EAORC BULLETIN 1,129 – 2 February 2025

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NOTICES

FORMATTED VERSION OF THIS BULLETIN

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

PUBLICATION ALERTS

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

EDITORIAL INTERJECTIONS

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

ACADEMIA.EDU – Advances in the emergence of language, human cognition, and modern cultures

John Benjamins (2009).

FRANCESCO D'ERRICO & JEAN-MARIE HOMBERT (eds.) – Becoming Eloquent: Advances in the emergence of language, human cognition, and modern cultures

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ANNE TRESSET et al – Early diffusion of domestic bovids in Europe: An indicator for human contacts, exchanges and migrations?

Language and genes

LOLKE VAN DER VEEN, LLUIS QUINTANA-MURCI & DAVID COMAS – Linguistic, cultural and genetic perspectives on human diversity in west-central Africa

JEAN-MICHEL DUGOUJON et al – The Berber and the Berbers: Genetic and linguistic diversities

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LUC STEELS – Can agent-based language evolution contribute to archeology?

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https://www.academia.edu/61843659/From_the_origin_of_language_to_the_diversification_of_languages

ACADEMIA.EDU – Puzzles and mysteries in the origins of language

Language & Communication 50, 12–21 (2016).

CHRIS KNIGHT – Puzzles and mysteries in the origins of language

Language evolved in no species other than humans, suggesting a deep-going obstacle to its evolution. Could it be that language simply cannot evolve in a Darwinian world? Reviewing the insights of Noam Chomsky, Amotz Zahavi and Dan Sperber, this article shows how and why each apparently depicts language's emergence as theoretically impossible. Chomsky shuns evolutionary arguments, asserting simply that language was instantaneously installed. Zahavi argues that language entails reliance on low cost conventional signals whose evolutionary emergence would contradict basic Darwinian theory. Sperber argues that a symbolic expression is, literally, a falsehood, adding to the difficulty of explaining how – in a Darwinan world – systematic reliance on language could ever have evolved. It is concluded that language exists, but for reasons which no currently accepted theoretical paradigm can explain.

https://www.academia.edu/73163878/Puzzles_and_mysteries_in_the_origins_of_language

NEWS

NATURE BRIEFING – The steps to stamp out fake research

The Avengers of research integrity — a group of 10 sleuths collectively responsible for uncovering thousands of problematic publications — have assembled to share advice on how to tackle paper mills. First, know your enemy, they say. Studies are needed to examine where paper mills are operating and the fields they're targeting. Publishers and editors should brush up on the telltale signs of papers submitted from mills, and guilty authors must be held to account with penalties such as temporary bans from receiving funding. "A structural shift in science is needed, if we are to wipe out commercialized fraud," they write.

https://www.nature.com/articles/d41586-025-00212-1

SAPIENS – The Vanishing Traces of Our Earliest Ancestors in Indonesia

"From the air, endless rows of palm trees swallowed the topography as we flew over Bintan Island in the South China Sea. On the ground, an occasional fallen palm tree and piles of red palm fruit scattered along the roadsides. Indonesia is the world's largest producer of palm oil and signs of the industry are everywhere in this palm-studded tropical island nation.

As a paleontologist, I traveled in May 2023 to the Indonesian islands of the Riau Archipelago, just south of Singapore, as part of an ongoing quest for evidence of Homo erectus, one of our oldest ancestors who once lived in this region from about 1.9 million years ago to 110,000 years ago. But due to widespread deforestation, palm oil plantations, and erosion, my team and I realized that much of the ancient landscape that remains above water has been obliterated—and finding signs of archaic life remains elusive."

https://www.sapiens.org/archaeology/the-vanishing-traces-of-our-earliest-ancestors-in-indonesia/

SAPIENS – Discovering Africa's Oldest Burial

A team of archaeologists are busy learning about human evolution, symbolism, and ritual from the remains of a child laid to rest in a Kenyan cave during the Middle Stone Age—the oldest-known human burial on the African continent to date.

