EAORC BULLETIN 1,136 – 23 March 2025

CONTENTS

NOTICES

FORMATTED VERSION OF THIS BULLETIN

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

PUBLICATION ALERTS

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

EDITORIAL INTERJECTIONS

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

NEWS

NATURE BRIEFING – What should happen to the Mungo remains?

A court case in Australia about the fate of pleistocene human remains taken from the dry bed of Lake Mungo in the 1960s and 1970s is coming to a head. The remains nicknamed 'Mungo Lady' show evidence of one of the world's oldest-known cremations, while 'Mungo Man' is among the earliest human skeletons ever found. The bones are remains of Aboriginal Australian people and — along with many more from the same area — have come to represent both the history of First Nations people and how science has sometimes disrespected their rights, by treating their ancestors as scientific material without permission. In 2022, the process began to rebury the remains — but there is disagreement, both among scientists and members of Aboriginal Australian communities, about whether that was the right decision.
https://www.abc.net.au/news/2025-03-19/mungo-reburial/105014182

NATURE BRIEFING – Forgotten, but not gone

Babies as young as one year old can form memories, a new study reveals — the hard part is recalling them. Researchers used MRI scans to measure the brain activity of children aged 4 months to 2 years. The team found that the greater the activity in a toddler's hippocampus when shown a certain image, the longer they looked at it when shown it again, which suggests they could remember it. Why we can't recall those memories as grown-ups might be down to a mismatch between how the memory was stored and what your adult brain is looking for, says cognitive psychologist Nick Turk-Browne.
https://www.nature.com/articles/d41586-025-00855-0

NEWS FROM SCIENCE – Neanderthals may have eaten maggots as part of their diet

High nitrogen in Neanderthal bones doesn't mean they were uber-carnivores.
https://www.science.org/content/article/neanderthals-may-have-eaten-maggots-part-their-diet

SCIENCEADVISER – A maggoty menu for Neanderthals

What's better than a wriggly, jiggly mouthful of maggots? For Neanderthals, the answer may have been: nothing. That's the implication suggested by research presented last week at the annual meeting of the American Association of Biological Anthropologists.
Researcher Melanie Beasley was intrigued by a dietary paradox involving our close evolutionary cousins. Decades of isotopic research revealed Neanderthals had a high ratio of nitrogen 15 compared with nitrogen 14. That's usually the signature of a high-meat diet—and Neanderthals' levels put them in the same class as uber-carnivores like hyenas and lions. Yet most primates simply can't tolerate that much meat; it causes a buildup of toxic ammonia in the bloodstream, causing illness and eventually death.
Beasley wondered whether maggots feasting on dead flesh might naturally bioaccumulate higher nitrogen 15 levels. She tested her theory by allowing fly larvae to feast outdoors on human cadavers donated to science at the University of Tennessee, Knoxville, Forensic Anthropology Center's Body Farm. Sure enough, when she analyzed the maggots' nitrogen, she found that the longer the insects fed on rotting tissue, the higher the nitrogen values of the larvae.
So it's a fair bet Neanderthals were eating these maggots. They're ubiquitous when processing game outdoors, and easy to scoop up from the soil beneath a carcass. Moreover, they're a salty tasting food full of fat and protein enjoyed by many modern foraging groups. Maggoty meals could explain the isotopic data without implying Neanderthals were hypercarnivores. "I think we should consider maggots as a regular food source for Neanderthals," Beasley says.
https://www.science.org/content/article/neanderthals-may-have-eaten-maggots-part-their-diet

SCIENCEADVISER – Watching babies' brains form memories

Why can't we recall our earliest experiences? Child psychologists have long believed babies' brains were simply too immature to form lasting memories before the age of 3 or 4. But recent research is questioning that assumption. Now, an imaging study in the latest issue of Science—the first of its kind—shows babies as young as 12 months old can create memories that endure for at least a few minutes.

In the experiment, 26 children ranging in age from 4 to 25 months viewed a series of images while researchers used functional magnetic resonance imaging to measure their brain activity. After 20 to 100 seconds, they saw the same images again along with a collection of new ones. In some babies—most of them older than 12 months—the researchers discovered that those who had more brain activity when they first viewed an image spent more time looking at that same image later. But if the hippocampus wasn't active when encoding an image, the babies didn't tend to prefer it over a new image when they saw it again.

That finding tracks with the way adults form memories, says study co-author Nicholas Turk-Browne—they don't generally remember everything they see. The work doesn't solve the mystery of infantile amnesia, but it suggests the hippocampus may develop the ability to encode memories earlier than previously thought.

https://www.science.org/content/article/pioneering-study-scans-babies-brains-they-form-memories

SCIENCE DAILY – What's in a label? It's different for boys vs. girls, new study of parents finds

Research has shown that adults instinctively think of men when asked to think of a person -- they describe the most 'typical' person they can imagine as male and assume storybook characters without a specified gender are men. A new study by psychology researchers shows that the way parents talk to their children may contribute to these perceptions. Their findings show that parents across the US are more likely to use gender-neutral labels -- for instance, 'kid' -- more often for boys than for girls and to use gender-specific labels, such as 'girl,' more often for girls than for boys.

https://www.sciencedaily.com/releases/2025/03/250310152915.htm

THE CONVERSATION – Evolution: features that help finding a mate may lead to smaller brains

Males and females differing in body size is a common outcome of sexual selection.

https://theconversation.com/evolution-features-that-help-finding-a-mate-may-lead-to-smaller-brains-252069

THE CONVERSATION – Fossil face discovery highlights challenges faced by Europe's earliest settlers

Western Europe appears to have been difficult territory for early human relatives to settle in.

https://theconversation.com/fossil-face-discovery-highlights-challenges-faced-by-europes-earliest-settlers-252413

THE CONVERSATION – Changes to speech and language can help detect Alzheimer's early

Ten million people are diagnosed with dementia worldwide each year – that's more than ever. According to the Alzheimer's Society approximately one million people in the UK are currently living with the disease. Studies predict this figure will rise to 1.6 million people by 2050.

https://theconversation.com/changes-to-speech-and-language-can-help-detect-alzheimers-early-here-are-five-things-to-look-out-for-252251

PUBLICATIONS

Cell Reports

PAPERS

ANTONINO CASILE et al – Neural correlates of minimal recognizable configurations in the human brain

