EAORC BULLETIN 1,099 – 7 July 2024

CONTENTS

NOTICES

PUBLICATION ALERTS

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

EDITORIAL INTERJECTIONS

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

APROPOS OF NOTHING

Which is the shortest month? When written in Calibri typeface, it's July.

May
July

ACADEMIA.EDU – Earliest prepared core technology in the Acheulean

Royal Society Open Science 4, 170288 (2017).

HAO LI et al – The Victoria West: earliest prepared core technology in the Acheulean at Canteen Kopje and implications for the cognitive evolution of early hominids

Prepared core technology illustrates in-depth planning and the presence of a mental template during the core reduction process. This technology is, therefore, a significant indicator in studying the evolution of abstract thought and the cognitive abilities of hominids. Here, we report on Victoria West cores excavated from the Canteen Kopje site in central South Africa, with a preliminary age estimate of approximately 1 Ma (million years ago) for these cores. Technological analysis shows that the Victoria West cores bear similarities to the 'Volumetric Concept' as defined for the Levallois, a popular and widely distributed prepared core technology from at least 200 ka (thousand years ago). Although these similarities are present, several notable differences also occur that make the Victoria West a unique and distinctive prepared core technology; these are: elongated and convergent core shapes, consistent blow directions for flake removal, a predominance of large side-struck flakes, and the use of these flakes to make Acheulean large cutting tools. This innovative core reduction strategy at Canteen Kopje extends the roots of prepared core technology to the latter part of the Early Acheulean and clearly demonstrates an increase in the cognitive abilities and complexities of hominids in this time period.

https://www.academia.edu/33932481/The_Victoria_West_earliest_prepared_core_technology_in_the_Acheulean_at_Canteen_Kopje_and_implications_for_the_cognitive_evolution_of_early_hominids

ACADEMIA.EDU – Revisiting the current phyto-scape of Boomplaas Cave

Azania: Archaeological Research in Africa, 2348407 (2024).

MARLIZE LOMBARD & JUSTIN PARGETER – Revisiting the current phyto-scape of Boomplaas Cave (South Africa) and the possible implications of this for past day-range foraging

Boomplaas Cave in the Western Cape Province of South Africa is one of only a few African sites with inland archaeological deposits spanning Marine Isotope Stages 4–1. Work conducted half a century ago predicted Boomplaas to be a meagre plant-food location. We reassess this interpretation here by presenting updated lists of the current vegetation and foodplants growing within roughly a day's foraging distance from the cave. By doing so, we increase the known foodplant species potentially available to Stone Age foragers by 356% and show that almost all the plant species/genera in the Boomplaas archaeobotanical assemblage still grow within a day's range of the site. We present nutritional values for some of the plant foods, highlighting those richest in moisture, ash, protein, fat, fibre, carbohydrates and energy and suggesting that such foods may have been important staples in the dietary ecology of the Stone Age foragers who used the site. Lastly, we demonstrate that the Boomplaas Cave foodplant fitness landscape is relatively rich and varied compared to similar data from other Cape sites such as Klasies River Main Cave, Diepkloof Rock Shelter and Hollow Rock Shelter.

https://www.academia.edu/121798973/Revisiting_the_current_phyto_scape_of_Boomplaas_Cave_South_Africa_and_the_possible_implications_of_this_for_past_day_range_foraging?email_work_card=view-paper

RESEARCHGATE – Extended Mind and Embodied Social Psychology: Historical Perspectives

Society 54, 171-186 (2017).

DMITRI N. SHALIN – Extended Mind and Embodied Social Psychology: Historical Perspectives

This study traces the evolution of a research program that frames the human mind as an embodied social phenomenon. The essay is divided into two parts, the first one focused on historical issues, the second on contemporary developments. The discussion begins with the mind-body problem central to the scholarship in this area and then focuses the changing perspective on consciousness as a symbolically mediated process. Next, the paper surveys the relevant writings of Mead and Vygotsky, tracks the debate about the place of body in interactionist sociology, and connects this debate to current research in neuroscience. The report concludes with reflections on the prospects for embodied sociology and the contribution it can make to the debate about extended mind.

https://www.researchgate.net/publication/314299595_Extended_Mind_and_Embodied_Social_Psychology_Historical_Perspectives

NEWS

JOHN TEMPLETON FOUNDATION – Probing the Mystery of Consciousness

Dr. Anil Seth is a Professor of Cognitive and Computational Neuroscience at the University of Sussex in the United Kingdom. The author of over 200 research papers, Anil integrates psychology, philosophy, computer science, and neuroscience to explore how our brains generate subjective experiences. Outside the laboratory, Anil has a knack for communication, too. His TED Talk has reached nearly 15 million viewers, and his bestselling book Being You: A New Science of Consciousness takes a baffling topic and makes it relatable and engaging for general readers. Anil joins the podcast to explain why animals may be conscious, but artificial intelligence is not, and why, despite the potential for technological dystopias, he is optimistic about the future.

https://www.templeton.org/news/probing-the-mystery-of-consciousness

JOHN TEMPLETON FOUNDATION – Waiting on the Invisible God

Where is God when God is silent? When we do not perceive God's presence, does this mean that God is absent, or is it that God was never there in the first place? How would we even discern the difference? Among philosophers, the experience of God's invisibility is known as the problem of divine hiddenness. At the heart of this philosophical quandary is the question, "Is the prevalence of unbelief, the uneven distribution of religious experience, or feelings of divine absence—in short, divine hiddenness—evidence against the existence of God?"

{Surely the null position is that God does not exist. So it is the hypothesis of their existence that needs evidence, not the null position. Evidence that something doesn't exist against a counter-argument that it's just hiding can never be sufficient – which means that the "they're hiding"argument is an unprovable hypothesis.}

https://www.templeton.org/news/waiting-on-the-invisible-god

NATURE BRIEFING – Why neuroscientists should study religion

Four authors — from psychology, neuroscience and medicine — call on diverse scholars to help establish "the neuroscience of religion". Social scientists have long studied the many ways that faith can influence people's behaviour but these authors argue that neuroscientists have been reluctant to investigate how people's beliefs affect their brains, and vice versa. They recommend building on what's known already from social science and applying existing neuroscience tools, such as brain imaging, or newer tools such as virtual reality or psychedelic drugs. They note that many people use meditation or prayer to deal with pain and addiction, and a better understanding of the brain processes involved could help religious and non-religious people alike.

https://www.nature.com/articles/d41586-024-02153-7

NATURE BRIEFING – Denisovans' survival secrets revealed

The enigmatic ancient humans known as Denisovans hunted marmots, eagles and even hyenas to thrive high on the Tibetan plateau for well over 100,000 years. "It's at high altitude. It's cold. It's not a nice place to be as a hominin," says archaeologist Frido Welker, one of the researchers who analysed thousands of animal bone fragments from a cave in northern China.

https://www.nature.com/articles/d41586-024-02194-y

NATURE BRIEFING – This Stone Age jewellery is fake

Ancient artisans probably wanted to mimic the feel and look of highly prized amber by coating shells in bone glue, pine resin, beeswax and a red-orange pigment. The beads, which were found in a tomb in what is now Portugal, are the oldest example of a human-made composite material.

https://www.sciencedirect.com/science/article/pii/S0305440324000797

NATURE BRIEFING – How the brain encodes words' meaning

For the first time, individual brain cells have been seen to respond to the essence of words. Researchers recorded the activity of around 300 neurons each in 10 people who had electrodes implanted in their brains to manage epilepsy. Only a few neurons fired for each word when the participants listened to short sentences. Words that fell into similar categories — actions, food or animals — as well as words that could be associated — such as 'duck' and 'egg' — triggered similar brain activity. To an extent, the researchers could determine what people were hearing by watching their neurons fire.

https://www.nature.com/articles/d41586-024-02146-6

SAPIENS – The Mysterious Power of Arrogance

Why do overbearing, obnoxious people so often come out on top? What the story of a local celebrity in the remote highlands of Papua New Guinea reveals about the rise of Donald Trump to the U.S. presidency.

https://www.sapiens.org/culture/trump-arrogance-papua-new-guinea/

SCIENCEADVISER – Sticks found in an Australian cave may have been part of a 12ky-old sorcery ritual

In 1887, an Australian geologist named Alfred Howitt wrote detailed reports of sorcery rituals practiced by Aboriginal people in southeastern Australia. Mulla-mullung, as the sorcerers were called, would seek to bring harm upon their enemies by obtaining a piece of their clothing, hair, or food, affixing it to the end of a stick smeared with human or kangaroo fat, and casting it into a fire.

