EAORC BULLETIN 1,147 – 8 June 2025

CONTENTS

NOTICES

FORMATTED VERSION OF THIS BULLETIN

A pdf formatted version of this Bulletin is available for download at martinedwardes.me.uk/eaorc/eaorc_bulletins.htm.

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.
If there is a journal you feel I should be tracking on a regular basis, let me know.
And if you have any other ideas for extending the "EAORC experience", please contact me.

EDITORIAL INTERJECTIONS

Comments in curly brackets are editorial interjections. The Editor reserves the right to be wrong, and doesn't object to being called out on it.

NEW BOOK ALERT – Ecological Perspectives on Language Endangerment and Loss

Springer Cham, 2025

SALIKOKO S. MUFWENE – Ecological Perspectives on Language Endangerment and Loss

This book discusses various issues arising from the dominant discourse on language endangerment and loss in linguistics. Are the terms mother tongue, heritage language, and ancestral language interchangeable? Does a child receiving formal

education in a mother tongue different from that or those of his/her parents lose a culture that he/she "should" otherwise inherit? Is a language separate from the culture in which its speakers evolve and it is being practiced? Thus, is a population shifting to a dominant language necessarily abandoning its traditional culture ipso facto or is it also reshaping it along with that associated with the new language into a new, mixed culture? Are cultures intended to be static? Must speakers of particular languages be wedded to them in the same way they are to their genes? What can we learn about language shift, language vitality, and human adaptiveness from the protracted history of mankind? These and a host of other issues regarding the intertwining of colonization, globalization, language, and culture are discussed in this book, inviting linguists and other interested scholars to be critical participants in the current debate.
https://link.springer.com/book/10.1007/978-3-031-91034-0

ACADEMIA.EDU – Technical invention in the Palaeolithic

In S.A. de Beaune, F. Coolidge & T. Wynn (eds.), Cognitive Archaeology and Human evolution. Cambridge University Press, ch2, 3-14 (2009).

SOPHIE A. DE BEAUNE – Technical invention in the Palaeolithic: What if the explanation comes from the cognitive and neuropsychological sciences?

The evolution of the cerebral capacities of humans, from the first hominins to modern humans, is at the heart of our interrogations. How can we explain the fact that only hominins seem to have developed the capacity for technical invention, in contrast to our closest relatives, the great apes? The archaeological data allow us to observe this phenomenon, but offer very little in the way of a response to this question. By examining the possible contributions of other disciplines, particularly in the cognitive and neuropsychological sciences, we can ask if there exists a cause-and-effect relationship between the following phenomena: (1) the archaeological data, which indicate that technical inventions throughout prehistory are increasingly frequent and complex from the first hominins to modern humans; (2) the cognitive perspective, which seems to indicate that the processes of analogical reasoning are increasingly frequent through time, either for "statistical" reasons (a greater population density leads to a greater probability of the meeting of two ideas) or for cognitive reasons; and (3) the palaeoanthropological data, which show that current neurological conditions developed progressively, with the frontal lobes and pre-frontal cortex becoming more and more accentuated from the first hominins to modern humans. We will explore the possible contribution of a confrontation of these different disciplines.
https://www.academia.edu/2614955/Technical_invention_in_the_Palaeolithic_what_if_the_explanation_comes_from_the_cognitive_and_neuropsychological_sciences

ACADEMIA.EDU – The co-evolution of tools and minds

Phenomenology and the Cognitive Sciences 9, 503-520 (2010).

BEN JEFFARES – The co-evolution of tools and minds: cognition and material culture in the hominin lineage

The structuring of our environment to provide cues and reminders for ourselves is common: We leave notes on the fridge, we have a particular place for our keys where we deposit them, making them easy to find. We alter our world to streamline our cognitive tasks. But how did hominins gain this capacity? What pushed our ancestors to structure their physical environment in ways that buffered thinking and began the process of using the world cognitively? I argue that the capacity to engage in these behaviours is a by-product of increased tool investment and tool curation, which in turn was necessary because of increasingly heterogeneous environments. The minute tools are carried and cared for, they begin to undergo selection for added functions, becoming available as cognitive primers and as signals. I explore the trajectory of this co-evolutionary feedback loop of hominins and their tools, and demonstrate the role tools have in shaping our thinking.
https://www.academia.edu/3788114/The_co_evolution_of_tools_and_minds_cognition_and_material_culture_in_the_hominin_lineage

NEWS

JOHN TEMPLETON FOUNDATION – Cooperation—The Ancient Technology That Never Goes Obsolete

Hands clapping, feet tapping. It didn't matter if it was a rhythmic movement or a sound; as long as the rhythm was coordinated as a group. Arizona State University psychology professor Athena Aktipis rewarded students taking her course with candy if they demonstrated a coordinated group effort. Students could also leave their small group and join a new one if they did not feel their group was cooperating.

