EAORC BULLETIN 1,094 – 2 June 2024

CONTENTS

NOTICES

PUBLICATION ALERTS

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

EDITORIAL INTERJECTIONS

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

ACADEMIA.EDU – On the Ancestry of Neandertals, Modern Humans and Others

In D. Begun (ed.), A Companion to Paleoanthropology. Wiley-Blackwell, 517-537 (2013)

JEAN-JACQUES HUBLIN – The Middle Pleistocene Record: On the Ancestry of Neandertals, Modern Humans and Others …

Late Pleistocene Neandertals, so-called "Cro-Magnons," as well as earlier Homo erectus, had been identified as early as the late 19th century. Following the discovery of the Mauer mandible in 1907 (see Figure 27.1), a group of intermediate Middle Pleistocene hominin forms surfaced on the paleoanthropological landscape, and their significance has since been much discussed. Primarily, these fossils share some derived characteristics with later humans, in particular a large brain size, but still retain plesiomorphies observed in Homo erectus sensu lato (see Antón, this volume Chapter 26), in particular a robust masticatory apparatus. In the past few decades, new and sometimes spectacular fossil material (Arsuaga et al. 1996) has been discovered. It has become possible to establish more reliable chronological frameworks and the specimens that were previously assigned to this "muddle in the middle" have been increasingly perceived as non-homogeneous. Along with these discoveries there also emerged a better understanding of Neandertal anatomy. Neandertals have been defined as a group geographically restricted to western and central Eurasia. Significantly, representatives of the Neandertal lineage have been identified in sites dating from the second half of the Middle Pleistocene, pushing the date of divergence between Neandertals and modern Homo sapiens further back in time (Arsuaga et al. 1996; Hublin 1978; Hublin 1982; Santa Luca 1978). In parallel, growing paleontological and genetic evidence bas supported the notion that non-African modern humans originated in Africa, where representatives of Homo sapiens anatomically rather close to extant humans have been evolving for the last 200ka (ka=thousands of years) (see Distotell, this volume Chapter 15). The challenge has become to assess the level of differentiation between various Middle Pleistocene human metapopulations and the evolutionary processes at work during this time period. To this day, debates still surround the problems of identifying distinct taxonomic entities in the fossil record and of relating them to Late Pleistocenc groups, in particular Neandertals and early representatives of our own species.

https://www.academia.edu/5797834/Hublin_J_J_2013_The_Middle_Pleistocene_Record_On_the_Origin_of_Neandertals_Modern_Humans_and_Others_In_D_Begun_ed_A_Companion_to_Paleoanthropology_Wiley_Blackwell_pp_517_537

ACADEMIA.EDU – 51kyo engraved bone reveals Neanderthals' capacity for symbolic behaviour

Nature Ecology & Evolution 5, 1273-1282 (2021)

DIRK LEDER et al – A 51,000-year-old engraved bone reveals Neanderthals' capacity for symbolic behaviour

While there is substantial evidence for art and symbolic behaviour in early Homo sapiens across Africa and Eurasia, similar evidence connected to Neanderthals is sparse and often contested in scientific debates. Each new discovery is thus crucial for our understanding of Neanderthals' cognitive capacity. Here we report on the discovery of an at least 51,000-year-old engraved giant deer phalanx found at the former cave entrance of Einhornhöhle, northern Germany. The find comes from an apparent Middle Palaeolithic context that is linked to Neanderthals. The engraved bone demonstrates that conceptual imagination, as a prerequisite to compose individual lines into a coherent design, was present in Neanderthals. Therefore, Neanderthal's awareness of symbolic meaning is very likely. Our findings show that Neanderthals were capable of creating symbolic expressions before H. sapiens arrived in Central Europe.

https://www.academia.edu/74946123/A_51_000_year_old_engraved_bone_reveals_Neanderthals_capacity_for_symbolic_behaviour

NEWS

NATURE BRIEFING – Neanderthal–human baby-making was recent — and brief

Analysis of dozens of ancient genomes reveals that close encounters between the two species took place in a narrow time window.

https://www.nature.com/articles/d41586-024-01452-3

SAPIENS – PODCAST: Learning from Handy Primates

In this episode, host Eshe Lewis delves into a conversation with Kirsty Graham, an animal behavior researcher. Kirsty explains how primates such as chimpanzees use tools to forage. Such innovative methods to access food reflect the basic yet profound necessities that drive tool innovation. Contrasting these findings with tool use in Homo sapiens highlights a vast range of purposes tools serve in human life.

https://www.sapiens.org/biology/primate-tool-use-human-origins/

SAPIENS – What Industrial Societies Get Wrong About Childhood

The industrial world's practice of placing children in classes of similar ages with an adult teacher is not the only way to learn—and it might not be the most effective.

https://www.sapiens.org/culture/children-social-learning/

SAPIENS – Did Humanity Really Arise in One Place?