https://www.sapiens.org/archaeology/kenya-cave-human-burial/

SAPIENS – The Oldest True Stories in the World

Evidence gathered in recent years shows that some ancient narratives contain remarkably reliable records of real events.
https://www.sapiens.org/language/oral-tradition/

SCIENCE DAILY – Rethinking altruistic punishment: How people decide to confront or avoid unfairness

A research team developed a new experimental game to explore whether people avoid witnessing selfish behavior to evade punishing others or simply to avoid confronting unfairness. The study found that avoidance is driven by both the desire to not acknowledge inequality and the wish to prevent confrontation, suggesting that altruistic punishment may be less common in real-life situations than previously believed.
https://www.sciencedaily.com/releases/2025/01/250127124709.htm

SCIENCE DAILY – The benefits of speaking multiple languages

New psychology research indicates that multilingual children may have enhanced executive function and perspective taking skills.
https://www.sciencedaily.com/releases/2025/01/250129162136.htm

SCIENCE DAILY – Towards a new generation of human-inspired language models

Can a computer learn a language the way a child does? A recent study sheds new light on this question. The researchers advocate for a fundamental revision of how artificial intelligence acquires and processes language.
https://www.sciencedaily.com/releases/2025/01/250128124300.htm

SCIENCE DAILY – Rethinking altruistic punishment: New experimental insights

A research team developed a new experimental game to explore whether people avoid witnessing selfish behavior to evade punishing others or simply to avoid confronting unfairness. The study found that avoidance is driven by both the desire to not acknowledge inequality and the wish to prevent confrontation, suggesting that altruistic punishment may be less common in real-life situations than previously believed.
https://www.sciencedaily.com/releases/2025/01/250127124709.htm

PUBLICATIONS

Biology Letters

PAPERS

ANDREW H. MOELLER – Partner fidelity, not geography, drives co-diversification of gut microbiota with hominids

Bacterial strains that inhabit the gastrointestinal tracts of hominids have diversified in parallel (co-diversified) with their host species. The extent to which co-diversification has been mediated by partner fidelity between strains and hosts or by geographical distance between hosts is not clear due to a lack of strain-level data from clades of hosts with unconfounded phylogenetic relationships and geographical distributions. Here, I tested these competing hypotheses through meta-analyses of 7121 gut bacterial genomes assembled from wild-living ape species and subspecies sampled throughout their ranges in equatorial Africa. Across the gut bacterial phylogeny, strain diversification was more strongly associated with host phylogeny than with geography. In total, approximately 14% of the branch length of the gut bacterial phylogeny showed significant evidence of co-diversification independent of geography, whereas only approximately 4% showed significant evidence of diversification associated with geography independent of host phylogeny. Geographically co-occurring heterospecific hosts (Pan and Gorilla) universally maintained distinct co-diversified bacterial strains. Strains whose diversification was associated with geography independent of host phylogeny included clades of Proteobacteria known to adopt free-living lifestyles (e.g. Escherichia). These results show that co-diversification of gut bacterial strains with hominids has been driven primarily by fidelity of strains to host lineages rather than geography.
https://royalsocietypublishing.org/doi/10.1098/rsbl.2024.0454

Cell

PAPERS

ATREYO PAL et al – Resolving the three-dimensional interactome of human accelerated regions during human and chimpanzee neurodevelopment

Human accelerated regions (HARs) have been implicated in human brain evolution. However, insight into the genes and pathways they control is lacking, hindering the understanding of their function. Here, we identify 2,963 conserved gene targets for 1,590 HARs and their orthologs in human and chimpanzee neural stem cells (NSCs). Conserved gene targets are enriched for neurodevelopmental functions and are overrepresented among differentially expressed genes (DEGs) identified in human NSCs (hNSCs) and chimpanzee NSCs (cNSCs) as well as in human versus non-human primate brains. Species-specific

gene targets do not converge on any function and are not enriched among DEGs. HAR targets also show cell-type-specific expression in the human fetal brain, including in outer radial glia, which are linked to cortical expansion. Our findings support that HARs influence brain evolution by altering the expression of ancestral gene targets shared between human and chimpanzee rather than by gaining new targets in human and facilitate hypothesis-directed studies of HAR biology.
https://www.cell.com/cell/abstract/S0092-8674(25)00036-4

