AC within both the TD ($p = 0.04$) and ASD groups ($p = 0.03$). In the TD group, high AC individuals also scored higher on the IRI's fantasy subscale as per the mUG ($p = 0.03$); however, this trend was not present in the ASD group.

The present findings indicate that empathy plays an important role in individual differences in AC-related behavior among adults with and without ASD, although the role could be different depending on the types of AC-related behavior between TD and ASD populations.

[https://www.cell.com/heliyon/fulltext/S2405-8440\(24\)12286-4](https://www.cell.com/heliyon/fulltext/S2405-8440(24)12286-4)

ALEXANDER KRAUSS – Science of Science: A multidisciplinary field studying science

Science and knowledge are studied by researchers across many disciplines, examining how they are developed, what their current boundaries are and how we can advance them. By integrating evidence across disparate disciplines, the holistic field of science of science can address these foundational questions. This field illustrates how science is shaped by many interconnected factors: the cognitive processes of scientists, the historical evolution of science, economic incentives, institutional influences, computational approaches, statistical, mathematical and instrumental foundations of scientific inference, scientometric measures, philosophical and ethical dimensions of scientific concepts, among other influences. Achieving a comprehensive overview of a multifaceted field like the science of science requires pulling together evidence from the many sub-fields studying science across the natural and social sciences and humanities. This enables developing an interdisciplinary perspective of scientific practices, a more holistic understanding of scientific processes and outcomes, and more nuanced perspectives to how scientific research is conducted, influenced and evolves. It enables leveraging the strengths of various disciplines to create a holistic view of the foundations of science. Different researchers study science from their own disciplinary perspective and use their own methods, and there is a large divide between quantitative and qualitative researchers as they commonly do not read or cite research using other methodological approaches. A broader, synthesizing paper employing a qualitative approach can however help provide a bridge between disciplines by pulling together aspects of science (economic, scientometric, psychological, philosophical etc.). Such an approach enables identifying, across the range of fields, the powerful role of our scientific methods and instruments in shaping most aspects of our knowledge and science, whereas economic, social and historical influences help shape what knowledge we pursue. A unifying theory is then outlined for science of science – the new-methods-drive-science theory.

[https://www.cell.com/heliyon/fulltext/S2405-8440\(24\)12097-X](https://www.cell.com/heliyon/fulltext/S2405-8440(24)12097-X)

Human Nature

PAPERS

HERBERT RENZ-POLSTER et al – Death from Failed Protection? An Evolutionary-Developmental Theory of Sudden Infant Death Syndrome

Sudden infant death syndrome (SIDS) has been mainly described from a risk perspective, with a focus on endogenous, exogenous, and temporal risk factors that can interact to facilitate lethal outcomes. Here we discuss the limitations that this risk-based paradigm may have, using two of the major risk factors for SIDS, prone sleep position and bed-sharing, as examples. Based on a multipronged theoretical model encompassing evolutionary theory, developmental biology, and

cultural mismatch theory, we conceptualize the vulnerability to SIDS as an imbalance between current physiologic-regulatory demands and current protective abilities on the part of the infant. From this understanding, SIDS appears as a developmental condition in which competencies relevant to self-protection fail to develop appropriately in the future victims. Since all of the protective resources in question are bound to emerge during normal infant development, we contend that SIDS may reflect an evolutionary mismatch situation—a constellation in which certain modern developmental influences may overextend the child's adaptive (evolutionary) repertoire. We thus argue that SIDS may be better understood if the focus on risk factors is complemented by a deeper appreciation of the protective resources that human infants acquire during their normal development. We extensively analyze this evolutionary-developmental theory against the body of epidemiological and experimental evidence in SIDS research and thereby also address the as-of-yet unresolved question of why breastfeeding may be protective against SIDS.

