

EAORC BULLETIN 1,079 – 18 February 2024

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NOTICES

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.

If there is a journal you feel I should be tracking on a regular basis, let me know.

And if you have any other ideas for extending the “EAORC experience”, please contact me.

EDITORIAL INTERJECTIONS

Comments in curly brackets are editorial interjections. The Editor reserves the right to be wrong.

ACADEMIA.EDU – The specificity of the human conceptual apparatus

In Cognition and Communication in the Evolution of Language, Oxford University Press, 59-114, ch3 (2017).

ANNE REBOUL – The specificity of the human conceptual apparatus

As we saw in Chapter 3, most theories of language evolution see language as a communication system in the strong sense that it has evolved for communication. Rather naturally, given that communication is the epitome of a communication system, this has led them to propose social scenarios for language evolution. One deep problem regarding language is its uniqueness. This means that, even in scenarios that see it as continuous with other animal communication systems, some discontinuity has to be postulated to explain why no other ape has developed as complex a communication system. On social scenarios, this entails locating this discontinuity in social factors. Here, two paths are available: the first one is to postulate a discontinuity in social organization; the second one is to locate the discontinuity in a change of social attitudes. This second path has been chosen by Tomasello (see, e.g., Tomasello 2009, 2010), who argues that humans are unique among primates (including apes) in being altruistically cooperative. This claim is justified on the basis that humans are ready to help even strangers that they meet on a one-off basis. This, or so it is argued, is enough to show that human cooperation is not due to reciprocal altruism (see Trivers 2002), as in reciprocal altruism organisms help others who will in return help them later on (in other words, it is a form of delayed mutualism, in which both the agent and the recipient benefit in the end). Given that helping a stranger that one will never meet again prevents any hope of such reciprocity, human cooperation is altruistic, rather than reciprocal, showing a deep change in pro-social attitude in humans as compared to apes. There are problems with this argument, the main one being that such help towards strangers, while it occurs in developed societies, seems extremely restricted if not entirely non-existent among people living in hunter-gatherer societies, where strangers may be offered violence rather than help (see, e.g., Keeley 1996, and, on a more anecdotal basis, Diamond 2012 and Chagnon 2013). Incidentally, a look at history may make one doubtful of human benevolence (see Kershaw 2008; Lifton 2011; Pinker 2011). What may even be a more serious counterargument is that it is not clear that the simplistic slogans ‘Nice humans, nasty apes’ or ‘Cooperative humans, competitive chimps’ are really supported by a careful comparison of social attitudes (as manifested in action) between humans and apes. For instance, it has been shown that chimpanzees can cooperate in hunting (see Boesch and Boesch 1989; Boesch 1994a,b, 2002, 2005), and occasionally act in an altruistic manner (for example, by adopting orphans—see Boesch et al. 2010—and effecting reconciliation—see Wittig and Boesch 2005). Finally, Tomasello completely ignores the second chimpanzee species, bonobos, which arguably is on a par with humans in terms of cooperation even with strangers (see de Waal 2013 for a general argument to that effect).

[https://www.academia.edu/47208492/Cognition and Communication in the Evolution of Language](https://www.academia.edu/47208492/Cognition_and_Communication_in_the_Evolution_of_Language)

ACADEMIA.EDU – Tracing the History of Bears as Healers

Roslyn M. Frank publications (2022).

ROSLYN M. FRANK – Bear Doctors: Tracing the History of Bears as Healers and How They Became Christian Saints

This monograph seeks answers to several questions relating to the intersection of two beliefs systems, two fundamentally opposed cosmologies, one anthropocentric and another opposed to that position. The first is built on the categories typically utilized in Western thought and, as such, will be familiar to most readers. In it, human beings are conceptualized as having been created in the image of an anthropomorphically configured deity, e.g., the Christian God, whereas other animals are assigned a lower rung on the great ladder of being. As Thompson has noted, “[s]uch an assumption is in line with Abrahamic mythological discourses that emphasize the absolute categorical difference between humans and all other forms of life (‘God made man in His image’)” (Thompson, 2018: 74). Implicit in this quite well-known and widely accepted cosmology is the assumption that agency should be solely assigned to the realm of the human. In addition, forms of superhuman agency, including the miraculous power to heal, are commonly attributed to anthropomorphically conceived figures who often fall into the category of Christian saints.

[https://www.academia.edu/86411447/Shamanism in Europe Part 3 Bear Doctors Tracing the History of Bears as Healers and How They Became Christian Saints](https://www.academia.edu/86411447/Shamanism_in_Europe_Part_3_Bear_Doctors_Tracing_the_History_of_Bears_as_Healers_and_How_They_Became_Christian_Saints)

ACADEMIA.EDU – Persistence of Middle Stone Age technology to the Pleistocene/Holocene transition

Journal of Archaeological Science: Reports 11, 639-646 (2017).

ELEANOR M.L. SCERRI et al with HUW S. GROUCUTT – Persistence of Middle Stone Age technology to the Pleistocene/Holocene transition supports a complex hominin evolutionary scenario in West Africa

The evolutionary origins of Homo sapiens and associated behavioural changes are increasingly seen as complex processes, involving multiple regions of Africa. In West Africa, Terminal Pleistocene/Holocene aged human fossils, demonstrating the late continuity of archaic morphological features in the region have been linked to models of surprisingly recent admixture processes between late archaic hominins and H. sapiens. However, the limited chronological resolution of the archaeological record has prevented evaluation of how these biological records relate to patterns of behaviour. Here, we provide a preliminary report of the first excavated and dated Stone Age site in northern Senegal which features the youngest Middle Stone Age (MSA) technology yet documented in Africa. Ndiayène Pendao features classic MSA core axes, basally thinned flakes, Levallois points and denticulates mostly made from chert. Similar technological features characterise several, larger surface sites in the vicinity. From this, it is postulated that populations using ‘anachronistic’ technologies in the Lower Senegal Valley around the transition to the Holocene may have been widespread, in sharp contrast to other areas of Senegal and West Africa. The chronology and technology of Ndiayène Pendao provides the first cultural evidence to support a complex evolutionary history in West Africa. This is consistent with a persistently high degree of Pleistocene population substructure in Africa and the spatially and temporally complex character of behavioural and biological evolution.