Inferring object identity from incomplete information is a ubiquitous challenge for the visual system. Here, we study the neural mechanisms underlying processing of minimally recognizable configurations (MIRCs) and their subparts, which are unrecognizable (sub-MIRCs). MIRCs and sub-MIRCs are very similar at the pixel level, yet they lead to a dramatic gap in recognition performance. To evaluate how the brain processes such images, we invasively record human neurophysiological responses. Correct identification of MIRCs is associated with a dynamic interplay of feedback and feedforward mechanisms between frontal and temporal areas. Interpretation of sub-MIRC images improves dramatically after exposure to the corresponding full objects. This rapid and unsupervised learning is accompanied by changes in neural responses in the temporal cortex. These results are at odds with purely feedforward models of object recognition and suggest a role for the frontal lobe in providing top-down signals related to object identity in difficult visual tasks.

https://www.cell.com/cell-reports/fulltext/S2211-1247(25)00200-1

Current Biology

PAPERS

KLÁRA DAŇKOVÁ et al – Highly accurate Batesian mimicry of wasps dates back to the Early Oligocene and was driven by non-passerine birds

Batesian mimicry is a widespread strategy that reduces the risk of predation of a harmless mimic by imitating a harmful model. Batesian mimics often vary greatly in how accurately they resemble their models. However, disentangling the causes of evolutionary changes in mimetic accuracy, or lack of them, is challenging. The fossil record provides a powerful tool, although it is constrained by the quality of preservation. In particular, fossil records of accurate mimics are exceptionally rare. Here, we describe the first evidence of highly accurate wasp mimicry, in a fossil belonging to diverse group of Batesian mimics: hoverflies (Diptera, Syrphidae). The hoverfly Spilomyia kvaceki sp. nov., from the Early Oligocene (33 mya) deposits in Děčín-Bechlejovice, Czech Republic, exhibits well-preserved color pattern that closely resembles extant wasp mimics. Whether modern wasp genera could have served as its model remains uncertain. However, there is an abundant fossil record of stem-group social wasps (Palaeovespa spp.) that we propose as suitable models. Notably, two Palaeovespa specimens were found in the same locality as S. kvaceki, supporting their co-occurrence. Currently, passerine birds (Passeriformes) are considered the main selecting agent of mimicry of wasps. However, passerines were rare in Europe during the Early Oligocene. Thus, the agents selecting the earliest known highly accurate mimics of wasps were most likely non-passerines of Coraciimorphae and Apodiformes clades. In conclusion, the highly accurate mimicry of wasps originated during or at least persisted through the era of non-passerine dominance in the guild of diurnal flying insectivorous predators in the Northern Hemisphere.
https://www.cell.com/current-biology/abstract/S0960-9822(25)00283-0

eLife

PAPERS

REBECCA L JACKSON, MATTHEW A LAMBON RALPH & TIMOTHY T ROGERS – Late maturation of semantic control promotes conceptual development

Control processes underpinned by the prefrontal cortex are critical for generating task-appropriate behaviour across cognitive domains, yet this region develops extremely late. Traditionally, this developmental pattern is considered negative but necessary. However, an alternative (yet perhaps complementary) view suggests that a developmental period without control could support learning, particularly in the semantic domain. Here, we exploit a recent computational model to test formally whether late development of the context-sensitive use of conceptual knowledge, or 'semantic control', would promote concept acquisition. Simulations show that late maturation of semantic control and anatomical connectivity conspire to promote conceptual learning. Delayed control speeds conceptual learning without compromising conceptual representations, particularly when control connects to intermediate layers. To assess whether semantic control also develops late in human children, we conducted a meta-analysis of the classic triadic matching task where participants decide which of two options best matches a third. Matching can be based on taxonomic or thematic relations. When these conflict, participants must exert semantic control to determine which relation is task appropriate. Context-sensitivity develops later than conceptual knowledge with large increases between 3 and 6 years. Thus, the protracted PFC development leads to a delay in acquiring semantic control processes, benefiting conceptual learning.
https://elifesciences.org/reviewed-preprints/105310

Evolutionary Human Sciences

PAPERS

MADISON CLARKE et al with LOUISE BARRETT – Social induction and the developmental trajectory of participation in intergroup conflict by vervet monkeys

We assess the proposition that intergroup conflict (IGC) in non-human primates offers a useful comparison for studies of human IGC and its links to parochial altruism and prosociality. That is, for non-linguistic animals, social network integration and maternal influence promote juvenile engagement in IGC and can serve as the initial grounding for sociocultural processes that drive human cooperation. Using longitudinal data from three cohorts of non-adult vervet monkeys (Chlorocebus pygerythrus), we show that non-adults are sensitive to personal (age) and situational risk (participant numbers). The frequency and intensity of participation, although modulated by rank and temperament, both mirrors maternal participation and reflects non-adult centrality in the grooming network. The possibility of social induction is corroborated by the distribution of grooming during IGC, with non-adults being more likely to be groomed if they were female, higher-ranking and participants themselves. Mothers were more likely to groom younger offspring participants of either sex, whereas other adults targeted higher-ranking female participants. Although we caution against a facile alignment of these outcomes to human culturally mediated induction, there is merit in considering how the embodied act of participation and the resultant social give-and-take might serve as the basis for a unified comparative investigation of prosociality.
https://www.cambridge.org/core/journals/evolutionary-human-sciences/article/social-induction-and-the-developmental-trajectory-of-participation-in-intergroup-conflict-by-vervet-monkeys/DF2E434F55579BF841C5467F2D5ABF94

Frontiers in Communication

PAPERS

GEORGIA ZELLOU et al – Cross-language variation in the acceptability of vowelless nonwords

This study examines the acceptability of voweled and vowelless nonwords produced by a native speaker of Tashlhiyt (a Moroccan Amazigh language) across listeners from five different language groups: L1 Tashlhiyt, L1 Tarifit, L1 Moroccan Arabic, L1 English, and L1 Mandarin. The languages vary in the complexity of allowable word types, though only Tashlhiyt allows lexically vowelless word forms. Hyper- and hypo-speech forms of the items were also compared in order to explore the effect of speaking style on listeners' phonological knowledge. Results show gradient cross-language effects of nonword acceptability: compared to the native Tashlhiyt listeners, L1 Tarifit and L1 Moroccan Arabic listeners did not differ in their wordlike judgments. In contrast, L1 English showed lower and sonority-based wordlikeness preferences; L1 Mandarin listeners provided the lowest ratings of Tashlhiyt nonwords and were not sensitive to sonority variations. In contrast to the language-specific effect of word phonotactics, the role of clear speech in enhancing wordlikeness judgments was equivalent in effect size across language backgrounds.