Now, discoveries in a local cave suggest that the ritual may be more than 12,000 years old. Researchers found two slightly burned sticks that had been smeared with human or animal fat laying across miniature fireplaces. They came from two species of Casuarina, flowering pine trees native to Australia with a long history of ceremonial use.

The sticks were about 12,000 and 11,000 years old, making them Australia's oldest known wooden artifacts—and they closely matched Howitt's description of the sorcery ritual. "That's 12,000 years of continuity, passing down knowledge from one generation to the next, of a cultural practice," says lead author Bruno David, an archaeologist at Monash University.

"My first reaction is simply 'wow," says archaeologist Tiina Manne of the University of Queensland, who was not involved in the study. "This is a remarkable piece of research."
https://www.science.org/content/article/sorcery-australian-cave-may-be-oldest-known-culturally-transmitted-ritual

SCIENCEADVISER – Eyed needles signal the beginning of dress

If you read last week's story on the oldest stone needles ever found, you know that eyed needles are key artifacts that suggest complex tailoring and sewing practices. Often, archaeologists who dig up the tools assume they were used to make either layered undergarments or add decoration to clothes. Either way, this paper suggests that eyed needles could mark the transition from clothing as protection to dress as a social symbol.
The invention of clothing allowed humans to live in all kinds of climates, and to go beyond adornment of the skin for cultural and individual expression. Clothing production also signifies resource management and foresight. In the archaeological record, the onset of eyed needles corresponds with early humans' need for portable insulation. While these fitted, thermal garments could have been made using awls—needles without eyes —eyed needles allowed users to pierce animal hides and thread them at the same time, facilitating more efficient and complex techniques for producing multi-layered clothing for warmth, perhaps marking the advent of using underwear for additional thermal regulation. Another interpretation is that these needles represent the beginning of decorative clothing—eyed needles allow stitchers to attach beads and adornments, thereby expressing communal identity, modesty, and social status through clothing.
https://www.science.org/doi/10.1126/sciadv.adp2887%0A%0A

SCIENCEADVISER – World's oldest cave art scene depicts a pig hunt

A painting of humanoid figures hunting a pig on the wall of an Indonesian cave is more than 50,000 years old, making it the world's oldest example of visual storytelling. Located in a limestone cave called Leang Karampuang on the Indonesian island of Sulawesi, the painting was dotted with lumps of calcium carbonate deposited naturally. The scientists dated it by employing a laser to sample uranium isotopes in the mineral layers, enabling them to test carbonate physically closer to the original pigment layer than previous dating methods used to study other cave paintings have allowed. "Every time, we push the dating back," says Griffith University archaeologist and geochemist Maxime Aubert, a co-author of the new paper. Painted by humans on their journey east out of Africa, the art predates depictions of animals on European cave walls by 15,000 years. "This team is almost single-handedly changing the history of art," says University of Victoria archaeologist April Nowell, who was not involved in the research.
https://www.science.org/content/article/dreamlike-pig-hunting-scene-world-s-oldest-figurative-art

SCIENCEADVISER – Fan of lamb? It runs in the family

Blue sheep bones turned up in a cave on the Tibetan Plateau, alongside a rib bone from a member of the Denisovans, our close but mysterious relatives. The fossil is surprisingly young, suggesting the group may have overlapped with modern humans.
https://www.nature.com/articles/s41586-024-07612-9

SCIENCE DAILY – Neighborhood opportunities influence infant development and cognition

Researchers find that growing up in neighborhoods with more educational and socioeconomic opportunities has a positive impact on infants' brain activity.
https://www.sciencedaily.com/releases/2024/06/240627172034.htm

SCIENCE DAILY – Watching others' biased behavior unconsciously creates prejudice

We unconsciously form prejudice toward groups when we see biased people interact with members of a group. That is according to new research by psychologists, who show for the first time that observational learning is an important mechanism of prejudice formation.
https://www.sciencedaily.com/releases/2024/07/240702135530.htm

SCIENCE DAILY – Measuring body language

A large international and interdisciplinary research team has developed software to measure the objective kinematic features of movements that express emotions.
https://www.sciencedaily.com/releases/2024/07/240703131729.htm

SCIENCE DAILY – Extinct humans survived on the Tibetan plateau for 160,000 years

Bone remains found in a Tibetan cave 3,280 m above sea level indicate an ancient group of humans survived here for many millennia.
https://www.sciencedaily.com/releases/2024/07/240703131710.htm

SCIENCE.ORG NEWS – Sorcery in Australian cave may be oldest known culturally transmitted ritual

"Revolutionary" find suggests ancient stick ceremony persisted among Aboriginal people from the last ice age to colonial times.
https://www.science.org/content/article/sorcery-australian-cave-may-be-oldest-known-culturally-transmitted-ritual

SCIENCE.ORG NEWS – Denisovans may have overlapped with modern humans on Tibetan Plateau

Bones found near 40,000-year-old rib on the Tibetan Plateau suggest our close cousins hunted goats, yaks, and birds.
https://www.science.org/content/article/mysterious-denisovans-may-have-overlapped-modern-humans-tibetan-plateau

SCIENCE.ORG NEWS – Dreamlike pig-hunting scene is the world's oldest figurative art

50,000 years ago, artists painted animal-human hybrids on the hunt on an Indonesian cave wall.
https://www.science.org/content/article/dreamlike-pig-hunting-scene-world-s-oldest-figurative-art

THE CONVERSATION – Words such as racist slurs can literally hurt – here's the science

Glenn Hadikin, University of Portsmouth Research has disproven the saying 'sticks and stones may break my bones but names will never hurt me'.
https://theconversation.com/words-such-as-racist-slurs-can-literally-hurt-heres-the-science-233798

THE CONVERSATION – What fathers in the animal kingdom can tell us about humans

Judith Lock, University of Southampton Some of the most caring animal fathers are insects.
https://theconversation.com/what-fathers-in-the-animal-kingdom-can-tell-us-about-humans-231191

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

YUMA TOMIZAWA et al – Shaft structure of the first metatarsal contains a strong phylogenetic signal in apes and humans

Metatarsal bones constitute a key functional unit of the foot in primates. While the form-function relationships of metatarsals have been extensively studied, particularly in relation to the loss of the grasping ability of the foot in humans in contrast to apes, the effect of phyletic history on the metatarsal morphology and its variability remains largely unknown. Here, we evaluate how the strength of the phylogenetic signal varies from the first to the fifth metatarsal in humans, chimpanzees, gorillas, orangutans, gibbons, and Japanese macaques. We use computed tomography imaging and morphometric mapping to quantify the second moment of area around and along the metatarsal shaft and evaluate the strength of the phylogenetic signal with multivariate K-statistics.
The shaft structure of the first metatarsal, but not the others, correlates well with the phylogeny of apes and humans. Given the importance of the first metatarsal for grasping and bipedal/quadrupedal locomotion, the strong phylogenetic but weak functional signal in its structure is unexpected. These findings suggest that the evolutionary diversification of hominoid locomotor behaviors, including human bipedality, is only partly reflected in form-function relationships of key skeletal elements, and that phylogenetic history acted as a major evolutionary constraint.
https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24987

Behavioral and Brain Sciences

COMMENTARIES

About Elizabeth S. Spelke, "What babies know: Core knowledge and composition", Oxford University Press (2022).