[https://www.academia.edu/30917161/Persistence of Middle Stone Age technology to the Pleistocene Holocene transition supports a complex hominin evolutionary scenario in West Africa](https://www.academia.edu/30917161/Persistence_of_Middle_Stone_Age_technology_to_the_Pleistocene_Holocene_transition_supports_a_complex_hominin_evolutionary_scenario_in_West_Africa)

ACADEMIA.EDU – An Archaeological Perspective on Human Cognitive Evolution

Journal of Cognition and Culture 19, 39-58 (2019).

KARENLEIGH A. OVERMANN & THOMAS WYNN – On Tools Making Minds: An Archaeological Perspective on Human Cognitive Evolution

Using a model of cognition as extended and enactive, we examine the role of materiality in making minds as exemplified by lithics and writing, forms associated with conceptual thought and meta-awareness of conceptual domains. We address ways in which brain functions may change in response to interactions with material forms, the attributes of material forms that may cause such change, and the spans of time required for neurofunctional reorganization. We also offer three hypotheses for investigating co-influence and change in cognition and material culture.

[https://www.academia.edu/67448256/On tools making minds An archaeological perspective on human cognitive evolution](https://www.academia.edu/67448256/On_tools_making_minds_An_archaeological_perspective_on_human_cognitive_evolution)

LECTURE ALERT – Symbol Grounding in humans

I'm please to invite you to our next talk in the Linguistics Seminars Series. The talk will be given by Mutsumi Imai, Keio University (Tokyo), and it will be held on Zoom, at 10am (UK time) on the 28th of February. Please see below for the details. Note that this is an online talk and will be held on Zoom. Please use this link to join:

<https://ucl.zoom.us/j/93367144409>

Meeting ID: 933 6714 4409

Title: Symbol Grounding in humans: The roles of iconicity and abductive inference in the acquisition and evolution of language

Abstract:

In 1990, Steven Harnad first proposed the “symbol grounding problem” in the context to criticize Artificial Intelligence using a symbolic approach at that time. He pointed out that symbols cannot acquire meanings through transformations of other symbols, arguing that symbols must be connected to the world, especially to the body (Harnad, 1990). Interestingly, after 30 years, people may think that the Symbol Grounding problem has been overcome by recent Generative AIs, but no matter how fluent and natural the generated language is, words are still not anchored to the world or the body.

In this talk, I address the process of symbol grounding in humans considering both language acquisition and language evolution. Language may be understood as a socially shared symbolic system (Nelson & Shaw, 2002). In my view, to solve the “symbol grounding problem” (Harnad, 2003), we need to understand not only how children map their physical and sensory experiences to the first set of symbols but also how they go from the “here and now” and climb the ladder into an interconnected system of socially shared, more or less abstract concepts, which are largely language-specific.

I consider two abilities of human children that play key roles in language learning. One is the ability to detect cross-modal iconicity between sound and other sensory modalities. However, as I show, this ability is not sufficient to initiate language learning. Language learning, particularly learning of word meanings, requires chains of abductive inference, in which different sources of knowledge and perceptual and contextual cues must be properly weighed and combined (Imai, 2017).

I present the results of two research programs from my laboratory. I will first show that preverbal infants can detect sound-meaning correspondence of novel words and discuss the implications of these findings (Asano et al., 2015; Yang et al., 2019). I then show that human infants have the ability (or disposition) to make abductive inferences at the age of 8 months, and this divides humans and non-human animal species in their ability to learn language (Imai et al., 2021). In the end, I will explore how these two elements—the ability to detect iconicity across different sensory modalities and the ability to draw abductive inference—might have kick-started the use of language in our ancestors.

NEWS

KINGUISTICS – Chomsky Who? AI Baby Contradicts Linguistic Innateness

Very recently – as in within 11 days of this article’s publication – an incredible piece of research has been unveiled relating directly to children’s language acquisition.

<https://kinguistics.wordpress.com/2024/02/15/chomsky-who-ai-baby-contradicts-linguistic-innateness/>

NATURE BRIEFING – Apes like to monkey around

Young great apes like to playfully hit or poke or pull the hair of older apes — just like human children do to adults. A study of zoo-kept bonobos, chimpanzees, gorillas and orangutans suggests that the cognitive tools for ‘joking around’ might date back at least 13 million years ago, to our last common ancestor. “Playful teasing is a thing,” says anthropologist and study co-author Erica Cartmill. It brings up questions “about what animals understand about other animals’ minds, expectations and the strength of their relationships”, she says.

<https://www.washingtonpost.com/climate-environment/2024/02/13/apes-primates-joking-teasing-study/>

ROYAL SOCIETY – Consciousness in humans and in other things

Join us for the Michael Faraday Prize Lecture given by 2023 winner Professor Anil Seth.

<https://royalsociety.org/science-events-and-lectures/2024/03/faraday-prize-lecture/>

SCIENCEADVISER – Submerged wall shows ancient hunters’ smarts

Scientists scanning the floor of the Baltic Sea for minerals weren’t expecting to find evidence of the hunting prowess of early Europeans. But that’s exactly what they did: Their acoustic images showed a submerged linear wall of stones nearly a kilometer long. Underwater drone images revealed the wall was made of more than 1,500 stones, mostly tennis-or-soccer-ball-sized chunks of granite. In a paper published yesterday in Proceedings of the National Academy of Sciences, the team argues the structure was human-made, built to help people hunt reindeer at the end of the last ice age, perhaps around 10,000 years ago.

<https://www.science.org/content/article/strange-wall-stones-found-beneath-baltic-sea-may-have-helped-humans-hunt-reindeer>

SCIENCEADVISER – ‘Tag!’ Other great apes share our affinity for playful teasing

Surprisingly similar teasing behaviors across species suggest it evolved at least 13 million years ago.

