

EAORC BULLETIN 1,045 – 25 June 2023

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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.

NEWS

NATURE BRIEFING – Hunter-gatherers’ diverse gut microbiome

A huge effort to sequence the microbiomes of hunter-gatherers, farmers and city-dwellers shows that the Western lifestyle seems to hobble the diversity of gut-bacteria populations. The microbiomes of the Hadza people — a hunter-gatherer society in northern Tanzania — have more than twice as many species as those of Californians. Foragers and farmers in Nepal seemed to occupy a middle ground in terms of gut diversity. Furthermore, the California gut-microbe species often contained genes associated with responding to oxidative damage — which might be a knock-on effect of chronic inflammation.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=c0e9dfe406&e=1db4b9a19b>

SCIENCE.ORG NEWS – 42,000-year-old Mongolian pendant may be earliest known phallic art

Carved piece of graphite was likely passed down over generations.

<https://www.science.org/content/article/42-000-year-old-mongolian-pendant-may-be-earliest-known-phallic-art>

SCIENCE.ORG NEWS – Harvard behavioral scientist faces research fraud allegations

Data sleuths say they have found evidence of possible research fraud in several papers by Francesca Gino, a behavioral scientist at Harvard Business School. The publications under scrutiny include a 2012 Proceedings of the National Academy of Sciences (PNAS) paper on dishonesty that has already been retracted for apparent data fabrication by a different researcher. “That’s right: Two different people independently faked data for two different studies in a paper about dishonesty,” write behavioral scientists Uri Simonsohn, Joseph Simmons, and Leif Nelson on their blog, Data Colada, where they published the new evidence supporting their allegations.

<https://www.science.org/content/article/harvard-behavioral-scientist-aces-research-fraud-allegations>

SCIENCE.ORG NEWS – Ancient city razed by IS group yields new artifacts from the rubble

Archaeologists uncover fragments at a 3000-year-old Assyrian temple dedicated to the first goddess in the written record

<https://www.science.org/content/article/ancient-city-razed-group-yields-new-artifacts-rubble>

THE CONVERSATION – How Mexican indigenous languages are surviving against the odds

Sociolinguists suggest that within the next century, 90% of the world’s languages will disappear, due largely to colonial languages dominating economies, education and governance.

<https://theconversationuk.cmail20.com/t/r-l-ttijttk-khhilillah-jl/>

PUBLICATIONS**Biology Letters****PAPERS****JAN M. ENGELMANN et al with JOSEP CALL & HANNES RAKOCZY – Chimpanzees prepare for alternative possible outcomes**

When facing uncertainty, humans often build mental models of alternative outcomes. Considering diverging scenarios allows agents to respond adaptively to different actual worlds by developing contingency plans (covering one’s bases). In a pre-registered experiment, we tested whether chimpanzees (*Pan troglodytes*) prepare for two mutually exclusive possibilities. Chimpanzees could access two pieces of food, but only if they successfully protected them from a human competitor. In one condition, chimpanzees could be certain about which piece of food the human experimenter would attempt to steal. In a second condition, either one of the food rewards was a potential target of the competitor. We found that chimpanzees were significantly more likely to protect both pieces of food in the second relative to the first condition, raising the possibility that chimpanzees represent and prepare effectively for different possible worlds.

<https://royalsocietypublishing.org/doi/10.1098/rsbl.2023.0179>

Cell**PAPERS****MATTHEW M. CARTER et al – Ultra-deep sequencing of Hadza hunter-gatherers recovers vanishing gut microbes**

The gut microbiome modulates immune and metabolic health. Human microbiome data are biased toward industrialized populations, limiting our understanding of non-industrialized microbiomes. Here, we performed ultra-deep metagenomic sequencing on 351 fecal samples from the Hadza hunter-gatherers of Tanzania and comparative populations in Nepal and California. We recovered 91,662 genomes of bacteria, archaea, bacteriophages, and eukaryotes, 44% of which are absent from existing unified datasets. We identified 124 gut-resident species vanishing in industrialized populations and highlighted distinct aspects of the Hadza gut microbiome related to in situ replication rates, signatures of selection, and strain sharing. Industrialized gut microbes were found to be enriched in genes associated with oxidative stress, possibly a result of microbiome adaptation to inflammatory processes. This unparalleled view of the Hadza gut microbiome provides a valuable resource, expands our understanding of microbes capable of colonizing the human gut, and clarifies the extensive perturbation induced by the industrialized lifestyle.