<https://link.springer.com/article/10.1007/s12110-024-09474-6>

NEIL R. CATON et al – Human Male Body Size Predicts Increased Knockout Power, Which Is Accurately Tracked by Conspecific Judgments of Male Dominance

Humans have undergone a long evolutionary history of violent agonistic exchanges, which would have placed selective pressures on greater body size and the psychophysical systems that detect them. The present work showed that greater body size in humans predicted increased knockout power during combative contests (Study 1a-1b: total N = 5,866; Study 2: N = 44 openweight fights). In agonistic exchanges reflective of ancestral size asymmetries, heavier combatants were 200% more likely to win against their lighter counterparts because they were 200% more likely to knock them out (Study 2). Human dominance judgments (total N = 500 MTurkers) accurately tracked the frequency with which men (N = 516) knocked out similar-sized adversaries (Study 3). Humans were able to directly perceive a man's knockout power because they were attending to cues of a man's body size. Human dominance judgments—which are important across numerous psychological domains, including attractiveness, leadership, and legal decision-making—accurately predict the likelihood with which a potential mate, ally, or rival can incapacitate their adversaries.

{Dare I say it, “a very Australian approach”? Seems to me, it gives more reason to pay attention to counter-dominance theories, such as Dessalles’ Political Singularity, Boehm’s Alpha Suppression, Knight et al’s Female Kin Coalition, etc.

Something stopped the Big Men from dominating (in this case, literally), and it wasn’t the Marquess of Queensbury.}

<https://link.springer.com/article/10.1007/s12110-024-09473-7>

Language Sciences

PAPERS

GUNNAR NORRMAN – Reconceptualizing the critical period hypothesis for second language acquisition: An appraisal of Lenneberg’s work on the epigenesis of language

The critical period hypothesis (CPH) as an explanation of age effects on language learning has been a perennial source of contention in the field of second language acquisition (SLA). Although this hypothesis – which suggests that adult language learning is constrained by biological or maturational changes in the brain – has been based on the work of Eric Lenneberg (i.e. *Biological Foundations of Language*, 1967), it does not reflect Lenneberg's original biological theory of language. In this paper, the CPH is examined in light of a comprehensive review of Lenneberg's work and related disciplines. By outlining Lenneberg's notion of epigenesis in language development, it is argued that the CPH interpretation of the critical period notion that has long skewed the debate over age effects in SLA must be re-evaluated, and that any reference to “Lenneberg's CPH” can – and should – be abandoned.

<https://www.sciencedirect.com/science/article/pii/S0388000124000342>

JANETTE FRIEDRICH – Skills, language and Indexicality – Determining a relationship

This paper investigates the concept of skills or abilities using the distinction between ‘knowing that’ and ‘knowing how’, as put forward by Gilbert Ryle in his 1949 book *The Concept of Mind*. The assertion of two forms of knowledge suggests the possibility that skills can be represented in propositional language. However, in the analysis of activities it is frequently shown that skills cannot be described ‘in words’, but at best can be indicated. On the other hand, speaking is itself a skill. If we accept Karl Bühler’s (1934) use of the concept of context we see that he describes representative language above all as a skill. The paper closes with a consideration of whether and, if so, to what extent it is possible to square these two conceptions of language.

<https://www.sciencedirect.com/science/article/abs/pii/S0388000124000470>

Mind & Language

PAPERS

PABLO FERNANDEZ VELASCO – Self-location in perceptual experience: A top-down account

Perceptual experience is self-locating. This claim aligns with our intuitions and is the dominant view in philosophy. To defend the claim, some philosophers have advanced perspectival accounts and others have advanced agentive accounts. Here, I explore tensions between the two accounts and propose a novel, integrative account: the top-down view, which defends

that visual experience is self-locating in virtue of cognitive maps that modulate visual processing in a top-down fashion. I assess recent neuroscientific evidence of spatial modulation in the visual cortex and show how it turns existing notions of self-location upside-down, shifting the focus from bottom-up to top-down processes.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12525>

Nature Communications

PAPERS

JOAQUIM FORT & JOAQUIM PÉREZ-LOSADA – Interbreeding between farmers and hunter-gatherers along the inland and Mediterranean routes of Neolithic spread in Europe

The Neolithic (i.e., farming and stockbreeding) spread from the Near East across Europe since about 9000 years before the common era (BCE) until about 4000 yr BCE. It followed two main routes, namely a sea route along the northern Mediterranean coast and an inland one across the Balkans and central Europe. It is known that the dispersive behavior of farmers depended on geography, with longer movements along the Mediterranean coast than along the inland route. In sharp contrast, here we show that for both routes the percentage of farmers who interbred with hunter-gatherers and/or acculturated one of them was strikingly the same (about 3.6%). Therefore, whereas the dispersive behavior depended on the proximity to the Mediterranean sea, the interaction behavior (incorporation of hunter-gatherers) did not depend on geographical constraints but only on the transition in the subsistence economy (from hunting and gathering to farming) and its associated way of life. These conclusions are reached by analyzing the clines of haplogroup K, which was virtually absent in hunter-gatherers and the most frequent mitochondrial haplogroup in early farmers. Similarly, the most frequent Y-chromosome Neolithic haplogroup (G2a) displays an inland cline that agrees with the percentage of interbreeding reported above.

