EAORC BULLETIN 1,040 – 21 May 2023

CONTENTS

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 – Self-Narrative, Embodied Action, and Social Context

In A. Wiercinski (ed.), Between Suspicion and Sympathy: Paul Ricoeur's Unstable Equilibrium (Festschrift for Paul Ricoeur) (409-423). Toronto: The Hermeneutic Press. (2003)

SHAUN GALLAGHER – Self-Narrative, Embodied Action, and Social Context

In recent philosophy of mind, informed by ongoing research in the cognitive neurosciences, there has been a tendency to offer deflationary or reductive explanations of self and self-identity. The background to such accounts includes a complex history of the problem of personal identity from Hume to Parfit. Paul Ricoeur has provided an insightful perspective on this history based on his distinction between ipse identity and idem identity. My intention is not to rehearse that history, or even to update it, but rather, assuming that history as background, to engage in a dialogue with the more recent proponents of deflationary, reductive, and internalist accounts of the self, and especially those accounts that put the notion of a narrative self into question.
https://www.academia.edu/102030711/Gallagher_S_2003_Self_narrative_embodied_action_and_social_context_in_A_Wiercinski_ed_Between_Suspicion_and_Sympathy_Paul_Ricoeurs_Unstable_Equilibrium_Festschrift_for_Paul_Ricoeur_409_423_Toronto_The_Hermeneutic_Press

ACADEMIA.EDU – What Is Phenomenology?

In Phenomenology, 2nd ed. [1st ed. 2012] Palgrave-Macmillan (2022). Preprint of Chapter 1.

SHAUN GALLAGHER – What Is Phenomenology?

What is phenomenology? There have been books written on this question, including books by some of the major figures in this philosophical tradition. Let's start with one of Edmund Husserl's own characterizations. For Husserl, considered the founder of the phenomenological movement, phenomenology is the systematic exploration of the field of conscious subjectivity (1997, 148). In other words, it is the study of consciousness. This is not the only characterization that Husserl offers, but it is an interesting one because he offers it in the context of writing an article on phenomenology for the Encyclopedia Britannica, which he was co-authoring with another famous phenomenologist, Martin Heidegger. In an earlier draft, Heidegger, had attempted to situate phenomenology in its historical context, and proposed the following formula: phenomenology is 'the radical and explicit determination of the path of, and the procedural rules for' and therefore 'the principle-based determination and systematic exploration of the field that is to be disclosed' as we turn our attention to consciousness itself.
https://www.academia.edu/2363509/Gallagher_S_2022_Phenomenology_2nd_Ed_Palgrave_Macmillan_original_ed_2012_

NEWS

NATURE BRIEFING – Human evolution has no single birthplace

Humans did not emerge from a single region of Africa, but from several populations that moved around the continent one million years ago and intermingled for millennia. The widely held idea of a single origin of Homo sapiens is based in part on fossil records. Computer modelling and genome data from modern African and European populations revealed that "our roots lie in a very diverse overall population made up of fragmented local populations", says evolutionary archaeologist Eleanor Scerri. This means human evolution looks more like a tangled vine than a 'tree of life.'
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=13b24ad38f&e=1db4b9a19b

SAPIENS – Is Homo longi an Extinct Human Species?
A newly analyzed skull from northeastern China may signal a species that had closer ties to us than Neanderthals.
https://www.sapiens.org/biology/homo-longi/

SAPIENS – Humanity's Story Has No End of Surprising Twists
Recent discoveries, and new analyses of old evidence, are revolutionizing the way scientists look at human history.
https://www.sapiens.org/biology/human-evolution-australia-asia/

SAPIENS – What the Discovery of Denisovan Remains in Laos Means
The new excavation of a fossil tooth places an enigmatic group of ancient humans in Southeast Asia more than 130,000 years ago.
https://www.sapiens.org/archaeology/denisovans-laos/

SCIENCE.ORG NEWS – Largest collection of ancient rock art threatened by petrochemical plants
Emissions will erode petroglyphs, scientists warn.
https://www.science.org/content/article/world-s-largest-collection-ancient-rock-art-threatened-australia-s-petrochemical-plants

SCIENCE.ORG NEWS – Mountain gorillas bounce back from rough childhoods better than many humans
Unlike other primates, young mountain gorillas who lose a parent or have disrupted families live just as long as their peers.
https://www.science.org/content/article/mountain-gorillas-bounce-back-rough-childhoods-better-many-humans-and-other-primates

SCIENCE.ORG NEWS – Elephants may be domesticating themselves
Find would put pachyderms in a rare group that only includes humans and bonobos
https://www.science.org/content/article/elephants-may-be-domesticating-themselves

SOCIETY FOR SCIENCE – The oldest scaled-down drawings of actual structures go back 9,000 years
Rock engravings in Jordan and Saudi Arabia may be maps or blueprints of desert kites, massive structures once used to capture animal herds.
http://click.societyforscience-email.com/?qs=98aa98ac1dd1f17275aae6a6c011624e386ed69ec604fcfb03f56f877dee67bf3561ae781ed71c9b4bbe7e6e6c31bb2a964547ef7ed5790230b9585b319c95c0