CAMERON T. ELLIS – Investigating infant knowledge with representational similarity analysis

Decades of research have pushed us closer to understanding what babies know. However, a powerful approach – representational similarity analysis (RSA) – is underused in developmental research. I discuss the strengths of this approach and what it can tell us about infant conceptual knowledge. As a case study, I focus on numerosity as a domain where RSA can make unique progress.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/investigating-infant-knowledge-with-representational-similarity-analysis/1B04E46E4283FE0387BE48A232B11B8F

SUSAN GOLDIN-MEADOW – How important is it to learn language rather than create it?

I focus here on concepts that are not part of core knowledge – the ability to treat people as social agents with shareable mental states. Spelke proposes that learning language from another might account for the development of these concepts. I suggest that homesigners, who create language rather than learn it, may be a potential counterexample to this hypothesis.

https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/how-important-is-it-to-learn-language-rather-than-create-it/10B4F52FA78F555297B2F01CA0B4F40C

TIBOR TAUZIN, PIERRE JACOB & GYÖRGY GERGELY – Early pragmatic expectations in human infancy
There is no room for pragmatic expectations about communicative interactions in core cognition. Spelke takes the combinatorial power of the human language faculty to overcome the limits of core cognition. The question is: Why should the combinatorial power of the human language faculty support infants' pragmatic expectations not merely about speech, but also about nonverbal communicative interactions?
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/early-pragmatic-expectations-in-human-infancy/890DC53C1E977A43F68ACC2F750FB173

LAURENCE KAUFMANN & AND FABRICE CLÉMENT – Wired for society? From ego-logy to eco-logy
Somewhat questioning Elizabeth Spelke's attempt to account for infants' social knowledge, our commentary argues that social cognition might be divided into several specialized systems. In addition to the core system dedicated to the intersubjective dimension of close relationships, infants could be prewired to process social relationships, such as dominance, characterized by their impersonal, normative dimension.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/wired-for-society-from-egology-to-ecology/6B2C0297A01729BCFEF0194ED9B4EF0C

SANDRA R. WAXMAN – Developmental origin of a language–cognition interface in infants: Gateway to advancing core knowledge?
Spelke's sweeping proposal requires greater precision in specifying the place of language in early cognition. We now know by 3 months of age, infants have already begun to forge a link between language and core cognition. This precocious link, which unfolds dynamically over development, may indeed offer an entry point for acquiring higher-order, abstract conceptual and representational capacities.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/developmental-origin-of-a-languagecognition-interface-in-infants-gateway-to-advancing-core-knowledge/2A2882D92BD94AAB8A79FFA1F35AD016

DENIS TATONE & BARBARA POMIECHOWSKA – Questioning the nature and origins of the "social agent" concept
Spelke posits that the concept of "social agent," who performs object-directed actions to fulfill social goals, is the first noncore concept that infants acquire as they begin to learn their native language. We question this proposal on empirical grounds and theoretical grounds, and propose instead that the representation of object-mediated interactions may be supported by a dedicated prelinguistic mechanism.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/questioning-the-nature-and-origins-of-the-social-agent-concept/1948FCCBEECE67BD310218E4E3BDE84D

J. KILEY HAMLIN – Evidence for core social goal understanding (and, perhaps, core morality) in preverbal infants
Spelke's What Babies Know masterfully describes infants' impressive repertoire of core cognitive concepts, from which the suite of human knowledge is eventually built. The current commentary argues for the existence of a core concept that Spelke claims preverbal infants lack: social goal. Core social goal concepts, operative extremely early in human development, underlie infants' basic abilities to interpret and evaluate entities within the moral world; such abilities support claims for a core moral domain.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/evidence-for-core-social-goal-understanding-and-perhaps-core-morality-in-preverbal-infants/309B7B2B653F2AA2064F87E8162943EE

TOBIAS GROSSMANN – The brain origins of early social cognition
This commentary challenges Spelke's view on the early development of social cognition from a neuroscience perspective by presenting an overlooked body of evidence from neuroimaging research on joint attention with human infants. Indeed, evidence demonstrating adult-like, neural sensitivity to joint attention in young infants, supports alternative theoretical views concerning the origins of uniquely human forms of social cognition.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/brain-origins-of-early-social-cognition/0380B584C30DB4F0A0B013795A4223C5

PETER KRØJGAARD – More than language is needed to represent and combine different core knowledge components
We question Spelke's key claim that the medium, in which contents from different core knowledge systems can be represented and combined, is language-based. Recalling an episodic memory, playing chess, and conducting mental rotation are tasks where core knowledge information is represented and combined. Although these tasks can be described by means of language, these tasks are not inherently language-based. Hence, language may be an important subset of an abstraction medium – not the medium as such.

https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/more-than-language-is-needed-to-represent-and-combine-different-core-knowledge-components/1B4F52E332655B5944015035FD661949

MARLENE D. BERKE – Core knowledge, visual illusions, and the discovery of the self
Why have core knowledge? Standard answers typically emphasize the difficulty of learning core knowledge from experience, or the benefits it confers for learning about the world. Here, we suggest a complementary reason: Core knowledge is critical for learning not just about the external world, but about the mind itself.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/core-knowledge-visual-illusions-and-the-discovery-of-the-self/F4F2AF64F203DF113A012BAC69D99952

SUSAN CAREY – The role of language in transcending core knowledge
What Babies Know (WBK) argues that core knowledge has a unique place in cognitive architecture, between fully perceptual and fully conceptual systems of representation. Here I argue that WBK's core knowledge is on the perception side of the perception/cognition divide. I discuss some implications of this conclusion for the roles language learning might play in transcending core knowledge.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/role-of-language-in-transcending-core-knowledge/00BDC70B65DF8BB62A960B28CA910BD6

KAREN E. ADOLPH & MARK A. SCHMUCKLER – What we don't know about what babies know: Reconsidering psychophysics, exploration, and infant behavior
Researchers must infer “what babies know” based on what babies do. Thus, to maximize information from doing, researchers should use tasks and tools that capture the richness of infants' behaviors. We clarify Gibson's views about the richness of infants' behavior and their exploration in the service of guiding action – what Gibson called “learning about affordances.”
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/what-we-dont-know-about-what-babies-know-reconsidering-psychophysics-exploration-and-infant-behavior/DE568A9429B34F93716B6990A983C676

ZOE JENKIN & LORI MARKSON – Learning in the social being system
We argue that the core social being system is unlike other core systems in that it participates in frequent, widespread learning. As a result, the social being system is less constant throughout the lifespan and less informationally encapsulated than other core systems. This learning supports the development of the precursors of bias, but also provides avenues for preempting it.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/learning-in-the-social-being-system/47986A9D2328B3B4B5B0B2ED52917AB3

DAVID S. MOORE & DAVID J. LEWKOWICZ – How do babies come to know what babies know?
Elizabeth Spelke's What Babies Know is a scholarly presentation of core knowledge theory and a masterful compendium of empirical evidence that supports it. Unfortunately, Spelke's principal theoretical assumption is that core knowledge is simply the innate product of cognitive evolution. As such, her theory fails to explicate the developmental mechanisms underlying the emergence of the cognitive systems on which that knowledge depends.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/how-do-babies-come-to-know-what-babies-know/883F6400577D4A5B6E19D699EE1FAE77

BRIAN J. SCHOLL – Perceptual (roots of) core knowledge
Some core knowledge may be rooted in – or even identical to – well-characterized mechanisms of mid-level visual perception and attention. In the decades since it was first proposed, this possibility has inspired (and has been supported by) several discoveries in both infant cognition and adult perception, but it also faces several challenges. To what degree does What Babies Know reflect how babies see and attend?
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/perceptual-roots-of-core-knowledge/B0639C443A2499D8190F1ADE4C018B6F