New evidence is prompting researchers to rethink Homo sapiens' origin story—and what it means to be human.
https://www.sapiens.org/archaeology/human-evolution-east-africa/

SCIENCEADVISER – Some words are sharper than others

One fascinating aspect of human language is the way we ascribe shapes to sounds. This sound symbolism is often called the Bouba-Kiki effect after two made-up words people across cultures associate with round and sharp objects, respectively. The effect has been found in infants as young as four months old, begging the question of whether it stems from an innate perceptual mechanism. However, even four-month-old children have had lots of exposure to language, so it's possible they've already learned sound symbolism through experience.

Ideally, psychologists would want to test even younger kids—but days-old babies don't exactly have the ability to let researchers know if they think a word sounds pointy. Three-day-old chicks, on the other hand, are much more precocious. If they exhibit sound symbolism, that would be a strong indicator that the phenomenon is innate rather than learned.

So, researchers taught 42 chicks to circle around a panel to get a tasty treat. Then, they presented them with two such panels: one had a spiky shape on it, the other a round one. Lo and behold, the chicks preferred the spiky shape when the researchers said "Kiki" and the round one when they said "Bouba," researchers report in a 17 May bioRxiv preprint. "Even though our subjects had never experienced the sound-symbolic matching prior to test, they still spontaneously associated the two dimensions of shape and sound," the team writes. This places "the developmental origin of sound-symbolism … at the earliest stages of life, possibly hinting at a predisposed experience-independent mechanism."

Not only do the findings suggest this effect is essentially innate, they indicate that it's not special to our brains. "Crucially, direct evidence in an animal model suggests that, rather than being a culturally learned phenomenon unique to humans, sound-symbolism may belong to a set of predisposed associations built into different species," the team writes.
https://www.biorxiv.org/content/10.1101/2024.05.17.594640v1.full

SCIENCEADVISER – 2020's fake news predominantly spread by small group of mostly older women

The 2020 U.S. presidential election was a minefield of misinformation on Twitter. From articles claiming that Kamala Harris joked about killing Mike Pence to stories supposedly revealing that large numbers of Trump votes were being secretly switched to Biden, it seemed like fake news was everywhere on the platform now known as X.

Many thought an army of bad actors was behind this deluge, but it was actually a mere battalion. According to a sample of more than 600,000 U.S. voters published in Science, about 2000 or so "supersharers" spread 80% of content from fake news sites during this period. More surprising still: The average supersharer was 58 years old, and almost 60% were women, challenging the stereotype of social media manipulators as young, alt-right men.

Given the wide reach of these tweets, if the platform had suspended supersharers in August 2020, it would have reduced the fake election news seen by voters by two thirds, says psychologist and study co-author Briony Swire-Thompson. Now that the team knows who these people are, she says, "the big question is: 'Why are they doing what they're doing?'"
https://www.science.org/content/article/tiny-number-supersharers-spread-vast-majority-fake-news

SCIENCE DAILY – Birdsong and human voice built from same genetic blueprint

Humans have been long fascinated by bird song and the cacophony of other avian sounds -- from coos and honks to quacks and peeps. But little is known about how the unique vocal organ of birds -- the syrinx -- varies from species to species or its deeper evolutionary origins. A trio of recent studies is changing that. The studies include high-resolution anatomical scans of syrinxes from hummingbirds and ostriches -- the world's smallest and largest bird species -- and the discovery that the syrinx and larynx, the vocal organ of reptiles and mammals, including humans, share the same developmental programming.
https://www.sciencedaily.com/releases/2024/05/240523153629.htm

SCIENCE DAILY – Excavation reveals 'major' ancient migration to Timor Island

The discovery of thousands of stone artefacts and animal bones in a deep cave in Timor Island has led archaeologists to reassess the route that early humans took to reach Australia. Researchers dated and analysed the artefacts and sediment at the Laili rock shelter in central-north Timor-Leste, north of Australia, to pinpoint the arrival of the colonists.
https://www.sciencedaily.com/releases/2024/05/240522130340.htm

SCIENCE DAILY – Meerkat chit-chat

Researchers unravel the vocal interactions of meerkat groups and show they use two different types of interactions to stay in touch.
https://www.sciencedaily.com/releases/2024/05/240520122825.htm

SCIENCE DAILY – Otters, especially females, use tools to survive a changing world

Sea otters are one of the few animals that use tools to access their food, and a new study has found that individual sea otters that use tools -- most of whom are female -- are able to eat larger prey and reduce tooth damage when their preferred prey becomes depleted.
https://www.sciencedaily.com/releases/2024/05/240516160511.htm

SCIENCE DAILY – Brain damage reveals part of the brain necessary for helping others