{"only Tashlhiyt allows lexically vowelless word forms" – Hmm. Really?}

https://www.frontiersin.org/journals/communication/articles/10.3389/fcomm.2025.1518754/full

Frontiers in Psychology

PAPERS

BARBARA PASTUSZEK-LIPIŃSKA – The role of musical aspects of language in human cognition

This paper reviews musicology, linguistics, cognitive psychology, and neuroscience research on the importance of music in developing human speech and cognition. It cites research from several scientific fields on how the brain processes and reacts to melody, rhythm, harmony, loudness, dynamics and types of articulation and timbre. It also discusses musical concepts and prosodic features such as intonation, rhythm and stress related to linguistic terminology and summarises results of earlier research on how the two systems interact to strengthen or weaken an individual's ability to function without nurturing stimulation. Music is an important preventive and therapeutic factor for human life. The author describes the interplay between music and language in the nervous system, improving or hindering communication and how it affects us personally and impacts societal mental health.

https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2025.1505694/full

iScience

PAPERS

QUENTIN GALLOT et al with KLAUS ZUBERBÜHLER – A primate grammar enabling incremental processing

Characterizing the structure and function of animal communication systems provides insights into the cognitive and evolutionary processes shaping signal complexity. One key question is whether and how call sequences allow potential listeners to make predictions about the call-eliciting referents. Here, we investigated whether primate call sequences contained properties that enabled such predictive processing. We analyzed several years of experimentally elicited alarm responses from a West African forest primate, wild Olive colobus monkeys. Using Kullback-Leibler Divergence and Prediction Gain approaches, we identified a simple primate grammar that allowed predictions of referents from only minimal input. In particular, sequence-initial positions reliably discriminated urgent from non-urgent threats while the following positions increased the referential specificity regarding two main predators (eagles, leopards) and non-predatory disturbances (falling tree parts). Sequences often contained further calls, which may allow callers to either confirm the referent or to alter the conveyed information. We concluded that animal communication can contain features adapted for predictive, incremental processing, suggesting evolutionary roots older than language.

https://www.cell.com/iscience/fulltext/S2589-0042(25)00490-0

Journal of Linguistics

PAPERS

ANDREW LAMONT – Shift is derived

Shift is an input–output mapping where a feature or autosegment loses its underlying associations and surfaces with different associations. In Harmonic Serialism, shift can either be analyzed as a multi-step process or a single-step process. While Gietz et al. (2023) argue for the latter, this paper refutes their arguments and provides evidence supporting a multi-step analysis of shift. Specifically, it demonstrates that shift in Kibondei and Halkomelem, the languages analyzed by Gietz et al. (2023), does not require a single-step shift operation and that the analyses they present are empirically inadequate. Typological modeling not only reinforces the result that a single-step shift operation is superfluous but demonstrates that grammars with such an operation undergenerate with respect to the attested typology.

https://www.cambridge.org/core/journals/journal-of-linguistics/article/shift-is-derived/D6461D291B496268ADA1D0255006ED99

MATTHEW REEVE – The argument structure of have and other transitive verbs
I argue that semi-lexical have is a transitive verb in the sense that it has the same selectional properties as lexical transitives but is lexically underspecified. I propose a system of argument linking that assigns verbs a set of 'D-selectors' (selectors for determiner phrases) that are distinguished by a 'thematic feature' ±θ; selectors are licensed by linking rules that associate them with a position in a conceptual structure on the basis of their ±θ-specification. I argue that have is underspecified both syntactically (its initial D-selector can be +θ or–θ) and semantically (it lacks a lexical conceptual structure, which must thus be provided in syntax). I show that this enables the major interpretations of have (causative, affected experiencer, possessive, locative, affectee) to be derived straightforwardly. A particular contribution of the paper is its description and analysis of 'affectee have', which, as I show, poses particular problems for recent analyses such as Kim (2012) and Myler (2016).
{This is why I have misgivings about tree structures and sentence parsing – "have" has mutative class and variable semantics, but is it an underspecified construct or an overly-constrained cluster of constructs? For instance, "Have you got the pole?" can be answered with "I have" (past participle, or just another way of saying yes?) or "I have it" (transitive possessive); while "Have you got a pole?" is answered by "I have" or "I have one". However, "Have you got the point?" can only be answered with "I have" – the point is not what you actually have, so "I have it" leaves "it" undefined. Reparsing Reeve's four initial sentences as interrogative forms indicates they may not actually be similar forms at all: has Barry got a ball?/ does Barry have a ball?; has Carla had Donna wash her car?/ did Carla have Donna wash her car?; has the cabinet got a clock on it?/ has the cabinet a clock on it?/ does the cabinet have a clock on it?; has the car had a rock thrown at it?/ did the car have a rock thrown at it? If similar constructs call for different transmutation rules, are they really similar constructs? I know that some people like to think that language is a fully rules-based system, but the reality seems to be that there is an awful lot of ad-hockery at work – including why ad-hockery requires an intrusive K. Language cannot be explained fully as a rules-based system, nor even as a negotiation to or of meaning. The only phrase that works for me is negotiation toward meaning – the negotiation over meaning gets conversational partners into the same semantic ballpark, but does not need them to sit in the same seat to understand the other's point of view.}
https://www.cambridge.org/core/journals/journal-of-linguistics/article/argument-structure-of-have-and-other-transitive-verbs/61636A996A3EF2A6C6D1D27621F21CD3

Nature

NEWS

Bird brains help scientists to unveil the secrets of speech
Neural recordings from parrots and songbirds reveal the ways in which vocal production is encoded in the brain, highlighting remarkable similarities between how parrots and humans learn to produce sounds.
https://www.nature.com/articles/d41586-025-00680-5

ARTICLES

MARTA MIRAZÓN LAHR – The early origins of bone-tool manufacturing traditions by hominins 1.5 million years ago
Excavations at Olduvai Gorge, Tanzania, reveal evidence of the systematic use of animal bones as a raw material for prehistoric tools.
https://www.nature.com/articles/d41586-025-00545-x

