EAORC BULLETIN 1,026 – 12 February 2023

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.

RESEARCHGATE – Taboo

In Alan Barnard & Jonathan Spencer (eds.), Encyclopedia of Social and Cultural Anthropology, 815-817. Routledge (2002).

CHRIS KNIGHT – Taboo

Introduced into English by Captain Cook, 'taboo' was once central among the constructs of social anthropology. Reporting the custom of human sacrifice in Tahiti, Cook observed: 'The solemnity itself is called Poore Eree, or Chief s Prayer; and the victim who is offered up, Tataa-taboo, or consecrated man' (III 1784, ii:40). The natives of Atui Island asked Cook's party apprehensively whether certain objects shown them were 'taboo, or, as they pronounced the word, tafoo?' (Cook III 1784 ii:249). Following Cook's death, his successor in maintaining the ship's journal wrote of native priests 'tabooing' a field of sweet potatoes using wands, and of women who — throughout Polynesia — 'are always tabooed, or forbidden to eat certain kinds of meats' (Cook III1784, iii: 10–11).
https://www.researchgate.net/publication/368357079_Chris_Knight_Taboo

NEWS

JOHN TEMPLETON FOUNDATION – Concepts of Space and Concepts of Self

It has been said that the twentieth century was the age of physics and the twenty-first will be the age of neuroscience. One way to think about this is that while much of the most celebrated science of the last century was devoted to understanding the movement of bodies in space, from the tiniest subatomic particles to superclusters of galaxies, a good deal of the current century's science seems set to address the machinations of mind and the attendant complexities of human behavior. Whereas in the twentieth century, physics articulated a picture of the external world with the twin pillars of quantum mechanics and general relativity, in our current era, more and more scientific research aims at describing the inner world of human perception and experience.
https://templeton.us14.list-manage.com/track/click?u=afebe06609a423c59c59cee74&id=1ba6379dbe&e=3098989a4b

NATURE BRIEFING – Now that's a good-looking fish

The bluestreak cleaner wrasse (Labroides dimidiatus) seems to recognize its own face — an indication of self-awareness that has so far been found only in humans and a few other species. Each fish was shown composite images: its own head photoshopped onto another fish's body, and its own body with another fish's head. The fish were less aggressive towards their own faces, even on another fish's body, suggesting that this fish forms a mental image of its countenance.
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=96a7b971bc&e=1db4b9a19b

NATURE BRIEFING – Autism researchers debate terminology

Scientists are grappling with the language used to describe autism. Some researchers say calling autism a 'disorder' or 'disease' — instead of a difference or neurodivergence — dehumanizes autistic people. Others counter that not being able to use words such as 'symptoms' and 'comorbidities' stifles scientific progress and downplays the experience of some autistic people. "Why not just be specific?" asks psychologist Monique Botha, who is autistic. "Specificity is always going to be more rigorous and accurate than generalization."
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=f3474cca74&e=1db4b9a19b

NATURE BRIEFING – "I believe we're at the brink of interspecies communication."

Digital geographer Karen Bakker says that technology such as digital recording and artificial intelligence will give us the ability to hear and understand animal communication on its own terms. (Scientific American | 7 min read)
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=2dce2472e8&e=1db4b9a19b

NATURE BRIEFING – Who butchered this ancient hippo?

Archaeologists in Kenya have unearthed dozens of stone tools scattered around the butchered bones of ancient hippopotamus-like creatures. The site dates to between 2.6 and 3 million years ago, and pushes back the known start of large-animal butchering by early human relatives by at least 600,000 years. The tools are the earliest known example — by around 700,000 years — of Oldowan tools, which became widespread across Africa and Asia. The tools were found alongside the teeth of an ancient human relative from the genus Paranthropus, raising the possibility that Paranthropus, rather than a member of the modern-human genus Homo, used the tools.
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=9f9cf26e0e&e=1db4b9a19b

SAPIENS – Climate Change May Have Been a Major Driver of Ancient Hominin Extinctions

A new study suggests at least two close relatives of Homo sapiens may have died out as their environments changed.
https://www.sapiens.org/archaeology/hominin-extinctions/

SCIENCE NEWS – Your native tongue holds a special place in your brain, even if you speak 10 languages

Neuroimaging reveals how polyglots' brains respond to both familiar and unfamiliar languages.
https://www.science.org/content/article/your-native-tongue-holds-special-place-your-brain-even-if-you-speak-10-languages

SCIENCE NEWS – Killer whale moms forgo having kids to look after grown sons

Males are a lifelong burden to their mothers.
https://www.science.org/content/article/killer-whale-moms-forgo-having-kids-look-after-grown-sons

SCIENCE NEWS – Did more than one ancient human relative use early stone tools?