<https://www.science.org/content/article/tag-other-great-apes-share-affinity-playful-teasing>

SCIENCE.ORG NEWS – Strange wall of stones found beneath Baltic Sea helped humans hunt reindeer

“Sensational” find shows people built structure 8500 years ago to herd animals to their death.

<https://www.science.org/content/article/strange-wall-stones-found-beneath-baltic-sea-may-have-helped-humans-hunt-reindeer>

SCIENCE.ORG NEWS – Vendor offering citations for purchase is latest bad actor in scholarly publishing

Unscrupulous researchers have many options for gaming citations metrics, new study highlights.

<https://www.science.org/content/article/vendor-offering-citations-purchase-latest-bad-actor-scholarly-publishing>

THE CONVERSATION – Stone Age ‘megastructure’ under Baltic Sea sheds light on Palaeolithic over 10kya

The find represents Europe’s largest human-made megastructure.

<https://theconversation.com/stone-age-megastructure-under-baltic-sea-sheds-light-on-strategy-used-by-palaeolithic-hunters-over-10-000-years-ago-223665>

PUBLICATIONS

Cell

PAPERS

HUGO ZEBERG, MATTIAS JAKOBSSON & SVANTE PÄÄBO – The genetic changes that shaped Neandertals, Denisovans, and modern humans

Modern human ancestors diverged from the ancestors of Neandertals and Denisovans about 600,000 years ago. Until about 40,000 years ago, these three groups existed in parallel, occasionally met, and exchanged genes. A critical question is why modern humans, and not the other two groups, survived, became numerous, and developed complex cultures. Here, we discuss genetic differences among the groups and some of their functional consequences. As more present-day genome sequences become available from diverse groups, we predict that very few, if any, differences will distinguish all modern humans from all Neandertals and Denisovans. We propose that the genetic basis of what constitutes a modern human is best thought of as a combination of genetic features, where perhaps none of them is present in each and every present-day individual.

[https://www.cell.com/cell/abstract/S0092-8674\(23\)01403-4](https://www.cell.com/cell/abstract/S0092-8674(23)01403-4)

Current Biology

PAPERS

FENGJUN MA, LINGWEI ZHANG & JINGFENG ZHOU – Event-specific and persistent representations for contextual states in orbitofrontal neurons

Flexible and context-dependent behaviors require animals, including humans, to identify their current contextual state for proper rules to apply, especially when information that defines these states is partially observable. Depending on behavioral needs, contextual states usually persist for prolonged periods and across other events, including sensory stimuli, actions, and rewards, highlighting prominent challenges of holding a reliable state representation. The orbitofrontal cortex (OFC) is crucial in behaviors requiring the identification of the current context (e.g., reversal learning); however, how single units in the OFC accomplish this function has not been assessed. Do they maintain such information persistently, in separate populations from those responding phasically to events within a task, or is contextual information dynamic and embedded in these phasic responses? Here, we investigated this question by recording single units from OFC in rats performing a task that required them to identify the current contextual state related to estimated proximity to future reward with distracting olfactory cues. We found that while some OFC neurons encode contextual states, most change their selectivity upon the transition of task events. Nevertheless, despite dynamic activities in single neurons, the neural populations maintain persistent representations regarding current contextual states within particular neural subspaces.

[https://www.cell.com/current-biology/abstract/S0960-9822\(24\)00097-6](https://www.cell.com/current-biology/abstract/S0960-9822(24)00097-6)

eLife

NEWS

The social brain

Scientists develop a new device to measure how different parts of the brain communicate during social interactions.

<https://elifesciences.org/digests/88439/the-social-brain>

PAPERS

NOÉMIE TE RIETMOLEN et al – Speech and music recruit frequency-specific distributed and overlapping cortical networks

To what extent does speech and music processing rely on domain-specific and domain-general neural networks? Using whole-brain intracranial EEG recordings in 18 epilepsy patients listening to natural, continuous speech or music, we investigated the presence of frequency-specific and network-level brain activity. We combined it with a statistical approach in which a clear distinction is made between shared, preferred, and domain-selective neural responses. We show that the majority of focal and network-level neural activity is shared between speech and music processing. Our data also reveal an absence of anatomical regional selectivity. Instead, domain-selective neural responses are restricted to distributed and frequency-specific coherent oscillations, typical of spectral fingerprints. Our work highlights the importance of considering natural stimuli and brain dynamics in their full complexity to map cognitive and brain functions.

<https://elifesciences.org/reviewed-preprints/94509>

Evolutionary Anthropology

PAPERS

BROOKE A. SCELZA – The cuckoldry conundrum

Concerns about cuckoldry are a dominant theme in evolutionary studies of mating, frequently used to explain sex differences in reproductive strategies. However, studies in nonhuman species have shown that cuckoldry can be associated with important benefits. These insights have not been well integrated with the human literature, which continues to focus on

anticuckoldry tactics and negative repercussions for men. I evaluate two key assumptions central to human models of cuckoldry: (1) men are being tricked into investing in nonbiological offspring and (2) investment in nonbiological offspring is wasted. The ethnographic data on fatherhood shows that the concepts of pater and genitor are complex and locally constructed ideas that often include explicit knowledge of extra-pair paternity, countering the idea that nonpaternity results from trickery. Furthermore, rather than being a “waste,” paternity loss can be associated with important gains for men, helping to explain why men invest in nonbiological offspring.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.22023>

Frontiers in Earth Science

PAPERS

ARIANA DANN et al – Changes in human calcaneal morphology throughout the Pleistocene-Holocene Levant