THE CONVERSATION – Talking to babies may contribute to brain development – here's how to do it
Here's how to get babies and toddlers chatting.
https://theconversationuk.cmail20.com/t/r-l-ttjiiudl-khhlilahh-w/

THE CONVERSATION – ChatGPT can't think – consciousness is something entirely different to today's AI
Of the risks posed by AI, overtaking human intelligence isn't an immediate concern.
https://theconversationuk.cmail19.com/t/r-l-ttjdtlc-khhlilahh-yd/

PUBLICATIONS

Animal Behaviour

PAPERS

JAKOB VILLIOTH, KLAUS ZUBERBÜHLER & NICHOLAS E. NEWTON-FISHER – Discrete choices: understanding the foraging strategies of wild chimpanzees

Optimal foraging theory has guided much of the research on foraging behaviour in the past five decades, with the notion of optimality deeply embedded in most models today. However, assuming that all foragers strive to maximize a certain predefined currency, such as amount of food per unit time, restricts what can be learned about the factors influencing foraging decisions. Here we applied a different approach: the discrete-choice model, which does not assume an optimal strategy as the starting point, but instead examines foraging decisions directly, modelling interpatch movements as the consequence of a choice of destination from a limited set of options. We analysed a set of foraging decisions by both adult male and female chimpanzees, Pan troglodytes, from two habituated communities in the Budongo forest, Uganda, to investigate the influence of foraging variables including food patch characteristics and interpatch distance on patch choice, with a view to identifying the strategy underlying these decisions. Despite differences in habitat between communities, we

found that foraging strategies were remarkably similar across both communities and sexes, with chimpanzees exhibiting a clear preference for closer and novel (not previously visited) food patches. Individuals of both communities frequently chose to forage on food patches providing young leaves, highlighting the importance of this food type in their diet. Contrary to expectation, patch size did not predict foraging decisions, except for adult males of one community that chose larger patches, while both sexes aimed to minimize travel distance between consecutive patches. This study provides the first direct evidence that chimpanzees consider travel distance and whether they have recently visited a patch when choosing between potential foraging sites and demonstrates that new insights can be gained (even in a well-studied system) from integrating several important variables describing feeding ecology into a coherent model of patch choice.
https://www.sciencedirect.com/science/article/pii/S0003347223000866

Cell Reports

PAPERS

AZADEH JAFARI et al – A vocalization-processing network in marmosets

Vocalizations play an important role in the daily life of primates and likely form the basis of human language. Functional imaging studies have demonstrated that listening to voices activates a fronto-temporal voice perception network in human participants. Here, we acquired whole-brain ultrahigh-field (9.4 T) fMRI in awake marmosets (Callithrix jacchus) and demonstrate that these small, highly vocal New World primates possess a similar fronto-temporal network, including subcortical regions, that is activated by the presentation of conspecific vocalizations. The findings suggest that the human voice perception network has evolved from an ancestral vocalization-processing network that predates the separation of New and Old World primates.
https://www.cell.com/cell-reports/fulltext/S2211-1247(23)00537-5

Current Biology

PAPERS

ROBIN E. MORRISON et al – Cumulative early-life adversity does not predict reduced adult longevity in wild gorillas

Extensive research across fields has repeatedly confirmed that early-life adversity (ELA) is a major selective force for many taxa, in part via its ties to adult health and longevity. Negative effects of ELA on adult outcomes have been documented in a wide range of species, from fish to birds to humans. We used 55 years of long-term data collected on 253 wild mountain gorillas to examine the effects of six putative sources of ELA on survival, both individually and cumulatively. Although cumulative ELA was associated with high mortality in early life, we found no evidence that it had detrimental consequences for survival later in life. Experiencing three or more forms of ELA was associated with greater longevity, with a 70% reduction in the risk of death across adulthood, driven specifically by greater longevity in males. Although this higher survival in later life is likely a consequence of sex-specific viability selection during early life due to the immediate mortality consequences of adverse experiences, patterns in our data also suggest that gorillas have significant resilience to ELA. Our findings demonstrate that the detrimental consequences of ELA on later life survival are not universal, and indeed largely absent in one of humans' closest living relatives. This raises important questions about the biological roots of sensitivity to early experiences and the protective mechanisms that contribute to resiliency in gorillas, which could be critical for understanding how best to encourage similar resiliency to early-life shocks in humans.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00533-X

eLife

PAPERS

XIAOSHA WANG, BIJUN WANG & YANCHAO BI – Early language exposure affects neural mechanisms of semantic representations