[https://www.cell.com/cell/fulltext/S0092-8674\(23\)00597-4](https://www.cell.com/cell/fulltext/S0092-8674(23)00597-4)

Current Biology**ARTICLES****BRIAN BUTTERWORTH – Categorising: Inside the crow’s brain**

Crows can learn to categorise line lengths into experimenter-defined categories. The crow’s brain codes and recodes line lengths in individual neurons in the nidopallium caudolaterale, part of the telencephalon.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(23\)00617-6](https://www.cell.com/current-biology/fulltext/S0960-9822(23)00617-6)

Frontiers in Artificial Intelligence

PAPERS

MARIA M. PIÑANGO – Solving the elusiveness of word meanings: two arguments for a continuous meaning space for language

I explore the hypothesis that the experience of meaning discreteness when we think about the “meaning” of a word is a “communicative” illusion. The illusion is created by processing-contextual constraints that impose disambiguation on the semantic input making salient a specific interpretation within a conceptual space that is otherwise continuous. It is this salience that we experience as discreteness. The understanding of word meaning as non-discrete raises the question of what is context; what are the mechanisms of constraint that it imposes and what is the nature of the conceptual space with which pronunciations (i.e., visual/oral signs) associate themselves. I address these questions by leveraging an algebraic continuous system for word meaning that is itself constrained by two fundamental parameters: control-asymmetry and connectedness. I evaluate this model by meeting two challenges to word meaning discreteness (1) cases where the same pronunciation is associated with multiple senses that are nonetheless interdependent, e.g., English “smoke,” and (2) cases where the same pronunciation is associated with a family of meanings, minimally distinct from each other organized as a “cline,” e.g., English “have.” These cases are not marginal—they are ubiquitous in languages across the world. Any model that captures them is accounting for the meaning system for language. At the heart of the argumentation is the demonstration of how the parameterized space naturally organizes these kinds of cases without appeal for further categorization or segmentation of any kind. From this, I conclude that discreteness in word meaning is epiphenomenal: it is the experience of salience produced by contextual constraints. And that this is possible because, by and large, every time that we become consciously aware of the conceptual structure associated with a pronunciation, i.e., its meaning, we do so under real-time processing conditions which are biased toward producing a specific interpretation in reference to a specific situation in the world. Supporting it is a parameterized space that gives rise to lexico-conceptual representations: generalized algebraic structures necessary for the identification, processing, and encoding of an individual's understanding of the world.

<https://www.frontiersin.org/articles/10.3389/frai.2023.1025293/full>

Frontiers in Ecology and Evolution

PAPERS

JEREMY DESILVA et al – Human brains have shrunk: the questions are when and why

Human brain reduction from the Late Pleistocene/Holocene to the modern day is a longstanding anthropological observation documented with numerous lines of independent evidence. In a recent study (DeSilva et al., 2021; *Front. Ecol. Evol.*), we analyzed a large compilation of fossil and recent human crania and determined that this reduction was surprisingly recent, occurring rapidly within the past 5,000 to 3,000 years of human history. We attributed such a change as a consequence of population growth and cooperative intelligence and drew parallels with similar evolutionary trends in eusocial insects, such as ants. In a reply to our study, Villmoare and Grabowski (2022; *Front. Ecol. Evol.*) reassessed our findings using portions of our dataset and were unable to detect any reduction in brain volume during this time frame. In this paper, responding to Villmoare and Grabowski's critique, we reaffirm recent human brain size reduction in the Holocene, and encourage our colleagues to continue to investigate both the timing and causes of brain size reduction in humans in the past 10,000 years.