Our willingness to help others is governed by a specific brain region pinpointed by researchers in a study of patients with brain damage to that region.
https://www.sciencedaily.com/releases/2024/05/240527115859.htm

SCIENCE DAILY – Researchers have located the brain network responsible for stuttering

An international research group led by researchers from the University of Turku and Turku University Hospital in Finland has succeeded in identifying the probable origin of stuttering in the brain.
https://www.sciencedaily.com/releases/2024/05/240528115020.htm

SCIENCE DAILY – Genetic mosaicism more common than thought

Researchers found that approximately one in 40 human bone marrow cells carry massive chromosomal alterations without causing any apparent disease or abnormality. Even so-called normal cells carry all sorts of genetic mutations, meaning there are more genetic differences between individual cells in our bodies than between different human beings. The discovery was enabled by a single-cell sequencing technology called Strand-seq, a unique DNA sequencing technique that can reveal subtle details of genomes in single cells that are too difficult to detect with other methods.
https://www.sciencedaily.com/releases/2024/05/240528115025.htm

SCIENCE.ORG NEWS – These crows may count in a way similar to human toddlers

Find in carrion crows suggests a language system that may be akin to ours.
https://www.science.org/content/article/these-crows-may-count-way-similar-human-toddlers

SCIENCE.ORG NEWS – Tiny number of 'supersharers' spread the vast majority of fake news

Less than 1% of Twitter users posted 80% of misinformation about the 2020 U.S. presidential election.
https://www.science.org/content/article/tiny-number-supersharers-spread-vast-majority-fake-news

THE CONVERSATION – How genes shape birdsong, even when birds grow up far from home

It may not be obvious to the human ear but birds of the same species sing in different dialects.
https://theconversation.com/how-genes-shape-birdsong-even-when-birds-grow-up-far-from-home-230789

PUBLICATIONS

Academia Biology

PAPERS

ANDRE J. VAN WIJNEN & ERIC A. LEWALLEN – Natural selection and evolution: evolving concepts

Many recent studies in evolutionary biology have expanded and refined definitions of biological evolution and natural selection. Current evolutionary models incorporate different adaptive and non-adaptive processes based on molecular genetic changes and how DNA is modified over time in unicellular species, or in germline versus somatic cells in metazoan species. Cogent arguments can be raised for the view that natural selection should be considered a biological law, consistent with quantitative mathematical equations that describe the fitness of individuals, as well as variations within and among populations. Evolution is an overarching framework that incorporates the laws of natural selection and clarifies why phenotypic variation can increase in prevalence and result in species adaptations. The conceptual framework for biological evolution incorporates many cohesive principles that collectively have a predictive value. This framework will continue to evolve with improvements in high-resolution technologies that enable us to examine both adaptive and non-adaptive changes that drive biological phenotypes.
https://www.academia.edu/2837-4010/2/2/10.20935/AcadBiol6245

Biology Letters

PAPERS

MAX S. FARNWORTH & STEPHEN H. MONTGOMERY – Evolution of neural circuitry and cognition

Neural circuits govern the interface between the external environment, internal cues and outwardly directed behaviours. To process multiple environmental stimuli and integrate these with internal state requires considerable neural computation. Expansion in neural network size, most readily represented by whole brain size, has historically been linked to behavioural complexity, or the predominance of cognitive behaviours. Yet, it is largely unclear which aspects of circuit variation impact variation in performance. A key question in the field of evolutionary neurobiology is therefore how neural circuits evolve to allow improved behavioural performance or innovation. We discuss this question by first exploring how volumetric changes in brain areas reflect actual neural circuit change. We explore three major axes of neural circuit evolution—replication, restructuring and reconditioning of cells and circuits—and discuss how these could relate to broader phenotypes and behavioural variation. This discussion touches on the relevant uses and limitations of volumetrics, while advocating a more circuit-based view of cognition. We then use this framework to showcase an example from the insect brain, the multi-sensory integration and internal processing that is shared between the mushroom bodies and central complex. We end by identifying future trends in this research area, which promise to advance the field of evolutionary neurobiology.
https://royalsocietypublishing.org/doi/full/10.1098/rsbl.2023.0576

Current Biology

PAPERS

GREGG A. CASTELLUCCI et al – Stimulation of caudal inferior and middle frontal gyri disrupts planning during spoken interaction