The calcaneal morphology changed considerably during human evolution to enable efficient bipedal locomotion. However, little information exists regarding its adaptation to changes in habitual activities following the transition to a sedentary lifestyle. We aimed to examine changes in calcaneal morphology during the Pleistocene-Holocene Levant in light of sexual dimorphism. We studied three archaic *Homo sapiens* calcanei dated to the Middle and Upper Paleolithic, 23 Natufian hunter-gatherers, 12 Pre-Pottery Neolithic early farmers, and 31 Chalcolithic farmers. The calcanei were scanned via a surface scanner and measured, and bone proportions were calculated. Measurements included the height, length, and width of various calcaneal elements. The sex of each individual was determined using methods based on calcaneal morphology. The validity of these methods was tested in those individuals who had the pelvis (92.3% agreement rate). Accordingly, the sample included 59.4% males and 40.6% females. Most calcaneal indices were sex-independent, except for the relative width, relative anterior length, and the cuboid index. Temporal trends between the Natufian and Chalcolithic periods were more pronounced among males than females. While in the proximal calcaneus, the temporal trend was similar between males and females, it differed in the distal part and articular facets. The calcanei of archaic *H. sapiens* exceeded the average of the Natufian hunter-gatherer for most variables, though the trend varied. To conclude, males and females were affected differently by the changing environment. The calcanei of archaic *H. sapiens* were better adapted for activity involving high mobility, independent of sex. During the transition to a sedentary way of life, different factors probably designed the male and female calcaneus. These could include factors related to the sexual division of labor, adaptation to lengthy standing, and changes in footwear.

<https://www.frontiersin.org/articles/10.3389/feart.2024.1294350/full>

Frontiers in Integrative Neuroscience

PAPERS

LEONARDO TARICIOTTI et al – Object-oriented hand dexterity and grasping abilities, from the animal quarters to the neurosurgical OR: a systematic review of the underlying neural correlates in non-human, human primate and recent findings in awake brain surgery

The sensorimotor integrations subserving object-oriented manipulative actions have been extensively investigated in non-human primates via direct approaches, as intracortical micro-stimulation (ICMS), cytoarchitectonic analysis and anatomical tracers. However, the understanding of the mechanisms underlying complex motor behaviors is yet to be fully integrated in brain mapping paradigms and the consistency of these findings with intraoperative data obtained during awake neurosurgical procedures for brain tumor removal is still largely unexplored. Accordingly, there is a paucity of systematic studies reviewing the cross-species analogies in neural activities during object-oriented hand motor tasks in primates and investigating the concordance with intraoperative findings during brain mapping. The current systematic review was designed to summarize the cortical and subcortical neural correlates of object-oriented fine hand actions, as revealed by fMRI and PET studies, in non-human and human primates and how those were translated into neurosurgical studies testing dexterous hand-movements during intraoperative brain mapping.

A systematic literature review was conducted following the PRISMA guidelines. PubMed, EMBASE and Web of Science databases were searched. Original articles were included if they: (1) investigated cortical activation sites on fMRI and/or PET during grasping task; (2) included humans or non-human primates. A second query was designed on the databases above to collect studies reporting motor, hand manipulation and dexterity tasks for intraoperative brain mapping in patients undergoing awake brain surgery for any condition. Due to the heterogeneity in neurosurgical applications, a qualitative synthesis was deemed more appropriate.

We provided an updated overview of the current state of the art in translational neuroscience about the extended frontoparietal grasping-praxis network with a specific focus on the comparative functioning in non-human primates, healthy humans and how the latter knowledge has been implemented in the neurosurgical operating room during brain tumor resection.

The anatomical and functional correlates we reviewed confirmed the evolutionary continuum from monkeys to humans, allowing a cautious but practical adoption of such evidence in intraoperative brain mapping protocols. Integrating the previous results in the surgical practice helps preserve complex motor abilities, prevent long-term disability and poor quality of life and allow the maximal safe resection of intrinsic brain tumors.

<https://www.frontiersin.org/articles/10.3389/fnint.2024.1324581/full>

Frontiers in Psychology

PAPERS

JOSEPH JORDANIA – Music as aposematic signal: predator defense strategies in early human evolution

The article draws attention to a neglected key element of human evolutionary history—the defense strategies of hominins and early humans against predators. Possible reasons for this neglect are discussed, and the historical development of this field is outlined. Many human morphological and behavioral characteristics—musicality, sense of rhythm, use of dissonances, entrainment, bipedalism, long head hair, long legs, strong body odor, armpit hair, traditions of body painting and cannibalism—are explained as predator avoidance tactics of an aposematic (warning display) defense strategy. The article argues that the origins of human musical faculties should be studied in the wider context of an early, multimodal human defense strategy from predators.

<https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2023.1271854/full>

JOSEPH LESHIN et al – Language access differentially alters functional connectivity during emotion perception across cultures

It is often assumed that the ability to recognize the emotions of others is reflexive and automatic, driven only by observable facial muscle configurations. However, research suggests that accumulated emotion concept knowledge shapes the way people perceive the emotional meaning of others' facial muscle movements. Cultural upbringing can shape an individual's concept knowledge, such as expectations about which facial muscle configurations convey anger, disgust, or sadness.

Additionally, growing evidence suggests that access to emotion category words, such as “anger,” facilitates access to such emotion concept knowledge and in turn facilitates emotion perception.

To investigate the impact of cultural influence and emotion concept accessibility on emotion perception, participants from two cultural groups (Chinese and White Americans) completed a functional magnetic resonance imaging scanning session to assess functional connectivity between brain regions during emotion perception. Across four blocks, participants were primed with either English emotion category words (“anger,” “disgust”) or control text (XXXXXX) before viewing images of White American actors posing facial muscle configurations that are stereotypical of anger and disgust in the United States. We found that when primed with “disgust” versus control text prior to seeing disgusted facial expressions, Chinese participants showed a significant decrease in functional connectivity between a region associated with semantic retrieval (the inferior frontal gyrus) and regions associated with semantic processing, visual perception, and social cognition. Priming the word “anger” did not impact functional connectivity for Chinese participants relative to control text, and priming neither “disgust” nor “anger” impacted functional connectivity for White American participants.