One signature of the human brain is its ability to derive knowledge from language inputs, in addition to nonlinguistic sensory channels such as vision and touch. How does human language experience modulate the mechanism in which semantic knowledge is stored in the human brain? We investigated this question using a unique human model with varying amounts and qualities of early language exposure: early deaf adults who were born to hearing parents and had reduced early exposure and delayed acquisition of any natural human language (speech or sign), with early deaf adults who acquired sign language from birth as the control group that matches on nonlinguistic sensory experiences. Neural responses in a semantic judgment task with 90 written words that were familiar to both groups were measured using fMRI. The deaf group with reduced early language exposure, compared with the deaf control group, showed reduced semantic sensitivity, in both multivariate pattern (semantic structure encoding) and univariate (abstractness effect) analyses, in the left dorsal anterior temporal lobe (dATL). These results provide positive, causal evidence that language experience drives the neural semantic representation in the dATL, highlighting the roles of language in forming human neural semantic structures beyond nonverbal sensory experiences.
https://elifesciences.org/articles/81681

Frontiers in Communication

PAPERS

GERD CARLING et al – The evolution of lexical semantics dynamics, directionality, and drift

The directionality of semantic change is problematic in traditional comparative models of language reconstruction. Compared to, e.g., phonological and morphological change, the directions of meaning change over time are potentially endless and difficult to reconstruct. The current paper attempts to reconstruct the mechanisms of lexical meaning change by a quantitative model. We use a data set of 104 core concepts in 160 Eurasian languages from several families, which are coded for colexification as well as cognacy, including semantic change of lexemes in etymologies. In addition, the various meanings are coded for semantic relation to the core concept, including relations such as metaphor, metonymy, generalization, specialization, holonymy, and meronymy. Further, concepts are coded into classes and semantic properties, including factors such as animacy, count/mass, concrete/abstract, or cultural connotations, such as taboo/non-taboo.

We use a phylogenetic comparative model to reconstruct the probability of presence at hidden nodes of different colexifying meanings inside etymological trees. We find that these reconstructions come close to meaning reconstructions based on the comparative method. By means of the phylogenetic reconstructions, we measure the evolutionary dynamics of meaning loss of co-lexifying meanings as well as concepts.

These change rates are highly varying, from almost complete stability to complete unstability. Change rates vary between different semantic classes, where for instance wild animals have low change rates and domestic animals and implements have high change rates. We find a negative correlation between taboo animals and change rate, i.e., taboo animals have lower change rates than non-taboo words. Further, we find a negative correlation between animacy and change rate, indicating that animate nouns have lower change rate than inanimate nouns. A further result is a negative correlation between change rate and degree of borrowing (borrowability) of concepts, indicating that lexemes that are more likely to be borrowed are less likely to change semantically. Among semantic relations, we find that metonomy is more frequent than any other change, including metaphor, and that a change from general to more specific is in all cases more frequent than the other way round.

https://www.frontiersin.org/articles/10.3389/fcomm.2023.1126249/full

Frontiers in Psychology

PAPERS

CALEB EVERETT et al – Aerosols, airflow, and more: examining the interaction of speech and the physical environment

We describe ongoing efforts to better understand the interaction of spoken languages and their physical environments. We begin by briefly surveying research suggesting that languages evolve in ways that are influenced by the physical characteristics of their environments, however the primary focus is on the converse issue: how speech affects the physical environment. We discuss the speech-based production of airflow and aerosol particles that are buoyant in ambient air, based on some of the results in the literature. Most critically, we demonstrate a novel method used to capture aerosol, airflow, and acoustic data simultaneously. This method captures airflow data via a pneumotachograph and aerosol data via an electrical particle impactor. The data are collected underneath a laminar flow hood while participants breathe pure air, thereby eliminating background aerosol particles and isolating those produced during speech. Given the capabilities of the electrical particle impactor, which has not previously been used to analyze speech-based aerosols, the method allows for the detection of aerosol particles at temporal and physical resolutions exceeding those evident in the literature, even enabling the isolation of the role of individual sound types in the production of aerosols. The aerosols detected via this method range in size from 70 nanometers to 10 micrometers in diameter. Such aerosol particles are capable of hosting airborne pathogens. We discuss how this approach could ultimately yield data that are relevant to airborne disease transmission and offer preliminary results that illustrate such relevance. The method described can help uncover the actual articulatory gestures that generate aerosol emissions, as exemplified here through a discussion focused on plosive aspiration and vocal cord vibration. The results we describe illustrate in new ways the unseen and unheard ways in which spoken languages interact with their physical environments.

https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1184054/full

JONATHAN D. CLAYDEN et al with LI WEI – The impact of multiple language exposure on cognition during childhood: evidence from the UK Millennium Cohort Study

Many studies argue that exposure to, and use of, multiple languages in childhood has beneficial effects beyond the linguistic domain, including on executive functions (EFs), although recent evidence remains controversial. EFs encompass abilities necessary for regulating goal-directed behaviours in everyday life and, in children, EFs strongly predict later academic achievement and wellbeing. One theoretical framework distinguishes “hot” EFs, which have a reward or affective component, from “cool” EFs that do not. How exposure to more than one language in early childhood modulates hot and cool EFs in later childhood, alongside other environmental and cognitive factors, remains poorly understood.