Turn-taking is a central feature of conversation across languages and cultures. This key social behavior requires numerous sensorimotor and cognitive operations that can be organized into three general phases: comprehension of a partner's turn, preparation of a speaker's own turn, and execution of that turn. Using intracranial electrocorticography, we recently demonstrated that neural activity related to these phases is functionally distinct during turn-taking. In particular, networks active during the perceptual and articulatory stages of turn-taking consisted of structures known to be important for speech-related sensory and motor processing, while putative planning dynamics were most regularly observed in the caudal inferior frontal gyrus (cIFG) and the middle frontal gyrus (cMFG). To test if these structures are necessary for planning during spoken interaction, we used direct electrical stimulation (DES) to transiently perturb cortical function in neurosurgical patient-volunteers performing a question-answer task. We found that stimulating the cIFG and cMFG led to various response errors but not gross articulatory deficits, which instead resulted from DES of structures involved in motor control (e.g., the precentral gyrus). Furthermore, perturbation of the cIFG and cMFG delayed inter-speaker timing—consistent with slowed planning—while faster responses could result from stimulation of sites located in other areas. Taken together, our findings suggest that the cIFG and cMFG contain critical preparatory circuits that are relevant for interactive language use.
https://www.cell.com/current-biology/abstract/S0960-9822(24)00592-X

Interface: Journal of the Royal Society

PAPERS

XIAOFENG WANG, FENG FU & LONG WANG – Deterministic theory of evolutionary games on temporal networks

Recent empirical studies have revealed that social interactions among agents in realistic networks merely exist intermittently and occur in a particular sequential order. However, it remains unexplored how to theoretically describe evolutionary dynamics of multiple strategies on temporal networks. Herein, we develop a deterministic theory for studying evolutionary dynamics of any $n\times n$
pairwise games in structured populations where individuals are connected and organized by temporally activated edges. In the limit of weak selection, we derive replicator-like equations with a transformed payoff matrix characterizing how the mean frequency of each strategy varies over time, and then obtain critical conditions for any strategy to be evolutionarily stable on temporal networks. Interestingly, the re-scaled payoff matrix is a linear combination of the original payoff matrix with an additional one describing local competitions between any pair of different strategies, whose weights are solely determined by network topology and selection intensity. As a particular example, we apply the deterministic theory to analysing the impacts of temporal networks in the mini-ultimatum game, and find that temporally networked population structures result in the emergence of fairness. Our work offers theoretical insights into the subtle effects of network temporality on evolutionary game dynamics.
https://royalsocietypublishing.org/doi/10.1098/rsif.2024.0055

Nature

NEWS

Monkey business: primates' social life tracked with wireless neuronal recording

Primates have rich social lives orchestrated by brain circuits that are still poorly understood, partly because they have not been studied under naturalistic conditions. New wireless technology for recording neuronal activity in freely moving monkeys enabled insights into how neurons track natural social interactions, including reciprocity and social support towards a partner.

https://www.nature.com/articles/d41586-024-00467-0

ARTICLES

JAMES MITCHELL CROW – I study artefacts left in prehistoric caves

Basran Burhan helped to date the oldest piece of figurative art discovered so far.

https://www.nature.com/articles/d41586-024-01526-2

Nature Communications Biology

PAPERS

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

Characterising how the totality of primate diversity is distributed across the order, and how it evolved, is challenging because diversity in individual traits often show opposing phylogenetic patterns. A species' combination of traits can be conceptualised as its 'niche'. Here, we describe and analyse seven-dimensional niche space, comprising 11 traits, for 191 primate species. Multifaceted diversity is distributed unequally among taxonomic groups. Cercopithecoidea and Hominidae occupy the largest areas of niche space, and are the most diverse families; platyrrhine families occupy small areas, and this space overlaps with strepsirrhines. The evolution of species' locations in niche space is regulated by selection for adaptive optima in trait combinations. Given that niche similarity results in interspecific competition, we quantify two measures of species' niche locations relative to others. We find that omnivores, frugivores, and species tolerating higher temperatures experience stronger interspecific competition. Hominidae occupation of niche space suggests competitive exclusion from niches by Cercopithecoidea over evolutionary time; but living great apes experience the lowest levels of interspecific competition. Callitrichids experience the highest levels of interspecific competition. Our results provide a standardised measure of primate niches that sheds light on the partitioning and evolution of primate diversity, and how this is driven by interspecific competition.

https://www.nature.com/articles/s42003-024-06324-0

Nature Human Behaviour

PAPERS

CECILIA PADILLA-IGLESIAS et al – Deep history of cultural and linguistic evolution among Central African hunter-gatherers

Human evolutionary history in Central Africa reflects a deep history of population connectivity. However, Central African hunter-gatherers (CAHGs) currently speak languages acquired from their neighbouring farmers. Hence it remains unclear which aspects of CAHG cultural diversity results from long-term evolution preceding agriculture and which reflect borrowing from farmers. On the basis of musical instruments, foraging tools, specialized vocabulary and genome-wide data from ten CAHG populations, we reveal evidence of large-scale cultural interconnectivity among CAHGs before and after the Bantu expansion. We also show that the distribution of hunter-gatherer musical instruments correlates with the oldest genomic segments in our sample predating farming. Music-related words are widely shared between western and eastern groups and likely precede the borrowing of Bantu languages. In contrast, subsistence tools are less frequently exchanged and may result from adaptation to local ecologies. We conclude that CAHG material culture and specialized lexicon reflect a long evolutionary history in Central Africa.