These findings provide preliminary evidence that emotion concept accessibility differentially impacts perception based on participants' cultural background.

<https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2023.1084059/full>

NAN XU RATTANASONE & JAE-HYUN KIM – Acquisition pattern and the role of vocabulary and language experience in the acquisition of inflectional grammar by Mandarin-English speaking preschoolers

Australian Mandarin-English bilingual preschoolers must acquire linguistic structures that occur only in the community language (e.g., English inflectional grammar). This study investigated how they acquire such structures and any relationship between linguistic knowledge and language experience on their performance. Twenty 4–6-year-olds showed known monolingual acquisition patterns with good performance for producing the progressive, developing ability for plurals, but only emerging ability for past and present tense. Better performance was related to a larger English vocabulary, more mixed language input and use, but less Mandarin input and use. On average, these children received less than 50% input in English and were performing behind monolinguals.

<https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2024.1302044/full>

Heliyon

PAPERS

LINLIN ZHAN et al – Brain functional connectivity alterations of Wernicke's area in individuals with autism spectrum conditions in multi-frequency bands: A mega-analysis

Characterized by severe deficits in communication, most individuals with autism spectrum conditions (ASC) experience significant language dysfunctions, thereby impacting their overall quality of life. Wernicke's area, a classical and traditional brain region associated with language processing, plays a substantial role in the manifestation of language impairments. The current study carried out a mega-analysis to attain a comprehensive understanding of the neural mechanisms underpinning ASC, particularly in the context of language processing. The study employed the Autism Brain Image Data Exchange (ABIDE) dataset, which encompasses data from 443 typically developing (TD) individuals and 362 individuals with ASC. The objective was to detect abnormal functional connectivity (FC) between Wernicke's area and other language-related functional regions, and identify frequency-specific altered FC using Wernicke's area as the seed region in ASC. The findings revealed that increased FC in individuals with ASC has frequency-specific characteristics. Further, in the conventional frequency band

(0.01–0.08 Hz), individuals with ASC exhibited increased FC between Wernicke's area and the right thalamus compared with TD individuals. In the slow-5 frequency band (0.01–0.027 Hz), increased FC values were observed in the left cerebellum Crus II and the right lenticular nucleus, pallidum. These results provide novel insights into the potential neural mechanisms underlying communication deficits in ASC from the perspective of language impairments.

[https://www.cell.com/heliyon/fulltext/S2405-8440\(24\)02229-1](https://www.cell.com/heliyon/fulltext/S2405-8440(24)02229-1)

XIAOYU LUAN et al – The effect of previously acquired languages on third language acquisition

Our study explores how previously acquired languages affect third language (L3) acquisition. The learning and control groups composed adpositional phrases and relative clauses, and then judged sentences with strict/sloppy readings presented in their L3. The results showed that native Japanese learners of Chinese were more influenced by the second language (English) for adpositional phrases and relative clauses than were native Chinese learners of Japanese, although both were influenced more by their native than second language (English) in strict/sloppy interpretation. This indicates that L3 acquisition can be influenced by all previously acquired languages and that the interrelationship between the positions of subgrammars in a sentence structure may influence learners' assessment of the structural similarity of the selected subgrammars, making it an important trigger for non-facilitative transfer. Overall, structural similarities played a stronger role than did typological proximity. This study differs from traditional models of L3 acquisition that focus on wholesale or property transfer by beginning with an investigation of the conditions under which non-facilitative transfers occur. These two perspectives are integrated in terms of cognitive economy, pointing to a more promising direction for L3 acquisition research in the future.

[https://www.cell.com/heliyon/fulltext/S2405-8440\(24\)02233-3](https://www.cell.com/heliyon/fulltext/S2405-8440(24)02233-3)

MARK ALFANO, MARC CHEONG & OLIVER SCOTT CURRY – Moral universals: A machine-reading analysis of 256 societies

What is the cross-cultural prevalence of the seven moral values posited by the theory of “morality-as-cooperation”? Previous research, using laborious hand-coding of ethnographic accounts of ethics from 60 societies, found examples of most of the seven morals in most societies, and observed these morals with equal frequency across cultural regions. Here we replicate and extend this analysis by developing a new Morality-as-Cooperation Dictionary (MAC-D) and using Linguistic Inquiry and Word Count (LIWC) to machine-code ethnographic accounts of morality from an additional 196 societies (the entire Human Relations Area Files, or HRAF, corpus). Again, we find evidence of most of the seven morals in most societies, across all cultural regions. The new method allows us to detect minor variations in morals across region and subsistence strategy. And we successfully validate the new machine-coding against the previous hand-coding. In light of these findings, MAC-D emerges as a theoretically-motivated, comprehensive, and validated tool for machine-reading moral corpora. We conclude by discussing the limitations of the current study, as well as prospects for future research.

[https://www.cell.com/heliyon/fulltext/S2405-8440\(24\)01971-6](https://www.cell.com/heliyon/fulltext/S2405-8440(24)01971-6)

Nature

NEWS

What a tease! Great apes pull hair and poke each other for fun

The animals' shenanigans hint that mischievous play evolved well before Homo sapiens did.

<https://www.nature.com/articles/d41586-024-00410-3>

PAPERS

M. FRANCH et al – Visuo-frontal interactions during social learning in freely moving macaques

Social interactions represent a ubiquitous aspect of our everyday life that we acquire by interpreting and responding to visual cues from conspecifics. However, despite the general acceptance of this view, how visual information is used to guide the decision to cooperate is unknown. Here, we wirelessly recorded the spiking activity of populations of neurons in the visual and prefrontal cortex in conjunction with wireless recordings of oculomotor events while freely moving macaques engaged in social cooperation. As animals learned to cooperate, visual and executive areas refined the representation of social variables, such as the conspecific or reward, by distributing socially relevant information among neurons in each area. Decoding population activity showed that viewing social cues influences the decision to cooperate. Learning social events increased coordinated spiking between visual and prefrontal cortical neurons, which was associated with improved accuracy of neural populations to encode social cues and the decision to cooperate. These results indicate that the visual-frontal cortical network prioritizes relevant sensory information to facilitate learning social interactions while freely moving macaques interact in a naturalistic environment.