<https://www.nature.com/articles/s41467-024-51335-4>

Nature Communications Biology

PAPERS

ANDREW T. L. ALLAN et al – Behavioural compatibility, not fear, best predicts the looking patterns of chacma baboons

Animal vigilance is often investigated under a narrow set of scenarios, but this approach may overestimate its contribution to animal lives. A solution may be to sample all looking behaviours and investigate numerous competing hypotheses in a single analysis. In this study, using a wild group of habituated chacma baboons (*Papio ursinus griseipes*) as a model system, we implemented a framework for predicting the key drivers of looking by comparing the strength of a full array of biological hypotheses. This included methods for defining individual-specific social threat environments, quantifying individual tolerance to human observers, and incorporating predator resource selection functions. Although we found evidence supporting reactionary and within-group (social) vigilance hypotheses, risk factors did not predict looking with the greatest precision, suggesting vigilance was not a major component of the animals' behavioural patterns generally. Instead, whilst some behaviours constrain opportunities for looking, many shared compatibility with looking, alleviating the pressure to be pre-emptively vigilant for threats. Exploring looking patterns in a thorough multi-hypothesis framework should be feasible across a range of taxa, offering new insights into animal behaviour that could alter our concepts of fear ecology.

<https://www.nature.com/articles/s42003-024-06657-w>

Nature Scientific Reports

PAPERS

SIBYLLA LEON GUERRERO, LAURA MESITE & GIGI LUK – Distinct functional connectivity patterns during naturalistic learning by adolescent first versus second language speakers

Spoken lessons (lectures) are commonly used in schools as a medium for conveying educational content. In adolescence, experience-expectant maturation of language and cognitive systems supports learning; however, little is known about whether or how learners' language experiences interact with this integration process during learning. We examined functional connectivity using fMRI in 38 Spanish–English bilingual (L1-Spanish) and English monolingual (L1-English) adolescents during a naturalistic science video lesson in English. Seed analyses including the left inferior frontal gyrus (*pars opercularis*) and posterior middle temporal gyrus showed that L1-Spanish adolescents, when learning in their second language (L2), displayed widespread bilateral functional connectivity throughout the cortex while L1-English adolescents displayed mostly left-lateralized connectivity with core language regions over the course of the science lesson. Furthermore, we identified functional seed connectivity associated with better learning outcomes for adolescents with diverse language backgrounds. Importantly, functional connectivity patterns in L1-Spanish adolescents while learning in English also correlate with their Spanish cloze reading. Findings suggest that functional networks associated with higher-order language processing and cognitive control are differentially engaged for L1 vs. L2 speakers while learning new information through spoken language.

<https://www.nature.com/articles/s41598-024-69575-1>

SIMONE RIEHL et al with NICHOLAS J. CONARD – Contextualizing wild cereal harvesting at Middle Palaeolithic Ghar-e Boof in the southern Zagros

A stratigraphic sequence from Ghar-e Boof, a cave site in Iran, covering a period of c. 80,000–30,000 BP and containing more than 20,000 seed and chaff remains, allows a detailed study of the use of annual seed species of Palaeolithic hunter-gatherer groups and its evolution under the influence of changing environmental conditions. Taxonomic changes in the archaeobotanical assemblage and the stable carbon isotope data of pistachio support a considerable change in environmental conditions over the sequence from MIS 5a to MIS 3. The exceptional dominance of wild ancestors of modern crop species, including glume wheat and large-seeded legumes from Middle Palaeolithic layers AH VI (OSL ranges 72–81 ka BP), coincides broadly with the transition from MIS 5a to MIS 4. With the beginning of MIS 4 these taxa are strongly reduced, corresponding with a strong decrease in global CO₂ concentrations and in the $\Delta^{13}\text{C}$ values of *Pistacia khinjuk/atlantica* from the site. Wild glume wheat completely disappears after Middle Palaeolithic AH Vb and never reappears at the site. We hypothesize that the Middle Palaeolithic niche that allowed the harvesting and consumption of wild cereals and legumes ended with a destabilization of the vegetation in early MIS 4.