Scientists find oldest Oldowan butchery tools—long seen as a hallmark of our own genus—with Paranthropus fossils.
https://www.science.org/content/article/one-ancient-human-relative-use-early-stone-tools

SOCIETY FOR SCIENCE – Mammals that live in groups may live longer, longevity research suggests

An analysis of nearly 1,000 mammal species reveals that the evolution of mammals' social lives and life spans could be linked.
http://click.societyforscience-email.com/?qs=277b0f54e74085e02997c6faa7d7e663537e2f1fe5e92675e67af9fee5cd229353baa7ff27625f0cb1020695bf94e62401ef67167663b1b7b4c5eb52a80c1c3f

SOCIETY FOR SCIENCE – Fish recognize themselves in photos, further evidence they may be self-aware

Cleaner fish recognize themselves in mirrors and photos, suggesting that far more animals may be self-aware than previously thought.
http://click.societyforscience-email.com/?qs=277b0f54e74085e07662b82c135b89373cb6919ae5d94714f244b7914480ba9fded3d6b06ecde7f32ce87f64a77336a1804d6a76556de44b09f249de4129d4e8

SOCIETY FOR SCIENCE – We prioritize family over self, and that has real-world implications

Two studies show how family bonds improve personal and mental health, suggesting policy makers should shift away from individualistic mindsets.
http://click.societyforscience-email.com/?qs=277b0f54e74085e061aa2adb1afc6862cde5f2e98867f31c05fbb41fdbfe7a22d275250b3f5786359ae7e3845b06eca6d83dc8f782ebf27f119cdbdf639471ee

SOCIETY FOR SCIENCE – Here are 3 people-animal collaborations besides dolphins and Brazilians

Dolphins working with people to catch fish recently made a big splash. But humans and other animals have cooperated throughout history.
http://click.societyforscience-email.com/?qs=277b0f54e74085e06a8b0e23a924f8430dbaf9a4032702bd38b493c1175fea77010bf4825e9e16769badc1e19b53c43fc21c358983a564d8e3f5914c622b0556

SOCIETY FOR SCIENCE – 50 years ago, scientists debated when humans first set foot in North America

In 1973, archaeologists debated when people first arrived in the Americas. Mounting evidence suggests its much earlier than they thought.
http://click.societyforscience-email.com/?qs=277b0f54e74085e0b2025bd517b36a47b69f72768d5b4be06674f1468d0561c5900674f6c6dfc30bf98056d4f4c49b1aa2ec732f1de116d4cdf8d47c06edf9e8

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

LEE T. GETTLER et al – BaYaka forager food sharing networks in the Congo Basin: The roles of gender homophily and kin sharing

Food sharing is a costly form of cooperation that was likely critical to human evolutionary success, including the emergence of human's life history strategy. Food sharing in human communities may be maintained through a number of pathways, including direct dyadic reciprocity, reputation-based processes, and kin-biased exchange. Differences in reproductive demands, labor, and cultural norms may also result in gendered differences in cooperative networks. Here, we examine cooperative networks in egalitarian BaYaka foragers from the Congo Basin.

We collected social network data from 112 adults in 41 households in this subsistence community. We implement a Bayesian latent network model to assess individual-, dyadic-, and block-level predictors of food sharing partners.

Conditioning on covariates, we found limited evidence for direct dyadic reciprocity in food sharing. Despite local norms regarding prestige avoidance, we found status-based homophily. High-status individuals—council members and local healers—were more likely to share with one another. Importantly, our results highlight gender differences in patterns of food sharing, interacting with genetic relatedness. Women were more likely to share with one another, especially with kin as genetic relatedness increased.