<https://www.frontiersin.org/articles/10.3389/fevo.2023.1191274/full>

Frontiers in Psychology

PAPERS

MERAV WEISS-SIDI & HILA RIEMER – Help others—be happy? The effect of altruistic behavior on happiness across cultures

Research has established that altruistic behavior increases happiness. We examined this phenomenon across cultures, differentiating between individualistic and collectivist cultures. We propose that cultural variations in the notion of altruism lead to different effects of helping on the helper's happiness. For individualists, altruism is linked to self-interest (“impure” altruism), and helping others results in increased happiness for the helper. For collectivists, altruism is focused on the recipient (“pure” altruism), and helping others is less likely to enhance the helper's happiness. Four studies support our predictions. Study 1 measured the dispositions toward altruism among people with various cultural orientations. Consistent with our predictions, the findings showed that individualism (collectivism) was positively associated with tendencies reflecting more “impure” (“pure”) altruism. Two experimental studies then examined the moderating role of cultural orientation on the effect of spending money on oneself versus others (Study 2) or of doing a kind action (making tea for oneself versus others; Study 3). Both experimental studies demonstrated that altruistic behavior had a positive effect on happiness for individualists but not for collectivists. Finally, Study 4, which utilized data from the World Values Survey to examine the altruism–happiness link in various countries, displayed a stronger link between altruistic behavior and happiness in individualistic (vs. collectivist) cultures. Altogether, this research sheds light on cultural differences in the display of altruism, revealing different motivations for and consequences of altruistic behaviors.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1156661/full>

SØREN WICHMANN – Tone and word length across languages

The aim of this paper is to show evidence of a statistical dependency of the presence of tones on word length. Other work has made it clear that there is a strong inverse correlation between population size and word length. Here it is additionally shown that word length is coupled with tonal distinctions, languages being more likely to have such distinctions when they exhibit shorter words. It is hypothesized that the chain of causation is such that population size influences word length, which, in turn, influences the presence and number of tonal distinctions.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1128461/full>

Heliyon**PAPERS****PEI-JUNG CHENG & I-CHEN LEE – Drawing tool incorporating tangible user interface concepts enhancing children's understanding and development of color cognition**

The goal of this study was to understand the effect of using an interactive drawing stylus incorporating tangible user interface concepts on color cognition, drawing behaviors, and drawing outcomes among students in the dawn realism stage. 27 fourth-grade students were invited to participate in a three-week drawing experiment involving drawing exercises and formal drawing experiments first with a typical stylus and then with an interactive drawing stylus. Color cognition tests were administered before and after using the interactive drawing stylus. The study found that the color cognition test results before and after using the interactive drawing stylus indicated that students developed a broader range of associations between hue and tone with the mentioned objects and were better able to consider variations in color tone. Besides, students in the dawn realism stage engaged in more frequent interactions with physical objects when manipulating the interactive drawing stylus to capture object colors. These interactions resulted in more opportunities for observing and comparing the differences between the actual object color and the captured color, which enabled them to develop further insight about abstract color concepts.

[https://www.cell.com/heliyon/fulltext/S2405-8440\(23\)04690-X](https://www.cell.com/heliyon/fulltext/S2405-8440(23)04690-X)

Interface: Journal of the Royal Society**PAPERS****JONATHAN S. REEVES et al – Emergent technological variation in archaeological landscapes: a primate perspective**

Archaeological evidence informs our understanding of the evolution of hominin behaviour. Such evidence is traditionally used to reconstruct hominin activities and intentions. In the Plio-Pleistocene, the presence or absence of specific tools and variation in artefact density is often used to infer foraging strategies, cognitive traits and functional activities. However, the Plio-Pleistocene archaeological record is known to be time-averaged and forms through the aggregation of repeated behavioural events over time. Thus, archaeological patterns do not reflect discrete episodes of activity, but rather the interaction of behaviour with environmental factors over time. However, little is known about how such interactions produce archaeological variation diversity. Primate archaeology can help address this research gap by providing the opportunity to observe how behaviour produces material patterns in a natural setting. This study, thus, examines how varying the material properties of stone and resource availability influence the artefactual signature of nut-cracking in a population of long-tailed macaques from Lobi Bay, Yao Noi island, Thailand. Results show that these interactions can produce a structured and diverse material signature in terms of artefact density and frequency of specific artefact types. These findings demonstrate how material patterns can emerge from long-term interactions between behaviour and environmental factors.

<https://royalsocietypublishing.org/doi/10.1098/rsif.2023.0118>

Nature**NEWS****Have a high-pitched voice? It might be in your genes**

Survey of nearly 13,000 Icelanders pinpoints for the first time a genetic variant that shapes whether a person's voice sounds high.