We analysed data from the UK Millennium Cohort Study, a large-scale, nationally representative longitudinal cohort study, which provides information on perinatal and environmental factors (e.g., languages spoken in the home, maternal education) alongside cognitive measures assessed in English. At 3 years, we examined the effect of multiple language exposure on the

Bracken school readiness assessment (knowledge of shapes, letters, etc.), and on naming vocabulary. At age 11, we examined the predictors of cool EF, measured with a spatial working memory task; hot EF, measured using a gambling task; and vocabulary, measured using a verbal reasoning task.
Data from 16,134 children were analysed. At age 3, a negative effect of multiple language exposure on school readiness and vocabulary was observed, but the difference was smaller with higher maternal education. At age 11, there was also a negative effect on vocabulary, but smaller than that observed at age 3. There were no direct effects of language exposure on either spatial working memory or gambling scores. For hot EF, the multiple language exposure effects were indirect, mediated by early cognition, and the most significant predictor of gambling strategy was sex. For cool EF, school readiness and vocabulary at age 3 were the strongest predictors.
Our findings, based on a UK population sample, highlight the importance of considering socioeconomic status and early-life abilities when interpreting the effects of language environments on hot and cool EFs.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1158333/full

Frontiers in Radiology

PAPERS

FANGRONG ZONG et al – Language function of the superior longitudinal fasciculus in patients with arteriovenous malformation as evidenced by automatic fiber quantification
The superior longitudinal fasciculus (SLF) is a major fiber tract involved in language processing and has been used to investigate language impairments and plasticity in many neurological diseases. The SLF is divided into four main branches that connect with different cortex regions, with two branches (SLF II, SLF III) being directly related to language. However, most white matter analyses consider the SLF as a single bundle, which may underestimate the relationship between these fiber bundles and language function. In this study, we investigated the differences between branches of the SLF in patients with arteriovenous malformation (AVM), which is a unique model to investigate language reorganization. We analyzed diffusion tensor imaging data of AVM patients and healthy controls to generate whole-brain fiber tractography, and then segmented the SLF into SLF II and III based on their distinctive waypoint regions. The SLF, SLF II, and III were further quantified, and four diffusion parameters of three branches were compared between the AVMs and controls. No significant diffusivity differences of the whole SLF were observed between two groups, however, the right SLF II and III in AVMs showed significant reorganization or impairment patterns as compared to the controls. Results demonstrating the need to subtracting SLF branches when studying structure-function relationship in neurological diseases that have SLF damage.
https://www.frontiersin.org/articles/10.3389/fradi.2023.1121879/full

Interface: Journal of the Royal Society

CORRECTIONS

TAKUYA TAKAHASHI & YASUO IHARA – Corrigendum to: 'Spatial evolution of human cultures inferred through Bayesian phylogenetic analysis' (2023) by Takahashi and Ihara
J. R. Soc. Interface 20, 20220543. (Published online 4 January 2023) (https://doi.org/10.1098/rsif.2022.0543)
[EAORC Bulletin 1,024]
The authors regret that they have found two errors in the article.
https://royalsocietypublishing.org/doi/10.1098/rsif.2023.0249

National Geographic

ARTICLES

ANGELA SAINI – A man's world? Not according to biology or history.
For proof, we can look to the many matrilineal societies dotted all over the world. In some regions, these traditions may date back thousands of years.
https://www.nationalgeographic.com/history/article/angela-saini-patriarchy-matriarchy-gender-equality

Nature

ARTICLES

JUDE COLEMAN – Human-evolution story rewritten by fresh data and more computing power
Humans did not emerge from a single region of Africa, suggests a powerful modelling study. Rather, our ancestors moved and intermingled for millennia.
https://www.nature.com/articles/d41586-023-01664-z

PAPERS

AARON P. RAGSDALE et al – A weakly structured stem for human origins in Africa
Despite broad agreement that Homo sapiens originated in Africa, considerable uncertainty surrounds specific models of divergence and migration across the continent1. Progress is hampered by a shortage of fossil and genomic data, as well as

variability in previous estimates of divergence times1. Here we seek to discriminate among such models by considering linkage disequilibrium and diversity-based statistics, optimized for rapid, complex demographic inference2. We infer detailed demographic models for populations across Africa, including eastern and western representatives, and newly sequenced whole genomes from 44 Nama (Khoe-San) individuals from southern Africa. We infer a reticulated African population history in which present-day population structure dates back to Marine Isotope Stage 5. The earliest population divergence among contemporary populations occurred 120,000 to 135,000 years ago and was preceded by links between two or more weakly differentiated ancestral Homo populations connected by gene flow over hundreds of thousands of years. Such weakly structured stem models explain patterns of polymorphism that had previously been attributed to contributions from archaic hominins in Africa2,3,4,5,6,7. In contrast to models with archaic introgression, we predict that fossil remains from coexisting ancestral populations should be genetically and morphologically similar, and that only an inferred 1–4% of genetic differentiation among contemporary human populations can be attributed to genetic drift between stem populations. We show that model misspecification explains the variation in previous estimates of divergence times, and argue that studying a range of models is key to making robust inferences about deep history.
https://www.nature.com/articles/s41586-023-06055-y