PAPERS

ZETIAN YANG & MICHAEL A. LONG – Convergent vocal representations in parrot and human forebrain motor networks
Cortical networks for the production of spoken language in humans are organized by phonetic features, such as articulatory parameters and vocal pitch. Previous research has failed to find an equivalent forebrain representation in other species. To investigate whether this functional organization is unique to humans, here we performed population recordings in the vocal production circuitry of the budgerigar (Melopsittacus undulatus), a small parrot that can generate flexible vocal output, including mimicked speech sounds. Using high-density silicon probes, we measured the song-related activity of a forebrain region, the central nucleus of the anterior arcopallium (AAC), which directly projects to brainstem phonatory motor neurons. We found that AAC neurons form a functional vocal motor map that reflects the spectral properties of ongoing vocalizations. We did not observe this organizing principle in the corresponding forebrain circuitry of the zebra finch, a songbird capable of more limited vocal learning. We further demonstrated that the AAC represents the production of distinct vocal features (for example, harmonic structure and broadband energy). Furthermore, we discovered an orderly representation of vocal pitch at the population level, with single neurons systematically selective for different frequency values. Taken together, we have uncovered a functional representation in a vertebrate brain that displays unprecedented commonalities with speech-related motor cortices in humans. This work therefore establishes the parrot as an important animal model for investigating speech motor control and for developing therapeutic solutions for addressing a range of communication disorders.
https://www.nature.com/articles/s41586-025-08695-8

JAMES T. STROUD & WILLIAM C. RATCLIFF – Long-term studies provide unique insights into evolution
From experimental evolution in the laboratory to sustained measurements of natural selection in the wild, long-term studies have revolutionized our understanding of evolution. By directly investigating evolutionary dynamics in real time, these approaches have provided unparallelled insights into the complex interplay between evolutionary process and pattern. These approaches can reveal oscillations, stochastic fluctuations and systematic trends that unfold over extended periods, expose critical time lags between environmental shifts and population responses, and illuminate how subtle effects may accumulate into significant evolutionary patterns. Long-term studies can also reveal otherwise cryptic trends that unfold over extended periods, and offer the potential for serendipity: observing rare events that spur new evolutionary hypotheses and research directions. Despite the challenges of conducting long-term research, exacerbated by modern funding landscapes favouring short-term projects, the contributions of long-term studies to evolutionary biology are indispensable. This is particularly true in our rapidly changing, human-dominated world, where such studies offer a crucial window into how environmental changes and altered species interactions shape evolutionary trajectories. In this Review article, we showcase the groundbreaking discoveries of long-term evolutionary studies, underscoring their crucial role in advancing our understanding of the complex nature of evolution across multiple systems and timescales.
https://www.nature.com/articles/s41586-025-08597-9

Nature Communications Biology

PAPERS

RYAN SIGMUNDSON et al with KLAUS ZUBERBÜHLER & CATHERINE CROCKFORD – Vocal sequence diversity and length remain stable across ontogeny in a catarrhine monkey (Cercocebus atys)
During childhood, human speech utterances increase steadily in complexity, length and diversity. In contrast, the vocal repertoire of non-human primates has long been considered fixed from birth. Recent studies showing the acquisition of vocal sequences during ontogeny in chimpanzees and marmosets challenge this view. Here we further explore the potential flexibility of non-human primate vocal production by comparing the vocal sequence repertoire across age groups in sooty mangabeys, a species with a rich sequence repertoire for a catarrhine monkey. We recorded 1844 utterances from 75 individuals from two wild groups in Taï National Park, Ivory Coast. We used custom-made Bayesian models specifically designed to estimate the individual repertoire size of vocal sequences while accounting for under-sampling of certain vocalisations in certain individuals. We hereby provide a tool to estimate vocal repertoire size applicable to other taxa. We found no relevant ontogenetic changes in vocal repertoire size and utterance length. Ontogenetic vocal sequence expansion is therefore not universal among primates that routinely use vocal sequences to communicate. Rather, this feature may have evolved independently in distantly-related taxa due to social features thought to promote vocal complexity, such as the complex social organisation of chimpanzees and the cooperative breeding systems of marmosets.
https://www.nature.com/articles/s42003-025-07922-2

AIAL SOBEH & SIMONE SHAMAY-TSOORY – The emergence of moral alignment within human groups is facilitated by interbrain synchrony
Humans tend to align their behaviors and beliefs with their group peers. Establishing alignment between group members is crucial for group unity, yet the mechanisms underlying its emergence are under-explored. Here we examined the extent to which the brains of group members synchronize during deliberation on moral issues, and how interbrain synchrony supports alignment in their moral beliefs. We scanned 200 participants, who were divided into groups of four, using functional Near-Infrared Spectroscopy (fNIRS) during discussions on moral dilemmas. Behavioral results show that following group deliberations, members aligned their beliefs by adjusting their private beliefs towards the collective sentiment. Critically, neuroimaging results reveal that increased interbrain synchrony in the left inferior frontal gyrus (IFG) between group members predicts the degree of alignment post-deliberation. These findings indicate that the human tendency to align with group members extends to moral beliefs and reveal that regions related to mirroring and semantic sequence processing work across brains in coordination, to promote shared moral beliefs.
https://www.nature.com/articles/s42003-025-07831-4

LUKAS ALEXANDER HAHN, ERICA FONGARO & JONAS ROSE – Neuronal correlates of endogenous selective attention in the endbrain of crows
The ability to direct attention and select important information is a cornerstone of adaptive behavior. Directed attention supports adaptive cognitive operations underlying flexible behavior, for example in extinction learning, and was demonstrated behaviorally in both mammals and in birds. The neural foundation of such endogenous attention, however, has been thoroughly investigated only in mammals and is still poorly understood in birds. And despite the similarities at the behavioral level, cognition of birds and mammals evolved in parallel for over 300 million years, resulting in different architectures of the endbrain, most notably the absence of cortical layering in birds. We recorded neuronal signals from the nidopallium caudolaterale, the avian equivalent to mammalian pre-frontal cortex, while crows employed endogenous attention to perform change detection in a working memory task. The neuronal activity profile clearly reflected attentional enhancement of information maintained by working memory. Our results show that top-down endogenous attention is possible without the layered configuration of the mammalian cortex.

https://www.nature.com/articles/s42003-025-07914-2

Nature Communications Psychology

PAPERS

CLAIRE LUGRIN, ARKADY KONOVALOV & CHRISTIAN C. RUFF – Manipulating attention facilitates cooperation

