EAORC BULLETIN 1,064 – 5 November 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.

CALL FOR PAPERS – BOOK – Working Title: Evolution, Culture and Human Behaviour
Deadline: 10th January 2024
Fields: Psychology, Anthropology
Editors and lead writers: Bruce Rawlings (Psychology/University of Durham), Linda Lidborg (Psychology/University of Durham), Lynda Boothroyd (Psychology/University of Durham), Sheina Lew-Levy (Psychology/University of Durham), Yan Birch (Psychology/University of Durham)
EHBEA representative: Rebecca Sear (President)

We seek submissions for an online, open-access textbook on ***Evolution, Culture and Human Behaviour***, produced in collaboration with the European Human Behaviour and Evolution Association (an academic society that encompasses diverse approaches to evolution and human psychology and behaviour).
At present, there exists no broad-based textbook for students in Psychology or Anthropology, to study human evolutionary behavioural sciences in a holistic manner. This textbook will cover a broad range of human behaviour and psychology, drawing on the distinct and overlapping approaches within EHBEA. It will examine the evolutionary and cultural origins of our species - including some chapters which will inevitably demonstrate where evolutionary approaches currently fail to explain very much at all (despite trying).
It will be targeted at students of A-level/advanced high school courses, and undergraduate psychology and anthropology courses. It will provide the basis for evidence-based and accurate teaching in this domain for experts and non-specialist teachers, and include learning activities alongside research-led content. By being open access, we will maximise benefit to students and teachers and avoid barriers to learning for those on comparatively lower budgets and/or weaker currencies.

Themes to be covered in the textbook are:
Evolution and our species; Methods and approaches in human evolutionary behavioural sciences; The human mind; Human sexual selection; Human groups; Cultural evolution and innovation

We are particularly keen to solicit contributed chapters covering: cognitive evolution, social and spatial cognition, and logical reasoning; cooperation, (inter)group dynamics, leadership and hierarchy; intersexual conflict and female sexuality; kinship, pair-bonding, family structures, and human life histories; human and cultural phylogenetics.
We also welcome short 'research focus' boxes. Contributors are welcome to suggest chapters they believe should be included and are not noted above.

Should you wish to submit a proposed contribution, please follow the guidelines below:
100-word abstracts stating which of the topics listed above your chapter will contribute to, with 5-10 key references, by 10th January 2024 at evolutionculturehumanbehaviour@gmail.com.
Chapters of up to 5,000 words (including notes and captions) with up to 5 illustrations, or research focus boxes of up to 600 words with 1 illustration, will be due June 2024 for publication in early 2025.
The book will be peer-reviewed and published online in full colour.
Images should be sourced as CC licensed OR redrawn to avoid fees.

For enquiries, please contact Gemma Cornetti at evolutionculturehumanbehaviour@gmail.com or gemma.cornetti@durham.ac.uk.

NEWS

JOHN TEMPLETON FOUNDATION – Hidden Intelligence
We know that humans are an intelligent species. Michael Levin, a developmental biologist, challenges conventional notions of intelligence, arguing that it is inherently collective rather than individual — suggesting a radical shift in understanding ourselves and the world around us.
https://www.youtube.com/watch?v=0a3xg4M9Oa8

NATURE BRIEFING – Consciousness is still a mystery
The scientific debate around consciousness is livelier than ever: what it is, where it comes from and whether machines can have it. Cognitive neuroscientist Liad Mudrik reviews three books that tackle these thorny questions. The authors — philosopher Daniel Dennet, geneticist Kevin Mitchell and neuroscientist Joseph LeDoux — agree that consciousness gave humans an evolutionary edge. Dennet and LeDoux argue that consciousness can exist only in biological beings, but Mitchell suggests that artificial systems could follow our evolutionary trajectory: embodiment, sensing, acting, with some motivation and learning abilities, and a drop of indeterminacy. Whether this is a good idea, writes Mudrik, is a different question.
https://www.nature.com/articles/d41586-023-03335-5

SAPIENS – Spend a Day Tracking Chimpanzees

A series of short videos captures a rare view into the lives of wild chimps through the eyes of a researcher.

https://www.sapiens.org/biology/senegal-chimps-animal-behavior/

SCIENCEADVISER – Roosters may recognize themselves

Place a rooster in front of a mirror, and it will ignore its reflection. That could be because it realizes that the image is itself and not another chicken, according to a PLOS ONE paper published last week. In other words, roosters may be self-aware, something few birds have demonstrated.

In the classic version of this "mirror test," scientists make a small mark on a creature and see if the animal tries to touch or mess with the mark when placed in front of a mirror—a clue the subject recognizes its reflection as itself. When the researchers did this, roosters failed. But that could be because roosters aren't too concerned about their looks. So the team tweaked the test to match a real-world scenario: If roosters see a hawk when there are other chickens around, they let out an alarm call. So the scientists scared them with a hawk cutout in the presence of another chicken or a mirror. Sure enough, when another chicken was nearby, the roosters crowed. But when the only other chicken visible was the rooster's own image in a mirror, they were silent.