<https://www.nature.com/articles/s41586-024-07084-x>

Nature Human Behaviour

PAPERS

PEDRO ACEVES & JAMES A. EVANS – Human languages with greater information density have higher communication speed but lower conversation breadth

Human languages vary widely in how they encode information within circumscribed semantic domains (for example, time, space, colour, human body parts and activities), but little is known about the global structure of semantic information and nothing about its relation to human communication. We first show that across a sample of ~1,000 languages, there is broad variation in how densely languages encode information into words. Second, we show that this language information density is associated with a denser configuration of semantic information. Finally, we trace the relationship between language information density and patterns of communication, showing that informationally denser languages tend towards faster communication but conceptually narrower conversations or expositions within which topics are discussed at greater depth. These results highlight an important source of variation across the human communicative channel, revealing that the structure of language shapes the nature and texture of human engagement, with consequences for human behaviour across levels of society.

<https://www.nature.com/articles/s41562-024-01815-w>

SABINA GHERMAN et al – Intracranial electroencephalography reveals effector-independent evidence accumulation dynamics in multiple human brain regions

Neural representations of perceptual decision formation that are abstracted from specific motor requirements have previously been identified in humans using non-invasive electrophysiology; however, it is currently unclear where these originate in the brain. Here we capitalized on the high spatiotemporal precision of intracranial EEG to localize such abstract decision signals. Participants undergoing invasive electrophysiological monitoring for epilepsy were asked to judge the direction of random-dot stimuli and respond either with a speeded button press (N = 24), or vocally, after a randomized delay (N = 12). We found a widely distributed motor-independent network of regions where high-frequency activity exhibited key characteristics consistent with evidence accumulation, including a gradual buildup that was modulated by the strength of the sensory evidence, and an amplitude that predicted participants' choice accuracy and response time. Our findings offer a new view on the brain networks governing human decision-making.

<https://www.nature.com/articles/s41562-024-01824-9>

Nature Humanities & Social Sciences Communications

PAPERS

ONE-SOON HER et al – Early humans out of Africa had only base-initial numerals

The vast majority of languages have numerals involving multiplication. Cross-linguistically, a numeral that involves a multiplier and a numeral base can be base-final, e.g., three hundred [three × hundred] in English, or base-initial, e.g., ikie ita [hundred × three] in Ibibio (Niger-Congo). A worldwide survey of 4099 languages reveals that 39% of the languages are base-initial, 48% are base-final, 4% use both orders, and 8% are without numeral bases. As the first step towards explaining this diversity and worldwide distribution, we offer convergent evidence to support the hypothesis that the languages of early humans in Africa had base-initial numerals. From a linguistic point of view, linearization is necessary for the verbal expression of multiplicative numerals. Between the two linear orders of multiplication, we demonstrate that the base-initial order has an initial advantage in communicative efficiency. We also offer typological evidence from the dominant head-initial word order in present-day numeral systems and nominal phrases in African languages. Finally, results from a phylogenetic analysis based on a global tree of human languages show that the base-initial order is more stable diachronically and more likely to be at the root of the reconstructed tree of languages in Africa between 100 and 150 thousand years ago. The dominant base-final order in non-African languages of modernity is thus likely to be a development after the Out-of-Africa exodus between 60 and 80 thousand years ago.

<https://www.nature.com/articles/s41599-023-02506-z>

Nature Italy

NEWS

Spotting lies with artificial intelligence

A large language model reached 80% accuracy in recognising truth and deception in text.

<https://www.nature.com/articles/d43978-024-00029-y>

Nature Neuroscience**ARTICLES****TAO HONG & WILLIAM R. STAUFFER – Anterior cingulate learns reward distribution**

Muller et al. demonstrate that reward signals recorded from the frontal cortex of nonhuman primates exhibit a population-based scheme for learning probability distributions over reward values. This study provides evidence that neural signals outside of the midbrain reflect the principles of distributional reinforcement-learning theory.

<https://www.nature.com/articles/s41593-024-01571-0>

Nature Scientific Reports**PAPERS****HYUN-WOONG KIM et al – Rhythmic motor behavior explains individual differences in grammar skills in adults**

A growing body of literature has reported the relationship between music and language, particularly between individual differences in perceptual rhythm skill and grammar competency in children. Here, we investigated whether motoric aspects of rhythm processing—as measured by rhythmic finger tapping tasks—also explain the rhythm-grammar connection in 150 healthy young adults. We found that all expressive rhythm skills (spontaneous, synchronized, and continued tapping) along with rhythm discrimination skill significantly predicted receptive grammar skills on either auditory sentence comprehension or grammaticality well-formedness judgment (e.g., singular/plural, past/present), even after controlling for verbal working memory and music experience. Among these, synchronized tapping and rhythm discrimination explained unique variance of sentence comprehension and grammaticality judgment, respectively, indicating differential associations between different rhythm and grammar skills. Together, we demonstrate that even simple and repetitive motor behavior can account for seemingly high-order grammar skills in the adult population, suggesting that the sensorimotor system continue to support syntactic operations.

<https://www.nature.com/articles/s41598-024-53382-9>

HIROHITO M. KONDO et al – Functional coupling between auditory memory and verbal transformations

The ability to parse sound mixtures into coherent auditory objects is fundamental to cognitive functions, such as speech comprehension and language acquisition. Yet, we still lack a clear understanding of how auditory objects are formed. To address this question, we studied a speech-specific case of perceptual multistability, called verbal transformations (VTs), in which a variety of verbal forms is induced by continuous repetition of a physically unchanging word. Here, we investigated the degree to which auditory memory through sensory adaptation influences VTs. Specifically, we hypothesized that when memory persistence is longer, participants are able to retain the current verbal form longer, resulting in sensory adaptation, which in turn, affects auditory perception. Participants performed VT and auditory memory tasks on different days. In the VT task, Japanese participants continuously reported their perception while listening to a Japanese word (2- or 3-mora in length) played repeatedly for 5 min. In the auditory memory task, a different sequence of three morae, e.g., /ka/, /hi/, and /su/, was presented to each ear simultaneously. After some period (0–4 s), participants were visually cued to recall one of the sequences, i.e., in the left or right ear. We found that delayed recall accuracy was negatively correlated with the number of VTs, particularly under 2-mora conditions. This suggests that memory persistence is important for formation and selection of perceptual objects.