https://www.nature.com/articles/s41562-024-01891-y

MAURICIO GONZÁLEZ-FORERO – Evolutionary–developmental (evo-devo) dynamics of hominin brain size

Brain size tripled in the human lineage over four million years, but why this occurred remains uncertain. Here, to study what caused this brain expansion, I mathematically model the evolutionary and developmental (evo-devo) dynamics of hominin brain size. The model recovers (1) the evolution of brain and body sizes of seven hominin species starting from brain and body sizes of the australopithecine scale, (2) the evolution of the hominin brain–body allometry and (3) major patterns of human development and evolution. I show that the brain expansion recovered is not caused by direct selection for brain size but by its genetic correlation with developmentally late preovulatory ovarian follicles. This correlation is generated over development if individuals experience a challenging ecology and seemingly cumulative culture, among other conditions. These findings show that the evolution of exceptionally adaptive traits may not be primarily caused by selection for them but by developmental constraints that divert selection.

https://www.nature.com/articles/s41562-024-01887-8

Nature Scientific Reports

PAPERS

SONJA J. EBEL et al with JOSEP CALL – Functional fixedness in chimpanzees

Differences in the tool use of non-human primates and humans are subject of ongoing debate. In humans, representations of object functions underpin efficient tool use. Yet, representations of object functions can lead to functional fixedness, which describes the fixation on a familiar tool function leading to less efficient problem solving when the problem requires using the tool for a new function. In the current study, we examined whether chimpanzees exhibit functional fixedness. After solving a problem with a tool, chimpanzees were less efficient in solving another problem which required using the same tool with a different function compared to a control group. This fixation effect was still apparent after a period of nine months and when chimpanzees had learned about the function of a tool by observation of a conspecific. These results suggest that functional fixedness in our closest living relatives likely exists and cast doubt on the notion that stable function representations are uniquely human.
https://www.nature.com/articles/s41598-024-62685-w

TOM S. ROTH et al – No immediate attentional bias towards or choice bias for male secondary sexual characteristics in Bornean orang-utans (Pongo pygmaeus)

Primate faces provide information about a range of variant and invariant traits, including some that are relevant for mate choice. For example, faces of males may convey information about their health or genetic quality through symmetry or facial masculinity. Because perceiving and processing such information may have bearing on the reproductive success of an individual, cognitive systems are expected to be sensitive to facial cues of mate quality. However, few studies have investigated this topic in non-human primate species. Orang-utans are an interesting species to test mate-relevant cognitive biases, because they are characterised by male bimaturism: some adult males are fully developed and bear conspicuous flanges on the side of their face, while other males look relatively similar to females. Here, we describe two non-invasive computerised experiments with Bornean orang-utans (Pongo pygmaeus), testing (i) immediate attention towards large flanges and symmetrical faces using a dot-probe task (N = 3 individuals; 2F) and (ii) choice bias for pictures of flanged males over unflanged males using a preference test (N = 6 individuals; 4F). In contrast with our expectations, we found no immediate attentional bias towards either large flanges or symmetrical faces. In addition, individuals did not show a choice bias for stimuli of flanged males. We did find exploratory evidence for a colour bias and energy efficiency trade-offs in the preference task. We discuss our null results and exploratory results in the context of the evolutionary history of Bornean orang-utans, and provide suggestions for a more biocentric approach to the study of orang-utan cognition.
https://www.nature.com/articles/s41598-024-62187-9

MAYADA OUDAH et al – Perception of experience influences altruism and perception of agency influences trust in human–machine interactions

As robots become increasingly integrated into social economic interactions, it becomes crucial to understand how people perceive a robot's mind. It has been argued that minds are perceived along two dimensions: experience, i.e., the ability to feel, and agency, i.e., the ability to act and take responsibility for one's actions. However, the influence of these perceived dimensions on human–machine interactions, particularly those involving altruism and trust, remains unknown. We hypothesize that the perception of experience influences altruism, while the perception of agency influences trust. To test these hypotheses, we pair participants with bot partners in a dictator game (to measure altruism) and a trust game (to measure trust) while varying the bots' perceived experience and agency, either by manipulating the degree to which the bot resembles humans, or by manipulating the description of the bots' ability to feel and exercise self-control. The results demonstrate that the money transferred in the dictator game is influenced by the perceived experience, while the money transferred in the trust game is influenced by the perceived agency, thereby confirming our hypotheses. More broadly, our findings support the specificity of the mind hypothesis: Perceptions of different dimensions of the mind lead to different kinds of social behavior.
https://www.nature.com/articles/s41598-024-63360-w