ELIZABETH S. SPELKE – Response to commentaries on What Babies Know
Twenty-five commentaries raise questions concerning the origins of knowledge, the interplay of iconic and propositional representations in mental life, the architecture of numerical and social cognition, the sources of uniquely human cognitive capacities, and the borders among core knowledge, perception, and thought. They also propose new methods, drawn from the vibrant, interdisciplinary cognitive sciences, for addressing these questions and deepening understanding of infant minds.
https://www.cambridge.org/core/journals/behavioral-and-brain-sciences/article/abs/response-to-commentaries-on-what-babies-know/167D3DF5608A9EF47980B789B164E85A

Current Anthropology

PAPERS

NICHOLAS BANNAN, ROBIN DUNBAR, & JOSHUA BAMFORD – The Evolution of Gender Dimorphism in the Human Voice: The Role of Octave Equivalence

Humans exhibit what appears to be a unique vocal property: octave equivalence, whereby adult male voices are, on average, an octave lower in pitch than those of adult females and children. The evolutionary significance of this seems largely to have escaped notice. While sexual selection might explain why male voices are generally lower, it cannot explain why they should be so much lower than what would be expected for body size or why the average difference should be exactly one octave. Nor does a generalized dimorphism convey why precisely tuned octaves feature so commonly in human vocal interaction. The octave features strongly in the organization of music. A consequence of this characteristic of human pitch perception and production is the capacity to share and respond to vocal pitches (and their instrumental equivalents) as if they are "the same" irrespective of the difference in range, a phenomenon known as octave equivalence. We investigate the nature of octave equivalence from an adaptive perspective and propose a hypothesis for its evolution based on the importance of chorusing for social bonding and pitch matching in intergenerational exchange.
https://www.journals.uchicago.edu/doi/abs/10.1086/730147

Current Biology

PAPERS

JAMES R. DAVIES et al – Episodic-like memory in wild free-living blue tits and great tits

Episodic-like memory in non-human animals represents the behavioral characteristics of human episodic memory—the ability to mentally travel backward in time to "re-live" past experiences. A focus on traditional model species of episodic-like memory may overlook taxa possessing this cognitive ability and consequently its evolution across species. Experiments conducted in the wild have the potential to broaden the scope of episodic-like memory research under the natural conditions in which they evolved. We combine two distinct yet complementary episodic-like memory tasks (the what-where-when memory and incidental encoding paradigms), each targeting a different aspect of human episodic memory, namely the content (what-where-when) and process (incidental encoding), to comprehensively test the memory abilities of wild, free-living, non-caching blue tits (Cyanistes caeruleus) and great tits (Parus major). Automated feeders with custom-built programs allowed for experimental manipulation of spatiotemporal experiences on an individual-level basis. In the what-where-when memory experiment, after learning individualized temporal feeder rules, the birds demonstrated their ability to recall the "what" (food type), "where" (feeder location), and "when" (time since their initial visit of the day) of previous foraging experiences. In the incidental encoding experiment, the birds showed that they were able to encode and recall incidental spatial information regarding previous foraging experiences ("where" test), and juveniles, but not adults, were also able to recall incidentally encoded visual information ("which" test). Consequently, this study presents multiple lines of converging evidence for episodic-like memory in a wild population of generalist foragers, suggesting that episodic-like memory may be more taxonomically widespread than previously assumed.
https://www.cell.com/current-biology/fulltext/S0960-9822(24)00813-3

eLife

PAPERS

ETIENNE COMBRISSON et al – Neural interactions in the human frontal cortex dissociate reward and punishment learning

How human prefrontal and insular regions interact while maximizing rewards and minimizing punishments is unknown. Capitalizing on human intracranial recordings, we demonstrate that the functional specificity toward reward or punishment learning is better disentangled by interactions compared to local representations. Prefrontal and insular cortices display non-selective neural populations to rewards and punishments. Non-selective responses, however, give rise to context-specific interareal interactions. We identify a reward subsystem with redundant interactions between the orbitofrontal and ventromedial prefrontal cortices, with a driving role of the latter. In addition, we find a punishment subsystem with redundant interactions between the insular and dorsolateral cortices, with a driving role of the insula. Finally, switching between reward and punishment learning is mediated by synergistic interactions between the two subsystems. These results provide a unifying explanation of distributed cortical representations and interactions supporting reward and punishment learning.
https://elifesciences.org/articles/92938

Frontiers for Young Minds

PAPERS

VERENA FOERSTER, MARINE SIMON & FRANK SCHAEBITZ – Drilling in an African Lake to Find Out Whether Climate Change Drove Human Evolution

Why does drilling into a dried-out lake in eastern Africa get scientists excited? Simple answer: the lake's sediments store valuable information about how past climate change shaped the environment where our earliest ancestors lived. Those

sediments serve as a natural record of Earth's ancient climate. While much is known about human evolution from fossil discoveries in eastern Africa, the role that climate change might have played for human biological and cultural evolution remained unclear for a long time. But now we have drilled 278 m into the ground at the bottom of the old Chew Bahir Lake in southern Ethiopia, which has given us some detailed answers. This natural record covers the last 620,000 years of climate history from one of the proven habitats of ancient Homo sapiens, and it can help us to unravel connections between climate and human evolution.
https://kids.frontiersin.org/articles/10.3389/frym.2024.1252697

Frontiers in Environmental Archaeology

PAPERS

MICHAEL-SHAWN FLETCHER et al – Lifting the veil: pyrogeographic manipulation and the leveraging of environmental change by people across the Vale of Belvoir, Tasmania, Australia

Humans undertake land management and care of landscapes to maintain safe, healthy, productive and predictable environments. Often, this is achieved through creating spatial and temporal heterogeneity in a way that leverages the natural world; both amplifying natural trends and, in some cases, driving shifts counter to natural processes. However, a persistent paradigm governing the understanding of proxy evidence of past human activity on the environment is that human agency is only recognized in proxy data when trends oppose what are expected to occur naturally. Framing research in such a way ignores the fact that people have, continue to, and will always leverage the environment in ways that both compliment and diverge from "natural" trends. Doing so masks, or erases, people from the histories of their territories and continues to perpetuate myths such as "wild" and "wilderness", particularly in places that have in fact been shaped and maintained by people for long periods of time. Here, we synthesize geographical, dendrochronological, palaeoecological, archaeological and palaeoclimatic data to demonstrate how Palawa people (Tasmanian Aboriginal people) in Lutruwita (now known as Tasmania, southeast Australia) leveraged climatic change to convert unproductive forest vegetation to open forest and grassland to support higher occupation levels. The fine-scale heterogeneity we have identified reflects the diversity of ways in which, and the spatial scale that, the Palawa engage with their land. We caution against adopting coarse spatial scale (i.e., continental, regional, etc.) methodologies to reconstruct the influence of past societies over landscape evolution as they assume homogeneity of human cultures and of human influence on landscapes. We also reinforce calls for those researching past landscape change to abandon tropes of human agency acting only in opposition to the natural world. Such approaches are couched within a narrow cultural understanding of human-environment interactions and result in the erasure of Indigenous and local peoples' role in maintaining healthy, biodiverse and safe landscapes.
https://www.frontiersin.org/journals/environmental-archaeology/articles/10.3389/fearc.2024.1386339/full

Frontiers in Human Neuroscience

PAPERS

MARIA CLEMENCIA ORTIZ-BARAJAS – Predicting language outcome at birth

Even though most children acquire language effortlessly, not all do. Nowadays, language disorders are difficult to diagnose before 3–4 years of age, because diagnosis relies on behavioral criteria difficult to obtain early in life. Using electroencephalography, I investigated whether differences in newborns' neural activity when listening to sentences in their native language (French) and a rhythmically different unfamiliar language (English) relate to measures of later language development at 12 and 18 months. Here I show that activation differences in the theta band at birth predict language comprehension abilities at 12 and 18 months. These findings suggest that a neural measure of language discrimination at birth could be used in the early identification of infants at risk of developmental language disorders.
https://www.frontiersin.org/journals/human-neuroscience/articles/10.3389/fnhum.2024.1370572/full