Nature Communications Biology

PAPERS

SEBASTIAN OCKLENBURG et al – Hemispheric asymmetries and brain size in mammals
Hemispheric asymmetries differ considerably across species, but the neurophysiological base of this variation is unclear. It has been suggested that hemispheric asymmetries evolved to bypass interhemispheric conduction delay when performing time-critical tasks. This implies that large brains should be more asymmetric. We performed preregistered cross-species meta-regressions with brain mass and neuron number as predictors for limb preferences, a behavioral marker of hemispheric asymmetries, in mammals. Brain mass and neuron number showed positive associations with rightward limb preferences but negative associations with leftward limb preferences. No significant associations were found for ambilaterality. These results are only partly in line with the idea that conduction delay is the critical factor that drives the evolution of hemispheric asymmetries. They suggest that larger-brained species tend to shift towards more right-lateralized individuals. Therefore, the need for coordination of lateralized responses in social species needs to be considered in the context of the evolution of hemispheric asymmetries.
https://www.nature.com/articles/s42003-023-04894-z

Nature Ecology & Evolution

ARTICLES

ELEANOR M. L. SCERRI – One species, many roots?
A new genetic study provides strong support for the view that our species evolved from exchanges between several ancestral populations in different African regions.
https://www.nature.com/articles/s41559-023-02080-2

Nature Humanities & Social Sciences Communications

PAPERS

ABDUWALI RAHMAN & WANZHI XU – Moderate semantic minimalism: an eclectic approach to trichotomy of meaning
In linguistic communication, the speaker's utterance simultaneously generates several levels of meaning related to Grice's distinction between what is said and what is implicated. Yet, there is a lively debate about the two notions. This study gives a general overview of three schools: Semantic Minimalism, Radical Contextualism, and Moderate Contextualism. After surveying the current controversies in these theories, it introduces a new direction: Moderate Semantic Minimalism. This eclectic approach isolates the propositional meaning as what is asserted, something intermediate between the literal level of what is said and the intentional level of what is implicated. It tends to take the minimal notion of what is said to be relatively context-independent and does not have to be a truth-evaluable proposition.
https://www.nature.com/articles/s41599-023-01701-2

Nature Science of Learning

PAPERS

CASEY L. ROARK & BHARATH CHANDRASEKARAN – Stable, flexible, common, and distinct behaviors support rule-based and information-integration category learning
The ability to organize variable sensory signals into discrete categories is a fundamental process in human cognition thought to underlie many real-world learning problems. Decades of research suggests that two learning systems may support category learning and that categories with different distributional structures (rule-based, information-integration) optimally rely on different learning systems. However, it remains unclear how the same individual learns these different categories and whether the behaviors that support learning success are common or distinct across different categories. In two experiments,

we investigate learning and develop a taxonomy of learning behaviors to investigate which behaviors are stable or flexible as the same individual learns rule-based and information-integration categories and which behaviors are common or distinct to learning success for these different types of categories. We found that some learning behaviors are stable in an individual across category learning tasks (learning success, strategy consistency), while others are flexibly task-modulated (learning speed, strategy, stability). Further, success in rule-based and information-integration category learning was supported by both common (faster learning speeds, higher working memory ability) and distinct factors (learning strategies, strategy consistency). Overall, these results demonstrate that even with highly similar categories and identical training tasks, individuals dynamically adjust some behaviors to fit the task and success in learning different kinds of categories is supported by both common and distinct factors. These results illustrate a need for theoretical perspectives of category learning to include nuances of behavior at the level of an individual learner.
https://www.nature.com/articles/s41539-023-00163-0

Nature Scientific Reports

PAPERS

SAREENA CHADHA, ADAM M. KLEINBAUM & ADRIENNE WOOD – Social networks are shaped by culturally contingent assessments of social competence

Cultural outsiders, like immigrants or international students, often struggle to make friends. We propose that one barrier to social connection is not knowing what it means to be socially competent in the host culture. First-year students at a U.S. business school (N = 1328) completed a social network survey and rated their own social competence and that of several peers. International students were rated by peers as less socially competent than U.S. students, especially if they were from nations more culturally dissimilar to the U.S. International students' self-reported competence ratings were uncorrelated with peers' judgments. Social network analysis revealed international students were less central to their peer networks than U.S. students, although this gap was reduced if peers evaluated them as socially competent. Peer-reported competence mediated the effects of international student status on social network centrality. Since learning local norms takes time, we suggest inclusivity will require host communities to define social competence more broadly.
https://www.nature.com/articles/s41598-023-34723-6

LAVINIA M. STANCAMPIANO et al – Organic geochemical evidence of human-controlled fires at Acheulean site of Valdocarros II (Spain, 245 kya)