<https://www.nature.com/articles/s41598-024-69056-5>

New Scientist**NEWS****Ancient plant artefact reveals humanity's epic journey to Australia**

We know that modern humans took one of two routes to first reach Australia, and now an ancient chunk of plant resin has tipped the evidence towards the northern option.

<https://www.newscientist.com/article/2443538-ancient-plant-artefact-reveals-humanitys-epic-journey-to-australia/>

PLoS One**PAPERS****MARIA GRÖNDAL, KARL ASK & STEFAN WINBLAD – An evaluation of the Ultimatum Game as a measure of irritability and anger**

The Ultimatum Game is an effective tool for understanding how social decision-making is influenced by emotions in both research and clinical settings. Previous findings have shown that the Ultimatum Game can evoke negative emotions, especially anger and aggression. In a sample of non-clinical adults (N = 143) we evaluated the sensitivity of an anger-infused version of the Ultimatum Game to individual differences in anger and irritability. Findings showed significant relationships between anger and aggressive behaviors in the Ultimatum game, but no association between irritability and aggressive behavior were observed. This indicates that the anger-infused Ultimatum Game is a promising method for studying individual differences in trait anger and anger expression. However, the relationship between decision-making in the anger-infused Ultimatum Game and irritability is less straight forward and needs further investigation. Therefore, when studying the behavioral responses of irritability, it would be beneficial to capture other behaviors beyond aggressive responses.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0304038>

COREY L. JOHNSON et al – Analyzing blank cutting edge efficiency associated with the adoption of microblade technology: A case study from Tolbor-17, Mongolia

The phenomenon of lithic miniaturization during the Late Pleistocene at times coincided with increased artifact standardization and cutting edge efficiency—likely reflecting the use of small, sharp artifacts as interchangeable inserts for composite cutting tools and hunting weapons. During Marine Isotope Stage 2, Upper Paleolithic toolmakers in northern East Asia specifically used pressure techniques to make small, highly standardized lithic artifacts called microblades. However, little is currently known about how microblades affected the cutting edge efficiency of the toolkits they were a part of. We applied three methods of analyzing cutting edge efficiency to two Upper Paleolithic assemblages recently excavated from Tolbor-17, Mongolia, that document the periods before and after the introduction of microblade technology to the Tolbor Valley. A model incorporating allometric relationships between blank cutting edge length and mass suggests no difference in efficiency between the two periods, while two more conventional approaches both indicate a significant increase. The potential for improved cutting edge efficiency is only observed when the microblade sample is artificially inflated via simulation. Our results highlight challenges related to detecting and interpreting archaeological differences in cutting edge efficiency at the assemblage level.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0305136>

DAVID F. URSCHLER, PETER FISCHER & THOMAS KESSLER – Standing-up against moral violations: The predicting role of attribution, kinship, and severity

Witnesses of moral violations stand up for their moral principles, despite facing substantial costs for intervening. Notwithstanding its importance, little is known whether responsibility attributions and the relation between the victim and a witness (i.e., kinship) have different effects on the intention to intervene in situations of different severity (e.g., moral courage situations). We predict an interaction between the situation's severity and the victims' responsibility for their plight. In less-severe situations, witnesses would be less willing to help when they perceive the victim to be responsible for their

plight. However, those who are not seen as responsible would receive more help. For more-severe situations, responsibility is predicted to have no effect. Opposite effects are predicted for the relationship between the helper and the victim. We further predict that perceived costs for helping mediates witnesses' willingness to intervene. Two studies showed that people are more willing to help individuals who are perceived as being innocent, but only in less-severe situations. In more-severe situations, people's willingness to intervene increases, regardless of responsibility attributions. We did not observe effects for kinship. Moreover, we provide partial evidence that witnesses of more-severe situations indeed accept higher costs for intervention.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0307740>