Frontiers in Psychology

PAPERS

MINGJUN WU, MIAOMIAO LI & DI WU – The neurocognitive processing mechanism of English subject-verb agreement by Chinese-speaking learners

Determiner phrases (DPs), an overarching term, can be classified into two determiner types: referential determiner phrases (RDPs, e.g., the boy) and quantificational determiner phrases (QDPs, e.g., each boy). Using the event-related potential (ERP) technique, this study explored the modulation of RDP vs. QDP in the online processing of English subject–verb agreement with omission errors by Chinese learners of English, addressing the question of whether singular quantification increases or decreases Chinese learners' sensitivity to agreement violations. The experiment manipulated the determiner type, specifically RDP vs. QDP, and grammaticality (grammatical vs. ungrammatical). The results indicated that similar to previous studies, a P600 effect was elicited in response to subject–verb agreement violations with omission errors, demonstrating that Chinese L2 learners are sensitive to such agreement violations. Additionally, the ERP patterns exhibited variations due to D-linking and number specification of RDP and QDP. Regarding D-linking, subject–verb agreement violations in the QDP conditions, necessitating integration of discourse-related knowledge, elicited laterally and frontally distributed P600 effects associated with integration complexity at the discourse level; however, non-D-linked referential determiners elicited the

posteriorly-distributed P600 effects. Differences in number specification resulted in the distinctive P600 latencies and whether P600 was preceded by N400 or not. While both the RDP and QDP conditions exhibited the P600 effects, the onset latency of this effect in the number-unspecified RDP condition was 300 ms later compared to the number-specified QDP condition. Furthermore, an additional N400 component observed in the RDP condition suggests that L2 learners acquire morphologically complex subject–verb agreements by rote, treating them as unanalyzed chunks. This N400 component was absent in the QDP condition. From these results, the conclusion can be drawn that L2 learners are sensitive to the subject–verb agreement violations with omission errors, and L2 processing patterns of subject–verb agreement vary with different features of determiners, providing further evidence for the cue-based retrieval model during comprehension of grammatical sentences. Pedagogical implications are provided, and the future research direction is suggested.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2024.1402355/full

ANDREA BALÁZS et al – The influence of temperament and perinatal factors on language development: a longitudinal study

Early language development is characterized by large individual variation. Several factors were proposed to contribute to individual pathways of language acquisition in infancy and childhood. One of the biologically based explaining factors is temperament, however, the exact contributions and the timing of the effects merits further research. Pre-term status, infant sex, and environmental factors such as maternal education and maternal language are also involved. Our study aimed to investigate the longitudinal relationship between infant temperament and early language development, also considering infant gender, gestational age, and birthweight. Early temperament was assessed at 6, 9, 18, 24, and 30 months with the Very Short Form of Infant Behavior Questionnaire (IBQ-R) and the Very Short Form of Early Childhood Behavior Questionnaire (ECBQ). Early nonverbal communication skills, receptive and expressive vocabulary were evaluated with the Hungarian version of The MacArthur Communicative Development Inventory (HCDI). Our study adds further evidence to the contribution of infant temperament to early language development. Temperament, infant gender, and gestational age were associated with language development in infancy. Infants and toddlers with higher Surgency might enter communicative situations more readily and show more engagement with adult social partners, which is favorable for communication development. Gestational age was previously identified as a predictor for language in preterm infants. Our results extend this association to the later and narrower gestational age time window of term deliveries. Infants born after longer gestation develop better expressive vocabulary in toddlerhood. Gestational age may mark prenatal developmental processes that may exert influence on the development of verbal communication at later ages.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2024.1375353/full

ALAN CIENKI – Variable embodiment of stance-taking and footing in simultaneous interpreting

Previous research has argued that consecutive interpreters constitute laminated speakers in the sense that they engage with different kinds of footing at once, representing another's point of view through their words in another language. These multiple roles also play out in their gesturing, as they sometimes indicate deictically who is the source of the ideas and stances they are expressing (the principal). Simultaneous interpreters, though, often work in an interpreting booth; they are often not seen by the audience, yet many of them gesture, sometimes frequently. How are simultaneous interpreters using gesture in relation to stance-taking and footing? We consider the case of simultaneous interpreters rendering popular science lectures between (both to and from) Russian (their L1) and either English or German (their L2). Though only hearing the audio of the lectures, the interpreters produced many gestures, which were analyzed for their function. Some representational and deictic gestures appeared to clearly involve the interpreter as the principal (writing numbers with one's finger to help remember them or pointing to two places on the desk to keep track of two different quantities mentioned). Other representational and deictic gestures are ambiguous as to whether they are enacting what the interpreter may have imagined what the lecturer did or whether they arose out of the interpreter's own thinking for speaking (e.g., tracing the form of a bird being mentioned or pointing to an empty space when the lecturer was referring to a graph). Pragmatic gestures, showing one's stance toward the topic of the talk, were the most ambiguous as to the footing, reflecting how the interpreter may be engaged in fictive interaction with their imagined audience. Self-adapters, however, more clearly involve the interpreter as the principal, as such actions are known to support cognitive focussing and self-soothing. In sum, we see varying degrees of clarity as to whose stance and principal footing simultaneous interpreters are expressing bodily as laminated speakers. The variable ambiguity can be attributed to the nature of gesture as a semiotic system, the functions of which are more often dependent on co-occurring speech than vice versa.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2024.1429232/full

Gesture

PAPERS

KAILIE DOMBRAUSKY et al – Chimpanzees coordinate interrogative markers to ask questions

Questions serve to initiate and continue conversation as well as to gain information and introduce new topics. In signed languages a question can be signaled by modifying the content of an utterance or by coordinating the use of nonmanual markers (e.g., the questioning look) and manual modulation (e.g., holding the sign for an extended duration). Cross-fostered chimpanzees, who use signs of American Sign Language (ASL), have demonstrated behaviors that appear in human

conversation, including question-answer exchanges. The current study describes the production of questions by signing chimpanzees in a conversational context and offers a methodology for quantifying the relationship between nonmanual markers and manual modulation involved in interrogative utterances.
https://benjamins.com/catalog/gest.22022.dom

Interaction Studies

PAPERS

STEFAN HARTMANN et al with SŁAWOMIR WACEWICZ – Delineating the field of language evolution research: A quantitative analysis of peer-review patterns at the Joint Conference on Language Evolution (JCoLE 2022)
Research on language evolution is an established subject area yet permeated by terminological controversies about which topics should be considered pertinent to the field and which not. By consequence, scholars focusing on language evolution struggle in providing precise demarcations of the discipline, where even the very central notions of evolution and language are elusive. We aimed at providing a data-driven characterisation of language evolution as a field of research by relying on quantitative analysis of data drawn from 697 reviews on 255 submissions from the Joint Conference on Language Evolution 2022 (Kanazawa, Japan). Our results delineate a field characterized by a core of main research topics such as iconicity, sign language, multimodality. Despite being explored within the framework of language evolution research, only very recently these topics became popular in linguistics. As a result, language evolution has the potential to emerge as a forefront of linguistic research, bringing innovation to the study of language. We also see the emergence of more recent topics like rhythm, music, and vocal learning. Furthermore, the community identifies cognitive science, primatology, archaeology, palaeoanthropology, and genetics as key areas, encouraging empirical rather than theoretical work. With new themes, models, and methodologies emerging, our results depict an intrinsically multidisciplinary and evolving research field, likely adapting as language itself.
https://benjamins.com/catalog/is.00024.har