Among the outstanding questions about the emergence of human-controlled fire is the systematic recurrence between the geochemical remains of fire and its preservation in the archaeological record, as the use of fire is considered a technological landmark, especially for its importance in food cooking, defensive strategies, and heating. Here we report fossil lipid biomarkers associated with incomplete combustion of organic matter at the Valdocarros II site, one of the largest European Acheulean sites in Spain dated to marine isotopic stage (MIS) 8/7 (~ 245 kya) allowing a multiproxy analysis of human-controlled fire use. Our results reveal isolated cases of highly concentrated and diverse polycyclic aromatic hydrocarbons (PAHs) and alkylated PAHs (APAHs), along with diagnostic conifer-derived triterpenoids in two hearth-like archaeological structures. The presence of combustion byproducts suggests the presence of anthropogenic (controlled) fires at Valdocarros—one of the oldest evidence of fire use in Europe-in association with Acheulean tools and bones. Hominins possibly used fire for two main activities, as a means of defense against predators and cooking. Our results help to better delineate major gaps in our current knowledge of human-controlled fire in the context of the Middle-Pleistocene in Europe and suggest that human ancestors were able to control fire before at least 250 kya.
https://www.nature.com/articles/s41598-023-32673-7

ROCIO CARO-CONSUEGRA et al – Identifying signatures of positive selection in human populations from North Africa

Because of its location, North Africa (NA) has witnessed continuous demographic movements with an impact on the genomes of present-day human populations. Genomic data describe a complex scenario with varying proportions of at least four main ancestry components: Maghrebi, Middle Eastern-, European-, and West-and-East-African-like. However, the footprint of positive selection in NA has not been studied. Here, we compile genome-wide genotyping data from 190 North Africans and individuals from surrounding populations, investigate for signatures of positive selection using allele frequencies and linkage disequilibrium-based methods and infer ancestry proportions to discern adaptive admixture from post-admixture selection events. Our results show private candidate genes for selection in NA involved in insulin processing (KIF5A), immune function (KIF5A, IL1RN, TLR3), and haemoglobin phenotypes (BCL11A). We also detect signatures of positive selection related to skin pigmentation (SLC24A5, KITLG), and immunity function (IL1R1, CD44, JAK1) shared with European populations and candidate genes associated with haemoglobin phenotypes (HPSE2, HBE1, HBG2), other immune-related (DOCK2) traits, and insulin processing (GLIS3) traits shared with West and East African populations. Finally, the SLC8A1 gene, which codifies for a sodium-calcium exchanger, was the only candidate identified under post-admixture selection in Western NA.
https://www.nature.com/articles/s41598-023-35312-3

PLoS One

PAPERS

LEONARDO COSTA RIBEIRO, AMÉRICO TRISTÃO BERNARDES & HELIANA MELLO – On the fractal patterns of language structures

Natural Language Processing (NLP) makes use of Artificial Intelligence algorithms to extract meaningful information from unstructured texts, i.e., content that lacks metadata and cannot easily be indexed or mapped onto standard database fields. It has several applications, from sentiment analysis and text summary to automatic language translation. In this work, we use NLP to figure out similar structural linguistic patterns among several different languages. We apply the word2vec algorithm that creates a vector representation for the words in a multidimensional space that maintains the meaning relationship between the words. From a large corpus we built this vectorial representation in a 100-dimensional space for English, Portuguese, German, Spanish, Russian, French, Chinese, Japanese, Korean, Italian, Arabic, Hebrew, Basque, Dutch, Swedish, Finnish, and Estonian. Then, we calculated the fractal dimensions of the structure that represents each language. The structures are multi-fractals with two different dimensions that we use, in addition to the token-dictionary size rate of the languages, to represent the languages in a three-dimensional space. Finally, analyzing the distance among languages in this space, we conclude that the closeness there is tendentially related to the distance in the Phylogenetic tree that depicts the lines of evolutionary descent of the languages from a common ancestor.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0285630

JACOB S. ADAY, LIN FANG & JOSHUA M. CARLSON – Eye-size effects in the dot-probe task: Greater sclera exposure predicts delayed disengagement from fearful faces

Fearful facial expressions are nonverbal and biologically salient signals of potential threat that automatically hold, capture, and direct observers' attention. They are characterized by enlarged eye whites and dilated pupils, and fearful eyes alone are sufficient to capture attention. The morphological properties of the eye region, such as sclera exposure, are thought to play an important role in nonverbal communication. Specifically, increased sclera exposure associated with fearful expressions has been shown to moderate how observers' shift their attention toward the direction of another's gaze. Yet, the extent to which variability in sclera exposure possibly impacts the capture and hold of attention by fearful faces is untested. To address this, a sample of 249 adults completed a dot-probe task of selective attention with fearful and neutral faces. The results suggested that (1) fearful faces were prioritized over neutral faces (i.e., they captured and held attention), (2) greater sclera exposure at target locations facilitated reaction times, and (3) attention was held by greater sclera exposure of fearful faces at task irrelevant locations resulting in delayed disengagement. Collectively, the results indicate that fearful facial expressions and sclera exposure modulate spatial attention through independent and interactive mechanisms. Sclera exposure appears to be an important facilitator of nonverbal communication and perhaps represents an understudied variable in social cognition more broadly.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0285839