PNAS

OBITUARIES

JOSHUA M. PLOTNIK – Frans B. M. de Waal, 1948 to 2024: Primatologist and evolutionary cognition researcher who brought us closer to our nonhuman relatives

Frans B. M. de Waal, one of the giants in the study of primate behavior and a remarkably prolific scientific and popular book writer, passed away at the age of 75 this past March. He is widely regarded as a pioneer in the observational and experimental investigation of conflict resolution, cooperation, and empathy in nonhuman primates. In addition to contributing several hundred peer-reviewed papers to the scientific literature, he wrote more than a dozen books (one more is forthcoming) that challenged the public to question their views of human supremacy within the world of animals.

<https://www.pnas.org/doi/full/10.1073/pnas.2414195121>

Proceedings of the Royal Society B

PAPERS

JOHN M. MCNAMARA et al – The evolutionary consequences of learning under competition

Learning is a taxonomically widespread process by which animals change their behavioural responses to stimuli as a result of experience. In this way, it plays a crucial role in the development of individual behaviour and underpins substantial phenotypic variation within populations. Nevertheless, the impact of learning in social contexts on evolutionary change is not well understood. Here, we develop game theoretical models of competition for resources in small groups (e.g. producer–scrounger and hawk–dove games) in which actions are controlled by reinforcement learning and show that biases in the subjective valuation of different actions readily evolve. Moreover, in many cases, the convergence stable levels of bias exist at fitness minima and therefore lead to disruptive selection on learning rules and, potentially, to the evolution of genetic polymorphisms. Thus, we show how reinforcement learning in social contexts can be a driver of evolutionary diversification. In addition, we consider the evolution of ability in our games, showing that learning can also drive disruptive selection on the ability to perform a task.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2024.1141>

DANIELE CARLESSO et al – Leaderless consensus decision-making determines cooperative transport direction in weaver ants

Animal groups need to achieve and maintain consensus to minimize conflict among individuals and prevent group fragmentation. An excellent example of a consensus challenge is cooperative transport, where multiple individuals cooperate to move a large item together. This behaviour, regularly displayed by ants and humans only, requires individuals to agree on which direction to move in. Unlike humans, ants cannot use verbal communication but most likely rely on private information and/or mechanical forces sensed through the carried item to coordinate their behaviour. Here, we investigated how groups of weaver ants achieve consensus during cooperative transport using a tethered-object protocol, where ants had to transport a prey item that was tethered in place with a thin string. This protocol allows the decoupling of the movement of informed ants from that of uninformed individuals. We showed that weaver ants pool together the opinions of all group members to increase their navigational accuracy. We confirmed this result using a symmetry-breaking task, in which we challenged ants with navigating an open-ended corridor. Weaver ants are the first reported ant species to use a 'wisdom-of-the-crowd' strategy for cooperative transport, demonstrating that consensus mechanisms may differ according to the ecology of each species.

<https://royalsocietypublishing.org/doi/10.1098/rspb.2023.2367>

Quarterly Review of Biology

PAPERS

NOAH M. T. SMITH & REUVEN DUKAS – Winner and Loser Effects and Social Rank In Humans

In many animals, the winners of a fight are more likely to win subsequent contests, while the losers tend to lose their following fights. Such winner and loser effects can have a large influence on individual behavior and fitness. Recent studies indicate that winner and loser effects occur in humans as well. Here we provide a narrative review of the relevant similarities and distinctions between nonhumans and humans with the goal of assessing the causes and consequences of winner and loser effects in humans. In both nonhumans and humans, winner and loser effects probably guide individuals to behave

according to their apparent social rank, with winners adopting assertive postures and losers becoming submissive. Physical formidability is the dominant dimension determining social rank in nonhuman species. In adult humans, physical formidability plays a lesser role, while social conventions, physical attractiveness, competence in complex skills, and social competence are more important for social rank. Recent data indicate that human winner and loser effects may influence behavior and social rank in nonaggressive contexts. We suggest future lines of research that will help us better understand how and why winner and loser effects shape human cognition, mood, and behavior.