Our results align with evolutionary framing emphasizing kin selection in costly cooperation. The results showing that women cooperate with other women, particularly kin, also complement sex-based patterns in some other mammalian species, potentially reflecting the social support necessary to manage reproductive costs and childcare. BaYaka women's subsistence productivity and local cultural dynamics for autonomy and egalitarianism may likewise help facilitate women's preferential cooperation with one another.

https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24688

ANNALISA PIETROBELLI et al – Linking the proximal tibiofibular joint to hominid locomotion: A morphometric study of extant species

We perform a comparative assessment of shape variation of the proximal fibula in extant humans and great apes, intending to investigate the possible link between proximal fibular shape and locomotor patterns.
Our sample includes 94 fibulae of 37 Homo sapiens, 15 Gorilla, 17 Pongo, and 25 Pan. Fibular morphology was investigated through three-dimensional (semi)landmark-based geometric morphometric methods.
We found unique features of the human fibular head compared to that of great apes (i.e., oblique articular surface, the presence of the styloid process, specific morphology of muscle attachment sites), supporting the functional role of this bone in relation to human obligate bipedalism. Great apes also showed distinctive traits in their proximal fibula morphology, in agreement with differences in locomotor behavior.
The morphology of the proximal fibula in extant humans and great apes is indicative of locomotor behavior, offering the potential for the comparative analysis of fossil hominin remains.
https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.24696

Current Biology

PAPERS

MICHAEL N. WEISS et al – Costly lifetime maternal investment in killer whales

Parents often sacrifice their own future reproductive success to boost the survival of their offspring, a phenomenon referred to as parental investment. In several social mammals, mothers continue to improve the survival of their offspring well into adulthood; however, whether this extended care comes at a reproductive costs to mothers, and therefore represents maternal investment, is not well understood. We tested whether lifetime maternal care is a form of parental investment in fish-eating "resident" killer whales. Adult killer whales, particularly males, are known to receive survival benefits from their mothers; however, whether this comes at a cost to mothers' reproductive success is not known. Using multiple decades of complete census data from the "southern resident" population, we found a strong negative correlation between females' number of surviving weaned sons and their annual probability of producing a viable calf. This negative effect did not attenuate as sons grew older, and the cost of sons could not be explained by long-term costs of lactation or group composition effects, supporting the hypothesis that caring for adult sons is reproductively costly. This is the first direct evidence of lifetime maternal investment in an iteroparous animal, revealing a previously unknown life history strategy.
https://www.cell.com/current-biology/fulltext/S0960-9822(22)01994-7

ANTONIO J. OSUNA-MASCARÓ et al – Flexible tool set transport in Goffin's cockatoos

The use of tool sets constitutes one of the most elaborate examples of animal technology, and reports of it in nature are limited to chimpanzees and Goffin's cockatoos. Although tool set use in Goffin's was only recently discovered, we know that chimpanzees flexibly transport tool sets, depending on their need. Flexible tool set transport can be considered full evidence for identification of a genuine tool set, as the selection of the second tool is not just a response to the outcomes of the use of the first tool but implies recognizing the need for both tools before using any of them (thus, categorizing both tools together as a tool set). In three controlled experiments, we tested captive Goffin's in tasks inspired by the termite fishing of Goualougo Triangle's chimpanzees. Thereby, we show that some Goffin's can innovate the use and flexibly use and transport a new tool set for immediate future use; therefore, their sequential tool use is more than the sum of its parts.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00057-X

Mind & Language

PAPERS

SEHRANG JOO, SAMI R. YOUSIF & JOSHUA KNOBE – Teleology beyond explanation

People often think of objects teleologically. For instance, we might understand a hammer in terms of its purpose of driving in nails. But how should we understand teleological thinking in the first place? This paper separates mere teleology (simply ascribing a telos) and teleological explanation (thinking something is explained by its telos) by examining cases where an object was designed for one purpose but is now widely used for a different purpose. Across four experiments, we show that teleology judgments and teleological explanation judgments are dissociable, and identify three factors that influenced teleology judgments (and one that did not).
https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12393

CECILIA HEYES – Imitation and culture: What gives?

What is the relationship between imitation and culture? This article charts how definitions of imitation have changed in the last century, distinguishes three senses of "culture" used by contemporary evolutionists (Culture1–Culture3), and summarises current disagreement about the relationship between imitation and culture. The disagreement arises from ambiguities in the distinction between imitation and emulation, and confusion between two explanatory projects—the anthropocentric project and the cultural selection project. I argue that imitation gives cultural evolution an inheritance

mechanism for communicative and gestural skills (but not technological skills), and cultural selection yields the cognitive mechanisms that make imitation possible.
https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12388

MARIANNA BERGAMASCHI GANAPINI – The signaling function of sharing fake stories
Why do people share or publicly engage with fake stories? Two possible answers come to mind: (a) people are deeply irrational and believe these stories to be true; or (b) they intend to deceive their audience. Both answers presuppose the idea that people put the stories forward as true. But I argue that in some cases, these outlandish (yet also very popular) stories function as signals of one's group membership. This signaling function can make better sense of why, despite their unusual nature or lack of a factual basis, some of these stories are so widespread.
https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12373