<https://www.nature.com/articles/s41598-024-54013-z>

KENT F. HUBERT, KIM N. AWA & DARYA L. ZABELINA – The current state of artificial intelligence generative language models is more creative than humans on divergent thinking tasks

The emergence of publicly accessible artificial intelligence (AI) large language models such as ChatGPT has given rise to global conversations on the implications of AI capabilities. Emergent research on AI has challenged the assumption that creative potential is a uniquely human trait thus, there seems to be a disconnect between human perception versus what AI is objectively capable of creating. Here, we aimed to assess the creative potential of humans in comparison to AI. In the present study, human participants (N = 151) and GPT-4 provided responses for the Alternative Uses Task, Consequences Task, and Divergent Associations Task. We found that AI was robustly more creative along each divergent thinking measurement in comparison to the human counterparts. Specifically, when controlling for fluency of responses, AI was more original and elaborate. The present findings suggest that the current state of AI language models demonstrate higher creative potential than human respondents.

<https://www.nature.com/articles/s41598-024-53303-w>

KANTA NAKAMURA et al – Twin vocal folds as a novel evolutionary adaptation for vocal communications in lemurs

Primates have varied vocal repertoires to communicate with conspecifics and sometimes other species. The larynx has a central role in vocal source generation, where a pair of vocal folds vibrates to modify the air flow. Here, we show that Madagascan lemurs have a unique additional pair of folds in the vestibular region, parallel to the vocal folds. The additional fold has a rigid body of a vocal muscle branch and it is covered by a stratified squamous epithelium, equal to those of the vocal fold. Such anatomical features support the hypothesis that it also vibrates in a manner like the vibrations that occur in

the vocal folds. To examine the acoustic function of the two pairs of folds, we made a silicone compound model to demonstrate that they can simultaneously vibrate to lower the fundamental frequency and increase vocal efficiency. Similar acoustic effects are achieved using different features of the larynx for the other primates, e.g., by vibrating multiple sets of ventricular folds in several species and further by an evolutionary modification of enlarged larynx in howler monkeys. Our multidisciplinary approaches found that these functions were acquired through a unique evolutionary adaptation of the twin vocal folds in Madagascar lemurs.

<https://www.nature.com/articles/s41598-024-54172-z>

Neuron

PAPERS

JURAJ BEVANDIĆ et al with FARANEH VARGHA-KHADEM & H. FREYJA ÓLAFSDÓTTIR – Episodic memory development: Bridging animal and human research

Human episodic memory is not functionally evident until about 2 years of age and continues to develop into the school years. Behavioral studies have elucidated this developmental timeline and its constituent processes. In tandem, lesion and neurophysiological studies in non-human primates and rodents have identified key neural substrates and circuit mechanisms that may underlie episodic memory development. Despite this progress, collaborative efforts between psychologists and neuroscientists remain limited, hindering progress. Here, we seek to bridge human and non-human episodic memory development research by offering a comparative review of studies using humans, non-human primates, and rodents. We highlight critical theoretical and methodological issues that limit cross-fertilization and propose a common research framework, adaptable to different species, that may facilitate cross-species research endeavors.

[https://www.cell.com/neuron/fulltext/S0896-6273\(24\)00046-1](https://www.cell.com/neuron/fulltext/S0896-6273(24)00046-1)

New Scientist

NEWS

Our human ancestors often ate each other, and for surprising reasons

Fossil evidence shows that humans have been practising cannibalism for a million years. Now, archaeologists are discovering that some of the time they did it to honour their dead.

<https://www.newscientist.com/article/mg26134780-500-our-human-ancestors-often-ate-each-other-and-for-surprising-reasons/>

ARTICLES

MOHEB COSTANDI – Babies in bilingual homes have distinct brain patterns at 4 months old

Infants aged just 4 months old who live in a home where two languages are spoken have distinct patterns of brain activation compared with infants living in monolingual environments.

<https://www.newscientist.com/article/2416169-babies-in-bilingual-homes-have-distinct-brain-patterns-at-4-months-old/>

MICHAEL MARSHALL – Hominins may have left Africa 700,000 years earlier than we thought

Our hominin ancestors originated in Africa and the consensus is that they didn't leave there until about 1.8 million years ago, but stone tools found in Jordan challenge the idea.

<https://www.newscientist.com/article/2416647-hominins-may-have-left-africa-700000-years-earlier-than-we-thought/>

Patterns

PAPERS

GONGSHU WANG et al – Using a deep generative network reveals neuroanatomical specificity in hemispheres

Asymmetry is an important property of brain organization, but its nature is still poorly understood. Capturing the neuroanatomical components specific to each hemisphere facilitates the understanding of the establishment of brain asymmetry. Since deep generative networks (DGNs) have powerful inference and recovery capabilities, we use one hemisphere to predict the opposite hemisphere by training the DGNs, which automatically fit the built-in dependencies between the left and right hemispheres. After training, the reconstructed images approximate the homologous components in the hemisphere. We use the difference between the actual and reconstructed hemispheres to measure hemisphere-specific components due to asymmetric expression of environmental and genetic factors. The results show that our model is biologically plausible and that our proposed metric of hemispheric specialization is reliable, representing a wide range of individual variation. Together, this work provides promising tools for exploring brain asymmetry and new insights into self-supervised DGNs for representing the brain.