Of course, games engage college students, but the simulation points to real world importance. "We take for granted that people should just cooperate," said Aktipis. "If people understood the structure of the problems they are trying to solve, everyone would be able to benefit more."
https://www.templeton.org/news/houston-we-have-a-problem-cooperating-in-times-of-crisis

NATURE BRIEFING – Thirsty cockatoos get the hang of fountains

A flock of sulphur-crested cockatoos (Cacatua galerita) in western Sydney have learned to operate drinking-water fountains. The behaviour is made possible by the dexterity of the cockatoos' feet, which gives them an edge over other brainy birds

such as crows (Corvus corone) at this kind of task, says behavioural ecologist Vladimir Pravosudov. The behaviour probably represents a local "cultural tradition", says Pravosudov; it appears to be spreading through Sydney's suburbs as the cockatoos learn from one another.
https://www.science.org/content/article/cockatoos-have-learned-operate-drinking-fountains-australia

NEWS FROM SCIENCE – Cockatoos have learned to operate drinking fountains in Australia

The behavior—never before seen in birds—may be a developing cultural tradition among one population.
https://www.science.org/content/article/cockatoos-have-learned-operate-drinking-fountains-australia

SCIENCEADVISER – Iron-ic sex development: XY mice born to anemic mothers can develop female parts

In mice, as in humans, chromosomes generally align with reproductive organs: Animals with two X chromosomes usually develop female parts, while those with one X and one Y generally develop male parts. But differences in sexual development can occur—for example, a mouse with XX chromosomes can develop as male if a gene called Sry, usually located on the Y chromosome, jumps to an X.

For the first time, researchers have now discovered that diet, too, can lead to differences in sexual development. Because a key enzyme in male development relies on iron, chromosomally male mice may be born with female reproductive organs if their mothers lack iron during pregnancy, new work has demonstrated. In one experiment, two out of 43 XY pups born to mice with a susceptibility to iron deficiency that were fed a low-iron diet developed ovaries and other female-typical body parts. And when the researchers gave mouse mothers-to-be a drug that sops up iron, six of 39 XY pups developed ovaries while one developed an ovary and a testis.

Although most of the pups developed the organs expected for their chromosomes, "this is a remarkable scientific result, and the findings are new, unexpected, and very clear," co-author Peter Koopman said in a statement. "No dietary influences on sex development have ever been established scientifically before."

Whether iron deficiency affects reproductive development in humans remains to be experimentally demonstrated, the researchers note. "The challenge ahead is to determine whether and in what situations the results are applicable to human pregnancies," Koopman added, "but at this point it is reasonable to suggest that attention to dietary iron intake may be a prudent precautionary measure for all pregnant women."
https://www.nature.com/articles/s41586-025-09063-2

SCIENCENEWS – Aussie cockatoos use their beaks and claws to turn on water fountains

Parrots living in Sydney have learned how to turn on water fountains for a drink. It's the first such drinking strategy seen in the birds.
https://www.sciencenews.org/article/cockatoos-parrots-beaks-claws-water

PUBLICATIONS

Biology Letters

PAPERS

BARBARA C. KLUMP et al – Emergence of a novel drinking innovation in an urban population of sulphur-crested cockatoos, Cacatua galerita

The spread of innovation has been proposed as a potentially important source of adaptive behavioural responses to anthropogenic change. Yet, while a diversity of urban innovations have been documented in animals, there are relatively few examples of these spreading to form local traditions. One notable example is the 'bin-opening innovation' in sulphur-crested cockatoos (Cacatua galerita), where individuals open household bin lids to access food waste, with this behaviour spreading across southern Sydney, Australia. Here, we describe a second innovation in this species, the 'drinking-fountain innovation'. Individuals from a population in western Sydney drink from twist-handle public drinking fountains, with this behaviour persisting over at least 2 years. Successful operation requires a coordinated sequence of actions, with only 41% of observed attempts ending in success. Intensive observation at one drinking fountain over 44 days revealed 525 attempts and 46% of marked individuals successfully engaging in the behaviour, with individuals visiting at dawn and dusk in line with expectations for use of a water resource. Public drinking fountains vary in design between local councils but are generally widespread. Yet, to our knowledge, this behaviour has not been observed elsewhere. Altogether, this suggests that this drinking innovation has spread to form a new urban-adapted local tradition.
https://royalsocietypublishing.org/doi/full/10.1098/rsbl.2025.0010