PHILIP SCALES, VÉRONIQUE AUBERGÉ & OLIVIER AYCARD – From vocal prosody to movement prosody, from HRI to understanding humans
Human–Human and Human–Robot Interaction are known to be influenced by a variety of modalities and parameters. Nevertheless, it remains a challenge to anticipate how a given mobile robot's navigation and appearance will impact how it is perceived by humans. Drawing a parallel with vocal prosody, we introduce the notion of movement prosody, which encompasses spatio-temporal and appearance dimensions which are involved in a person's perceptual experience of interacting with a mobile robot. We design a novel robot motion corpus, encompassing variables related to the kinematics, gaze, and appearance of the robot, which we hypothesize are involved in movement prosody. Initial results of three perception experiments suggest that these variables have significant influences on participants' perceptions of robot socio-affects and physical attributes.
https://benjamins.com/catalog/is.22010.sca

Nature

NEWS

Eating habits of Denisovans on the Tibetan Plateau revealed
The discovery of a rib fragment from Baishiya Karst Cave greatly extends the presence of Denisovan hominins on the Tibetan Plateau. In-depth analyses of fossilized animal bones from the same site show that Denisovans made full use of the available animal resources.
https://www.nature.com/articles/d41586-024-02160-8

ARTICLES

EWEN CALLAWAY – How Denisovans thrived on top of the world: mysterious ancient humans' survival secrets revealed
The cave-dwelling group hunted animals such as hyenas and hares to sustain themselves in harsh environments.
https://www.nature.com/articles/d41586-024-02194-y

PATRICK MCNAMARA et al – Neuroscientists must not be afraid to study religion
Scientists interested in the brain have tended to avoid studying religion or spirituality for fear of being seen as unscientific.
https://www.nature.com/articles/d41586-024-02153-7

PAPERS

MOHSEN JAMALI et al with EVELINA FEDORENKO – Semantic encoding during language comprehension at single-cell resolution
From sequences of speech sounds or letters, humans can extract rich and nuanced meaning through language. This capacity is essential for human communication. Yet, despite a growing understanding of the brain areas that support linguistic and semantic processing, the derivation of linguistic meaning in neural tissue at the cellular level and over the timescale of action

potentials remains largely unknown. Here we recorded from single cells in the left language-dominant prefrontal cortex as participants listened to semantically diverse sentences and naturalistic stories. By tracking their activities during natural speech processing, we discover a fine-scale cortical representation of semantic information by individual neurons. These neurons responded selectively to specific word meanings and reliably distinguished words from nonwords. Moreover, rather than responding to the words as fixed memory representations, their activities were highly dynamic, reflecting the words' meanings based on their specific sentence contexts and independent of their phonetic form. Collectively, we show how these cell ensembles accurately predicted the broad semantic categories of the words as they were heard in real time during speech and how they tracked the sentences in which they appeared. We also show how they encoded the hierarchical structure of these meaning representations and how these representations mapped onto the cell population. Together, these findings reveal a finely detailed cortical organization of semantic representations at the neuron scale in humans and begin to illuminate the cellular-level processing of meaning during language comprehension.
https://www.nature.com/articles/s41586-024-07643-2

HUAN XIA et al with JEAN-JACQUES HUBLIN – Middle and Late Pleistocene Denisovan subsistence at Baishiya Karst Cave

Genetic and fragmented palaeoanthropological data suggest that Denisovans were once widely distributed across eastern Eurasia. Despite limited archaeological evidence, this indicates that Denisovans were capable of adapting to a highly diverse range of environments. Here we integrate zooarchaeological and proteomic analyses of the late Middle to Late Pleistocene faunal assemblage from Baishiya Karst Cave on the Tibetan Plateau, where a Denisovan mandible and Denisovan sedimentary mitochondrial DNA were found. Using zooarchaeology by mass spectrometry, we identify a new hominin rib specimen that dates to approximately 48–32 thousand years ago (layer 3). Shotgun proteomic analysis taxonomically assigns this specimen to the Denisovan lineage, extending their presence at Baishiya Karst Cave well into the Late Pleistocene. Throughout the stratigraphic sequence, the faunal assemblage is dominated by Caprinae, together with megaherbivores, carnivores, small mammals and birds. The high proportion of anthropogenic modifications on the bone surfaces suggests that Denisovans were the primary agent of faunal accumulation. The chaîne opératoire of carcass processing indicates that animal taxa were exploited for their meat, marrow and hides, while bone was also used as raw material for the production of tools. Our results shed light on the behaviour of Denisovans and their adaptations to the diverse and fluctuating environments of the late Middle and Late Pleistocene of eastern Eurasia.
https://www.nature.com/articles/s41586-024-07612-9

ADHI AGUS OKTAVIANA et al – Narrative cave art in Indonesia by 51,200 years ago

Previous dating research indicated that the Indonesian island of Sulawesi is host to some of the oldest known rock art. That work was based on solution uranium-series (U-series) analysis of calcite deposits overlying rock art in the limestone caves of Maros-Pangkep, South Sulawesi. Here we use a novel application of this approach—laser-ablation U-series imaging—to re-date some of the earliest cave art in this karst area and to determine the age of stylistically similar motifs at other Maros-Pangkep sites. This method provides enhanced spatial accuracy, resulting in older minimum ages for previously dated art. We show that a hunting scene from Leang Bulu' Sipong 4, which was originally dated using the previous approach to a minimum of 43,900 thousand years ago (ka)3, has a minimum age of 50.2 ± 2.2 ka, and so is at least 4,040 years older than thought. Using the imaging approach, we also assign a minimum age of 53.5 ± 2.3 ka to a newly described cave art scene at Leang Karampuang. Painted at least 51,200 years ago, this narrative composition, which depicts human-like figures interacting with a pig, is now the earliest known surviving example of representational art, and visual storytelling, in the world3. Our findings show that figurative portrayals of anthropomorphic figures and animals have a deeper origin in the history of modern human (Homo sapiens) image-making than recognized to date, as does their representation in composed scenes.
https://www.nature.com/articles/s41586-024-07541-7

CORRECTIONS

SUJAYA NEUPANE, ILA FIETE & MEHRDAD JAZAYERI – Mental navigation in the primate entorhinal cortex

PUBLISHER CORRECTION

Correction to: Nature https://doi.org/10.1038/s41586-024-07557-z Published online 12 June 2024.

 Also, there were errors in the Fig. 3b y-axis labels where, in the text now reading "Cross-validated R2 at offset", "offset" originally appeared as "onset". The errors have been corrected in the HTML and PDF versions of the article.
https://www.nature.com/articles/s41586-024-07737-x

Nature Communications Biology

CORRECTIONS

L. A. VAN HOLSTEIN et al – Multidimensional primate niche space sheds light on interspecific competition in primate evolution

PUBLISHER CORRECTION

Correction to: Communications Biology https://doi.org/10.1038/s42003-024-06324-0, published online 27 May 2024.
In the original version of the Article, Figure 3 was incorrectly pasted in twice in the pdf version. This has now been corrected.
https://www.nature.com/articles/s42003-024-06519-5

Nature Humanities & Social Sciences Communications

PAPERS

LETAO WANG & YUE JIANG – Do translation universals exist at the syntactic-semantic level? A study using semantic role labeling and textual entailment analysis of English-Chinese translations