RÉMY CRASSARD et al – The oldest plans to scale of humanmade mega-structures

Data on how Stone Age communities conceived domestic and utilitarian structures are limited to a few examples of schematic and non-accurate representations of various-sized built spaces. Here, we report the exceptional discovery of the up-to-now oldest realistic plans that have been engraved on stones. These engravings from Jordan and Saudi Arabia depict 'desert kites', humanmade archaeological mega-traps that are dated to at least 9,000 years ago for the oldest. The extreme precision of these engravings is remarkable, representing gigantic neighboring Neolithic stone structures, the whole design of which is impossible to grasp without seeing it from the air or without being their architect (or user, or builder). They reveal a widely underestimated mental mastery of space perception, hitherto never observed at this level of accuracy in such an early context. These representations shed new light on the evolution of human discernment of space, communication, and communal activities in ancient times.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0277927

Proceedings of the Royal Society B

PAPERS

HANLAN FEI et al – Wild gibbons plan their travel pattern according to food types of breakfast

Planning for the future is a complex skill that is often considered uniquely human. This cognitive ability has never been investigated in wild gibbons (Hylobatidae). Here we evaluated the movement patterns from sleeping trees to out-of-sight breakfast trees in two groups of endangered skywalker gibbons (Hoolock tianxing). These Asian apes inhabit a cold seasonal montane forest in southwestern China. After controlling for possible confounding variables including group size, sleeping pattern (sleep alone or huddle together), rainfall and temperature, we found that food type (fruits or leaves) of the breakfast tree was the most important factor affecting gibbon movement patterns. Fruit breakfast trees were more distant from sleeping trees compared with leaf trees. Gibbons left sleeping trees and arrived at breakfast trees earlier when they fed on fruits compared with leaves. They travelled fast when breakfast trees were located further away from the sleeping trees. Our study suggests that gibbons had foraging goals in mind and plan their departure times accordingly. This ability may reflect a

capacity for route-planning, which would enable them to effectively exploit highly dispersed fruit resources in high-altitude montane forests.
https://royalsocietypublishing.org/doi/10.1098/rspb.2023.0430

Quarterly Review of Biology

REVIEWS

THOMAS D. SEELEY – Communication between Honeybees
Review of 'Communication between Honeybees: More Than Just a Dance in the Dark' by Jürgen Tautz; translated by David C. Sandeman. Springer, 2022.
https://www.journals.uchicago.edu/doi/abs/10.1086/725274

JOHN F. HOFFECKER – Updating Neanderthals
Review of 'Updating Neanderthals: Understanding Behavioural Complexity in the Late Middle Palaeolithic' edited by Francesca Romagnoli, Florent Rivals, & Stefano Benazzi. Elsevier, 2022.
https://www.journals.uchicago.edu/doi/abs/10.1086/725253

MIRIAM BELMAKER – Between Ape and Human
Review of 'Between Ape and Human: An Anthropologist on the Trail of a Hidden Hominoid' by Gregory Forth. Pegasus Books, 2022.
https://www.journals.uchicago.edu/doi/abs/10.1086/725273

ELOF AXEL CARLSON – Our Genes
Review of 'Our Genes: A Philosophical Perspective on Human Evolutionary Genomics' by Rasmus Grønfeldt Winther. Cambridge University Press, 2022.
https://www.journals.uchicago.edu/doi/abs/10.1086/725264

SAIRA KHAN – The Mirror and the Mind
Review of 'The Mirror and the Mind: A History of Self-Recognition in the Human Sciences' by Katja Guenther. Princeton University Press, 2022.
https://www.journals.uchicago.edu/doi/abs/10.1086/725265

CATHERINE DRISCOLL – Life Is Simple
Review of 'Life Is Simple: How Occam's Razor Set Science Free and Shapes the Universe' by Johnjoe McFadden. Basic Books, 2021.
https://www.journals.uchicago.edu/doi/abs/10.1086/725295

R. PAUL THOMPSON – A Better Ape
Review of 'A Better Ape: The Evolution of the Moral Mind and How It Made Us Human' by Victor Kumar and Richmond Campbell. Oxford University Press, 2022.
https://www.journals.uchicago.edu/doi/abs/10.1086/725291

Science

NEWS

World's largest collection of ancient rock art threatened by Australia's petrochemical plants
Emissions will erode petroglyphs, scientists warn.
https://www.science.org/content/article/world-s-largest-collection-ancient-rock-art-threatened-australia-s-petrochemical-plants

Science Advances

PAPERS

CLAUDIA ZEITRÄG, STEPHAN A. REBER & MATHIAS OSVATH – Gaze following in Archosauria—Alligators and palaeognath birds suggest dinosaur origin of visual perspective taking
Taking someone else's visual perspective marks an evolutionary shift in the formation of advanced social cognition. It enables using others' attention to discover otherwise hidden aspects of the surroundings and is foundational for human communication and understanding of others. Visual perspective taking has also been found in some other primates, a few songbirds, and some canids. However, despite its essential role for social cognition, visual perspective taking has only been fragmentedly studied in animals, leaving its evolution and origins uncharted. To begin to narrow this knowledge gap, we investigated extant archosaurs by comparing the neurocognitively least derived extant birds—palaeognaths—with the

closest living relatives of birds, the crocodylians. In a gaze following paradigm, we showed that palaeognaths engage in visual perspective taking and grasp the referentiality of gazes, while crocodylians do not. This suggests that visual perspective taking originated in early birds or nonavian dinosaurs—likely earlier than in mammals.
https://www.science.org/doi/full/10.1126/sciadv.adf0405