Frontiers in Aging

PAPERS

DANIEL SOLOMONS et al – Right hemisphere engagement in language abilities in older adults: indication of compensation rather than decline

Structural brain changes during aging have been used as specific markers to distinguish normal aging from dementia. Changes in specific cognitive abilities such as episodic memory, processing speed, and executive functions, are observed in healthy aging. Limited evidence reports changes in linguistic functions alongside structural and functional brain changes. This study investigates correlations between language performance, gray matter volume (GMV), and neural activity in language regions, adjusted for demographic factors, in healthy older adults.

Twenty-seven right-handed participants aged 60–87 were evaluated for overall linguistic performance using the Spanish version of ScreeLing (SCL) test and phonemic fluency and semantic verbal fluency tasks (PF and SF). Participants also underwent an MRI session during which they performed a functional MRI language task. T1-weighted MRI scans were used to measure GMV in specific language-related regions and assess language lateralization. Correlational analyses were conducted between language scores, GMV, years of education, age, sex, and fMRI lateralization.

In the right hemisphere (RH), significant positive correlations were found between SCL scores and GMV in the orbital inferior frontal gyrus ($r = 0.5402$; $p = 0.0044$) and the superior temporal gyrus ($r = 0.516$; $p = 0.007$). Furthermore, SCL and Phonemic fluency positively correlated with years of education, indicating that higher education enhances speech performance. No significant correlations were found in the left hemisphere (LH). Age, sex, and fMRI lateralization did not significantly correlate with specific linguistic scores.

These results challenge the current view of the role of the right hemisphere in language performance as increased GMV in specific right hemisphere language regions is associated with better language performance, highlighting the role of the right hemisphere in supporting language skills during healthy aging.

https://www.frontiersin.org/journals/aging/articles/10.3389/fragi.2025.1458692/full

Frontiers in Human Neuroscience

PAPERS

SHINGO TOKIMOTO & NAOKO TOKIMOTO – Understanding implicature as an inner simulation of the speaker's context retrieval

In everyday conversation, speakers often convey their intentions indirectly, requiring listeners to infer meaning beyond the literal content of the utterance. For example, the question “Do you know the way to the station?” implies a request such as “Please tell me the way to the station.” Although pragmatic inference is generally assumed to support the comprehension of such implicit intentions, the underlying neural mechanisms remain poorly understood. This study investigated the cognitive and neural processes involved in comprehending indirect utterances, using electroencephalography (EEG) recorded while participants listened to spoken dialogues. We manipulated both the contextual explicitness (explicit vs. implicit) and the temporal reference (present intention vs. past experience) of the speaker's implicit intentions. EEG analyses revealed a significant effect of contextual explicitness only in conversations involving past experiences. Specifically, in the implicit context condition relative to the explicit condition, we observed a significant positive deflection in the event-related potential and significant suppression in the θ and β frequency bands of event-related spectral perturbation. The β-band suppression was interpreted as reflecting perspective-taking by the listener. To further investigate the neural mechanisms involved, we analyzed effective connectivity among 28 regions of interest—previously identified in fMRI studies of indirect utterance comprehension—using source-localized EEG data. In the implicit context condition for past-experience conversations, we found a significant increase in information flow to the parahippocampal gyrus, suggesting a role for autobiographical memory retrieval. Multiple regression analyses showed that this connectivity was significantly associated with subscores on the Autism-Spectrum Quotient, particularly the Imagination and Communication subscales—both related to theory of mind (ToM). These findings suggest that autobiographical memory retrieval is guided by second-order ToM processes, enabling listeners to internally simulate the speaker's context retrieval. Our results challenge traditional linguistic models that conceptualize the comprehension of implicit intentions as a stepwise construction of propositional representations. Instead, they support a pragmatic inference as context search model, in which listeners actively search for a context that coherently integrates the indirect utterance with the preceding discourse.

https://www.frontiersin.org/journals/human-neuroscience/articles/10.3389/fnhum.2025.1568070/full

iScience

PAPERS

KINGA MAKOVI et al – Rewards and Punishments Help Humans Overcome Biases Against Cooperation Partners Assumed to be Machines