Cell Reports

PAPERS

JIALIN YE et al – Hierarchical behavioral analysis framework as a platform for standardized quantitative identification of behaviors

Behavior is composed of modules that operate based on inherent logic. Understanding behavior and its neural mechanisms is facilitated by clear structural behavioral analysis. Here, we developed a hierarchical behavioral analysis framework (HBAF) that efficiently reveals the organizational logic of these modules by analyzing high-dimensional behavioral data. By creating a spontaneous behavior atlas for male and female mice, we discovered that spontaneous behavior patterns are hardwired, with sniffing serving as the hub node for movement transitions. The sniffing-to-grooming ratio accurately distinguished the spontaneous behavioral states in a high-throughput manner. These states are influenced by emotional status, circadian rhythms, and lighting conditions, leading to unique behavioral characteristics, spatiotemporal features, and dynamic patterns. By implementing the straightforward and achievable spontaneous behavior paradigm, HBAF enables swift and accurate assessment of animal behavioral states and bridges the gap between a theoretical understanding of the behavioral structure and practical analysis using comprehensive multidimensional behavioral information.
https://www.cell.com/cell-reports/fulltext/S2211-1247(25)00010-5

Frontiers in Psychology

PAPERS

MASAKI TOMONAGA – I've just seen a face: further search for face pareidolia in chimpanzees (Pan troglodytes)

Seeing faces in random patterns, such as in clouds, is known as pareidolia. Two possible mechanisms can cause pareidolia: a bottom-up mechanism that automatically detects inverted triangle or top-heavy patterns, and a top-down mechanism that actively seeks out faces. Pareidolia has been reported in nonhuman animals as well. In chimpanzees, it has been suggested that the bottom-up mechanism is involved in their pareidolic perception, but the extent of the contribution of the top-down mechanism remains unclear. This study investigated the role of topdown control in face detection in chimpanzees.

After being trained on an oddity task in which they had to select a noise pattern where a face (either human or chimpanzee) or a letter (Kanji characters) was superimposed among three patterns, they were tested with noise patterns that did not contain any target stimuli.

When the average images of the patterns selected by the chimpanzees in these test trials were analyzed and compared with those that were not selected (i.e., difference images), a clear non-random structure was found in the difference images. In contrast, such structures were not evident in the difference images obtained by assuming that one of the three patterns was randomly selected.

These results suggest that chimpanzees may have been attempting to find "faces" or "letters" in random patterns possibly through some form of top-down processing.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2024.1508867/full

iScience

PAPERS

YINMEI NI & JIAN LI – Relative Social Status Alters the Synchrony of Attribute Integration in Altruistic Decisions

Social status, which represents the relative dominance structure in societies, forms the backdrop against which most social decisions are made. Effective social decision-making demands flexible integration of decision attribute weight (importance of an attribute), and attribute latency (when attributes start to affect decisions). However, current understanding of how attribute weight and latency are influenced by relative social status is limited. In three experiments, we dynamically manipulated subjects' relative social status before they engaged in an altruistic decision task and found that their altruistic behavior was better explained by a time-varying drift diffusion model, in which relative social status selectively modulated attribute latency but not attribute weights. Furthermore, prosocial subjects exhibited higher sensitivity to attribute latency in response to changes in relative social status compared with individualistic subjects. Our results introduce a new dimension to the computational mechanisms underlying the intricate interplay between relative social status and attribute integration.
https://www.cell.com/iscience/fulltext/S2589-0042(25)00171-3

HE CHEN et al with MASAYUKI MATSUMOTO – Formation of brain-wide neural geometry during visual item recognition in monkeys