That didn't rule out the possibility that the roosters knew they were alone because they couldn't hear or smell another chicken. So, the researchers put a live chicken behind the mirror before bringing out the fake hawk. Again, the roosters stayed quiet, evidence they really did know they were alone.

"Potentially, this study shows strong evidence for self-awareness," biologist Masanori Kohda tells The New York Times. Whether the birds are aware of how annoying their trumpeting calls are first thing in the morning remains to be seen.

https://www.nytimes.com/2023/10/25/science/roosters-mirror-test.html

SCIENCEADVISER – Do rats have an imagination?

We humans can remember moments from the past in great detail and we picture how similar events might play out in the future—and we do it all the time. But it has long remained unclear whether other animals have this kind of imagination. After all, scientists can't exactly ask a rat to envision something that could happen and have it tell them what it conjures to mind. Or, perhaps they can—with clever technology. Researchers designed a brain-machine interface that hooks into a rat's hippocampus, the region of the brain where memories of places are stored. By monitoring the neurons firing there, they can tell where a rat thinks it is. They connected this interface to a virtual reality system and had the rats navigate through a virtual world in search of treats using a spherical treadmill.

Once the rats had learned where to find their reward, the researchers unhooked the treadmill. Now, physical movement no longer mattered; to get the treat, the rat needed to think about how it would get to the right spot. "We are asking the animal to voluntarily control its hippocampal representation of place," says coauthor Albert Lee. And so the rats did—some while sitting still—which the authors say is evidence rodents can imagine themselves performing an action from their past.

In a related Perspective, Michael Coulter and Caleb Kemere say that it's not totally clear if the animals imagined themselves moving through space or some other object, "which would be less akin to mental navigation." Still, the setup designed by the team will enable neuroscientists to probe all sorts of unanswered questions about animals' spatial cognition.

https://www.science.org/doi/10.1126/science.adl0806

SCIENCE.ORG NEWS – Rats can 'imagine' places they've previously visited

Virtual reality study suggests that rodents, like humans, are capable of mental navigation.

https://www.science.org/content/article/rats-can-imagine-places-they-ve-previously-visited

PUBLICATIONS

American Journal of Biological Anthropology

REVIEWS

ROBIN G. NELSON – Bridging biology & belief

Review of 'Race, monogamy, and other lies they told you: Busting myths about human nature' (Second Edition), by Agustín Fuentes.University of California Press (2022).

https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24867

KATHLEEN D. STANSBURY – Old bones new tricks

Review of 'Behavior in Our Bones: How Human Behavior Influences Skeletal Morphology', edited by Cara Stella Hirst, Rebecca J. Gilmour, Kimberly A. Plomp, and Francisca Alves Cardoso. Elsevier (2023).

https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24864

Cell Reports
PAPERS

DANIEL R. SCHONHAUT et al – A neural code for time and space in the human brain

Time and space are primary dimensions of human experience. Separate lines of investigation have identified neural correlates of time and space, yet little is known about how these representations converge during self-guided experience. Here, 10 subjects with intracranially implanted microelectrodes play a timed, virtual navigation game featuring object search and retrieval tasks separated by fixed delays. Time cells and place cells activate in parallel during timed navigation intervals, whereas a separate time cell sequence spans inter-task delays. The prevalence, firing rates, and behavioral coding strengths of time cells and place cells are indistinguishable—yet time cells selectively remap between search and retrieval tasks, while place cell responses remain stable. Thus, the brain can represent time and space as overlapping but dissociable dimensions. Time cells and place cells may constitute a biological basis for the cognitive map of spatiotemporal context onto which memories are written.

https://www.cell.com/cell-reports/fulltext/S2211-1247(23)01250-0

PRADIPTAJATI KUSUMA et al – Deep ancestry of Bornean hunter-gatherers supports long-term local ancestry dynamics

Borneo was a crossroad of ancient dispersals, with some of the earliest Southeast Asian human remains and rock art. The island is home to traditionally hunter-gatherer Punan communities, whose origins, whether of subsistence reversion or long-term foraging, are unclear. The connection between its past and present-day agriculturalist inhabitants, who currently speak Austronesian languages and have composite and complex genetic ancestry, is equally opaque. Here, we analyze the genetic ancestry of the northeastern Bornean Punan Batu (who still practice some mobile hunting and gathering), Tubu, and Aput. We find deep ancestry connections, with a shared Asian signal outgrouping modern and ancient Austronesian-ancestry proxies, suggesting a time depth of more than 7,500 years. They also largely lack the mainland Southeast Asian signals of agricultural Borneans, who are themselves genetically heterogeneous. Our results support long-term inhabitation of Borneo by some Punan ancestors and reveal unexpected complexity in the origins and dispersal of Austronesian-expansion-related ancestry.