AGNIESZKA TYMULA et al – Dynamic prospect theory: Two core decision theories coexist in the gambling behavior of monkeys and humans
Research in the multidisciplinary field of neuroeconomics has mainly been driven by two influential theories regarding human economic choice: prospect theory, which describes decision-making under risk, and reinforcement learning theory, which describes learning for decision-making. We hypothesized that these two distinct theories guide decision-making in a comprehensive manner. Here, we propose and test a decision-making theory under uncertainty that combines these highly influential theories. Collecting many gambling decisions from laboratory monkeys allowed for reliable testing of our model and revealed a systematic violation of prospect theory's assumption that probability weighting is static. Using the same experimental paradigm in humans, substantial similarities between these species were uncovered by various econometric analyses of our dynamic prospect theory model, which incorporates decision-by-decision learning dynamics of prediction errors into static prospect theory. Our model provides a unified theoretical framework for exploring a neurobiological model of economic choice in human and nonhuman primates.
https://www.science.org/doi/full/10.1126/sciadv.ade7972

CÉLINE AMIEZ et al – A revised perspective on the evolution of the lateral frontal cortex in primates
Detailed neuroscientific data from macaque monkeys have been essential in advancing understanding of human frontal cortex function, particularly for regions of frontal cortex without homologs in other model species. However, precise transfer of this knowledge for direct use in human applications requires an understanding of monkey to hominid homologies, particularly whether and how sulci and cytoarchitectonic regions in the frontal cortex of macaques relate to those in hominids. We combine sulcal pattern analysis with resting-state functional magnetic resonance imaging and cytoarchitectonic analysis to show that old-world monkey brains have the same principles of organization as hominid brains, with the notable exception of sulci in the frontopolar cortex. This essential comparative framework provides insights into primate brain evolution and a key tool to drive translation from invasive research in monkeys to human applications.
https://www.science.org/doi/full/10.1126/sciadv.adf9445

ELIZABETH C. LANGE et al – Early life adversity and adult social relationships have independent effects on survival in a wild primate
Adverse conditions in early life can have negative consequences for adult health and survival in humans and other animals. What variables mediate the relationship between early adversity and adult survival? Adult social environments represent one candidate: Early life adversity is linked to social adversity in adulthood, and social adversity in adulthood predicts survival outcomes. However, no study has prospectively linked early life adversity, adult social behavior, and adult survival to measure the extent to which adult social behavior mediates this relationship. We do so in a wild baboon population in Amboseli, Kenya. We find weak mediation and largely independent effects of early adversity and adult sociality on survival. Furthermore, strong social bonds and high social status in adulthood can buffer some negative effects of early adversity. These results support the idea that affiliative social behavior is subject to natural selection through its positive relationship with survival, and they highlight possible targets for intervention to improve human health and well-being.
https://www.science.org/doi/full/10.1126/sciadv.ade7172

Scientific American Mind

ARTICLES

ANVITA ABBI – This Ancient Language Has the Only Grammar Based Entirely on the Human Body
An endangered language family suggests that early humans used their bodies as a model for reality.
https://www.scientificamerican.com/article/this-ancient-language-has-the-only-grammar-based-entirely-on-the-human-body/

Trends in Cognitive Sciences

PAPERS

EMILY TOWNER, GABRIELE CHIERCHIA & SARAH-JAYNE BLAKEMORE – Sensitivity and specificity in affective and social learning in adolescence
Adolescence is a period of heightened affective and social sensitivity. In this review we address how this increased sensitivity influences associative learning. Based on recent evidence from human and rodent studies, as well as advances in computational biology, we suggest that, compared to other age groups, adolescents show features of heightened Pavlovian learning but tend to perform worse than adults at instrumental learning. Because Pavlovian learning does not involve decision-making, whereas instrumental learning does, we propose that these developmental differences might be due to

heightened sensitivity to rewards and threats in adolescence, coupled with a lower specificity of responding. We discuss the implications of these findings for adolescent mental health and education.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00092-X

GUOSHENG DING, HEHUI LI & XIAOXIA FENG – Detecting the visual word form area in a bilingual brain
Utilizing a millimeter-scale fMRI technique and individual-based analysis, Zhan and colleagues drew a new cortical map of the visual word form area (VWFA) and examined how it processes diverse languages among different bilinguals. This research advances the current understanding of cortical language organization in the bilingual brain.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00120-1

Trends in Ecology and Evolution

REVIEWS

ULRICH R. ERNST – With Darwin towards complexity: a review of Domains and Major Transitions of Social Evolution
Review of 'Domains and Major Transitions of Social Evolution' by Jacobus J. Boomsma. Oxford University Press, 2022.
https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(23)00092-7?dgcid=raven_jbs_aip_email

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