Neuron

PAPERS

SIQI FAN et al – Closed-loop microstimulations of the orbitofrontal cortex during real-life gaze interaction enhance dynamic social attention

Neurons from multiple prefrontal areas encode several key variables of social gaze interaction. To explore the causal roles of the primate prefrontal cortex in real-life gaze interaction, we applied weak closed-loop microstimulations that were precisely triggered by specific social gaze events. Microstimulations of the orbitofrontal cortex, but not the dorsomedial prefrontal cortex or the anterior cingulate cortex, enhanced momentary dynamic social attention in the spatial dimension by decreasing the distance of fixations relative to a partner's eyes and in the temporal dimension by reducing the inter-looking interval and

the latency to reciprocate the other's directed gaze. By contrast, on a longer timescale, microstimulations of the dorsomedial prefrontal cortex modulated inter-individual gaze dynamics relative to one's own gaze positions. These findings demonstrate that multiple regions in the primate prefrontal cortex may serve as functionally accessible nodes in controlling different aspects of dynamic social attention and suggest their potential for a therapeutic brain interface.
https://www.cell.com/neuron/abstract/S0896-6273(24)00330-1

New Scientist

NEWS

Early humans took northern route to Australia, cave find suggests
An excavation on Timor reveals humans first settled on the island 44,000 years ago, long after the earliest occupation of Australia – suggesting migration to the latter took another route.
https://www.newscientist.com/article/2432435-early-humans-took-northern-route-to-australia-cave-find-suggests/

Huge nose of male proboscis monkeys is key to mating success
Male proboscis monkeys use their enormous noses to make loud trumpeting sounds, and the organ's size advertises their health and status to prospective mates and rivals.
https://www.newscientist.com/article/2432576-huge-nose-of-male-proboscis-monkeys-is-key-to-mating-success/

PLoS Biology

ARTICLES

MASAHIKO HARUNO – Unraveling how the third-party brain under stress responds to injustices
How third-party individuals respond to injustices is important for resolving conflict in society. A study in PLOS Biology shows that individuals experiencing acute stress prefer to aid victims over punishing offenders, an opposite pattern to non-stress conditions.
https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3002618

PAPERS

HUAGEN WANG et al – Acute stress during witnessing injustice shifts third-party interventions from punishing the perpetrator to helping the victim
People tend to intervene in others' injustices by either punishing the transgressor or helping the victim. Injustice events often occur under stressful circumstances. However, how acute stress affects a third party's intervention in injustice events remains open. Here, we show a stress-induced shift in third parties' willingness to engage in help instead of punishment by acting on emotional salience and central-executive and theory-of-mind networks. Acute stress decreased the third party's willingness to punish the violator and the severity of the punishment and increased their willingness to help the victim. Computational modeling revealed a shift in preference of justice recovery from punishment the offender toward help the victim under stress. This finding is consistent with the increased dorsolateral prefrontal engagement observed with higher amygdala activity and greater connectivity with the ventromedial prefrontal cortex in the stress group. A brain connectivity theory-of-mind network predicted stress-induced justice recovery in punishment. Our findings suggest a neurocomputational mechanism of how acute stress reshapes third parties' decisions by reallocating neural resources in emotional, executive, and mentalizing networks to inhibit punishment bias and decrease punishment severity.
https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3002195

PLoS One

PAPERS

JULIA M. ZEH et al – Acoustic behavior of humpback whale calves on the feeding ground: Comparisons across age and implications for vocal development
Studying sound production at different developmental stages can provide insight into the processes involved in vocal ontogeny. Humpback whales (Megaptera novaeangliae) are a known vocal learning species, but their vocal development is poorly understood. While studies of humpback whale calves in the early stages of their lives on the breeding grounds and migration routes exist, little is known about the behavior of these immature, dependent animals by the time they reach the feeding grounds. In this study, we used data from groups of North Atlantic humpback whales in the Gulf of Maine in which all members were simultaneously carrying acoustic recording tags attached with suction cups. This allowed for assignment of likely caller identity using the relative received levels of calls across tags. We analyzed data from 3 calves and 13 adults. There were high levels of call rate variation among these individuals and the results represent preliminary descriptions of calf behavior. Our analysis suggests that, in contrast to the breeding grounds or on migration, calves are no longer acoustically cryptic by the time they reach their feeding ground. Calves and adults both produce calls in bouts, but there may be some differences in bout parameters like inter-call intervals and bout durations. Calves were able to produce most of the adult vocal repertoire but used different call types in different proportions. Finally, we found evidence of immature call types in calves, akin to protosyllables used in babbling in other mammals, including humans. Overall, the sound production of

humpback whale calves on the feeding grounds appears to be already similar to that of adults, but with differences in line with ontogenetic changes observed in other vocal learning species.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0303741