Albeit extensive studies of translation universals at lexical and grammatical levels, there has been scant research at the syntactic-semantic level. To bridge this gap, this study employs semantic role labeling and textual entailment analysis to compare Chinese translations with English source texts and non-translated Chinese original texts. The research has found substantial evidence for translation universals like explicitation, simplification, and levelling out at the syntactic-semantic level, which is illustrated by significant differences between syntactic-semantic features of Chinese translations and those of English source texts and Chinese original texts. This suggests a distinct syntactic-semantic uniqueness of Chinese translations, wherein the overall features exhibit an "eclectic" characteristic, showcasing contrasting outcomes such as explicitation identified as S-universal and implicitation deemed T-universal. This could be attributed to the gravitational pull from the two language systems. In the inspection of specific semantic roles, features of agents and discourse markers are found to be evidence for both S-explicitation and T-explicitation, potentially reflecting the role of socio-cultural factors in shaping the uniqueness of syntactic-semantic features of Chinese translations. These findings further underscore the complexity inherent in translation, highlighting its function as a dynamic balance system.
https://www.nature.com/articles/s41599-024-03317-6

Nature Scientific Reports

PAPERS

LI ZHANG & XIAOBO CHEN – Social coevolution and Sine chaotic opposition learning Chimp Optimization Algorithm for feature selection

Feature selection is a hot problem in machine learning. Swarm intelligence algorithms play an essential role in feature selection due to their excellent optimisation ability. The Chimp Optimisation Algorithm (CHoA) is a new type of swarm intelligence algorithm. It has quickly won widespread attention in the academic community due to its fast convergence speed and easy implementation. However, CHoA has specific challenges in balancing local and global search, limiting its optimisation accuracy and leading to premature convergence, thus affecting the algorithm's performance on feature selection tasks. This study proposes Social coevolution and Sine chaotic opposition learning Chimp Optimization Algorithm (SOSCHoA). SOSCHoA enhances inter-population interaction through social coevolution, improving local search. Additionally, it introduces sine chaotic opposition learning to increase population diversity and prevent local optima. Extensive experiments on 12 high-dimensional classification datasets demonstrate that SOSCHoA outperforms existing algorithms in classification accuracy, convergence, and stability. Although SOSCHoA shows advantages in handling high-dimensional datasets, there is room for future research and optimization, particularly concerning feature dimensionality reduction.
https://www.nature.com/articles/s41598-024-66285-6

New Scientist

NEWS

Neanderthal child may have had Down's syndrome

A fossil bone displaying features consistent with Down's syndrome belonged to a Neanderthal child who survived beyond 6 years old, adding to evidence that these extinct humans cared for members of their community.
https://www.newscientist.com/article/2437263-neanderthal-child-may-have-had-downs-syndrome/

PeerJ

PAPERS

AHMAD MUSYAFA et al – Dynamic decoding and dual synthetic data for automatic correction of grammar in low-resource scenario

Grammar error correction systems are pivotal in the field of natural language processing (NLP), with a primary focus on identifying and correcting the grammatical integrity of written text. This is crucial for both language learning and formal communication. Recently, neural machine translation (NMT) has emerged as a promising approach in high demand.

However, this approach faces significant challenges, particularly the scarcity of training data and the complexity of grammar error correction (GEC), especially for low-resource languages such as Indonesian. To address these challenges, we propose InSpelPoS, a confusion method that combines two synthetic data generation methods: the Inverted Spellchecker and Patterns+POS. Furthermore, we introduce an adapted seq2seq framework equipped with a dynamic decoding method and state-of-the-art Transformer-based neural language models to enhance the accuracy and efficiency of GEC. The dynamic decoding method is capable of navigating the complexities of GEC and correcting a wide range of errors, including contextual and grammatical errors. The proposed model leverages the contextual information of words and sentences to generate a corrected output. To assess the effectiveness of our proposed framework, we conducted experiments using synthetic data and compared its performance with existing GEC systems. The results demonstrate a significant improvement in the accuracy of Indonesian GEC compared to existing methods.
https://peerj.com/articles/cs-2122/

PLoS One

PAPERS

DREW GORENZ & NORBERT SCHWARZ – How funny is ChatGPT? A comparison of human- and A.I.-produced jokes
Can a large language model produce humor? Past research has focused on anecdotal examples of large language models succeeding or failing at producing humor. These examples, while interesting, do not examine ChatGPT's humor production abilities in ways comparable to humans' abilities, nor do they shed light on how funny ChatGPT is to the general public. To provide a systematic test, we asked ChatGPT 3.5 and laypeople to respond to the same humor prompts (Study 1). We also asked ChatGPT 3.5 to generate humorous satirical headlines in the style of The Onion and compared them to published headlines of the satirical magazine, written by professional comedy writers (Study 2). In both studies, human participants rated the funniness of the human and A.I.-produced responses without being aware of their source. ChatGPT 3.5-produced jokes were rated as equally funny or funnier than human-produced jokes regardless of the comedic task and the expertise of the human comedy writer.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0305364

CHRISTOPHER KENDALL et al – Global and local ancestry estimation in a captive baboon colony
The last couple of decades have highlighted the importance of studying hybridization, particularly among primate species, as it allows us to better understand our own evolutionary trajectory. Here, we report on genetic ancestry estimates using dense, full genome data from 881 olive (Papio anubus), yellow (Papio cynocephalus), or olive-yellow crossed captive baboons from the Southwest National Primate Research Center. We calculated global and local ancestry information, imputed low coverage genomes (n = 830) to improve marker quality, and updated the genetic resources of baboons available to assist future studies. We found evidence of historical admixture in some putatively purebred animals and identified errors within the Southwest National Primate Research Center pedigree. We also compared the outputs between two different phasing and imputation pipelines along with two different global ancestry estimation software. There was good agreement between the global ancestry estimation software, with R2 > 0.88, while evidence of phase switch errors increased depending on what phasing and imputation pipeline was used. We also generated updated genetic maps and created a concise set of ancestry informative markers (n = 1,747) to accurately obtain global ancestry estimates.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0305157

SOPHIE ALSHUKRI et al – Psychopathy, pain, and pain empathy: A psychophysiological study
The present study examined whether people higher in psychopathy experienced less self-reported and psychophysiological nociceptive pressure than people lower in psychopathy. We also examined whether psychopathy affects empathy for others' pain via self-reported and psychophysiological measures. Three hundred and sixty-nine students (18–78 years; M = 26, SD = 9.34) were screened for psychopathic traits using the Youth Psychopathy Inventory (YPI). Stratified sampling was used to recruit 49 adults residing in the highest (n = 23) and lowest (n = 26) 20% of the psychopathy spectrum. Using skin conductance response (SCR) and self-report responses, participants responded to individually adjusted intensities of pneumatic pressure and others' pain images and completed self-reported psychopathy and empathy measures (Triarchic Psychopathy Measure, TriPm; Interpersonal Reactivity Index, IRI). People higher in psychopathy self-reported feeling less nociceptive pressure compared to people lower in psychopathy, yet we did not find any differences in SCR to nociceptive pressure. However, when viewing other people in pain, the high psychopathy group displayed lower SCR and lower self-reported empathy compared to those lower in psychopathy. Our results suggest psychopathic traits relate to problems empathising with others' pain, as well as the perception of nociceptive pressure. We also show support for the theory of dual harm which has been receiving increasing attention. Consequently, psychopathy interventions should focus both on recognising and empathising with the pain of others.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0306461

PNAS

PAPERS

ERIC SCHNELL & MICHAEL MUTHUKRISHNA – Indirect reciprocity undermines indirect reciprocity destabilizing large-scale cooperation

Previous models suggest that indirect reciprocity (reputation) can stabilize large-scale human cooperation [K. Panchanathan, R. Boyd, Nature 432, 499–502 (2004)]. The logic behind these models and experiments [J. Gross et al., Sci. Adv. 9, eadd8289 (2023) and O. P. Hauser, A. Hendriks, D. G. Rand, M. A. Nowak, Sci. Rep. 6, 36079 (2016)] is that a strategy in which individuals conditionally aid others based on their reputation for engaging in costly cooperative behavior serves as a punishment that incentivizes large-scale cooperation without the second-order free-rider problem. However, these models and experiments fail to account for individuals belonging to multiple groups with reputations that can be in conflict. Here, we extend these models such that individuals belong to a smaller, "local" group embedded within a larger, "global" group. This introduces competing strategies for conditionally aiding others based on their cooperative behavior in the local or global group. Our analyses reveal that the reputation for cooperation in the smaller local group can undermine cooperation in the larger global group, even when the theoretical maximum payoffs are higher in the larger global group. This model reveals that indirect reciprocity alone is insufficient for stabilizing large-scale human cooperation because cooperation at one scale can be considered defection at another. These results deepen the puzzle of large-scale human cooperation.
https://www.pnas.org/doi/10.1073/pnas.2322072121