<https://www.nature.com/articles/d41586-023-01901-5>

Nature Ecology & Evolution**PAPERS****CHRIS BAUMANN et al with FELIX RIEDE – Evidence for hunter-gatherer impacts on raven diet and ecology in the Gravettian of Southern Moravia**

The earlier Gravettian of Southern Moravia—the Pavlovian—is notable for the many raven bones (*Corvus corax*) documented in its faunal assemblages. On the basis of the rich zooarchaeological and settlement data from the Pavlovian, previous work suggested that common ravens were attracted by human domestic activities and subsequently captured by Pavlovian people, presumably for feathers and perhaps food. Here, we report independent $\delta^{15}\text{N}$, $\delta^{13}\text{C}$ and $\delta^{34}\text{S}$ stable isotope data obtained from 12 adult ravens from the Pavlovian key sites of Předmostí I, Pavlov I and Dolní Věstonice I to test this idea. We show

that Pavlovian ravens regularly fed on larger herbivores and especially mammoths, aligning in feeding preferences with contemporaneous Gravettian foragers. We argue that opportunistic-generalist ravens were encouraged by human settlement and carcass provisioning. Our data may thus provide surprisingly early evidence for incipient synanthropism among Palaeolithic ravens. We suggest that anthropogenic manipulation of carrion supply dynamics furnished unique contexts for the emergence of human-oriented animal behaviours, in turn promoting novel human foraging opportunities—dynamics which are therefore important for understanding early hunter-gatherer ecosystem impacts.

<https://www.nature.com/articles/s41559-023-02107-8>

Nature Human Behaviour

CORRECTIONS

ENRIQUE BAQUEDANO et mul – Author Correction: A symbolic Neanderthal accumulation of large herbivore crania

In the version of this article initially published, the first affiliation shown for Laura Rodríguez was incorrect and should have been listed as Department of Biodiversity and Environmental Management, University of León, León, Spain. The error has been corrected in the HTML and PDF versions of the article.

<https://www.nature.com/articles/s41562-023-01650-5>

Original paper: ENRIQUE BAQUEDANO et mul – A symbolic Neanderthal accumulation of large herbivore crania

EAORC Bulletin 1,024

<https://www.nature.com/articles/s41562-022-01503-7>

Nature Humanities & Social Sciences Communications

PAPERS

MASAKI IWASAKI – Social preferences and well-being: theory and evidence

Many studies have shown that individuals engage in prosocial behaviors, such as pro-environmental and charitable behaviors, on the basis of their social preferences. But the nature of social preferences has not been well studied, and it has been unclear how they relate to individual well-being. It is important to clarify this linkage so that various policies and laws can maximize social welfare. This study explores the hypothesis that social preferences are in general positively correlated with subjective well-being and that individuals who are more prosocial are happier than individuals who are more prosocial. This study first presents a theoretical model that mathematically describes the relationship between social preferences and subjective well-being. Then it uses survey data from the United States to empirically examine the relationship between the two. Regression analysis finds a statistically significant positive correlation between prosociality and total well-being, a correlation driven primarily by eudaimonic well-being and hedonic well-being, subdomains of total well-being. The effect size of prosociality on well-being is similar to the effect sizes of parenthood, income, and education, which are important determinants of well-being, thus confirming that prosociality is a crucial determinant of individual well-being.

<https://www.nature.com/articles/s41599-023-01782-z>

RUNDONG WANG & HONGWEI ZHAN – Deliberate misinterpretation from the perspective of socio-cognitive pragmatics

The present study explores the realizing mechanisms of deliberate misinterpretation, by examining the specific situations of deliberate misinterpretation in fictional conversation, from the perspective of socio-cognitive pragmatics, so as to shed light on human daily conversations. The results of analyzing dialogs in the sitcom Friends show that deliberate misinterpretation has to do with the possibility of ambiguity on the speaker's side and deliberate divergence on the hearer's side. It is also argued that in these circumstances egocentrism on the hearer's side is manifested consciously and deliberately. Unlike generally discussed, the deliberate breakdown of communication usually has a positive influence on the communication, and certain communicative goals of the speaker may thus be fulfilled.

<https://www.nature.com/articles/s41599-023-01760-5>

Nature Reviews Psychology

ARTICLES

AYANNA K. THOMAS – Studying cognition in context to identify universal principles

Much of the study of cognition has focused on identifying universal principles and has thereby marginalized approaches that consider culture and context. However, embracing context can lead to better methods for identifying universality.