Cooperation is essential for human societies, but not all individuals cooperate to the same degree. This is typically attributed to individual motives - for example, to be prosocial or to avoid risks. Here, we investigate whether cooperative behavior can, in addition, reflect what people pay attention to and whether cooperation may therefore be influenced by manipulations that direct attention. We first analyze the attentional patterns of participants playing one-shot Prisoner's Dilemma games and find that choices indeed relate systematically to attention to specific social outcomes, as well as to individual eye movement patterns reflecting attentional strategies. To test for the causal impact of attention independently of participants' prosocial and risk attitudes, we manipulate the task display and find that cooperation is enhanced when displays facilitate attention to others' outcomes. Machine learning classifiers trained on these attentional patterns confirm that attentional strategies measured using eye-tracking can accurately predict cooperation out-of-sample. Our findings demonstrate that theories of cooperation can benefit from incorporating attention and that attentional interventions can improve cooperative outcomes.

https://www.nature.com/articles/s44271-025-00206-9

Nature Genetics

PAPERS

TREVOR COUSINS, AYLWYN SCALLY & RICHARD DURBIN – A structured coalescent model reveals deep ancestral structure shared by all modern humans

Understanding the history of admixture events and population size changes leading to modern humans is central to human evolutionary genetics. Here we introduce a coalescence-based hidden Markov model, cobraa, that explicitly represents an ancestral population split and rejoin, and demonstrate its application on simulated and real data across multiple species. Using cobraa, we present evidence for an extended period of structure in the history of all modern humans, in which two ancestral populations that diverged ~1.5 million years ago came together in an admixture event ~300 thousand years ago, in a ratio of ~80:20%. Immediately after their divergence, we detect a strong bottleneck in the major ancestral population. We inferred regions of the present-day genome derived from each ancestral population, finding that material from the minority correlates strongly with distance to coding sequence, suggesting it was deleterious against the majority background. Moreover, we found a strong correlation between regions of majority ancestry and human–Neanderthal or human–Denisovan divergence, suggesting the majority population was also ancestral to those archaic humans.

https://www.nature.com/articles/s41588-025-02117-1

Nature Scientific Reports

PAPERS

LINK TEJAVIBULYA et al – Brain handedness associations depend on how and when handedness is measured

Hand preference is ubiquitous, intuitive, and often simplified to right- or left-handed. Accordingly, differences between right- and left-handed individuals in the brain have been established. Nevertheless, considering handedness as a binarized construct fails to capture the variability of brain-handedness associations across different domains or activities. Further, hand-use changes across generations (e.g., letter writing vs. texting) such that individuals of different ages live in different environments. As a result, brain-handedness associations may depend on how and when handedness is measured. We used two large datasets, the Human Connectome Project-Development (HCP-D; n = 465; age = 5–21 years) and Human Connectome Project-Aging (HCP-A; n = 368; age = 36–100 years), to investigate generational differences in brain-handedness associations. Nine items from the Edinburgh Handedness Inventory were associated with resting-state functional connectomes. We show that brain-handedness associations differed across the two cohorts. Moreover, these differences depended on the way handedness was measured. Given that brain-handedness associations differ across handedness measures and datasets, we caution against a one-size-fits-all approach to neuroimaging studies of this complex trait.

https://www.nature.com/articles/s41598-025-94036-8

Neuron

PAPERS

ANASTASIA DIMAKOU – The predictive nature of spontaneous brain activity across scales and species

Emerging research suggests the brain operates as a "prediction machine," continuously anticipating sensory, motor, and cognitive outcomes. Central to this capability is the brain's spontaneous activity—ongoing internal processes independent of external stimuli. Neuroimaging and computational studies support that this activity is integral to maintaining and refining mental models of our environment, body, and behaviors, akin to generative models in computation. During rest, spontaneous activity expands the variability of potential representations, enhancing the accuracy and adaptability of these

models. When performing tasks, internal models direct brain regions to anticipate sensory and motor states, optimizing performance. This review synthesizes evidence from various species, from C. elegans to humans, highlighting three key aspects of spontaneous brain activity's role in prediction: the similarity between spontaneous and task-related activity, the encoding of behavioral and interoceptive priors, and the high metabolic cost of this activity, underscoring prediction as a fundamental function of brains across species.
https://www.cell.com/neuron/fulltext/S0896-6273(25)00127-8

New Scientist

NEWS

Ancient face bones offer clues to identity of early humans in Europe
Bone fragments from a cave in northern Spain suggest there were multiple hominin species living in western Europe around a million years ago.
https://www.newscientist.com/article/2471861-ancient-face-bones-offer-clues-to-identity-of-early-humans-in-europe/

Philosophical Transactions of the Royal Society B

PAPERS

MICHAEL TABORSKY – The evolution of division of labour: preconditions and evolutionary feedback
Division of Labour (DoL) among group members reflects the pinnacle of social complexity. The synergistic effects created by task specialization and the sharing of duties benefitting the group raise the efficiency of the acquisition, use, management and defence of resources by a fundamental step above the potential of individual agents. At the same time, it may stabilize societies because of the involved interdependence among collaborators. Here, I review the conditions associated with the emergence of DoL, which include the existence of (i) sizeable groups with enduring membership; (ii) individual specialization improving the efficiency of task performance; and (iii) low conflict of interest among group members owing to correlated payoffs. This results in (iv) a combination of intra-individual consistency with inter-individual variance in carrying out different tasks, which creates (v) some degree of mutual interdependence among group members. DoL typically evolves 'bottom-up' without external regulatory forces, but the latter may gain importance at a later stage of the evolution of social complexity. Owing to the involved feedback processes, cause and effect are often difficult to disentangle in the evolutionary trajectory towards structured societies with well-developed DoL among their members. Nevertheless, the emergence of task specialization and DoL may entail a one-way street towards social complexity, with retrogression getting increasingly difficult the more individual agents depend on each other at progressing stages of social evolution.
https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2023.0262

KOICHI ITO & ANDREW HIGGINSON – Specialism and generalism in social animals in variable environments
An important advantage to sociality is division of labour, which is often associated with specialization of group members, such as the polymorphic subcastes of ant workers. Given this advantage, it is puzzling that many social groups do not show clear specialization. Among ants, workers of closely related species have one, two or even three polymorphisms. The degree of specialism of asocial animals depends on environmental variability because specialists will perform poorly in some conditions. Here, we use a numeric model to consider whether the magnitude and type of environmental variability can help to explain the diversity of specialism in cooperative groups. By finding the optimal distribution of group members along a single dimension of specialization for two tasks, we predict when groups should be composed of specialists, generalists, both of these (trimodal) or moderate specialists. Generalism is predicted more when environments are unstable and when task importance—rather than demand—varies but depends on the likelihood that the group can complete all tasks in the range of experienced conditions. The benefit of sociality is strongest in invariable environments and there is selection for redundancy in the workforce, which may explain the widely observed inactivity in social insects.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2023.0264