Neural dynamics are though to reflect computations that relay and transform information in the brain. Previous studies have identified the neural population dynamics in many individual brain regions as a trajectory geometry, preserving a common

computational motif. However, whether these populations share particular geometric patterns across brain-wide neural populations remains unclear. Here, by mapping neural dynamics widely across temporal/frontal/limbic regions in the cortical and subcortical structures of monkeys, we show that 10 neural populations, including 2,500 neurons, propagate visual item information in a stochastic manner. We found that visual inputs predominantly evoked rotational dynamics in the higher-order visual area, TE and its downstream striatum tail, while curvy/straight dynamics appeared frequently downstream in the orbitofrontal/hippocampal network. These geometric changes were not deterministic but rather stochastic according to their respective emergence rates. Our meta-analysis results indicate that visual information propagates as a heterogeneous mixture of stochastic neural population signals in the brain.
https://www.cell.com/iscience/fulltext/S2589-0042(25)00196-8

YAMING HUANG et al – A rapid decline in gender bias relates to changes in subsistence practices over demographic changes in a formerly matrilineal community
This research examines dynamics of kinship systems, emphasizing changes in gender-biased inheritance and social interaction within a formerly matrilineal community. Using demographic data over 70-years of lifespan from 17 Tibetan villages, we observe a significant shift within the predominantly matrilineal inheritance structure: a once-prevalent preference for females in older cohorts has now gone in recent generations. We explore two possible explanations: that this is driven by changes in subsistence system or by changes in sibling configuration. Our investigation reveals that a change from agriculture to non-traditional economy with more market integration marks a pivot from matrilineal to non-unilineal inheritance systems. Moreover, results from economic games conducted in two distinct survey periods (2015 and 2021), indicate that high donations for females in 2015 has become unbiased in 2021. These findings provide concrete evidence of shifts in gender preference both at the level of familial resource allocation and broader societal interactions.
https://www.cell.com/iscience/fulltext/S2589-0042(25)00186-5

Nature

ARTICLES

MARÍA MARTINÓN-TORRES & CARLES LALUEZA-FOX – Ancient human genomes offer clues about the earliest migrations out of Africa
Analyses of 45,000-year-old bones from Europe allow scientists to pin down when modern humans interbred with Neanderthals, shedding light on the histories of populations with no present-day descendants.
https://www.nature.com/articles/d41586-025-00182-4

OBITUARIES

CYPRIAN BROODBANK – Colin Renfrew obituary: archaeologist who shifted thinking on how societies evolve
He brought cutting-edge methods to archaeological analysis, helping to reshape the field.
https://www.nature.com/articles/d41586-025-00220-1

Nature Humanities & Social Sciences Communications

PAPERS

OU LI, YAN SHI & KUANGRAN LI – Red, rather than blue can promote fairness in decision-making
The present study investigated the effect of colors red and blue on fair behavior in two economic games. Study 1 showed that the color red (vs. blue) could lead to a higher (vs. lower) offer in the ultimatum game, and that this effect was mediated by the perceived competitiveness. Study 2 introduced the impunity game and showed that the colors red and blue only affected offers in the ultimatum game, but not in the impunity game. These findings suggested that colors play a more influential role in strategic motives than in pure altruism in fair decision-making, and color-induced perceived competitiveness underlies this effect. This study presents the first empirical evidence of the relationship between colors and fairness in decision-making and offers a solution to nudge cooperative and fair behavior in allocation.
https://www.nature.com/articles/s41599-025-04407-9

New Scientist

ARTICLES

ALISON GEORGE – How our ancestors invented clothing and transformed it into fashion
Remarkable archaeological finds are telling a new story of how prehistoric humans turned clothing from a necessity into a means of self-expression.
https://www.newscientist.com/article/mg26535280-500-how-our-ancestors-invented-clothing-and-transformed-it-into-fashion/

SIMON INGS – How humans evolved to think about risk may cost Earth dearly
A provocative new book delves into the way humans – and elephants – evolved to manage risk. We might do better to think more like elephants.

https://www.newscientist.com/article/mg26535284-400-how-humans-evolved-to-think-about-risk-may-cost-earth-dearly/

REVIEWS

MICHAEL MARSHALL – This look at animal consciousness is a moral workout – in the best way

Some animals – and even machines – may turn out to be conscious. Must we wait for scientific certainty before sharing our rights, asks The Moral Circle.