https://www.cell.com/cell-reports/fulltext/S2211-1247(23)01358-X

Current Anthropology
PAPERS

JESPER BORRE PEDERSEN et al with FELIX RIEDE – Climate Niche Modeling Reveals the Fate of Pioneering Late Pleistocene Populations in Northern Europe

Following deglaciation during the final stages of the Pleistocene, vast landscapes became increasingly accessible for human dispersal. With no historical analogs, it remains uncertain how people were adapting to these unknown and often unstable environments and whether dispersals were sustained or characterized by local retreat or extinction events. We here address these uncertainties by using climate niche modeling to investigate the relationship between climate and the archaeological record of such a dispersal event: the Late Upper Paleolithic Hamburgian settlement of northern Europe. Our models consider temperature and precipitation from paleoclimate models with high temporal and spatial resolution. They suggest that rising temperatures instead of precipitation changes drove dispersal events by allowing carriers of the Hamburgian tradition to occupy a specific northward-shifting climate space. Similarly, our models suggest a subsequent constriction and fragmentation of this climate space caused by declining temperatures. This climatic downturn and shifting climate space coincide with the disappearance of the Hamburgian tradition from the archaeological record. We argue that this sudden climatic change altered the social and demographic costs of northward dispersal to become unsustainable, leading to a depopulation of the region.

https://www.journals.uchicago.edu/doi/abs/10.1086/726700

Evolutionary Anthropology
PAPERS

TEGAN I. F. FOISTER et al – Homo heterogenus: Variability in early Pleistocene Homo environments

To understand the ecological dominance of Homo sapiens, we need to investigate the origins of the plasticity that has enabled our colonization of the planet. We can approach this by exploring the variability of habitats to which different hominin populations have adapted over time. In this article, we draw upon and synthesize the current research on habitats of genus Homo during the early Pleistocene. We examined 121 published environmental reconstructions from 74 early Pleistocene sites or site phases to assess the balance of arguments in the research community. We found that, while grasslands and savannahs were prominent features of Homo habitats in the early Pleistocene, current research does not place early Pleistocene Homo, in any single environmental type, but in a wide variety of environments, ranging from open grasslands to forests. Our analysis also suggests that the first known dispersal of Homo out of Africa was accompanied by niche expansion.

https://onlinelibrary.wiley.com/doi/full/10.1002/evan.22005

Frontiers in Aging Neuroscience

PAPERS

SHENG HE et al – Human-to-monkey transfer learning identifies the frontal white matter as a key determinant for predicting monkey brain age

The application of artificial intelligence (AI) to summarize a whole-brain magnetic resonance image (MRI) into an effective "brain age" metric can provide a holistic, individualized, and objective view of how the brain interacts with various factors (e.g., genetics and lifestyle) during aging. Brain age predictions using deep learning (DL) have been widely used to quantify the developmental status of human brains, but their wider application to serve biomedical purposes is under criticism for requiring large samples and complicated interpretability. Animal models, i.e., rhesus monkeys, have offered a unique lens to understand the human brain - being a species in which aging patterns are similar, for which environmental and lifestyle factors are more readily controlled. However, applying DL methods in animal models suffers from data insufficiency as the availability of animal brain MRIs is limited compared to many thousands of human MRIs. We showed that transfer learning can mitigate the sample size problem, where transferring the pre-trained AI models from 8,859 human brain MRIs improved monkey brain age estimation accuracy and stability. The highest accuracy and stability occurred when transferring the 3D ResNet [mean absolute error (MAE) = 1.83 years] and the 2D global-local transformer (MAE = 1.92 years) models. Our models identified the frontal white matter as the most important feature for monkey brain age predictions, which is consistent with previous histological findings. This first DL-based, anatomically interpretable, and adaptive brain age estimator could broaden the application of AI techniques to various animal or disease samples and widen opportunities for research in non-human primate brains across the lifespan.

https://www.frontiersin.org/articles/10.3389/fnagi.2023.1249415/full

Frontiers in Cell & Development Biology

PAPERS

AKO AGATA et al – A Neanderthal/Denisovan GLI3 variant contributes to anatomical variations in mice

Changes in genomic structures underlie phenotypic diversification in organisms. Amino acid-changing mutations affect pleiotropic functions of proteins, although little is known about how mutated proteins are adapted in existing developmental programs. Here we investigate the biological effects of a variant of the GLI3 transcription factor (GLI3R1537C) carried in Neanderthals and Denisovans, which are extinct hominins close to modern humans. R1537C does not compromise protein stability or GLI3 activator-dependent transcriptional activities. In contrast, R1537C affects the regulation of downstream target genes associated with developmental processes. Furthermore, genome-edited mice carrying the Neanderthal/Denisovan GLI3 mutation exhibited various alterations in skeletal morphology. Our data suggest that an extinct hominin-type GLI3 contributes to species-specific anatomical variations, which were tolerated by relaxed constraint in developmental programs during human evolution.