ERNESTO PERINI-SANTOS – Articulating a framework for unarticulated constituents
The truth-conditions of many utterances have components that do not correspond to any uttered morpheme. This happens because linguistic acts are always a supplement to whatever else is available to agents engaged in a conversation. Unarticulated constituents result from the informational trade-off between what is available in the situation of utterance and what needs to be linguistically articulated. Unarticulated constituents are constituents of propositions, that is, of classifying tools that are neutral with respect to the way in which what is given in a situation interacts with the words uttered.
https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12386

JOSHUA MAY – Moral rationalism on the brain
I draw on neurobiological evidence to defend the rationalist thesis that moral judgments are essentially dependent on reasoning, not emotions (conceived as distinct from inference). The neuroscience reveals that moral cognition arises from domain-general capacities in the brain for inferring, in particular, the consequences of an agent's action, the agent's intent, and the rules or norms relevant to the context. Although these capacities entangle inference and affect, blurring the reason/emotion dichotomy does not preferentially support sentimentalism. The argument requires careful consideration of the empirical evidence (from neuroimaging to psychopathology) and philosophical analysis of the commitments of rationalism versus sentimentalism in ethics.
{Hmm. If moral judgements are essentially dependent on reasoning, then are immoral judgments also essentially dependent on reasoning? Discuss, with attention to the definition of "moral".}
https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12394

WOLFRAM HINZEN & OTÁVIO MATTOS – Explaining early generics: A linguistic model
Preschoolers naturally form mental representations that capture generic knowledge about object kinds. These have been considered to pose a special explanatory and learning challenge. We here argue for a new deductive model of them, where (i) the representations in question have a linguistic format from the start; (ii) they are inherently structurally simpler compared to reference to individuals or quantifications; and (iii) formed in communicative contexts because communication in humans is linked to language. In this model, specific language-related resources explain the scope and limits of the forms of knowledge obtained, illustrating how language and cognition develop in tandem.
{But if language is cognition, what could they do other than develop in tandem?}
https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12367

ANNA DROŻDŻOWICZ – Experiences of linguistic understanding as epistemic feelings
Language understanding comes with a particular kind of phenomenology. It is often observed that when listening to utterances in a familiar language, competent language users can have experiences of understanding the meanings of these utterances. The nature of such experiences is a much debated topic. In this paper, I develop a new proposal according to which experiences of understanding are a particular kind of epistemic feelings of fluency that result from evaluative monitoring processes. The perceptual experience that accompanies linguistic comprehension results from the deployment of early stage auditory processes of speech perception that lead to the recognition of words.
https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12346

KARL BERGMAN – Should the teleosemanticist be afraid of semantic indeterminacy?
The teleosemantic indeterminacy problem has generated much discussion but no consensus. One possible solution is to accept indeterminacy as a real feature of some representations. I call this view "indeterminacy realism." In this paper, I argue that indeterminacy realism should be treated as a serious option. By drawing an analogy with vagueness, I try to show that accepting the reality of indeterminacy would not be catastrophic for teleosemantics. I further argue that there are positive reasons to endorse indeterminacy realism. I end the paper by arguing that indeterminacy realism need not generalize viciously to the case of propositional attitudes.
https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12395

REGINA E. FABRY – Distributed autobiographical memories, distributed self-narratives
Richard Heersmink argues that self-narratives are distributed across embodied organisms and their environment, given that their building blocks, autobiographical memories, are distributed. This argument faces two problems. First, it commits a fallacy of composition. Second, it relies on Marya Schechtman's narrative self-constitution view, which is incompatible with the distributed cognition framework. To solve these problems, this article develops an alternative account of self-narratives. On this account, we actively connect distributed autobiographical memories through distributed conversational and textual self-narrative practices. This account enhances our understanding of the memory–narrative nexus and has implications for philosophical conceptions of self.
https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12453

DAVID BALCARRAS – Is meaning cognized?
In this article, I defend an account of linguistic comprehension on which meaning is not cognized, or on which we do not tacitly know our language's semantics. On this view, sentence comprehension is explained instead by our capacity to translate sentences into the language of thought. I explain how this view can explain our capacity to correctly interpret novel utterances, and then I defend it against several standing objections.
https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12452