COMMENTARIES

JÖRG GROSS et al with CARSTEN K. W. DE DREU – Indirect reciprocity can foster large-scale cooperation

Schnell and Muthukrishna (S&M) present an intriguing theoretical model, extending indirect reciprocity to group-structured populations. In their model, agents interact across two stages. First, each agent chooses one of the following actions: defect, cooperate only with members of their own group, or cooperate with members of other groups. Second, in a "Mutual Aid Game" (MAG), agents are paired with a partner and can create a benefit for them conditional on the target's reputation. The authors conclude that under a range of reputation rules, indirect reciprocity alone "is insufficient for stabilizing large-scale human cooperation."

The model makes one important assumption: Agents only interact with fellow in-group members in the MAG. This raises three important questions: a) Can indirect reciprocity, in theory, promote large-scale cooperation when allowing for interactions across group boundaries such that reputation toward out-group members is also pertinent? b) Do people actually implement conditional reputation strategies when interacting with out-group members? c) To which degree does belonging to a group restrict interaction frequency with out-group members in humans and other animals?
https://www.pnas.org/doi/full/10.1073/pnas.2409894121

ERIC SCHNELL & MICHAEL MUTHUKRISHNA – Reply to Gross et al.: Indirect reciprocity undermines large-scale cooperation under realistic conditions

Gross et al. point out that in our model of how "indirect reciprocity undermines indirect reciprocity destabilizing large-scale cooperation", we do not consider intergroup interactions between players in different local groups in the Mutual Aid Game (MAG). This was by design. As we say in the paper, "if group members interact more frequently across local group boundaries and move between groups, the effective population becomes closer to the global population incentivizing higher-scale cooperation." Our model is based on the assumption that local subgroups do indeed exist, and by definition, these local groups are the people that we interact with more frequently and to which we show a preference for cooperation—ingroup favoritism. If individuals were to interact with a large number of outgroup members more frequently than they do ingroup members, then we agree that global cooperation would be more stable. In fact, we argue that one the keys to building large-scale cooperation is to breakdown the mechanisms that incentivize ingroup biases. However, there is a problem when mapping from our models to the real world. Whether people would interact and cooperate more with those in their local ingroup than outgroup members is precisely what we are trying to explain.
https://www.pnas.org/doi/full/10.1073/pnas.2410085121

Proceedings of the Royal Society B

PAPERS

DORI M. GRIJSEELS, DANIELLA A. FAIRBANK & CORY T. MILLER – A model of marmoset monkey vocal turn-taking

Vocal turn-taking has been described in a diversity of species. Yet, a model that is able to capture the various processes underlying this social behaviour across species has not been developed. To this end, here we recorded a large and diverse dataset of marmoset monkey vocal behaviour in social contexts comprising one, two and three callers and developed a model to determine the keystone factors that affect the dynamics of these natural communicative interactions. Notably, marmoset turn-taking did not abide by coupled-oscillator dynamics, but rather call timing was overwhelmingly stochastic in these exchanges. Our features-based model revealed four key factors that encapsulate the majority of patterns evident in the behaviour, ranging from internal processes, such as particular states of the individual driving increased calling, to social context-driven suppression of calling. These findings indicate that marmoset vocal turn-taking is affected by a broader suite

of mechanisms than previously considered and that our model provides a predictive framework with which to further explicate this natural behaviour at both the behavioural and neurobiological levels, and for direct comparisons with the analogous behaviour in other species.
https://royalsocietypublishing.org/doi/10.1098/rspb.2024.0150

Royal Society Open Science

PAPERS

RAFFAELE D'-ISA et al – Catch me if you can: free-living mice show a highly flexible dodging behaviour suggestive of intentional tactical deception

Intentional tactical deception, the employment of a tactic to intentionally deceive another animal, is a complex behaviour based on higher-order cognition, that has rarely been documented outside of primates and corvids. New laboratory-to-field assays, however, provide the opportunity to investigate such behaviour among free-living mice. In the present study, we placed laboratory-style test chambers with a single entrance near a forest outside Warsaw, where we observed the social interactions of two territorial murids, black-striped and yellow-necked mice, under food competition for seven months. Notably, among the social interactions, we video-recorded 21 instances of deceptive pursuer evasion. In the most obvious cases, an individual inside the chamber, to avoid an incoming mouse, hid by the chamber opening (the only means to enter or exit), paused until the pursuer entered and passed by, and then exploited the distraction of the back-turned pursuer by fleeing through the opening in a direction opposite to the one the pursuer came from. This deceptive dodging is the first evidence of a behaviour suggestive of intentional tactical deception among mice. As such, this deceptive behaviour may be of interest not only for rodent psychology but also, more generally, for the fields of non-human intentionality and theory of mind.
{But is anticipation comparable to Theory of Mind? Is the question "what is likely to happen next?" equivalent to "what will X do next?"}
https://royalsocietypublishing.org/doi/abs/10.1098/rsos.231692

Trends in Cognitive Sciences

COMMENTARIES

HENRY TAYLOR & ANDREW J. BREMNER – Cluster kinds and the developmental origins of consciousness

There is a clue in the name. 'Infant' is derived from the Latin in fans (without speech). Human babies cannot report their experiences and are uncooperative (to say the least) when it comes to experimental task instructions. For these reasons, it has been difficult to establish when babies become conscious. Bayne and colleagues propose a cluster-based methodology for overcoming these issues, arguing that consciousness emerges in the last prenatal trimester. We are heartily enthusiastic about this approach but consider some complications. While Bayne et al. identify behavioural and neural markers of consciousness commensurate with an 'early emergence' view, we note that other markers point to a 'late emergence' view. In the spirit of optimism, we suggest how the cluster-based methodology may overcome this problem.
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(24)00007-X

TIM BAYNE et al – Infants and markers: reply to Taylor and Bremner

In a recent paper, we suggested that the question of when consciousness emerges is best answered by asking when markers of consciousness that have been validated in adults might first appear. Taking four such markers, we argued in favour of an 'early onset' view, suggesting that consciousness is likely to be in place by 3–4 months of age and perhaps even arises before birth. Taylor and Bremner share our commitment to a marker-based approach, but argue that we were too quick to come down in favour of an early-onset account. They note that many of the other putative markers of consciousness, for example, protodeclarative pointing, intentional control ('intentional means-ends coordination of actions'), and explicit memory, emerge only much later in development. In arguing that the cluster-based approach supports an early-emergence view of infant consciousness, aren't we unjustifiably privileging some markers (those that favour early-onset accounts) over others?
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(24)00052-4

Original paper: https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00214-0

Trends in Ecology and Evolution

PAPERS

DAIPING WANG et al – Female alternative reproductive tactics: diversity and drivers

It is often argued that anisogamy causes alternative reproductive tactics (ARTs) to be more common in males than females. We challenge this view by pointing out logical flaws in the argument. We then review recent work on the diversity of female ARTs, listing several understudied types such as solitary versus communal breeding and facultative parthenogenesis. We highlight an important difference between male and female ARTs that caused female ARTs to be overlooked: male ARTs tend to focus on successful fertilization, whereas female ARTs occur at many stages of reproduction and often form complex

networks of decision points. We propose to study correlated female ARTs as a whole to better understand their drivers and eco-evolutionary dynamics.
https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(24)00140-X

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