Review of 'The Moral Circle' by Jeff Sebo, W. W. Norton (2025).

https://www.newscientist.com/article/mg26535284-100-this-look-at-animal-consciousness-is-a-moral-workout-in-the-best-way/

PLoS One

PAPERS

GAVIN M. BIDELMAN, FALLON BERNARD & KIMBERLY SKUBIC – Hearing in categories and speech perception at the "cocktail party"

We aimed to test whether hearing speech in phonetic categories (as opposed to a continuous/gradient fashion) affords benefits to "cocktail party" speech perception. We measured speech perception performance (recognition, localization, and source monitoring) in a simulated 3D cocktail party environment. We manipulated task difficulty by varying the number of additional maskers presented at other spatial locations in the horizontal soundfield (1–4 talkers) and via forward vs. time-reversed maskers, the latter promoting a release from masking. In separate tasks, we measured isolated phoneme categorization using two-alternative forced choice (2AFC) and visual analog scaling (VAS) tasks designed to promote more/less categorical hearing and thus test putative links between categorization and real-world speech-in-noise skills. We first show cocktail party speech recognition accuracy and speed decline with additional competing talkers and amidst forward compared to reverse maskers. Dividing listeners into "discrete" vs. "continuous" categorizers based on their VAS labeling (i.e., whether responses were binary or continuous judgments), we then show the degree of release from masking experienced at the cocktail party is predicted by their degree of categoricity in phoneme labeling and not high-frequency audiometric thresholds; more discrete listeners make less effective use of time-reversal and show less release from masking than their gradient responding peers. Our results suggest a link between speech categorization skills and cocktail party processing, with a gradient (rather than discrete) listening strategy benefiting degraded speech perception. These findings suggest that less flexibility in binning sounds into categories may be one factor that contributes to figure-ground deficits.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0318600

MARION DÉCAILLET et al – Characterization of language abilities and semantic networks in very preterm children at school-age

It has been widely assessed that very preterm children (<32 weeks gestational age) present language and memory impairments compared with full-term children. However, differences in their underlying semantic memory structure have not been studied yet. Nevertheless, the way concepts are learned and organized across development relates to children's capacities in retrieving and using information later. Therefore, the semantic memory organization could underlie several cognitive deficits existing in very preterm children. Computational mathematical models offer the possibility to characterize semantic networks through three coefficients calculated on spoken language: average shortest path length (i.e., distance between concepts), clustering (i.e., local interconnectivity), and modularity (i.e., compartmentalization into small sub-networks). Here we assessed these coefficients in 38 very preterm schoolchildren (aged 8–10 years) compared with 38 full-term schoolchildren (aged 7–10 years) based on a verbal fluency task. Using semantic network analysis, very preterm children showed a longer distance between concepts and a lower interconnectivity at a local level than full-term children. In addition, we found a trend for a higher modularity at a global in very preterm children compared with full-term children. These findings provide preliminary evidence that very preterm children demonstrate subtle impairments in the organization of their semantic network, encouraging the adaptation of the support and education they receive.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0317535

CATIA CORREIA-CAEIRO et al with KATJA LIEBAL – GorillaFACS: The Facial Action Coding System for the Gorilla spp.

The Facial Action Coding System (FACS) is an objective observation tool for measuring human facial behaviour. It avoids subjective attributions of meaning by objectively measuring independent movements linked to facial muscles, called Action Units (AUs). FACS has been adapted to 11 other taxa, including most apes, macaques and domestic animals, but not yet gorillas. To carry out cross species studies of facial expressions within and beyond apes, gorillas need to be included in such studies. Hence, we developed the GorillaFACS for the Gorilla spp. We followed similar methodology as previous FACS: First, we examined the facial muscular plan of the gorilla. Second, we analysed gorilla videos in a wide variety of contexts to identify their spontaneous facial movements. Third, we classified the individual facial movements according to appearance changes produced by the corresponding underlying musculature. A diverse repertoire of 42 facial movements was identified in the gorilla, including 28 AUs and 14 Action Descriptors, with several new movements not identified in the HumanFACS. Although some of the movements in gorillas differ from humans, the total number of AUs is comparable to the HumanFACS (32 AUs). Importantly, the gorilla's range of facial movements was larger than expected, suggesting a more relevant role in

social interactions than what was previously assumed. GorillaFACS is a scientific tool to measure facial movements, and thus, will allow us to better understand the gorilla's expressions and communication. Furthermore, GorillaFACS has the potential be used as an important tool to evaluate this species welfare, particularly in settings of close proximity to humans.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0308790