Nature

NEWS

CRISPR voles can't detect 'love hormone' oxytocin — but still mate for life
Prairie voles lacking oxytocin receptors bonded with mates and cared for pups.
https://www.nature.com/articles/d41586-023-00197-9

How rare mutations contribute to complex traits
An analysis of rare genetic variants reveals that they influence human traits through similar biological pathways to common ones. The work deepens our understanding of how this type of variant affects complex traits.
https://www.nature.com/articles/d41586-023-00272-1

Ancient stone tools suggest early humans dined on hippo
Fossils and artefacts unearthed in Kenya suggest our ancestors used stone stools to feed on large animals in the distant past.
https://www.nature.com/articles/d41586-023-00386-6

ARTICLES

DORGHAM KHATIB & GENELA MORRIS – Spontaneous behaviour is shaped by dopamine in two ways
The neurotransmitter dopamine has well-established roles in reward-driven behaviours, such as searching for food. The discovery that it also shapes spontaneous behaviour reveals parallels between these two phenomena.
https://www.nature.com/articles/d41586-023-00004-5

EVA A. M. VAN DIS et al with WILLEM ZUIDEMA – ChatGPT: five priorities for research
Conversational AI is a game-changer for science. Here's how to respond.
https://www.nature.com/articles/d41586-023-00288-7

PAPERS

JEFFREY E. MARKOWITZ et al – Spontaneous behaviour is structured by reinforcement without explicit reward
Spontaneous animal behaviour is built from action modules that are concatenated by the brain into sequences. However, the neural mechanisms that guide the composition of naturalistic, self-motivated behaviour remain unknown. Here we show that dopamine systematically fluctuates in the dorsolateral striatum (DLS) as mice spontaneously express sub-second behavioural modules, despite the absence of task structure, sensory cues or exogenous reward. Photometric recordings and calibrated closed-loop optogenetic manipulations during open field behaviour demonstrate that DLS dopamine fluctuations increase sequence variation over seconds, reinforce the use of associated behavioural modules over minutes, and modulate the vigour with which modules are expressed, without directly influencing movement initiation or moment-to-moment kinematics. Although the reinforcing effects of optogenetic DLS dopamine manipulations vary across behavioural modules and individual mice, these differences are well predicted by observed variation in the relationships between endogenous dopamine and module use. Consistent with the possibility that DLS dopamine fluctuations act as a teaching signal, mice build sequences during exploration as if to maximize dopamine. Together, these findings suggest a model in which the same circuits and computations that govern action choices in structured tasks have a key role in sculpting the content of unconstrained, high-dimensional, spontaneous behaviour.
https://www.nature.com/articles/s41586-022-05611-2

Nature Ecology & Evolution

ARTICLES

APRIL RICH & ANNE-RUXANDRA CARVUNIS – De novo gene increases brain size

Comparative analysis of human and macaque brain transcripts together with experiments in mice and in a cortical organoid model show the de novo emergence of a hominoid-specific protein-coding gene implicated in brain development. The evolution of RNA nuclear export signals enabled a new protein to become translated from an ancestral long-noncoding RNA locus.

https://www.nature.com/articles/s41559-022-01942-5

PAPERS

JÜLIDE KUBAT et al – Dietary strategies of Pleistocene Pongo sp. and Homo erectus on Java (Indonesia)

During the Early to Middle Pleistocene, Java was inhabited by hominid taxa of great diversity. However, their seasonal dietary strategies have never been explored. We undertook geochemical analyses of orangutan (Pongo sp.), Homo erectus and other mammalian Pleistocene teeth from Sangiran. We reconstructed past dietary strategies at subweekly resolution and inferred seasonal ecological patterns. Histologically controlled spatially resolved elemental analyses by laser-based plasma mass spectrometry confirmed the preservation of authentic biogenic signals despite the effect of spatially restricted diagenetic overprint. The Sr/Ca record of faunal remains is in line with expected trophic positions, contextualizing fossil hominid diet. Pongo sp. displays marked seasonal cycles with ~3 month-long strongly elevated Sr/Ca peaks, reflecting contrasting plant food consumption presumably during the monsoon season, while lower Sr/Ca ratios suggest different food availability during the dry season. In contrast, omnivorous H. erectus shows low and less accentuated intra-annual Sr/Ca variability compared to Pongo sp., with δ13C data of one individual indicating a dietary shift from C4 to a mix of C3 and C4 plants. Our data suggest that H. erectus on Java was maximizing the resources available in more open mosaic habitats and was less dependent on variations in seasonal resource availability. While still influenced by seasonal food availability, we infer that H. erectus was affected to a lesser degree than Pongo sp., which inhabited monsoonal rain forests on Java. We suggest that H. erectus maintained a greater degree of nutritional independence by exploiting the regional diversity of food resources across the seasons.