[https://www.cell.com/patterns/fulltext/S2666-3899\(24\)00021-7](https://www.cell.com/patterns/fulltext/S2666-3899(24)00021-7)

PeerJ**PAPERS****TAYLOR CREWS, JENNIFER VONK & MOLLY MCGUIRE – Catcalls: exotic cats discriminate the voices of familiar caregivers**

The ability to differentiate familiar from unfamiliar humans has been considered a product of domestication or early experience. Few studies have focused on voice recognition in Felidae despite the fact that this family presents the rare opportunity to compare domesticated species to their wild counterparts and to examine the role of human rearing. We tested whether non-domesticated Felidae species recognized familiar human voices by exposing them to audio playbacks of familiar and unfamiliar humans. In a pilot study, we presented seven cats of five species with playbacks of voices that varied in familiarity and use of the cats' names. In the main study, we presented 24 cats of 10 species with unfamiliar and then familiar voice playbacks using a habituation-dishabituation paradigm. We anticipated that human rearing and use of the cats' names would result in greater attention to the voices, as measured by the latency, intensity, and duration of responses regardless of subject sex and subfamily.

Cats responded more quickly and with greater intensity (e.g., full versus partial head turn, both ears moved versus one ear twitching) to the most familiar voice in both studies. They also responded for longer durations to the familiar voice compared to the unfamiliar voices in the main study. Use of the cats' name and rearing history did not significantly impact responding. These findings suggest that close human contact rather than domestication is associated with the ability to discriminate between human voices and that less social species may have socio-cognitive abilities akin to those of more gregarious species. With cats of all species being commonly housed in human care, it is important to know that they differentiate familiar from unfamiliar human voices.

<https://peerj.com/articles/16904/>

PLoS One**PAPERS****MARIO SCHARFBILLIG, JAN CIECIUCH & ELDAD DAVIDOV – One and the same? How similar are basic human values and economic preferences**

Both the basic human values approach and the economic preference approach have been developed and applied to represent fundamental drivers of human behavior in various domains by measuring people's underlying preferences and motivations. Both of them have been used, however, in isolation from each other, the former primarily in social psychology studies and the latter mainly in economic studies. But how similar are they? Finding that they differ may suggest that combining them to explain human behavior might be beneficial. To the best of our knowledge, only a few studies have attempted to explore and empirically examine the theoretical and empirical link between variables in both approaches. The current study tries to fill this gap by examining relations between basic human values and major economic preferences. We examine the associations between the values of self-transcendence, self-enhancement, openness to change and conservation, and the economic preferences of risk aversion (or seeking), altruism, trust, and positive and negative reciprocity. We propose mechanisms as to how they may be associated with one another. For example, we expect an association between conservation and risk aversion as both are motivated by attributing importance to stability and the status quo, or between self-transcendence and altruism, as both are motivated by concern for others. For the empirical analysis we employed convenience samples collected in Poland and Germany. Results in both samples support our expectations: several values and economic preferences are linked in theoretically predictable ways, but only to a weak or moderate extent. We conclude that they are not mutually exclusive but may rather be complementary, and therefore likely both relevant for investigations into explaining behavior.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0296852>

Proceedings of the Royal Society B**PAPERS****I. B. LAUMER et al with E. A. CARTMILL – Spontaneous playful teasing in four great ape species**

Joking draws on complex cognitive abilities: understanding social norms, theory of mind, anticipating others' responses and appreciating the violation of others' expectations. Playful teasing, which is present in preverbal infants, shares many of these cognitive features. There is some evidence that great apes can tease in structurally similar ways, but no systematic study exists. We developed a coding system to identify playful teasing and applied it to video of zoo-housed great apes. All four species engaged in intentionally provocative behaviour, frequently accompanied by characteristics of play. We found playful teasing to be characterized by attention-getting, one-sidedness, response looking, repetition and elaboration/escalation. It takes place mainly in relaxed contexts, has a wide variety of forms, and differs from play in several ways (e.g. asymmetry, low rates of play signals like the playface and absence of movement-final 'holds' characteristic of intentional gestures). As playful teasing is present in all extant great ape genera, it is likely that the cognitive prerequisites for joking evolved in the hominoid lineage at least 13 million years ago.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2023.2345>

The Innovation

PAPERS

YINAN ZHANG et al – Lufengpithecus inner ear provides evidence of a common locomotor repertoire ancestral to human bipedalism

Various lines of evidence have been used to infer the origin of human bipedalism, but the paucity of hominoid postcranial fossils and the diversity of inferred locomotor modes have tended to confound the reconstruction of ancestral morphotypes. Examination of the bony labyrinth morphology of the inner ear of extinct and living hominoids provides independent evidence for inferring the evolution of hominoid locomotor patterns. New computed tomography data and morphometric analyses of the Late Miocene ape Lufengpithecus indicate that it and other stem great apes possess labyrinths similar to one another and show that hominoids initially evolved from a positional repertoire that included orthograde, below-branch forelimb suspension and progression, above-branch bipedalism, climbing, clambering, and leaping (hylobatid-like) to one that comprised above-branch quadrupedalism, below-branch forelimb suspension, vertical climbing, limited leaping, terrestrial quadrupedal running and walking, possibly with knuckle walking, and short bouts of bipedalism (chimpanzee-like). The bony labyrinth morphology of Lufengpithecus indicates that it probably conforms more closely to the last common ancestors of crown hominoids and hominids in its locomotor behavior than do other Miocene hominoids. Human bipedalism evolved from this common archetypal Lufengpithecus-like locomotor repertoire. The low evolutionary rate of semicircular canal morphology suggests that Lufengpithecus experienced a relative stasis in locomotor behavior, probably due to the uplift of the Tibetan Plateau, which created a stable environment in the Miocene of southwestern China.

[https://www.cell.com/the-innovation/fulltext/S2666-6758\(24\)00018-3](https://www.cell.com/the-innovation/fulltext/S2666-6758(24)00018-3)

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