<https://www.nature.com/articles/s44159-023-00209-5>

Nature Scientific Reports

PAPERS

VIOLET GIBSON et al with MARINA DAVILA-ROSS – Preverbal infants produce more protophones with artificial objects compared to natural objects

Protophones are considered to be precursors of speech. These vocalizations have been notably discussed in relation to toys and their importance for developing language skills. However, little is known about how natural objects, compared to

artificial objects, may affect protophone production, an approach that could additionally help reconstruct how language evolved. In the current study, we examined protophone production in 58 infants (4–18 months) while interacting with their caregivers when using natural objects, household items, and toys. The infants were recorded in their home environment, in a rural area in Zambia. The results showed that the infants produced significantly fewer protophones when using natural objects than when using household items or toys. Importantly, this pattern was found only for the younger preverbal infants, and there was no indication in the data that the level of caregiver responsiveness differed with regard to the object type. Furthermore, the infants of the present work selected primarily the household items when exposed to both natural objects and household items. These findings suggest that natural objects are less likely to promote protophone production and, consequently, language skill development than artificial objects in preverbal infants, who seem to favor the latter, perhaps due to their features designed for specific functional purposes. Furthermore, these findings provide empirical evidence that the use of complex tools in social interactions may have helped to promote the evolution of language among hominins.

<https://www.nature.com/articles/s41598-023-36734-9>

JENNIFER T. KUBOTA et al – Distrust as a form of inequality

Navigating social hierarchies is a ubiquitous aspect of human life. Social status shapes our thoughts, feelings, and actions toward others in various ways. However, it remains unclear how trust is conferred within hierarchies and how status-related cues are used when resources are on the line. This research fills this knowledge gap by examining how ascribed, consensus-based status appearance, and perceived status appearance impact investment decisions for high- and low-status partners during a Trust Game. In a series of pre-registered experiments, we examined the degree to which participants trusted unfamiliar others with financial investments when the only available information about that person was their socioeconomic status (SES). In Study 1, SES was ascribed. Studies 2 and 3 conveyed SES with visual antecedents (clothing). Across all three experiments, participants trusted high SES partners more than low SES partners. In addition, subjective perceptions of status based on visual cues were a stronger predictor of trust than consensus-based status judgments. This work highlights a high status-trust bias for decisions where an individual's money is on the line. In addition, high-status trust bias may occur simply because of an individual's subjective assumptions about another's rank.

<https://www.nature.com/articles/s41598-023-36948-x>

New Scientist

NEWS

Chimpanzees can prepare for alternative futures

Our closest relatives, chimpanzees, seem able to think ahead and prepare for two possible futures – the only animal apart from humans known to do so.

<https://www.newscientist.com/article/2379077-chimpanzees-can-prepare-for-alternative-futures/>

Fossils in Laos cave imply modern humans were in Asia 86,000 years ago

Human skull and shinbone fragments found in a cave in northern Laos suggest modern humans may have been in South-East Asia between 68,000 and 86,000 years ago, considerably further back than the previous estimates of around 50,000 years

<https://www.newscientist.com/article/2378160-fossils-in-laos-cave-imply-modern-humans-were-in-asia-86000-years-ago/>

ARTICLES

THOMAS LEWTON – How a radical redefinition of life could help us find aliens

Sara Imari Walker, who developed Assembly Theory with chemist Lee Cronin, explains how the theory's definition of life might help us find it on other planets.

<https://www.newscientist.com/article/mg25834440-800-how-a-radical-redefinition-of-life-could-help-us-find-aliens/>

PLoS One

PAPERS

MICHAEL S. VITEVITCH & MARY SALE – Identifying the phonological backbone in the mental lexicon

Previous studies used techniques from network science to identify individual nodes and a set of nodes that were “important” in a network of phonological word-forms from English. In the present study we used a network simplification process—known as the backbone—that removed redundant edges to extract a subnetwork of “important” words from the network of phonological word-forms. The backbone procedure removed 68.5% of the edges in the original network to extract a backbone with a giant component containing 6,211 words. We compared psycholinguistic and network measures of the words in the backbone to the words that did not survive the backbone extraction procedure. Words in the backbone occurred more frequently in the language, were shorter in length, were similar to more phonological neighbors, and were closer to other words than words that did not survive the backbone extraction procedure. Words in the backbone of the phonological network might form a “kernel lexicon”—a small but essential set of words that allows one to communicate in a wide-range of situations—and may provide guidance to clinicians and researchers on which words to focus on to facilitate

typical development, or to accelerate rehabilitation efforts. The backbone extraction method may also prove useful in other applications of network science to the speech, language, hearing and cognitive sciences.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0287197>