https://www.nature.com/articles/s41559-022-01947-0

Nature European Journal of Human Genetics

PAPERS

MARTINA RAUDENSKA et al – Johann Gregor Mendel: the victory of statistics over human imagination

In 2022, we celebrated 200 years since the birth of Johann Gregor Mendel. Although his contributions to science went unrecognized during his lifetime, Mendel not only described the principles of monogenic inheritance but also pioneered the modern way of doing science based on precise experimental data acquisition and evaluation. Novel statistical and algorithmic approaches are now at the center of scientific work, showing that work that is considered marginal in one era can become a mainstream research approach in the next era. The onset of data-driven science caused a shift from hypothesis-testing to hypothesis-generating approaches in science. Mendel is remembered here as a promoter of this approach, and the benefits of big data and statistical approaches are discussed.

https://www.nature.com/articles/s41431-023-01303-1

Nature Molecular Psychiatry

PAPERS

KAITLYN M. PRICE et al – Identification of brain cell types underlying genetic association with word reading and correlated traits

Neuroimaging studies implicate multiple cortical regions in reading ability/disability. However, the neural cell types integral to the reading process are unknown. To contribute to this gap in knowledge, we integrated genetic results from genome-wide association studies for word reading (n = 5054) with gene expression datasets from adult/fetal human brain. Linkage disequilibrium score regression (LDSC) suggested that variants associated with word reading were enriched in genes expressed in adult excitatory neurons, specifically layer 5 and 6 FEZF2 expressing neurons and intratelencephalic (IT) neurons, which express the marker genes LINC00507, THEMIS, or RORB. Inhibitory neurons (VIP, SST, and PVALB) were also found. This finding was interesting as neurometabolite studies previously implicated excitatory-inhibitory imbalances in the etiology of reading disabilities (RD). We also tested traits that shared genetic etiology with word reading (previously determined by polygenic risk scores): attention-deficit/hyperactivity disorder (ADHD), educational attainment, and cognitive ability. For ADHD, we identified enrichment in L4 IT adult excitatory neurons. For educational attainment and cognitive ability, we confirmed previous studies identifying multiple subclasses of adult cortical excitatory and inhibitory neurons, as well as astrocytes and oligodendrocytes. For educational attainment and cognitive ability, we also identified enrichment in multiple fetal cortical excitatory and inhibitory neurons, intermediate progenitor cells, and radial glial cells. In summary, this study supports a role of excitatory and inhibitory neurons in reading and excitatory neurons in ADHD and contributes new

information on fetal cell types enriched in educational attainment and cognitive ability, thereby improving our understanding of the neurobiological basis of reading/correlated traits.
https://www.nature.com/articles/s41380-023-01970-y

Nature Scientific Reports

PAPERS

RACHANA NITIN et al – Exploring individual differences in musical rhythm and grammar skills in school-aged children with typically developing language

A growing number of studies have shown a connection between rhythmic processing and language skill. It has been proposed that domain-general rhythm abilities might help children to tap into the rhythm of speech (prosody), cueing them to prosodic markers of grammatical (syntactic) information during language acquisition, thus underlying the observed correlations between rhythm and language. Working memory processes common to task demands for musical rhythm discrimination and spoken language paradigms are another possible source of individual variance observed in musical rhythm and language abilities. To investigate the nature of the relationship between musical rhythm and expressive grammar skills, we adopted an individual differences approach in N = 132 elementary school-aged children ages 5–7, with typical language development, and investigated prosodic perception and working memory skills as possible mediators. Aligning with the literature, musical rhythm was correlated with expressive grammar performance ($r = 0.41$, $p < 0.001$). Moreover, musical rhythm predicted mastery of complex syntax items ($r = 0.26$, $p = 0.003$), suggesting a privileged role of hierarchical processing shared between musical rhythm processing and children's acquisition of complex syntactic structures. These relationships between rhythm and grammatical skills were not mediated by prosodic perception, working memory, or non-verbal IQ; instead, we uncovered a robust direct effect of musical rhythm perception on grammatical task performance. Future work should focus on possible biological endophenotypes and genetic influences underlying this relationship.
https://www.nature.com/articles/s41598-022-21902-0