HYUNJOO YOO et al with D. KIMBROUGH OLLER – Infant vocal category exploration as a foundation for speech development

Non-random exploration of infant speech-like vocalizations (e.g., squeals, growls, and vowel-like sounds or "vocants") is pivotal in speech development. This type of vocal exploration, often noticed when infants produce particular vocal types in clusters, serves two crucial purposes: it establishes a foundation for speech because speech requires formation of new vocal categories, and it serves as a basis for vocal signaling of wellness and interaction with caregivers. Despite the significance of clustering, existing research has largely relied on subjective descriptions and anecdotal observations regarding early vocal category formation. In this study, we aim to address this gap by presenting the first large-scale empirical evidence of vocal category exploration and clustering throughout the first year of life. We observed infant vocalizations longitudinally using all-day home recordings from 130 typically developing infants across the entire first year of life. To identify clustering patterns, we conducted Fisher's exact tests to compare the occurrence of squeals versus vocants, as well as growls versus vocants. We found that across the first year, infants demonstrated clear clustering patterns of squeals and growls, indicating that these categories were not randomly produced, but rather, it seemed, infants actively engaged in practice of these specific categories. The findings lend support to the concept of infants as manifesting active vocal exploration and category formation, a key foundation for vocal language.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0299140

ROSE IANNUZZELLI, KAREN GONSALKORALE & LISA A. WILLIAMS – Motives matter: The psychological experience of ostracizing among sources

Individuals ostracize others for myriad reasons, yet the influence of those reasons on the psychological experience of ostracizing is yet unknown. Two studies aimed to determine the emotional and behavioral sequelae of ostracizing for different motives, directly comparing punitive to defensive motives. We focused our examination on a suite of emotions expected to arise as a function of (1) the situations that give rise to ostracizing for punitive and defensive reasons (anger, fear, anxiety, and sadness) and (2) the act of ostracizing itself (i.e., pride and guilt). The research employed a novel paradigm to induce the experience of ostracizing for defensive or punitive motives. Study 1 (N = 372) investigated sources' experienced emotion as a function of motive. Study 2 (N = 743) expanded consideration to behavioral intentions, including intentions to continue ostracizing and to recruit others to join in ostracizing the target. Across both studies and supported by an internal meta-analysis, ostracizing for defensive reasons was associated with higher levels of guilt, fear, and anxiety, and lower levels of anger, compared to ostracizing for punitive reasons. Neither sadness nor positive emotion (pride or happiness) differed significantly according to motive in either study. Moreover, guilt and anger mediated the impact of motive on intentions to continue ostracizing and recruit others to join them in ostracizing. To the extent that punitive sources experienced anger relative to defensive sources, they expressed greater intentions to continue ostracizing the target and to recruit others to join in ostracizing the target. To the extent that defensive sources experienced guilt relative to punitive sources, they reported reduced intentions to continue ostracizing the target. Findings add to a growing literature on ostracism sources, and highlight the mediating role of sources' emotion in guiding future actions.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0303510

PNAS

ARTICLES

ERIC B. BRENNAN – "I" versus "the author": The power of first-person voice when writing about science

I remember the moment when I began losing faith in the editorial fairness of peer-reviewed science literature. It happened as I struggled to publish a paper in a well-respected agricultural journal. In the article, I told a story about an important sampling mistake that I and other researchers have made and suggested solutions. Stories are a great way to communicate science, and it made sense to write my article in the first person. Normally, I celebrate when my papers are accepted, but not this time. This paper frustrated me because my article was accepted only after I reluctantly changed my writing from first person ("I") to third person ("the author"). This change introduced false modesty, took away my agency, and made many sentences difficult to read and imprecise (which author—me, or one of the 77 authors I cited?). The third-person voice also inserted unnecessary barriers between me and readers.
https://www.pnas.org/doi/full/10.1073/pnas.2316966121

Proceedings of the Royal Society B

PAPERS

BEN T. HIRSCH et al – Smarter foragers do not forage smarter: a test of the diet hypothesis for brain expansion

A leading hypothesis for the evolution of large brains in humans and other species is that a feedback loop exists whereby intelligent animals forage more efficiently, which results in increased energy intake that fuels the growth and maintenance of

large brains. We test this hypothesis for the first time with high-resolution tracking data from four sympatric, frugivorous rainforest mammal species (42 individuals) and drone-based maps of their predominant feeding trees. We found no evidence that larger-brained primates had more efficient foraging paths than smaller brained procyonids. This refutes a key assumption of the fruit-diet hypothesis for brain evolution, suggesting that other factors such as temporal cognition, extractive foraging or sociality have been more important for brain evolution.
https://royalsocietypublishing.org/doi/10.1098/rspb.2024.0138