AISHA MAHMOUD, LAUREN SCOTT & BRITTANY N. FLORKIEWICZ – Examining Mammalian facial behavior using Facial Action Coding Systems (FACS) and combinatorics

There has been an increased interest in standardized approaches to coding facial movement in mammals. Such approaches include Facial Action Coding Systems (FACS), where individuals are trained to identify discrete facial muscle movements that combine to create a facial configuration. Some studies have utilized FACS to analyze facial signaling, recording the quantity of morphologically distinct facial signals a species can generate. However, it is unclear whether these numbers represent the total number of facial muscle movement combinations (which we refer to as facial configurations) that each species is capable of producing. If unobserved combinations of facial muscle movements are communicative in nature, it is crucial to identify them, as this information is important for testing research hypotheses related to the evolution of complex communication among mammals. Our study aimed to assess how well the existing literature represents the potential range of facial signals in two previously studied species: chimpanzees (Pan troglodytes) and domesticated cats (Felis silvestris catus). We adhered to the coding guidelines outlined in the FACS manuals, which are based on the anatomical constraints and capabilities of each mammal's face, to create our comprehensive list of all potential facial configurations. Using this approach, we found that chimpanzees and domesticated cats may be capable of producing thousands of facial configurations, many of which have not yet been documented in the existing research literature. It is plausible that some of these facial configurations are communicative and could be discovered with further research and video recording. In addition to our findings having significant implications for future research on the communicative complexity of mammals, it can also assist researchers in evaluating FACS coding accuracy.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0314896

PNAS

ARTICLES

MAFALDA S. FERREIRA – Evolution of complexity through regulatory variation at a single gene

How does biodiversity originate? What is its function? How does it change over time by interacting with the environment or other diversity? The answers may allow us to predict the direction in which a trait will evolve in response to environmental change. The quest for this predictive power is old and is still underway. Part of the quest involves determining how traits are built, from physiological and hormonal changes, to tissues and cell types, to proteins, genes, and mutations. All of these components act in coordination to construct a functional organism, and changes to one or various of these components create diversity. Selection acts on this diversity, which can fundamentally alter the evolutionary trajectory of populations and species. Therefore, it is important to know how traits are built—mechanistically—to be able to predict evolutionary outcomes.
https://www.pnas.org/doi/full/10.1073/pnas.2424050122

PAPERS

YIHAN QIAN, SUSAN GOLDIN-MEADOW & LIN BIAN – Gesture counteracts gender stereotypes conveyed through subtle linguistic cues

Despite increased attempts to express equality in speech, biases often leak out through subtle linguistic cues. For example, the subject–complement statement (SCS, "Girls are as good as boys at math") is used to advocate for equality but often reinforces gender stereotypes (boys are the standard against which girls are judged). We ask whether stereotypes conveyed by SCS can be counteracted by gesture. Two preregistered studies with 8- to 11-y-old children (N = 320 total) investigate whether an equal gesture—two palms placed at the same height—mitigates the gender stereotype induced by SCS. Children who saw the equal gesture along with SCS were more likely to express egalitarian beliefs than children who saw no gesture or an unequal gesture. Children can extract meaning from gesture when making stereotypical inferences, suggesting that the equal gesture may prove to be an innovative, and simple, intervention to counteract stereotypes introduced by subtle language.
https://www.pnas.org/doi/full/10.1073/pnas.2415671122