LAURA STETTER et al – Handwriting kinematics during learning to write with the dominant left hand in converted left-handers

Converting left-handers to their non-dominant right hand was previously widespread, particularly for handwriting. The present study aimed to explore the extent to which adult, converted left-handers can learn writing with their dominant left hand during a 2-year training program. Eleven converted left-handers participated in the training. Handwriting kinematics were assessed at regular intervals (seven sessions) and compared to those of 11 innate left-handed controls matched for age, gender, and overall handedness score for basic (Finger, Wrist, Circle) and complex (Sentence, Copy) handwriting tasks. Regarding basic tasks in the training group, we found rapid increases in left and right-hand frequency and no significant differences between both hands at any time point, indicating successful hand transfer. After 24 months, training participants significantly surpassed controls for writing frequency in basic tasks with their left hand. For complex tasks, we identified significant increases in the training groups' left-hand writing frequency and duration between the first and last session. While training participants' left-hand writing remained significantly slower than their right-hand writing, statistics confirmed final differences between hands only for the duration of the Sentence task. Importantly, left-hand writing in the training group was characterized by lower frequency, lower automaticity, and prolonged duration after 24 months compared to innate left-handers. With training participants' left-hand writing skills significantly increasing for complex tasks and no final statistically significant differences between hands for frequency and automaticity, the program was considered effective. Nevertheless, within 2 years, training participants did not reach innate left-handers handwriting proficiency for complex tasks. Underlying reasons may be various, such as a non-optimal training program, a sensitive period for learning to write, irreversible neural changes during conversion in childhood, age-related decline of motor learning capacity, or retrograde interference between right- and left-hand writing.
https://www.nature.com/articles/s41598-023-28911-7

PLoS Biology

PAPERS

CAROLINE I. JAHN et al – Neural responses in macaque prefrontal cortex are linked to strategic exploration

This is an uncorrected proof.

Humans have been shown to strategically explore. They can identify situations in which gathering information about distant and uncertain options is beneficial for the future. Because primates rely on scarce resources when they forage, they are also thought to strategically explore, but whether they use the same strategies as humans and the neural bases of strategic exploration in monkeys are largely unknown. We designed a sequential choice task to investigate whether monkeys mobilize strategic exploration based on whether that information can improve subsequent choice, but also to ask the novel question about whether monkeys adjust their exploratory choices based on the contingency between choice and information, by sometimes providing the counterfactual feedback about the unchosen option. We show that monkeys decreased their reliance on expected value when exploration could be beneficial, but this was not mediated by changes in the effect of

uncertainty on choices. We found strategic exploratory signals in anterior and mid-cingulate cortex (ACC/MCC) and dorsolateral prefrontal cortex (dlPFC). This network was most active when a low value option was chosen, which suggests a role in counteracting expected value signals, when exploration away from value should to be considered. Such strategic exploration was abolished when the counterfactual feedback was available. Learning from counterfactual outcome was associated with the recruitment of a different circuit centered on the medial orbitofrontal cortex (OFC), where we showed that monkeys represent chosen and unchosen reward prediction errors. Overall, our study shows how ACC/MCC-dlPFC and OFC circuits together could support exploitation of available information to the fullest and drive behavior towards finding more information through exploration when it is beneficial.
https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001985

Proceedings of the Royal Society B

PAPERS

CLÉMENCE POIROTTE & MARIE J. E. CHARPENTIER – Mother-to-daughter transmission of hygienic anti-parasite behaviour in mandrills

Social animals are particularly exposed to infectious diseases. Pathogen-driven selection pressures have thus favoured the evolution of behavioural adaptations to decrease transmission risk such as the avoidance of contagious individuals. Yet, such strategies deprive individuals of valuable social interactions, generating a cost–benefit trade-off between pathogen avoidance and social opportunities. Recent studies revealed that hosts differ in these behavioural defences, but the determinants driving such inter-individual variation remain understudied. Using 6 years of behavioural and parasite data on a large natural population of mandrills (Mandrillus sphinx), we showed that, when parasite prevalence was high in the population, females avoided grooming their conspecifics' peri-anal region (PAR), where contagious gastro-intestinal parasites accumulate. Females varied, however, in their propensity to avoid this risky body region: across years, some females consistently avoided grooming it, while others did not. Interestingly, hygienic females (i.e. those avoiding the PAR) were less parasitized than non-hygienic females. Finally, age, dominance rank and grooming frequency did not influence a female's hygiene, but both mother–daughter and maternal half-sisters exhibited similar hygienic levels, whereas paternal half-sisters and non-kin dyads did not, suggesting a social transmission of this behaviour. Our study emphasizes that the social inheritance of hygiene may structure behavioural resistance to pathogens in host populations with potential consequences on the dynamics of infectious diseases.
https://royalsocietypublishing.org/doi/full/10.1098/rspb.2022.2349