High levels of human-machine cooperation are required to combine the strengths of human and artificial intelligence. Here we investigate strategies to overcome the machine penalty, where people are less cooperative with partners they assume to be machines, than with partners they assume to be humans. Using a large-scale iterative public goods game with nearly 2000 participants, we find that peer rewards or peer punishments can both promote cooperation with partners assumed to be

machines, but do not overcome the machine penalty. Their combination, however, eliminates the machine penalty, because it is uniquely effective for partners assumed to be machines, and inefficient for partners assumed to be humans. These findings provide a nuanced road map for designing a cooperative environment for humans and machines, depending on the exact goals of the designer.
https://www.cell.com/iscience/fulltext/S2589-0042(25)01094-6

Language and Cognition

PAPERS

JENNA CROSSLEY & EMANUEL BYLUND – Direction of reading, not writing, shapes concepts of time

It is commonly stated that the direction in which we read and write influences our conceptualisation of the flow of time. However, research to date has only established a causal link between reading direction and temporal thought, leaving out the question of whether the act of writing indeed shapes the mental timeline. The current study addresses this gap by examining whether writing direction modulates how events are mapped onto time. Consistent with previous findings, results from a reading experiment showed that participants who read mirror texts (right-to-left orthography) indeed mapped time as flowing leftwards. However, contrary to prevailing assumptions, results from a series of writing experiments showed that participants assigned to a mirror writing condition (right-to-left orthography) displayed the same left-to-right mapping of the flow of time as participants in the standard writing condition (left-to-right orthography), despite progressive increases in mirror-writing training. It is suggested that the act of writing does not shape time concepts because it is not unambiguously unidirectional: the fine-motoric action of forming individual letters is multidirectional and thus interferes with the lateral time–space association obtained with the gross-motoric action of moving the hand/arm sideways.
https://www.cambridge.org/core/journals/language-and-cognition/article/direction-of-reading-not-writing-shapes-concepts-of-time/E6EF809D0235A311468C83167059623E

Mind & Language

PAPERS

SUSANNA SCHELLENBERG – The polysemy of "I"

Orthodoxy assumes that the first-person thoughts of an individual are anchored to a stable object. I challenge this assumption by arguing that "I" is polysemous. The perspectival anchor of a first-person thought could be the bearer of the thought, the agent, the bearer of perception, or a body, to name just a few options. These different possible anchors do not form a unity. So, a unified or minimal self cannot, without argument, be posited as the stable anchor of an individual's first-person thoughts. I show how the polysemy of "I" can be analyzed in terms of polysemous mental files.
https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12551

JAMES D. GRAYOT – Representation hunger: Reformulating the "problem-domain" of truly complex cognition

The rapid growth of 4E-cognition has led to increased skepticism about the role of internal representations in understanding complex cognitive tasks. Critics challenge the idea of representation-hungry cognition (RHC), rejecting the notion that thinking about absent or abstract objects requires internal representations. Despite criticisms, I argue that RHC remains relevant to understanding what makes cognition truly complex. My goal is to defend RHC while reformulating it to highlight how external vehicles shape cognition through processes of enculturation. I conclude that critics must either accept internal representations in the production of novel content or allow that content be internalized independently of external representational vehicles.
https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12553

Nature

PAPERS

JINCHENG WANG et al – Ancient DNA reveals a two-clanned matrilineal community in Neolithic China

Studies of ancient DNA from cemeteries provide valuable insights into early human societies, and have strongly indicated patrilocality. Here, we analysed ancient DNA alongside archaeological contexts and multiple stable isotopic data from 60 individuals in 2 separate cemeteries at the Fujia archaeological site in eastern China, dating between 2750 and 2500 bce. Our findings suggest the existence of an early-described matrilineal community in the Neolithic period, characterized by high endogamy and a population practicing millet agriculture near the coast. Evidence of intermarriage between individuals in the two cemeteries and the presence of both primary and secondary burials, organized strictly according to maternal clans, underscore a strong sense of social cohesion and identity at Fujia. Bayesian modelling of radiocarbon dates indicates that the two cemeteries were used for approximately 250 years, implying a stable matrilineal lineage spanning at least 10 generations. This study contributes to the ongoing debate in anthropology and archaeology11, not only suggesting the existence of a matrilineal society in early human history but also revealing a pair of Neolithic cemeteries organized around two matrilineal clans, furthering our understanding of the early evolution of human societies through kinship systems.
https://www.nature.com/articles/s41586-025-09103-x