DEYUN YIN et al – Identify novel elements of knowledge with word embedding

As novelty is a core value in science, a reliable approach to measuring the novelty of scientific documents is critical. Previous novelty measures however had a few limitations. First, the majority of previous measures are based on recombinant novelty concept, attempting to identify a novel combination of knowledge elements, but insufficient effort has been made to identify a novel element itself (element novelty). Second, most previous measures are not validated, and it is unclear what aspect of newness is measured. Third, some of the previous measures can be computed only in certain scientific fields for technical constraints. This study thus aims to provide a validated and field-universal approach to computing element novelty. We drew on machine learning to develop a word embedding model, which allows us to extract semantic information from text data. Our validation analyses suggest that our word embedding model does convey semantic information. Based on the trained word embedding, we quantified the element novelty of a document by measuring its distance from the rest of the document universe. We then carried out a questionnaire survey to obtain self-reported novelty scores from 800 scientists. We found that our element novelty measure is significantly correlated with self-reported novelty in terms of discovering and identifying new phenomena, substances, molecules, etc. and that this correlation is observed across different scientific fields.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0284567>

JEAN-CLAUDE MARQUET et al – The earliest unambiguous Neanderthal engravings on cave walls: La Roche-Cotard, Loire Valley, France

Here we report on Neanderthal engravings on a cave wall at La Roche-Cotard (LRC) in central France, made more than 57±3 thousand years ago. Following human occupation, the cave was completely sealed by cold-period sediments, which prevented access until its discovery in the 19th century and first excavation in the early 20th century. The timing of the closure of the cave is based on 50 optically stimulated luminescence ages derived from sediment collected inside and from around the cave. The anthropogenic origin of the spatially-structured, non-figurative marks found within the cave is confirmed using taphonomic, traceological and experimental evidence. Cave closure occurred significantly before the regional arrival of *H. sapiens*, and all artefacts from within the cave are typical Mousterian lithics; in Western Europe these are uniquely attributed to *H. neanderthalensis*. We conclude that the LRC engravings are unambiguous examples of Neanderthal abstract design.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0286568>

YUKA TAKAHASHI et al – Is reading fiction associated with a higher mind-reading ability? Two conceptual replication studies in Japan

Previous studies have revealed that reading fiction is associated with dispositional empathy and theory-of-mind abilities. Earlier studies established a correlation between fiction reading habits and the two measures of social cognition: trait fantasy (i.e., the tendency to transpose oneself into fictitious characters) and performance on the Reading the Mind in the Eyes Test (RMET; a test of the ability to identify others' mental states based on their eyes). Recently, experimental studies have shown that brief exposure to fiction enhances RMET performance. Nevertheless, these studies have been conducted only in Western countries, and few published studies have investigated these relationships in Asian countries. This research aims to address this gap. Study 1, which involved 338 Japanese undergraduates, conceptually replicated the previously reported correlations between fiction reading and fantasy and RMET scores (after statistically controlling for the effect of outliers). However, Study 2, which involved 304 Japanese undergraduates, failed to replicate the causal relationship. Participants read an excerpt either from literary fiction or from nonfiction, or engaged in a calculation task, before completing the RMET. Brief exposure to literary fiction did not increase the RMET score. In sum, this study replicated the associations of fiction reading with fantasy and RMET scores in Japan, but failed to replicate the causal relationship.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0287542>

Proceedings of the Royal Society B

COMMENTARIES

ALBERTO J. C. MICHELETTI et al – Studying human culture with small datasets and evolutionary models

In our paper, we aimed to advance and assess the hypothesis that committing a son to lifelong religious celibacy is an adaptive way for parents to reduce competition between their sons and increase their own reproductive success. We formalized this hypothesis with an inclusive fitness model identifying the conditions under which this behaviour is favoured by natural selection and tested whether these conditions—that is, the assumptions of our model—are met in a Tibetan population where parents often sent a son to the monastery until recently. Some of the goals and methods of studies such as ours, which seek to understand the extent to which human cultural behaviours are adaptive using data from the field and evolutionary models, are sometimes misunderstood, leading to confusion. We take the opportunity offered by the comment by von Pein et al. to once again clarify this confusion, while confirming our results.