COMMENTARIES

JACOBUS J. BOOMSMA – Maternal manipulation in the social Hymenoptera

Rees-Baylis et al. claim that maternal underprovisioning can induce the evolution of reproductive altruism at reduced sibling relatedness. However, they modeled situations that have not occurred in nature, misinterpret the predictive domain of the monogamy hypothesis, and use the unfounded assumption that permanent castes arose from facultative reproductive role-differentiation.
https://www.pnas.org/doi/full/10.1073/pnas.2424729122

ELLA REES-BAYLIS, IDO PEN & JAN J. KREIDER – Reply to Boomsma: The evidence that eusociality evolved from monogamous ancestors is inconclusive

Boomsma criticizes our model in Rees-Baylis et al. for considering the evolution of eusociality in promiscuous species. Previously, Boomsma argued that strict lifetime monogamy was a "universally necessary […] condition" for the evolution of eusociality, negating even the theoretical possibility that eusociality evolves in promiscuous species. However, our model demonstrates that eusociality can in principle evolve despite promiscuous mating, especially when mothers can coerce their offspring by keeping them small.

[Original paper: https://www.pnas.org/doi/10.1073/pnas.2402179121 - EAORC Bulletin 1,124]

https://www.pnas.org/doi/full/10.1073/pnas.2425329122

Proceedings of the Prehistoric Society

PAPERS

PHIL HARDING – et al – Earliest Movement of Sarsen into the Stonehenge Landscape: New Insights from Geochemical and Visibility Analysis of the Cuckoo Stone and Tor Stone

This paper presents the results of new research on two sarsen stones, known as the Cuckoo Stone and Tor Stone, both former standing stones that lie on opposite banks of the River Avon and straddle the eastern border of the Stonehenge and Avebury World Heritage Site. Geochemical analysis indicates that both stones were probably transported to their present site from West Woods on the Marlborough Downs in north Wiltshire, a source that likely also supplied the large sarsen monoliths at Stonehenge. The paper examines the geological conditions necessary for the formation of sarsen across the site of the present-day Salisbury Plain to address the apparent absence of natural sarsen in the area. The results are integrated with those of archaeological fieldwork from nearby contemporaneous sites to suggest that the Cuckoo Stone and Tor Stone were probably introduced into the Stonehenge landscape in the early part of the Late Neolithic period, ie, contemporary with Phase 1 of Stonehenge and some 400–500 years before the construction of the principal sarsen settings at the monument. Visibility analysis indicates that the two stones were probably intervisible and likely to have formed part of a planned landscape and were positioned to create a formal portal to the Stonehenge area on either bank of the River Avon.

https://www.cambridge.org/core/journals/proceedings-of-the-prehistoric-society/article/earliest-movement-of-sarsen-into-the-stonehenge-landscape-new-insights-from-geochemical-and-visibility-analysis-of-the-cuckoo-stone-and-tor-stone/C7C6D363A6E59D0BBF5C3158077ABB24

Proceedings of the Royal Society B

PAPERS

CAMILLA CAPONI et al – Feature-selective adaptation of numerosity perception

Perceptual adaptation has been widely used to infer the existence of numerosity detectors, enabling animals to quickly estimate the number of objects in a scene. Here, we investigated, in humans, whether numerosity adaptation is influenced by stimulus feature changes as previous research suggested that adaptation is reduced when the colour of adapting and test stimuli did not match. We tested whether such adaptation reduction is due to unspecific novelty effects or changes of stimuli identity. Numerosity adaptation was measured for stimuli matched or unmatched for low-level (colour, luminance, shape and motion) or high-level (letters' identity and face emotions) features. Robust numerosity adaptation occurred in all conditions, but it was reduced when adapting and test stimuli differed for colour, luminance and shape. However, no reduction was observed between moving and still stimuli, a readable change that did not affect the item's identity. Similarly, changes in letters' spatial rotations or face features did not affect adaptation magnitude. Overall, changes in stimulus identity defined by low-level features, rather than novelty in general, determined the strength of the adaptation effects, provided these changes were readily noticeable. These findings suggest that numerosity mechanisms operate on categorized items in addition to the total quantity of the set.