https://www.frontiersin.org/articles/10.3389/fcell.2023.1247361/full

Frontiers in Communication

PAPERS

MEGHAN CORELLA – "Talk to the hand": handling peer conflict through gestural socialization in an elementary classroom

Although researchers of language and communication have become increasingly interested in both embodiment and conflict in recent years, little is known about how elementary students use embodied actions modeled by their teachers as they engage in peer conflicts. This paper addresses such questions, focusing on the "quiet coyote" gesture and the "open hand prone" gesture, two emblems commonly used as classroom management strategies in elementary grades. Building on work in language socialization, gesture studies, and other areas of discourse analysis, I propose what I call a gestural socialization perspective for analyzing the nuanced ways the US second-grade children in this study use and socialize one another to use these gestures, as well as other semiotic resources, to handle peer disputes. An ethnographically informed, multimodal discourse analysis centering on a multiracial group of girls reveals how students' gesture practices draw on their teacher's gestural socialization practices while also diverging from them, especially with regard to gestural form, stance object, intended recipient, and accompanying metapragmatic commentary. These aspects of the participants' appropriations of the "open hand prone" and "quiet coyote" emblems, together with their use of gestural innovations, metagestures, and other semiotic resources, allow them to take more oppositional stances than those made relevant by the teacher's practices. Through these multimodal stances, students take a hands-on approach to starting, continuing, and closing peer disputes on their own terms. Overall, the study highlights how participants' handling of disputes often subverted a local emphasis on conflict avoidance, efficiency, and appropriateness and the developmentalist, neoliberal, and standard language ideologies underpinning these norms. The paper closes with a discussion of implications for research and pedagogy, emphasizing the importance of closely attending to the multimodal, interactionally emergent, and culturally situated nature of conflicts among children and people of all ages.

https://www.frontiersin.org/articles/10.3389/fcomm.2023.1251128/full

Frontiers in Ecology and Evolution
PAPERS

WREN I. EDWARDS et al – Living at the edge: home range patterns of the Buraiga Chimpanzee Community, Kibale National Park, Uganda

Data on space-use patterns are essential for understanding species ecology and conservation. Individual chimpanzee communities are known to vary in home range size and habitat use dynamics, reflecting site-specific strategies to differences in resource availability on different landscapes. Here we present home range estimates for the Buraiga chimpanzees of Kibale National Park, Uganda, a community of eastern chimpanzees (Pan troglodytes schweinfurthii) living within the largest remaining population fragment in Uganda. The Buraiga chimpanzees are currently undergoing habituation for research and tourism under the direction of the Uganda Wildlife Authority (UWA). We analyzed 15 months of GPS data (August 2019 – March 2020, and January – July 2022), calculating overall and seasonal home range and core area estimates with two methods, minimum convex polygon (MCP) and kernel density estimates (KDE). Home range was estimated to cover an area of 15.77 km2 (95% KDE), and 24.90 km2 (100% MCP). Additionally, we found that 15.82% of the Buraiga chimpanzee's home range overlaps with community-managed land, primarily the Kanyanchu Swamp corridor and adjacent agricultural land. Seasonally, we found that Buraiga chimpanzees used a larger area during dry season months, compared with rainy season months. Documenting how great ape populations utilize increasingly anthropogenically influenced landscapes is important in order to facilitate long-term survival in the face of climate change, habitat fragmentation, and other ongoing threats.
https://www.frontiersin.org/articles/10.3389/fevo.2023.1267688/full

Frontiers in Language Sciences
PAPERS

CAS W. COOPMANS & EMILIANO ZACCARELLA – Three conceptual clarifications about syntax and the brain

Linguistic theories offer empirical hypotheses about the architecture of human language, which provide the basis for neurobiological investigations into the study of language use. Unfortunately, progress in linking the two fields of inquiry is hampered because core concepts and ideas from linguistics are not seldom misunderstood, making them controversial and seemingly irrelevant to the neurobiology of language. Here we identify three such proposals: the distinction between competence and performance, the autonomy of syntax, and the abstract nature of syntactic representations. In our view, confusion about these concepts stems from the fact that they are interpreted at a level of analysis different from the level at which they were originally described. We clarify the intended interpretation of these concepts and discuss how they might be contextualized in the cognitive neuroscience of language. By doing so, the discussion about the integration of linguistics and neurobiology of language can move toward a fruitful exploration of linking hypotheses within a multi-level theory of syntax in the brain.
https://www.frontiersin.org/articles/10.3389/flang.2023.1218123/full