HILJE M. DOEKES & RUTGER HERMSEN – Multiscale selection in spatially structured populations
The spatial structure of populations is key to many (eco-)evolutionary processes. In such cases, the strength and sign of selection on a trait may depend on the spatial scale considered. An example is the evolution of altruism: selection in local environments often favours cheaters over altruists, but this can be outweighed by selection at larger scales, favouring clusters of altruists over clusters of cheaters. For populations subdivided into distinct groups, this effect is described formally by multilevel selection theory. However, many populations do not consist of non-overlapping groups but rather (self-)organize into other ecological patterns. We therefore present a mathematical framework for multiscale selection. This framework decomposes natural selection into two parts: local selection, acting within environments of a certain size, and interlocal selection, acting among them. Varying the size of the local environments subsequently allows one to measure the contribution to selection of each spatial scale. To illustrate the use of this framework, we apply it to models of the evolution of altruism and pathogen transmissibility. The analysis identifies how and to what extent ecological processes at different spatial scales contribute to selection and compete, thus providing a rigorous underpinning to eco-evolutionary intuitions.
https://royalsocietypublishing.org/doi/10.1098/rspb.2023.2559

Trends in Cognitive Sciences

PAPERS

SHAOCONG MA et al – Scientific and religious beliefs are primarily shaped by testimony
Understanding why individuals are more confident of the existence of invisible scientific phenomena (e.g., oxygen) than invisible religious phenomena (e.g., God) remains a puzzle. Departing from conventional explanations linking ontological beliefs to direct experience, we introduce a model positing that testimony predominantly shapes beliefs in both scientific and religious domains. Distinguishing direct experience (personal observation) from cultural input (testimony-based evidence), we argue that even apparently direct experiences often stem from others' testimony. Our analysis indicates that variability in direct experience cannot explain belief disparities between science and religion, within each domain, or across cultures. Instead, variability in testimony is the primary driver of ontological beliefs. We present developmental evidence for testimony-based beliefs and elucidate the mechanisms underlying their impact.
{"Understanding why individuals are more confident of the existence of invisible scientific phenomena (e.g., oxygen) than invisible religious phenomena (e.g., God) remains a puzzle". No it doesn't. We have secondary evidence for the existence of oxygen, such as the splint test. We can also detect the presence of oxygen by its signature in the spectrum (~530nm & ~560nm), and we know enough about the element to say it has atomic number 8, atomic mass 15.999, a 2–6 electron configuration with a valence of 2, and under atmospheric pressure and temperature, it is a colorless, odorless, and tasteless gas (https://www.hamiltoncompany.com/process-analytics/dissolved-oxygen-knowledge/why-oxygen/properties-of-oxygen). Some things are invisible because they cannot be directly detected by human senses, although they are indirectly detectable; and then there are things invisible because there is only the unevidenced word others. The first type is endorsed by knowledge; the second by faith – or, if you prefer, ignorance on a pogo stick. Comparing incomparables is a bad way to open an interesting topic. (It's marking season again – does it show?)}
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(24)00112-8

Trends in Ecology and Evolution

PAPERS

SALVA DURAN-NEBREDA et al – On the multiscale dynamics of punctuated evolution
For five decades, paleontologists, paleobiologists, and ecologists have investigated patterns of punctuated equilibria in biology. Here, we step outside those fields and summarize recent advances in the theory of and evidence for punctuated equilibria, gathered from contemporary observations in geology, molecular biology, genetics, anthropology, and sociotechnology. Taken in the aggregate, these observations lead to a more general theory that we refer to as punctuated evolution. The quality of recent datasets is beginning to illustrate the mechanics of punctuated evolution in a way that can be modeled across a vast range of phenomena, from mass extinctions hundreds of millions of years ago to the possible future ahead in the Anthropocene. We expect the study of punctuated evolution to be applicable beyond biological scenarios.
https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(24)00114-9

Trends in Neurosciences

PAPERS

ANDREA I. LUPPI et al – Unravelling consciousness and brain function through the lens of time, space, and information

Disentangling how cognitive functions emerge from the interplay of brain dynamics and network architecture is among the major challenges that neuroscientists face. Pharmacological and pathological perturbations of consciousness provide a lens to investigate these complex challenges. Here, we review how recent advances about consciousness and the brain's functional organisation have been driven by a common denominator: decomposing brain function into fundamental constituents of time, space, and information. Whereas unconsciousness increases structure–function coupling across scales, psychedelics may decouple brain function from structure. Convergent effects also emerge: anaesthetics, psychedelics, and disorders of consciousness can exhibit similar reconfigurations of the brain's unimodal–transmodal functional axis. Decomposition approaches reveal the potential to translate discoveries across species, with computational modelling providing a path towards mechanistic integration.
https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(24)00087-0

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