https://royalsocietypublishing.org/doi/10.1098/rspb.2024.1841

YI-LIN LI, FRANCESCO POLI & AZZURRA RUGGERI – Active control over exploration improves memory in toddlers

Across two experiments, we implemented a novel gaze-contingent eye-tracking paradigm to investigate the early emergence of memory benefits from active control over exploration and to examine how exploratory behaviours affect memory formation in early development. Toddlers (experiment 1: n = 36, 18–36 months; experiment 2: n = 41, 23–36 months) were either allowed to actively control their exploration (active condition) or presented with the same information that they could only passively observe (passive condition in experiment 1; yoked condition in experiment 2). They were then tested in a preferential-looking paradigm in which familiar versus novel stimuli were presented in pairs. Evidence from eye-movement patterns indicates that toddlers demonstrate improved recognition memory when given active control over learning. Toddlers' pace of learning (i.e. visitation rate) explains the recognition improvement in their active exploration. Their memory improvement is also related to individual differences in the systematicity of exploratory behaviour (i.e. sequence entropy). These findings suggest that toddlers exhibit more sophisticated exploratory strategies than previously believed, revealing the early emergence and development of their ability to adapt these strategies to enhance memory and therefore support learning.

https://royalsocietypublishing.org/doi/10.1098/rspb.2024.2555

LINUS HAHNER & ANDREAS NIEDER – Volitional spatial attention is lateralized in crows
Like humans and many other animal species, birds exhibit left–right asymmetries in certain behaviours due to differences in hemispheric brain functions. While the lateralization of sensory and motor functions is well established in birds, the potential lateralization of high-level executive control functions, such as volitional attention, remains unknown. Here, we demonstrate that carrion crows exhibit more pronounced volitional (endogenous) attention for stimuli monocularly viewed with the left eye and thus in the left visual hemifield. We trained four crows on Posner-like spatial cueing tasks using informative cues to evaluate their volitional top-down attention. The crows detected cued targets using either the left or right eye. As a measure of volitional attention, we calculated reaction time differences for detecting targets that were correctly (validly) and incorrectly (invalidly) cued, separately for the left and right visual hemifields. We found that cued targets were detected more quickly and efficiently in the left visual field compared with the right visual field. Because the left-eye system of the crow's brain processes information primarily from the left visual hemifield, these findings suggest that crows, like humans, exhibit superior executive control of attention in the left-eye/right hemisphere system of their brains.
https://royalsocietypublishing.org/doi/10.1098/rspb.2024.2540

Trends in Genetics

PAPERS

SEBASTIAN OCKLENBURG et al – Genetics of human handedness: microtubules and beyond
Handedness (i.e., the preference to use either the left or the right hand for fine motor tasks) is a widely investigated trait. Handedness heritability is consistently estimated to be 25%. After decades of research, recent large-scale genome-wide association and exome sequencing studies have identified multiple genes associated with handedness and highlighted tubulin genes. Tubulin genes play a role in several processes during brain development that may be relevant for handedness ontogenesis, including axon guidance, axon growth, and forming the inner structure of motile cilia. Moreover, tubulin genes are associated with several psychiatric disorders. This finding therefore may offer insights into biological pathways mediating the link between handedness, brain asymmetries, and psychiatric traits.
https://www.cell.com/trends/genetics/fulltext/S0168-9525(25)00006-X

THOMAS FELESINA & BRENDAN P. ZIETSCH – Emerging insights into the genetics and evolution of human same-sex sexual behavior
Thanks to twin studies, it has been known for decades that human same-sex sexual behavior (SSB) has a substantial heritable component. However, only recently have large genome-wide association studies (GWAS) begun to illuminate the complex genetics involved. These studies have established that SSB is influenced by many common genetic variants, each with tiny but cumulative effects. The evolutionary explanation for the persistence of genetic variants associated with SSB, despite their apparent fitness costs, remains uncertain. In this review, we synthesize advances in understanding the genetic and evolutionary bases of SSB, while identifying the many areas in which we still have much to learn.
https://www.cell.com/trends/genetics/abstract/S0168-9525(24)00300-7

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