Frontiers in Psychology
PAPERS

CHIRAG RAJENDRA CHITTAR et al with JEROME LEWIS – Music production and its role in coalition signaling during foraging contexts in a hunter-gatherer society

Music is a cultural activity universally present in all human societies. Several hypotheses have been formulated to understand the possible origins of music and the reasons for its emergence. Here, we test two hypotheses: (1) the coalition signaling hypothesis which posits that music could have emerged as a tool to signal cooperative intent and signal strength of alliances and (2) music as a strategy to deter potential predators. In addition, we further explore the link between tactile cues and the propensity of mothers to sing toward infants. For this, we investigated the singing behaviors of hunter-gatherer mothers during daily foraging trips among the Mbendjele BaYaka in the Republic of the Congo. Although singing is a significant component of their daily activities, such as when walking in the forest or collecting food sources, studies on human music production in hunter-gatherer societies are mostly conducted during their ritual ceremonies. In this study, we collected foraging and singing behavioral data of mothers by using focal follows of five BaYaka women during their foraging trips in the forest. In accordance with our predictions for the coalition signaling hypothesis, women were more likely to sing when present in large groups, especially when group members were less familiar. However, predictions of the predation deterrence hypothesis were not supported as the interaction between group size and distance from the village did not have a significant effect on the likelihood of singing. The latter may be due to limited variation in predation risk in the foraging areas, because of the intense bush meat trade, and hence, future studies should include foraging areas with higher densities of wild animals. Lastly, we found that mothers were more likely to sing when they were carrying infants compared to when infants were close, but carried by others, supporting the prediction that touch plays an important prerequisite role in musical interaction between the mother and child. Our study provides important insight into the role of music as a tool in displaying the intent between or within groups to strengthen potentially conflict-free alliances during joint foraging activities.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1218394/full

ANNA ŻOCHOWSKA, MICHAŁ J. WÓJCIK & ANNA NOWICKA – How far can the self be extended? Automatic attention capture is triggered not only by the self-face

The preferential processing of self-related information is thought to be driven by its high level of familiarity. However, some behavioral studies have shown that people may exhibit a preference for initially unfamiliar stimuli that have been associated with themselves arbitrarily. One of the key questions that needs to be addressed concerns the role of early attention in the prioritization of newly acquired information associated with the self. Another question is whether both highly familiar as well as new information referring to a subjectively significant person (i.e. close-other) benefits from preferential attentional processing. We aimed to tackle both questions by investigating the neural mechanisms involved in processing extremely familiar stimuli, like one's own face or the face of a close-other, as well as stimuli (abstract shapes) that were newly linked to each person. We used a dot-probe paradigm that allowed us to investigate the early stages of attentional prioritization. Our analysis of the N2pc component unveiled that attention was automatically captured by the self-face, a shape associated with oneself, and the face of the close person. However, a shape associated with the close-other did not elicit the same attentional response, as the N2pc was absent. Thus, both the self-face and information referring to the extended self (self-assigned shape, close-other's face) benefit from preferential early and automatic attentional processing.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1279653/full

Nature

REVIEWS

LIAD MUDRIK – Consciousness: what it is, where it comes from — and whether machines can have it

To understand where artificial intelligence might be heading, we must first understand what consciousness, the self and free will mean in ourselves.
Review of 'I've Been Thinking' by Daniel C. Dennett, W. W. Norton (2023).
Review of 'Free Agents: How Evolution Gave Us Free Will' by Kevin J. Mitchell, Princeton Univ. Press, (2023).
Review of 'The Four Realms of Existence: A New Theory of Being Human' by Joseph E. LeDoux, Harvard Univ. Press (2023).
https://www.nature.com/articles/d41586-023-03335-5

Nature Communications Psychology

PAPERS

SAYURI HAYAKAWA & VIORICA MARIAN – Sound-meaning associations allow listeners to infer the meaning of foreign language words

An attribute of human language is the seemingly arbitrary association between a word's form and meaning. We provide evidence that the meaning of foreign words can be partially deduced from phonological form. Monolingual English speakers listened to 45 antonym word pairs in nine foreign languages and judged which English words corresponded to these words' respective meanings. Despite no proficiency in the foreign language tested, participants' accuracy was higher than chance in each language. Words that shared meaning across languages were more likely to share phonological form. Accuracy in judging meaning from form was associated with participants' verbal working memory and with how consistently phonological and semantic features of words covaried across unrelated languages. A follow-up study with native Spanish speakers replicated the results. We conclude that sound maps to meaning in natural languages with some regularity, and sensitivity to form-meaning mappings indexes broader cognitive functions.
https://www.nature.com/articles/s44271-023-00030-z

Nature Human Behaviour

PAPERS

KENNY R. COVENTRY et mul with ANGELO CANGELOSI – Spatial communication systems across languages reflect universal action constraints