PETRI RAUTIALA & ANDY GARDNER – The geometry of evolutionary conflict

Conflicts of interest abound not only in human affairs but also in the biological realm. Evolutionary conflict occurs over multiple scales of biological organization, from genetic outlawry within genomes, to sibling rivalry within nuclear families, to collective-action disputes within societies. However, achieving a general understanding of the dynamics and consequences of evolutionary conflict remains an outstanding challenge. Here, we show that a development of R. A. Fisher's classic 'geometric model' of adaptation yields novel and surprising insights into the dynamics of evolutionary conflict and resulting maladaptation, including the discoveries that: (i) conflict can drive evolving traits arbitrarily far away from all parties' optima and, indeed, if all mutations are equally likely then contested traits are more often than not driven outwith the zone of actual conflict (hyper-maladaptation); (ii) evolutionary conflicts drive persistent maladaptation of orthogonal, non-contested traits (para-maladaptation); and (iii) modular design greatly ameliorates conflict-driven maladaptation, thereby facilitating major transitions in individuality.
https://royalsocietypublishing.org/doi/full/10.1098/rspb.2022.2423

Science

NEWS

Did more than one ancient human relative use early stone tools?

Scientists find oldest Oldowan butchery tools—long seen as a hallmark of our own genus—with Paranthropus fossils.
https://www.science.org/content/article/one-ancient-human-relative-use-early-stone-tools

Disorder or difference? Autism researchers face off over field's terminology

Sometimes acrimonious debate is playing out in scientific papers, at conferences, and on social media.
https://www.science.org/content/article/disorder-or-difference-autism-researchers-face-over-field-s-terminology

PAPERS

THOMAS W. PLUMMER et mul – Expanded geographic distribution and dietary strategies of the earliest Oldowan hominins and Paranthropus

The oldest Oldowan tool sites, from around 2.6 million years ago, have previously been confined to Ethiopia's Afar Triangle. We describe sites at Nyayanga, Kenya, dated to 3.032 to 2.581 million years ago and expand this distribution by over 1300 kilometers. Furthermore, we found two hippopotamid butchery sites associated with mosaic vegetation and a C4 grazer–

dominated fauna. Tool flaking proficiency was comparable with that of younger Oldowan assemblages, but pounding activities were more common. Tool use-wear and bone damage indicate plant and animal tissue processing. Paranthropus sp. teeth, the first from southwestern Kenya, possessed carbon isotopic values indicative of a diet rich in C4 foods. We argue that the earliest Oldowan was more widespread than previously known, used to process diverse foods including megafauna, and associated with Paranthropus from its onset.
https://www.science.org/doi/10.1126/science.abo7452

Trends in Cognitive Sciences

PAPERS

ELENA SIXTUS et al – A sensorimotor perspective on numerical cognition

Numbers are present in every part of modern society and the human capacity to use numbers is unparalleled in other species. Understanding the mental and neural representations supporting this capacity is of central interest to cognitive psychology, neuroscience, and education. Embodied numerical cognition theory suggests that beyond the seemingly abstract symbols used to refer to numbers, their underlying meaning is deeply grounded in sensorimotor experiences, and that our specific understanding of numerical information is shaped by actions related to our fingers, egocentric space, and experiences with magnitudes in everyday life. We propose a sensorimotor perspective on numerical cognition in which number comprehension and numerical proficiency emerge from grounding three distinct numerical core concepts: magnitude, ordinality, and cardinality.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00016-5

Trends in Genetics

PAPERS

CHRIS PAPADOPOULOS & M. MAR ALBÀ – Newly evolved genes in the human lineage are functional

Genes restricted to a given species or lineage are mysterious. Many emerged de novo from ancestral noncoding genomic regions rather than from pre-existing genes. A new study by Vakirlis and colleagues shows that, in humans, many of these are associated with phenotypic effects, accelerating our understanding of their functional importance.
https://www.cell.com/trends/genetics/fulltext/S0168-9525(23)00025-2

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