Nature Africa

ARTICLES

ELNA SCHÜTZ – I got too close to a chimpanzee, and thought I would die
Salmah Jombela hangs out near wild chimpanzees, so that they tolerate close observation without altering their behaviour.
https://www.nature.com/articles/d44148-025-00168-4

Nature Communications

PAPERS

JOSÉ BRAGA & JACOPO MOGGI-CECCHI – Infant craniofacial diversity in Early Pleistocene Homo
The adult craniofacial diversity of early Pleistocene Homo species is relatively well-documented, but its developmental foundations is hindered by the scarcity of infant specimens with preserved skeletal features. Here, we present evidence of craniofacial development in early Pleistocene Homo infants. This study focuses on a mandible (Omo 222-1973-2744) from the Lower Omo Valley in Ethiopia, attributed to Homo habilis, along with a mandible (KW 7000) from Kromdraai and a maxilla (DNH 83) from Drimolen, both in South Africa. We find that early Homo from southern Africa includes infant specimens with diagnostic facial features, with DNH 83 and KW 7000 uniquely combining both dental and skeletal evidence. Structural differences between the mandibles of Omo 222-1973-2744 and KW 7000 attributed to Homo aff. H. erectus, suggest that taxonomic diversity in early Homo was already evident in infancy. Furthermore, the unique combination of mandibular and dental features in these infants highlights the importance of integrating both dental and cranial morphology to identify early Homo.
https://www.nature.com/articles/s41467-025-59734-x

ALEJANDRO TLAIE et al – Inferring internal states across mice and monkeys using facial features
Animal behaviour is shaped to a large degree by internal cognitive states, but it is unknown whether these states are similar across species. To address this question, here we develop a virtual reality setup in which male mice and macaques engage in the same naturalistic visual foraging task. We exploit the richness of a wide range of facial features extracted from video recordings during the task, to train a Markov-Switching Linear Regression (MSLR). By doing so, we identify, on a single-trial basis, a set of internal states that reliably predicts when the animals are going to react to the presented stimuli. Even though the model is trained purely on reaction times, it can also predict task outcome, supporting the behavioural relevance of the inferred states. The relationship of the identified states to task performance is comparable between mice and monkeys. Furthermore, each state corresponds to a characteristic pattern of facial features that partially overlaps between species, highlighting the importance of facial expressions as manifestations of internal cognitive states across species.
https://www.nature.com/articles/s41467-025-60296-1

Nature Communications Biology

PAPERS

ANDREA L. PERMANA et al with CAREL P. VAN SCHAIK & CAROLINE SCHUPPLI – Observational social learning of "know-how" and "know-what" in wild orangutans: evidence from nest-building skill acquisition
Immature great apes learn how to build their nests over multiple years, yet how they do so has remained largely unclear. We investigated the detailed role of social learning in the acquisition of nest-building skills in wild Sumatran orangutans (Pongo abelii) using data on nest-building, nest practice, and nest peering behaviour from 44 individuals, collected over 17 years. We found that nest peering (but not being close to a nesting individual without peering) is associated with a significant increase in nest practice and is primarily directed at multi-step nest elements. Dependent immatures mostly peer at their mothers and use nest tree species in common with her, independent immatures peer at a larger range of individuals and use nest tree species in common with them. Our results suggest that orangutans acquire their nest-building skills through observational social learning, selective attention to "know-how" and the transmission of "know-what" information.
https://www.nature.com/articles/s42003-025-08217-2

Nature Human Behaviour

PAPERS

BYUNGHWEE LEE et al – A semantic embedding space based on large language models for modelling human beliefs
Beliefs form the foundation of human cognition and decision-making, guiding our actions and social connections. A model encapsulating beliefs and their interrelationships is crucial for understanding their influence on our actions. However, research on belief interplay has often been limited to beliefs related to specific issues and has relied heavily on surveys. Here we propose a method to study the nuanced interplay between thousands of beliefs by leveraging online user debate data and mapping beliefs onto a neural embedding space constructed using a fine-tuned large language model. This belief space captures the interconnectedness and polarization of diverse beliefs across social issues. Our findings show that positions within this belief space predict new beliefs of individuals and estimate cognitive dissonance on the basis of the distance

between existing and new beliefs. This study demonstrates how large language models, combined with collective online records of human beliefs, can offer insights into the fundamental principles that govern human belief formation.
https://www.nature.com/articles/s41562-025-02228-z