<https://royalsocietypublishing.org/doi/10.1098/rspb.2023.0753>

Original Paper: ALBERTO J. C. MICHELETTI et al – Religious celibacy brings inclusive fitness benefits

EAORC Bulletin 994.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2022.0965>

Royal Society Open Science

PAPERS

MARTIN WEIß et al – Can monetary incentives overturn fairness-based decisions?

Fairness norms and resulting behaviours are an important prerequisite for cooperation in human societies. At the same time, financial incentives are commonly used to motivate social behaviours, yet it remains unclear how financial incentives affect fairness-based behaviours. Combining a decision paradigm from behavioural economics with hierarchical drift-diffusion modelling, we investigated the effect of different financial incentives on two types of fairness-based decisions in four experimental groups. In two groups, participants divided points between themselves and a disadvantaged person, inciting fairness-based compensation behaviour, in two other groups they divided points between themselves and a fairness violator, inciting fairness-based punishment behaviour. In addition, each group received financial incentives that were either aligned or in conflict with the respective fairness-based behaviour. This design allowed us to directly investigate how different incentives shape the cognitive mechanism of fairness-based decisions and whether these effects are comparable across different fairness domains (fairness-based punishment versus fairness-based compensation). Results showed that offering conflicting incentives diminished fairness-congruent decision behaviour and rendered the fairness-congruent decision process less efficient. These findings demonstrate that financial incentives can undermine fairness-based behaviour, and thus are relevant for the development of incentive schemes aimed at fostering cooperative behaviour.

<https://royalsocietypublishing.org/doi/10.1098/rsos.211983>

MINQI JIANG, TIM ROCKTÄSCHEL & EDWARD GREFENSTETTE – General intelligence requires rethinking exploration

We are at the cusp of a transition from ‘learning from data’ to ‘learning what data to learn from’ as a central focus of artificial intelligence (AI) research. While the first-order learning problem is not completely solved, large models under unified architectures, such as transformers, have shifted the learning bottleneck from how to effectively train models to how to effectively acquire and use task-relevant data. This problem, which we frame as exploration, is a universal aspect of learning in open-ended domains like the real world. Although the study of exploration in AI is largely limited to the field of reinforcement learning, we argue that exploration is essential to all learning systems, including supervised learning. We propose the problem of generalized exploration to conceptually unify exploration-driven learning between supervised learning and reinforcement learning, allowing us to highlight key similarities across learning settings and open research challenges. Importantly, generalized exploration is a necessary objective for maintaining open-ended learning processes, which in continually learning to discover and solve new problems, provides a promising path to more general intelligence.

<https://royalsocietypublishing.org/doi/10.1098/rsos.230539>

Trends in Neurosciences

PAPERS

ABIGAIL S. GREENE et al – Why is everyone talking about brain state?

The rapid and coordinated propagation of neural activity across the brain provides the foundation for complex behavior and cognition. Technical advances across neuroscience subfields have advanced understanding of these dynamics, but points of convergence are often obscured by semantic differences, creating silos of subfield-specific findings. In this review we describe how a parsimonious conceptualization of brain state as the fundamental building block of whole-brain activity offers a common framework to relate findings across scales and species. We present examples of the diverse techniques commonly used to study brain states associated with physiology and higher-order cognitive processes, and discuss how integration across them will enable a more comprehensive and mechanistic characterization of the neural dynamics that are crucial to survival but are disrupted in disease.

[https://www.cell.com/trends/neurosciences/fulltext/S0166-2236\(23\)00101-7](https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(23)00101-7)

TEJJA KUJALA et al – Prerequisites of language acquisition in the newborn brain

Learning to decode and produce speech is one of the most demanding tasks faced by infants. Nevertheless, infants typically utter their first words within a year, and phrases soon follow. Here we review cognitive abilities of newborn infants that promote language acquisition, focusing primarily on studies tapping neural activity. The results of these studies indicate that infants possess core adult auditory abilities already at birth, including statistical learning and rule extraction from variable speech input. Thus, the neonatal brain is ready to categorize sounds, detect word boundaries, learn words, and separate speech streams: in short, to acquire language quickly and efficiently from everyday linguistic input.

[https://www.cell.com/trends/neurosciences/fulltext/S0166-2236\(23\)00136-4](https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(23)00136-4)

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