The extent to which languages share properties reflecting the non-linguistic constraints of the speakers who speak them is key to the debate regarding the relationship between language and cognition. A critical case is spatial communication, where it has been argued that semantic universals should exist, if anywhere. Here, using an experimental paradigm able to separate variation within a language from variation between languages, we tested the use of spatial demonstratives—the most fundamental and frequent spatial terms across languages. In n = 874 speakers across 29 languages, we show that speakers of all tested languages use spatial demonstratives as a function of being able to reach or act on an object being referred to. In some languages, the position of the addressee is also relevant in selecting between demonstrative forms. Commonalities and differences across languages in spatial communication can be understood in terms of universal constraints on action shaping spatial language and cognition.
https://www.nature.com/articles/s41562-023-01697-4

Nature Italy
ARTICLES

CHIARA SABELLI – The surprising toolbox of the early Homo erectus
The analysis of a 2 million years-old jawbone found in Ethiopia suggests that the hominin species refined its technological skills earlier than previously thought.
https://www.nature.com/articles/d43978-023-00162-0

Nature Pediatric Research
PAPERS

HEDVIG KVANTA et al – Language performance and brain volumes, asymmetry, and cortical thickness in children born extremely preterm
Children born preterm are more prone to have language difficulties. Few studies focus on children born extremely preterm (EPT) and the structural differences in language-related regions between these children and children born at term.
Our study used T1-weighted magnetic resonance imaging (MRI) scans to calculate the brain volumetry, brain asymmetry, and cortical thickness of language-related regions in 50 children born EPT and 37 term-born controls at 10 years of age. The language abilities of 41 of the children born EPT and 29 term-born controls were then assessed at 12 years of age, using the Wechsler Intelligence Scale for Children, Fifth Edition and the Clinical Evaluations of Language Fundamentals, Fourth Edition. The differences between MRI parameters and their associations with language outcomes were compared in the two groups. Brain volume and cortical thickness of language-related regions were reduced in children born EPT, but volumetric asymmetry was not different between children born EPT and at term. In children born EPT the brain volume was related to language outcomes, prior to adjustments for full-scale IQ.
These findings expand our understanding of the structural correlates underlying impaired language performance in children born with EPT.
https://www.nature.com/articles/s41390-023-02871-0

Nature Scientific Reports
PAPERS

IZZY WISHER, PAUL PETTITT & ROBERT KENTRIDGE – The deep past in the virtual present: developing an interdisciplinary approach towards understanding the psychological foundations of palaeolithic cave art
Virtual Reality (VR) has vast potential for developing systematic, interdisciplinary studies to understand ephemeral behaviours in the archaeological record, such as the emergence and development of visual culture. Upper Palaeolithic cave art forms the most robust record for investigating this and the methods of its production, themes, and temporal and spatial changes have been researched extensively, but without consensus over its functions or meanings. More compelling arguments draw from visual psychology and posit that the immersive, dark conditions of caves elicited particular psychological responses, resulting in the perception—and depiction—of animals on suggestive features of cave walls. Our research developed and piloted a novel VR experiment that allowed participants to perceive 3D models of cave walls, with the Palaeolithic art digitally removed, from El Castillo cave (Cantabria, Spain). Results indicate that modern participants' visual attention corresponded to the same topographic features of cave walls utilised by Palaeolithic artists, and that they perceived such features as resembling animals. Although preliminary, our results support the hypothesis that pareidolia—a product of our cognitive evolution—was a key mechanism in Palaeolithic art making, and demonstrates the potential of interdisciplinary VR research for understanding the evolution of art, and demonstrate the potential efficacy of the methodology.
https://www.nature.com/articles/s41598-023-46320-8

MARIO MATA-GONZÁLEZ et al with NICHOLAS J. CONARD – Evidence of diverse animal exploitation during the Middle Paleolithic at Ghar-e Boof (southern Zagros)
Although Middle Paleolithic (MP) hominin diets consisted mainly of ungulates, increasing evidence demonstrates that hominins at least occasionally consumed tortoises, birds, leporids, fish, and carnivores. Until now, the MP zooarchaeological record in the Zagros Mountains has been almost exclusively restricted to ungulates. The narrow range of hominin prey may reflect socioeconomic decisions and/or environmental constraints, but could also result from a research bias favoring the study of large prey, since archaeologists have undertaken no systematic taphonomic analyses of small game or carnivores in the region. Here, we report on the first comprehensive taphonomic analysis of an MP faunal assemblage from Ghar-e Boof (∼ 81–45 kyr), a Late Pleistocene site in the southern Zagros of Iran. Anthropogenic bone surface modifications point to hominins as the main agent of accumulation. Hominins preyed primarily on ungulates, particularly wild goat. However, we also found evidence for MP hominin exploitation of carnivores and tortoises at the site. Although small game represents only a minor portion of the diet, our results suggest that the hunting behavior of MP hominins in the Zagros was more diverse than previously thought, similar to what we find elsewhere in Eurasia.
https://www.nature.com/articles/s41598-023-45974-8