CHRISTOPH NETZ et al with MICHAEL TABORSKY – Group size and labour demands determine division of labour as a consequence of demographic stochasticity
Division of labour (DoL) is most prominently observed in eusocial insects but also occurs in much smaller cooperative groups where all individuals could potentially perform any task. In such groups, previous experience and learning are the most important mechanisms underlying specialization. Using behavioural simulations, we investigate the dynamics of task specialization in groups of various sizes and with different constraints on the choice of task. We assume that individuals choose tasks by weighing their own competence to perform a task against the group requirement of how much that task needs to be performed. We find that task specialization occurs even if individuals choose tasks based solely on the group's needs rather than their own competence. As large groups are less affected by demographic stochasticity, they can more accurately distribute labour across tasks, and individuals become more effective due to a reduced need to switch between tasks. This effect is enhanced if groups must perform a larger number of tasks. However, from an evolutionary point of view, individuals in larger groups develop a greater responsiveness to group requirements than those in small groups when labour variation carries a fitness penalty and thus will more readily switch between tasks. Small groups thus seem less able to

distribute labour optimally over tasks through increased switching, and therefore evolve to ignore task imbalances up to a higher level before the threshold to switch between tasks is crossed. Further, we find that selection on learning ability is stronger in small than in large groups. We conclude that the reason why DoL may emerge more readily in large groups might not be due to a group-size effect on optimal decision-making, but rather because of a lower degree of variation of the labour distribution as a consequence of demographic stochasticity.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2024.0206

BARBARA TABORSKY – Helping niches may trigger the development of task specialization and division of labour
Multimember societies often exhibit Division of labour (DoL), where different individuals perform distinct tasks such as brood care, food acquisition and defence. While demand for tasks exists at the group level, assigning them to specific members poses an organizational challenge. I propose the 'Helping Niche Specialization hypothesis' (HeNS hypothesis), which suggests that cues indicating societal demand for tasks along with the current distribution of help, influence individual biases towards specific task preferences. This process may begin during early ontogeny, even before helping behaviours are actively performed. I first introduce the concept of the 'helping niche', a special form of the social niche. Next, I outline procedures central to the HeNS hypothesis, which represent a stepwise process: (i) societal and environmental cues bias individuals towards task preferences, which may arise already during early life, (ii) experience with preferred tasks reinforces these biases, (iii) learning-by-doing enhances task performance, and/or (iv) reduced response thresholds make task execution more likely, leading to (v) differentiation and specialization. Furthermore, I discuss the costs and benefits of specialization, how helping niches may emerge during development, the environmental conditions that favour them, and alternative pathways to DoL.
https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2023.0273

ANTÓNIO M. M. RODRIGUES & CHRISTINA RIEHL – The evolution of cooperative breeding in family groups: when should parents tolerate unhelpful helpers?
Cooperatively breeding vertebrates typically live in family groups in which some offspring delay breeding and remain on the natal territory to help rear younger siblings. However, field studies find that helpers can have a neutral or even negative effect on the survival of their relatives. Why, then, do helpers remain, and why do parents tolerate them? Here, we use a kin selection approach to model the conditions under which tolerating helpers is adaptive to parents. Unlike previous models, we consider scenarios in which relatives compete for breeding opportunities in a saturated habitat. We show that kin competition is sufficient to favour tolerance of helpers, even when helpers decrease parental survival or fecundity. Helping is additionally favoured when delaying dispersal benefits the helper (either by decreasing the costs of dispersal or by increasing the chance of territory inheritance). This suggests that the division of reproduction in cooperative family groups can emerge for reasons unrelated to the effects of help itself, but the resulting society sets the stage for more elaborate forms of division of labour. Kin-based helping may therefore be adaptive not only because helpers are related to the brood whom they help, but also because delayed breeding reduces reproductive conflict among siblings.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2023.0275

JEREMY FIELD – Role specialization and reproductive division of labour at the origin of eusociality
The evolution of primitive eusociality from non-social ancestors in organisms such as bees and wasps is often regarded as a major evolutionary transition. The division of labour between reproductives that specialize on egg production and workers that specialize on tasks such as foraging is the key feature defining eusociality and is why social insects are so successful ecologically. In taxa with morphological castes, individuals are often irreversibly specialized for particular roles when they reach adulthood. At the origin of sociality, however, such adaptations were absent, and we must consider why selection would favour individuals specializing when they are undifferentiated from the ancestral, non-social phenotype. Here, I focus on constraints based on life-history tradeoffs and plasticity that would be faced by ancestral females when specializing. These include limited efficiency of within-individual tradeoffs between reproductive and worker functions, imperfect matching of the productivities of social partners and lack of coordination. I also discuss the possibility that payoffs through specialization could be condition dependent. Eusocial taxa lacking morphological castes have traditionally been the testing grounds to understand the origin of eusociality, but significant adaptation has occurred since helping first evolved. Investigating role specialization at the origin of eusociality therefore requires utilizing non-social taxa.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2023.0265

JENNIFER H. FEWELL & JUDITH L. BRONSTEIN – Mutualism and division of labour: a mutual expansion of concepts
Division of labour within social groups and the interspecific relationships within mutualisms have traditionally been treated as separate research areas. In this opinion, we align terminologies and concepts between the two fields, by comparing within-group division of labour to the outsourcing of functions in mutualisms. Division of labour and interspecific outsourcing share fundamental similarities. Both are built from specialization of some individuals within the relationship on tasks or functions required for survival, growth and reproduction. Both also generate variable fitness outcomes. A key difference is that mutualisms generally generate direct fitness gain, while benefits from cooperative sociality often accrue from a mix of direct and indirect fitness. Additionally, the levels of physical and physiological specialization within many mutualisms expand

far beyond the levels of differentiation seen in cooperative social groups, with the exception of reproductive division of labour. The consideration of between-species outsourcing in the context of division of labour allows expansion of our understanding of both fields and beyond, to consider general principles as drivers of division of labour, and role differences more broadly across levels of complexity.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2023.0266