Nature Scientific Reports

PAPERS

LEVEDA CHENG et al – Oxytocin activity is not linked to out-group prosociality in wild bonobos

In many group-living species, cooperative group defense is crucial to the reproduction and survival of group members. In humans and chimpanzees, this adaptive behavior is regulated by oxytocin, a highly conserved neurohormone. In humans, oxytocin can also enhance prosocial attitudes towards out-group individuals and reduces xenophobia. While the role of oxytocin in supporting cooperative group defense is likely evolutionarily ancient, it is unclear to what extent oxytocin's role in promoting out-group prosociality is conserved. Bonobos, our closest living relatives together with chimpanzees, can provide valuable insights into this question, because they are not known to engage in collective group defense but instead exhibit tolerance and prosocial behaviors across groups. Through examining variation in bonobo cooperative behavior, specifically coalition formation, we reinforce the idea that bonobo coalitions do not serve as a form of group defense. Despite increased competition, bonobos formed fewer coalitions in the presence of out-groups. Further, bonobo coalitions included both in- and out-group partners, reflecting reduced xenophobia and between-group cooperation. Physiologically, neither females nor males showed increased oxytocin activity with out-group presence. This suggests that, unlike in humans, oxytocin is not involved in regulating out-group prosociality in bonobos.
https://www.nature.com/articles/s41598-025-00209-w

R. JOLY-MASCHERONI et al – Chimpanzees yawn when observing an android yawn

This study explores contagious yawning in adult chimpanzees (Pan troglodytes) in the presence of a non-biological humanoid agent, an android. Chimpanzees observed an android portraying specific facial expressions, including yawns and gapes. The results showed that adult chimpanzees exhibited across-agent yawn contagion, with a graded response: the highest contagion occurred when the android displayed a fully wide-open mouth (Yawn condition), a reduced response when the mouth was partially opened (Gape condition), and no contagion when the android's mouth was closed (Close condition). Additionally, chimpanzees engaged in behaviours associated with drowsiness, such as gathering bedding materials, constructing nests, and lying down, while observing the android yawning. This suggests that yawning by an unfamiliar model may act as a contextual cue for rest, rather than merely triggering a motor resonance response. These findings contribute to the understanding of non-human primates' susceptibility to contagiously induced behaviours, specifically yawns, even when triggered by an artificial agent. This study highlights the role of social factors in shaping yawn contagion and calls for further research on cross-species and cross-agent interactions.
https://www.nature.com/articles/s41598-025-98639-z

New Scientist

NEWS

Do we have free will? Quantum experiments may soon reveal the answer

Whether or not we have partial free will could soon be resolved by experiments in quantum physics, with potential consequences for everything from religion to quantum computers.
https://www.newscientist.com/article/2481354-do-we-have-free-will-quantum-experiments-may-soon-reveal-the-answer/

Humans were crafting tools from whale bones 20,000 years ago

More than 60 ancient tools found in France and Spain have been identified as whale bone, and the evidence shows that people made tools from this material a thousand years earlier than previously thought.
https://www.newscientist.com/article/2481873-humans-were-crafting-tools-from-whale-bones-20000-years-ago/

ARTICLES

MICHAEL MARSHALL – We're about to unlock the secrets of ancient human brains

For the first time, we have a method for extracting proteins from preserved soft tissues like brains – which could be a treasure trove of evolutionary information.
https://www.newscientist.com/article/2481910-were-about-to-unlock-the-secrets-of-ancient-human-brains/

PeerJ

PAPERS

LINGHUA ZHONG et al – Neural mechanism of dopamine modulating singing related behavior in songbirds: an updated review

Similar to human language, songbird singing is a complex motor skill learning behavior that is regulated by an interconnected network of neural nuclei in the brain. This network of nuclei demonstrates structural homology with human vocal control-

related brain regions and shares common regulatory mechanisms for vocal learning. As an important neurotransmitter, dopamine plays a key role in the learning and maintenance of songbirds' singing behavior. Studies have demonstrated that the dopaminergic system plays a critical role in regulating the plasticity of singing via the midbrain dopamine pathway, which projects to the song control circuit. Novel experimental techniques, such as optogenetic circuit manipulation and neural activity monitoring, have significantly advanced our understanding of the cellular and synaptic mechanisms underlying vocalization behavior of dopamine effects. This review offers an updated insight into the neural mechanisms by which dopamine modulates singing-related behavior, along with future prospects for utilizing dopamine in the treatment of speech-related disorders.
https://peerj.com/articles/19500/