<https://www.journals.uchicago.edu/doi/abs/10.1086/732049>

Royal Society Open Science

PAPERS

MALCOLM K. Y. WONG et al – Does implicit mentalizing involve the representation of others' mental state content? Examining domain-specificity with an adapted Joint Simon task

Implicit mentalizing involves the automatic awareness of others' perspectives, but its domain-specificity is debated. The Joint Simon task demonstrates implicit mentalizing as a Joint Simon effect (JSE), proposed to stem from spontaneous action co-representation of a social partner's frame of reference in the Joint (but not Individual) task. However, evidence also shows that any sufficiently salient entity (not necessarily social) can induce the JSE. Here, we investigated the content of co-representation through a novel Joint Simon task where participants viewed a set of distinct images assigned to either themselves or their partner. Critically, a surprise image recognition task allowed us to identify partner-driven effects exclusive to the Joint task-sharing condition, versus the Individual condition. We did not observe a significant JSE, preventing us from drawing confident conclusions about the effect's domain-specificity. However, the recognition task results revealed that participants in the Joint task did not recognize their partner's stimuli more accurately than participants in the Individual task. This implies that participants were no more likely to encode content from their partner's perspective during the Joint task. Overall, this study pushes methodological boundaries regarding the elicitation of co-representation in the Joint Simon task and demonstrates the potential utility of a surprise recognition task.

<https://royalsocietypublishing.org/doi/10.1098/rsos.230239>

DAVID N. MATZIG, BEN MARWICK, FELIX RIEDE & RACHEL C. M. WARNOCK – A macroevolutionary analysis of European Late Upper Palaeolithic stone tool shape using a Bayesian phylodynamic framework

Phylogenetic models are commonly used in palaeobiology to study the patterns and processes of organismal evolution. In the human sciences, phylogenetic methods have been deployed for reconstructing ancestor–descendant relationships using linguistic and material culture data. Within evolutionary archaeology specifically, phylogenetic analyses based on maximum parsimony and discrete traits dominate, which sets limitations for the downstream role cultural phylogenies, once derived, can play in more elaborate analytical pipelines. Recent methodological advances in Bayesian phylogenetics, however, now allow us to infer evolutionary dynamics using continuous characters. Capitalizing on these developments, we here present an exploratory analysis of cultural macroevolution of projectile point shape evolution in the European Final Palaeolithic and earliest Mesolithic (approx. 15 000–11 000 BP) using a Bayesian phylodynamic approach and the fossilized birth–death process model. This model-based approach leaps far beyond the application of parsimony, in that it not only produces a tree, but also divergence times, and diversification rates while incorporating uncertainties. This allows us to compare rates to the pronounced climatic changes that occurred during our time frame. While common in cultural evolutionary analyses of language, the extension of Bayesian phylodynamic models to archaeology arguably represents a major methodological breakthrough.

<https://royalsocietypublishing.org/doi/10.1098/rsos.240321>

DOROTHY V. M. BISHOP – What does lack of language lateralization signify? Evidence of fluctuating asymmetry rather than hemispheric equipose on non-lateralized tasks

In a study of patterns of language laterality in left- and right-handers, Woodhead et al. (Woodhead ZVJ, Thompson PA, Karlsson EM, Bishop DVM. 2021 R. Soc. Open Sci. 8, 200696. (doi:10.1098/rsos.200696)) noted that several tasks showed no bias to the left hemisphere in left-handed individuals. This might appear to suggest that these functions were mediated by the two hemispheres working together equally—what can be termed 'hemispheric equipose'. Here, I consider an alternative possibility that individuals show lateral bias on these tasks, but the bias can occur to either the left or right—a form of fluctuating asymmetry. Further analysis of the distributions of data from individuals in Woodhead et al. is compared with simulated data. The pattern of results suggests that the impression of hemispheric equipose may be an artefact of reliance on group data: even though the group mean does not differ from zero, a high proportion of individuals are biased to the left or right.