LUIS ALFREDO AVITIA DOMÍNGUEZ et al – Factors that influence the caste ratio in a bacterial division of labour
Colonies of the bacterim Streptomyces coelicolor divide labour between cells that specialize in growth and sporulation and cells that specialize in antibiotic production. This division of labour arises owing to costly chromosome deletions in the antibiotic overproducers. However, the spatial distribution and temporal emergence of these mutations in S. coelicolor colonies remain unknown, or whether mutation frequency—which we liken to the caste ratio in social insects—is phenotypically plastic. To elucidate changes in the proportions of specialized cells (measured as the mutation frequency), we sampled S. coelicolor colonies grown under different conditions. Temporally, mutation frequency increased linearly with colony age and size. Spatially, mutations accumulated disproportionately in the colony centre, despite greater growth and sporulation at the periphery. Exposing colonies to sub-inhibitory concentrations of some antibiotics, a competitive cue in Streptomyces, increased mutation frequencies. Finally, direct competition with other Streptomyces that naturally produce antibiotics increased mutation frequencies, while also increasing spore production. Our findings provide insights into the intrinsic and environmental factors driving division of labour in Streptomyces colonies by showing that mutation frequencies are dynamic and responsive to the competitive environment. These results show that chromosome deletions are phenotypically plastic and suggest that Streptomyces can flexibly adjust their caste ratio.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2023.0267

J. KORB – Changes of division of labour along the eusociality spectrum in termites, with comparisons to multicellularity
Eusocial insects are characterized by reproductive division of labour, with one (or a few) individuals specialized in reproduction (queen and in termites, also a king) and the other individuals performing all other tasks (workers). Among workers, further division of labour can occur. Termites have three main castes: reproductives, comprising a queen and king; morphologically differentiated sterile soldiers; and workers. Task division among workers varies greatly depending on lifestyle and degree of workers' reproductive potential, which varies from totipotency to reproduce up to sterility. In wood-dwelling species, which do not forage outside the nest, all tasks are performed by totipotent workers, comprising multiple-instars with less further division of labour. Foraging species with pluripotent workers also have a multi-instar worker caste, but some division of labour between brood care versus foraging and defence exists. The first task seems mainly to be done by smaller—and potentially younger—instars, while the latter two tasks are performed by larger—and potentially older—workers. The highest degree of division of labour occurs in foraging species with sterile workers. Here, morphological worker castes with defined tasks and age polyethism occur. Comparisons with Metazoa reveal striking similarities with termites concerning gradients in germline/soma differentiation and cell totipotency.
https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2023.0268

ETTORE CAMERLENGHI & DANAI PAPAGEORGIOU – Multi-level societies: different tasks at different social levels
Multi-level vertebrate societies, characterized by nested social units, allow individuals to perform a wide range of tasks in cooperation with others beyond their core social unit. In these societies, individuals can selectively interact with specific partners from higher social levels to cooperatively perform distinct tasks. Alternatively, social units of the same level can merge to form higher-level associations, enabling individuals to benefit from large social units without always maintaining a large core social unit. The reasons why multi-level sociality evolves in some systems but not in others are not well understood. We propose that this is partly due to a lack of data, especially regarding the fitness consequences of cooperation at different social levels. First, we argue that in multi-level societies individual fitness benefits should increase when performing tasks in cooperation with associates from higher social levels. Second, as more multi-level societies are documented across taxa, we will continue to find similar cooperative tasks performed at each of the different social levels. By providing compelling species examples, from dolphins to fairy-wrens, we underscore that despite the diversity of multi-level social organization, convergence in task performance across social levels will become clearer as more data accumulates. Finally, we highlight the role of multi-level sociality in buffering fluctuating environmental conditions by enabling flexible social associations to emerge according to need.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2023.0274

SHAY ROTICS et al with TIM CLUTTON-BROCK – Workload distribution in wild Damaraland mole-rat groups
The social organization of Damaraland and naked mole-rats is often suggested to resemble the societies of eusocial insects more closely than that of any other vertebrate. Eusocial insects feature queens that hardly contribute to the workforce, and specialized worker castes. However, in Damaraland and naked mole-rats, which live in family groups with a single breeding pair and multiple non-breeding helpers, the work division is still unclear. Previous studies, largely confined to laboratory settings, could not quantify their primary cooperative behaviour, which is digging extensive foraging tunnels. Here, we studied the distribution of workload in 11 wild Damaraland mole-rat groups, using body acceleration loggers to evaluate

behavioural time budgets of 86 individuals. We found behavioural differences between breeders and non-breeders that emerged with increases in group size, such that in large groups, breeders spent less time digging, more time resting, and were overall less active than non-breeders. We did not find any indication of a caste system among non-breeders, though the amount of time individuals spent digging varied with age and sex. Overall, the lower contribution by breeders to the group's workload is a pattern rarely observed in other cooperative vertebrates; nevertheless, the lack of evidence for castes suggests that eusociality may be limited to invertebrates.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2023.0276

LUCIO VINICIUS et al – Cultural evolution, social ratcheting and the evolution of human division of labour
While ecological specialization, social differentiation and division of labour are found in many species, extensive and irreversible interdependence among culturally specialized producers is a characteristic feature of humans. By extending the concept of cultural ratcheting (or the evolution of cultural products of such complexity that they become very unlikely to be recreated from scratch by naive individuals), we present simulation models showing how cumulative cultural evolution may have engendered a parallel process of 'social ratcheting' or the origin of culturally differentiated and irreversible interdependent individuals and groups. We provide evidence that the evolution of cultural division of labour in humans may have been associated with social network structures splitting the cognitive costs of cultural production across differentiated specialists, significantly reducing the burden of cultural learning on individual cognition and memory. While previous models often assumed agents with unlimited memories, we show that limiting individual memories to a fraction of available cultural repertoires has a noticeable accelerating effect on both cultural evolution and social differentiation among producers. We conclude that cultural and social ratcheting may have been two linked outcomes of cultural evolution in the hominin lineage.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2023.0277

CLAUDIA DIEHL & PETER PREISENDÖRFER – Inefficiencies in the division of labour in human societies
The article reviews the long-standing debate on the division of labour in human societies from a sociological perspective. The division of labour is analysed as a secular trend towards increasing specialization on the one hand and as prevailing arrangements of specialization on the other. The dominant view in economics and other social sciences is that division of labour exists in human societies because it is efficient. We cast doubt on this view by discussing objections to the efficiency paradigm. We show that efficiency considerations, while important, are ultimately insufficient to explain both increasing specialization over time and prevailing arrangements of specialization in real life. As a broader framework, we briefly outline an explanatory triad of efficiency, norms and power. Social norms and power relations often complement unclear and ambiguous efficiency and performance criteria, but they can also conflict with principles of efficiency and rationality.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2023.0278