PLoS Biology

PAPERS

SAM HALL-MCMASTER et al – Neural evidence that humans reuse strategies to solve new tasks

Generalization from past experience is an important feature of intelligent systems. When faced with a new task, one efficient computational approach is to evaluate solutions to earlier tasks as candidates for reuse. Consistent with this idea, we found that human participants (n = 38) learned optimal solutions to a set of training tasks and generalized them to novel test tasks in a reward-selective manner. This behavior was consistent with a computational process based on the successor representation known as successor features and generalized policy improvement (SF&GPI). Neither model-free perseveration or model-based control using a complete model of the environment could explain choice behavior. Decoding from functional magnetic resonance imaging data revealed that solutions from the SF&GPI algorithm were activated on test tasks in visual and prefrontal cortex. This activation had a functional connection to behavior in that stronger activation of SF&GPI solutions in visual areas was associated with increased behavioral reuse. These findings point to a possible neural implementation of an adaptive algorithm for generalization across tasks.
https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3003174

PLoS One

PAPERS

ELIZABETH WARREN, EMMA SUVI MCEWEN & JOSEP CALL – Do chimpanzees (Pan troglodytes) mentally represent collaboration? Action-learning and communication in a partnered task

Non-human primates engage in complex collective behaviours, but existing research does not paint a clear picture of what individuals cognitively represent when they act together. This study investigates chimpanzees' capacity for co-representation. If individuals represent others' actions as they relate to their own during a collaborative task, they should more easily learn to reproduce that action when their roles are switched. In a between-subjects design, we trained ten chimpanzees (Pan troglodytes) on a sequential task, in which the first action is performed by either a human partner or a non-social object, and the second action is performed by the subject. We then imposed a breakdown in the action sequence, in which subjects could perform both actions themselves, but received no help from the experimenter or object. We measured subjects' success in reproducing the first action in the sequence, as well as their attempts to recruit the experimenter's help using requesting gestures. We found no overall difference in subjects' ability to perform the first action in the sequence, but we observed significant qualitative differences in their solutions: individuals in the partnered condition replicated the experimenter's action, while those in the non-social condition achieved the same end using alternative methods. This difference in solution style could indicate that only those chimpanzees in the partnered condition mentally represented the experimenter's action during the collaborative task. We caution, however, that given the small number of subjects who solved the task, this result could also be driven by individual differences. We also found that subjects consistently produced communicative gestures toward the experimenter, but were more likely to do so after exhausting all actions they could take alone. We suggest that these patterns of behaviour highlight a number of key empirical considerations for the study of coordination in non-human primates.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0325418

ANDREAS TROTZKE et al – Asking for help: An empirical exploration into social grammar

This paper explores the interface between linguistic form and social meaning by focusing on correlations between sentence type and the social distance between interlocutors—a central aspect of the social meaning component of politeness. We present a forced-choice experiment with four different groups of speakers (L1 British English speakers, L1 American English speakers, L2 English/German speakers, and L1 German speakers). In this experiment, we manipulated the linguistic form of asking for help along the syntactic dimension of sentence type (declaratives, interrogatives, or imperatives) and recorded the addressee our participants picked for each form (brother, coworker, or stranger). We broaden the empirical picture by going beyond highly conventionalized forms (e.g., Can you VP?) and therefore also varying the modal auxiliary verbs (e.g., Will you VP?). Based on this comprehensive picture of ways of asking for help, we identify clusters of linguistic forms depending on their felicity in different social scenarios. Our descriptive cluster analysis as well as the statistical comparisons between sentence types indicate that there are systematic correspondences between linguistic form and social meaning across

different groups of speakers and languages, and we propose that our empirical data provide a potential starting point for rethinking speech act grammar in terms of 'social grammar'.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0325598