ALEXANDER KOPLENIG & SASCHA WOLFER – Languages with more speakers tend to be harder to (machine-)learn

Computational language models (LMs), most notably exemplified by the widespread success of OpenAI's ChatGPT chatbot, show impressive performance on a wide range of linguistic tasks, thus providing cognitive science and linguistics with a computational working model to empirically study different aspects of human language. Here, we use LMs to test the hypothesis that languages with more speakers tend to be easier to learn. In two experiments, we train several LMs—ranging from very simple n-gram models to state-of-the-art deep neural networks—on written cross-linguistic corpus data covering 1293 different languages and statistically estimate learning difficulty. Using a variety of quantitative methods and machine learning techniques to account for phylogenetic relatedness and geographical proximity of languages, we show that there is robust evidence for a relationship between learning difficulty and speaker population size. However, contrary to expectations derived from previous research, our results suggest that languages with more speakers tend to be harder to learn.
https://www.nature.com/articles/s41598-023-45373-z

New Scientist

NEWS

Roosters may be able to recognise themselves in a mirror

Very few non-human animals have passed the mirror self-recognition test, but roosters have now succeeded at a modified version, which may mean they can understand that a reflection represents their own body.
https://www.newscientist.com/article/2399445-roosters-may-be-able-to-recognise-themselves-in-a-mirror/

Most mammals go through the menopause - if they live long enough

The majority of female mammals stop producing eggs long before the end of their potential lifespans, but in the wild few reach this point, other than humans and some whales.
https://www.newscientist.com/article/2399813-most-mammals-go-through-the-menopause-if-they-live-long-enough/

REVIEWS

COLIN BARRAS – How language may shape our world view

Review of Caleb Everett's 'A Myriad of Tongues: How Languages Reveal Differences in How We Think, Harvard University Press (2023).

An assured guide to new thinking about how language shapes the way we see the world – at a time when thousands of languages are vanishing.
https://www.newscientist.com/article/mg26034630-900-a-myriad-of-tongues-review-how-language-may-shape-our-world-view/

PeerJ

PAPERS

IACOPO GHINASSI et al – Comparing neural sentence encoders for topic segmentation across domains: not your typical text similarity task

Neural sentence encoders (NSE) are effective in many NLP tasks, including topic segmentation. However, no systematic comparison of their performance in topic segmentation has been performed. Here, we present such a comparison, using supervised and unsupervised segmentation models based on NSEs. We first compare results with baselines, showing that the use of NSEs does often provide improvements, except for specific domains such as news shows. We then compare over three different datasets a range of existing NSEs and a new NSE based on ad hoc pre-training strategy. We show that existing literature documenting general performance gains of NSEs does not always conform to the results obtained by the same NSEs in topic segmentation. If Transformers-based encoders do improve over previous approaches, fine-tuning in sentence similarity tasks or even on the same topic segmentation task we aim to solve does not always equate to better performance, as results vary across method being used and domains of application. We aim to explain this phenomenon and the relative poor performance of NSEs in news shows by considering how well different NSEs encode the underlying lexical cohesion of same-topic segments; to do so, we introduce a new metric, ARP. The results from this study suggest that good topic segmentation results do not always rely on good cohesion modelling on behalf of the segmenter and that is dependent upon what kind of text we are trying to segment. Also, it appears evident that traditional sentence encoders fail to create topically cohesive clusters of segments when used on conversational data. Overall, this work advances our understanding of the use of NSEs in topic segmentation and of the general factors determining the success (or failure) of a topic segmentation system. The new proposed metric can quantify the lexical cohesion of a multi-topic document under different sentence encoders and, as such, might have many different uses in future research, some of which we suggest in our conclusions.
https://peerj.com/articles/cs-1593/

PLoS One
PAPERS

SAMUEL SHAKI & MARTIN H. FISCHER – Language directs spatial attention differently in explicit and implicit tasks

How do words with either explicit or implicit spatial meanings (e.g., DOWN, BOOT) shift our attention? Recent studies, presenting prime words followed by probe targets, suggested that, for implicit spatial words, both the spatial meaning of prime words and the target locations must be processed to induce congruency benefits. Here we examined the functional necessity of the latter location component. 91 healthy adults discriminated target letters that followed explicit or implicit spatial words. Words either did or did not have to be semantically processed. Target discrimination speed was used to compute congruency benefits. With explicit prime words, spatial congruency effects emerged without semantic processing instructions. In contrast, with implicit prime words, only instructing their semantic processing ensured a congruency benefit. This shows that, for implicit spatial words, spatial processing of target locations is not necessary; instead, processing the spatial connotation of the prime, together with the identity of the target, can induce congruency benefits. Our results help to understand previous conflicting findings.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0291518