<https://royalsocietypublishing.org/doi/10.1098/rsos.240495>

Science

ARTICLES

MELANIE MITCHELL – The Turing Test and our shifting conceptions of intelligence

“Can machines think?” So asked Alan Turing in his 1950 paper, “Computing Machinery and Intelligence.” Turing quickly noted that, given the difficulty of defining thinking, the question is “too meaningless to deserve discussion.” As is often done in philosophical debates, he proposed replacing it with a different question. Turing imagined an “imitation game,” in which a human judge converses with both a computer and a human (a “foil”), each of which vies to convince the judge that they are the human. Importantly, the computer, foil, and judge do not see one another; they communicate entirely through text. After conversing with each candidate, the judge guesses which one is the real human. Turing’s new question was, “Are there imaginable digital computers which would do well in the imitation game?”

<https://www.science.org/doi/10.1126/science.adq9356>

STEFFEN R. HAGE – Language evolution in primates

Language plays a pivotal role in shaping the interdependent physiological foundations of human social communication. Language, whether expressed verbally or through manual signing (1), is an essential human capability that underpins cognitive skill development. A variety of core capacities, including symbolic representation and combinatorial abilities, enable the generation and comprehension of syntax-like structures (2). Socially, language provides humans with the ability to share information, discuss complex topics, plan goal-directed behavior, reflect on the past, and express consciousness (1). Although speech is the primary mode of language production for most humans, its evolution has remained enigmatic. Precisely when humans first began to talk to each other and what specifically happened to enable them to do so are not known (2). This is particularly intriguing given the recent shift from a long-standing opinion that dismissed vocalization of nonhuman primates (hereafter primates) as a potential evolutionary precursor to human speech.

<https://www.science.org/doi/10.1126/science.ad04341>

Science Advances

PAPERS

HANNES RATHMANN et al with KATERINA HARVATI – Human population dynamics in Upper Paleolithic Europe inferred from fossil dental phenotypes

Despite extensive archaeological research, our knowledge of the human population history of Upper Paleolithic Europe remains limited, primarily due to the scarce availability and poor molecular preservation of fossil remains. As teeth dominate the fossil record and preserve genetic signatures in their morphology, we compiled a large dataset of 450 dentitions dating between ~47 and 7 thousand years ago (ka), outnumbering existing skeletal and paleogenetic datasets. We tested a range of competing demographic scenarios using a coalescent-based machine learning Approximate Bayesian Computation (ABC) framework that we modified for use with phenotypic data. Mostly in agreement with but also challenging some of the hitherto available evidence, we identified a population turnover in western Europe at ~28 ka, isolates in western and eastern refugia between ~28 and 14.7 ka, and bottlenecks during the Last Glacial Maximum. Methodologically, this study marks the pioneering application of ABC to skeletal phenotypes, paving the way for exciting future research avenues.

<https://www.science.org/doi/10.1126/sciadv.adn8129>

Trends in Cognitive Sciences

PAPERS

AMIR HOSEIN HADIAN RASANAN et al – Beyond discrete-choice options

While decision theories have evolved over the past five decades, their focus has largely been on choices among a limited number of discrete options, even though many real-world situations have a continuous-option space. Recently, theories have attempted to address decisions with continuous-option spaces, and several computational models have been proposed within the sequential sampling framework to explain how we make a decision in continuous-option space. This article aims to review the main attempts to understand decisions on continuous-option spaces, give an overview of applications of these types of decisions, and present puzzles to be addressed by future developments.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(24\)00175-X](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(24)00175-X)

Trends in Parasitology

PAPERS

SYLVIA CREMER & CHRISTOPHER D. PULL – Unconditional versus condition-dependent social immunity

Socially living animals can counteract disease through cooperative defences, leading to social immunity that collectively exceeds the sum of individual defences. In superorganismal colonies of social insects with permanent caste separation between reproductive queen(s) and nonreproducing workers, workers are obligate altruists and thus engage in unconditional social immunity, including highly specialised and self-sacrificial hygiene behaviours. Contrastingly, cooperation is facultative in cooperatively breeding families, where all members are reproductively totipotent but offspring transiently forgo

reproduction to help their parents rear more siblings. Here, helpers should either express condition-dependent social immunity or disperse to pursue independent reproduction. We advocate inclusive fitness theory as a framework to predict when and how indirect fitness gains may outweigh direct fitness costs, thus favouring conditional social immunity.

[https://www.cell.com/trends/parasitology/fulltext/S1471-4922\(24\)00206-X](https://www.cell.com/trends/parasitology/fulltext/S1471-4922(24)00206-X)

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