IVAN COLAGÈ & FRANCESCO D'ERRICO – An empirically-based scenario for the evolution of cultural transmission in the human lineage during the last 3.3 million years
Humans accumulate an ever-growing body of knowledge that far exceeds the capacity of any single individual or generation. Social learning and transmission are essential for this process. However, how cultural transmission strategies evolved in our lineage remains unclear. Here we assess the transmission strategies needed to ensure the perpetuation across generations of 103 cultural traits that emerged in the Paleolithic. Our study provides a novel approach to assessing the transmission behaviors implicated in Paleolithic cultural traits and the evolution of cultural transmission over the last 3.3 million years. The results identify trends in the evolution of cultural transmission and reveal a coevolutionary dynamic between the emergence of novel cultural traits and the complexification of transmission strategies. While effective means of overt explanation, perhaps associating gesture and verbal expression, were already present at least 600,000 years ago, the period between 200,000 and 100,000 years ago appears as a crucial tipping point for the emergence of modern language.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0325059

FRANCESCO D'ERRICO et al – Multivariate analyses of Aurignacian and Gravettian personal ornaments support cultural continuity in the Early Upper Palaeolithic
Traditionally, lithic artefacts have served as the principal proxy for the definition of archaeological cultures in the Upper Paleolithic. However, the culture-historical framework in use, constructed unsystematically and shaped by regional research traditions, features a number of widely acknowledged drawbacks. Here we use personal ornaments to explore the nature of Early Upper Paleolithic cultural entities and establish to what extent they represent distinct or evolving cultural adaptations. We present an analysis of an updated georeferenced dataset composed of personal ornaments coming from two key successive Upper Paleolithic technocomplexes, the Aurignacian (42–34,000 years ago) and the Gravettian (34–24,000 years ago). Using a range of multivariate statistics, we demonstrate that, at both European and regional scales, people belonging to these technocomplexes wore similar personal ornaments, though fully-shaped personal ornaments appear more different between technocomplexes. We additionally show that the variability of the Aurignacian ornaments suggests more fragmented cultural clusters compared to the Gravettian, implying more extensive symbolic networks in the latter. Despite a long-standing consensus based on other archaeological proxies, which emphasises the dissimilarity between these cultural entities, our results demonstrate the complex nature of Upper Paleolithic cultures which are characterised by discontinuities in economic and technical systems and continuity in the culturalisation of the body.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0323148

Proceedings of the Royal Society B

PAPERS

LAURA SIMONE LEWIS et al with ALISON GOPNIK – Chimpanzees and children are curious about social interactions
Curiosity is adaptive, enhances learning, and reduces uncertainty. Social curiosity is defined as the motivation to gain information about the actions, relationships, and psychology of others. Little is known about the developmental and evolutionary roots of social curiosity. Here, across three comparative studies, we investigate whether chimpanzees (n = 27) and young children (4–6 years old, n = 94) show particular interest in social interactions among third parties. Chimpanzees and children preferred to watch videos of social interactions compared with videos of a single conspecific (Experiment 1) and young children and male chimpanzees even paid a material cost to gain social information (Experiment 2). Finally, our results show that boys become more curious about negative social interactions whereas girls become more curious about positive social interactions as they develop, while chimpanzees demonstrated no preference for negative versus positive social interactions (Experiment 3). Taken together, these findings suggest that social curiosity emerges early in human ontogeny and is shared with one of our two closest living relatives, the chimpanzees.
https://royalsocietypublishing.org/doi/full/10.1098/rspb.2024.2242

Trends in Cognitive Sciences

PAPERS

HALELY BALABAN & TOMER D. ULLMAN – Physics versus graphics as an organizing dichotomy in cognition
People build world models that simulate the dynamics of the real world. They do so in engineered systems for the purposes of scientific understanding or recreation, as well as in intuitive reasoning to predict and explain the environment. On the basis of a major split in the simulation of real-time dynamics in engineered systems, we argue that people's intuitive mental simulation includes a basic split between physical simulation and graphical rendering. We first show how the separation between physics and graphics relies on a natural division of labor in any cognitive system. We then use the physics/graphics distinction to tie together and explain a range of classic and recent findings across different domains in cognitive science and neuroscience, including aphantasia and imagery, different visual streams, and object tracking.

https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(25)00116-0

SUBSCRIBE to the EAORC Bulletin

If you would like to subscribe to this free weekly newsletter, please contact martin.edwardes@btopenworld.com.

UNSUBSCRIBE from the EAORC Bulletin

Send an email to martin.edwardes@btopenworld.com with the subject "EAORC unsubscribe".

PRODUCED BY AND FOR THE EAORC EMAIL GROUP

EAORC is a fee-free academic internet news service and has no commercial sponsorship or other commercial interests.
EAORC website information is at http://martinedwardes.me.uk/eaorc/
If you have received this bulletin, and are unhappy about receiving it, please contact martin.edwardes@btopenworld.com.