PNAS
PAPERS

YUE SUN & DAVID POEPPEL – Syllables and their beginnings have a special role in the mental lexicon

The beginnings of words are, in some informal sense, special. This intuition is widely shared, for example, when playing word games. Less apparent is whether the intuition is substantiated empirically and what the underlying organizational principle(s) might be. Here, we answer this seemingly simple question in a quantitatively clear way. Based on arguments about the interplay between lexical storage and speech processing, we examine whether the distribution of information among different speech sounds of words is governed by a critical computational unit for online speech perception and production: syllables. By analyzing lexical databases of twelve languages, we demonstrate that there is a compelling asymmetry between syllable beginnings (onsets) versus ends (codas) in their involvement in distinguishing words stored in the lexicon. In particular, we show that the functional advantage of syllable onset reflects an asymmetrical distribution of lexical informativeness within the syllable unit but not an effect of a global decay of informativeness from the beginning to the end of a word. The converging finding across languages from a range of typological families supports the conjecture that the syllable unit, while being a critical primitive for both speech perception and production, is also a key organizational constraint for lexical storage.
https://www.pnas.org/doi/10.1073/pnas.2215710120

LILA GEIS et al with FRANCESCO D'ERRICO – Multiproxy analysis of Upper Palaeolithic lustrous gravels supports their anthropogenic use

Upper Palaeolithic sites in southwestern France attributed to the Upper Gravettian and the Solutrean yielded sub spherical gravels with a highly shiny appearance that have intrigued researchers since the 1930s. In this work, we analyze specimens from five sites, including the recently excavated Solutrean site of Landry, to establish whether their presence in archaeological layers and peculiar aspect are due to natural processes or human agency. We study the spatial distribution of gravels at Landry and submit archaeological gravels from the five sites, natural formations, Landry sediment sieving, and polishing experiments with a rotary tumbling machine to morphometric, colorimetric, microscopic, and textural analyses. Our results indicate the lustrous gravels found at the five sites result from deliberate selection and suggest their shiny appearance is the consequence of human agency, possibly resulting from prolonged contact with a soft material such as animal skin. Ethnographic accounts indicate that these gravels may have been used for magico-religious ritual purposes (charms, sorcery, divination etc.), in games, as elements of musical instruments, and as items serving other social and personal purposes. We argue that these objects reflect a cultural innovation emerged during the Gravettian and continued into the Solutrean.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0291552

Royal Society Open Science
PAPERS

JOHANNES ZONKER, CECILIA PADILLA-IGLESIAS & NATAŠA DJURDJEVAC CONRAD – Insights into drivers of mobility and cultural dynamics of African hunter–gatherers over the past 120 000 years

Humans have a unique capacity to innovate, transmit and rely on complex, cumulative culture for survival. While an important body of work has attempted to explore the role of changes in the size and interconnectedness of populations in determining the persistence, diversity and complexity of material culture, results have achieved limited success in explaining the emergence and spatial distribution of cumulative culture over our evolutionary trajectory. Here, we develop a spatio-temporally explicit agent-based model to explore the role of environmentally driven changes in the population dynamics of hunter–gatherer communities in allowing the development, transmission and accumulation of complex culture. By modelling separately demography- and mobility-driven changes in interaction networks, we can assess the extent to which cultural change is driven by different types of population dynamics. We create and validate our model using empirical data from

Central Africa spanning 120 000 years. We find that populations would have been able to maintain diverse and elaborate cultural repertoires despite abrupt environmental changes and demographic collapses by preventing isolation through mobility. However, we also reveal that the function of cultural features was also an essential determinant of the effects of environmental or demographic changes on their dynamics. Our work can therefore offer important insights into the role of a foraging lifestyle on the evolution of cumulative culture.

https://royalsocietypublishing.org/doi/10.1098/rsos.230495

Science Advances

PAPERS

KATHARINA H. MENN, CLAUDIA MÄNNEL & LARS MEYER – Phonological acquisition depends on the timing of speech sounds: Deconvolution EEG modeling across the first five years

The late development of fast brain activity in infancy restricts initial processing abilities to slow information. Nevertheless, infants acquire the short-lived speech sounds of their native language during their first year of life. Here, we trace the early buildup of the infant phoneme inventory with naturalistic electroencephalogram. We apply the recent method of deconvolution modeling to capture the emergence of the feature-based phoneme representation that is known to govern speech processing in the mature brain. Our cross-sectional analysis uncovers a gradual developmental increase in neural responses to native phonemes. Critically, infants appear to acquire those phoneme features first that extend over longer time intervals—thus meeting infants' slow processing abilities. Shorter-lived phoneme features are added stepwise, with the shortest acquired last. Our study shows that the ontogenetic acceleration of electrophysiology shapes early language acquisition by determining the duration of the acquired units.

https://www.science.org/doi/10.1126/sciadv.adh2560

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