DEBORAH JAMES – What relevance has division of labour in a world of precarious work?
Post-Marx, social scientists have tended to define 'labour' as working for others in return for a wage rather than as a harmonious Durkheimian-style interdependency. This mini-review of recent anthropological literature considers whether, in a world where the 'standard employment contract' is dwindling and many are out of work, 'division of labour' has any continuing relevance.
https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2023.0279

ANINDITA BRAHMA & RAGHAVENDRA GADAGKAR – The origin and maintenance of division of labour in an Indian paper wasp
Division of labour (DoL) is of prime importance in the success of social insects in various ecosystems and benefits their colonies by increasing efficiency and productivity. This review summarizes more than three decades of experimental evidence collected towards understanding the emergence and maintenance of division of labour in the Indian tropical paper wasp Ropalidia marginata. This primitively eusocial species provides an interesting variation between newly founded colonies and mature colonies in terms of the behavioural mechanisms regulating division of labour. Newly founded colonies rely on physical dominance behaviour for establishing division of labour. Workers in mature post-emergence colonies continue to implement physical dominance as a way to regulate non-reproductive division of labour in a decentralized manner, while the queens switch to chemical regulation of worker reproduction. We discuss experiments that build evidence toward establishing R. marginata as an important model for understanding the origin and maintenance of division of labour.
https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2023.0269

ZIMAI LI et al – Division of labour in colony defence in a clonal ant
Division of labour (DOL) plays a key role across all scales of biological organization, but how its expression varies across contexts is still poorly understood. Here, we measure DOL in a crucial task, colony defence, in a social insect that affords precise experimental control over individual and colony traits, the clonal raider ant (Ooceraea biroi). We find that DOL in defence behaviour emerges within colonies of near-identical workers, likely reflecting variation in individual response thresholds, and that it increases with colony size. Additionally, colonies with pupae show higher defence levels than those without brood. However, we do not find evidence for a behavioural syndrome linking defence with exploration and activity,

as previously reported in other systems. By showing how colony composition and size affect group response to potential threats, our findings highlight the role of the social context in shaping DOL.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2023.0270

PLoS One

PAPERS

JULIE SHERMAN et al – Outcomes of orangutan wild-to-wild translocations reveal conservation and welfare risks
Wild orangutans (Pongo spp.) are captured and moved (wild-to-wild translocated) primarily to prevent crop foraging or out of concern for orangutans' survival in fragmented habitat. Little is known about wild-to-wild translocation frequency, circumstances, and possible species conservation and individual welfare outcomes. We investigated orangutan wild-to-wild translocations in Indonesia from 2005 to 2022 using primarily data from public sources and consultation with practitioners. At least 988 wild orangutans were captured for translocation during the study period, including many reproductively valuable resident females and adult males removed from unprotected fragmented forests and forest patches. Data on health condition (n = 808) indicated 81.7% were reported as healthy at time of capture. Information on post-capture disposition (n = 268) showed that only 23% were translocated immediately. Mean estimated killing combined with reported translocation removals was calculated to affect 3.3% of orangutans in Kalimantan, and 11.6% in Sumatra, both higher than the threshold of mortality from human actions expected to drive populations to extinction. Negative impacts are likely compounded where multiple individuals are translocated from the same area, and for the Tapanuli orangutan (P. tapanuliensis), which has the smallest population and range of all orangutan species. Data on reasons for capture (n = 743) indicated most translocations (69%) were conducted to address crop foraging and orangutan presence in or around croplands and plantations. Forest cover analysis around 104 orangutan capture sites with high resolution spatial information indicated that deforestation levels in the year preceding capture were not significantly associated with likelihood of captures for translocation. To improve conservation outcomes, wild-to-wild translocations should be used only in exceptional circumstances. Most orangutans should instead be monitored and protected in situ by addressing conflicts and maintaining the forests, including forest fragments, they are using. When translocation is necessary, post-release survival and potential conservation impacts must be monitored.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0317862

Proceedings of the Royal Society B

PAPERS

CONNER S. PHILSON, JULIEN G. A. MARTIN & DANIEL T. BLUMSTEIN – Multilevel selection on individual and group social behaviour in the wild
How phenotypes are shaped by multilevel selection—the theoretical framework proposing natural selection occurs at more than one level of biological organization—is a classic debate in biology. Though social behaviours are a common theoretical example for multilevel selection, it is unknown if and how multilevel selection acts on sociality in the wild. We studied the relative strength of multilevel selection on both individual behaviour and group social structure, quantified with social networks and 19 years of data from a wild, free-living mammal, the yellow-bellied marmot (Marmota flaviventer). Contextual analysis (exploring the impact of individual and group social phenotypes on individual fitness, relative to each other) revealed multilevel selection gradients in specific fitness and life history contexts, with selection for group social structure being just as strong, if not stronger, than individual social behaviour. We also found antagonistic multilevel selection gradients within and between levels, potentially explaining why increased sociality is not as beneficial or heritable in this system compared with other social taxa. Thus, the evolutionary dynamics of hierarchical or nested biological traits should be assessed at multiple levels simultaneously to tell a more accurate and comprehensive story. Overall, we provide empirical evidence suggesting that multilevel selection acts on social relationships and structures in the wild and provide direct evidence for a classic, unanswered question in biology.
https://royalsocietypublishing.org/doi/full/10.1098/rspb.2024.3061

Science

ARTICLES

ADAM I. RAMSARAN & PAUL W. FRANKLAND – Babies form fleeting memories
The human hippocampus constructs short-lived memories from around 1 year of age.
https://www.science.org/doi/10.1126/science.adw1923

PAPERS

TRISTAN S. YATES et al – Hippocampal encoding of memories in human infants
Humans lack memories for specific events from the first few years of life. We investigated the mechanistic basis of this infantile amnesia by scanning the brains of awake infants with functional magnetic resonance imaging while they performed a subsequent memory task. Greater activity in the hippocampus during the viewing of previously unseen photographs was related to later memory-based looking behavior beginning around 1 year of age, suggesting that the capacity to encode

individual memories comes online during infancy. The availability of encoding mechanisms for episodic memory during a period of human life that is later lost from our autobiographical record implies that postencoding mechanisms, whereby memories from infancy become inaccessible for retrieval, may be more responsible for infantile amnesia.
{How about "The unavailability of encoding mechanisms for episodic memory during infancy is caused by the postencoding mechanisms being reliant upon an autobiographical recording system which is only available when our self-awareness has developed sufficiently"? Memories from infancy do not become inaccessible, they really aren't there.}
https://www.science.org/doi/10.1126/science.adt7570

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