

EAORC BULLETIN 1,117 – 10 November 2024

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NOTICES

FORMATTED VERSION OF THIS BULLETIN

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

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.

If there is a journal you feel I should be tracking on a regular basis, let me know.

And if you have any other ideas for extending the “EAORC experience”, please contact me.

EDITORIAL INTERJECTIONS

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

ACADEMIA.EDU – The Skylore of an Indigenous People

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ROSLYN M. FRANK – The Skylore of an Indigenous People: The Case of the Performance Art and Traditional Beliefs of the Lenape Delaware (Algonquian) of the Northeastern Woodlands

During the time Frank Gouldsmith Speck (1881–1950) supervised Alfred Irving Hallowell’s (1892–1974) doctoral dissertation on “Bear Ceremonialism in the Northern Hemisphere” (published 1926), Speck was also studying and documenting the indigenous cultures of North America, especially those of the Northern and Eastern Woodlands. In the process he came across extensive evidence for bear ceremonialism among these groups, most particularly members of the Algonquian family. Undoubtedly, Hallowell’s choice of a dissertation topic was influenced by Speck’s own enthusiastic embrace of Native American culture and beliefs. At the same time, there was another powerful influence. Whilst pursuing his Ph. D at the University of Pennsylvania, Hallowell would travel to Columbia University each week to attend a seminar led by then world-renowned anthropologist Franz Boas (1858–1942) whose theories would become instrumental in Hallowell’s own formation as an anthropologist. Speck, too, had been a student of Boas but his research took a different direction from that of Hallowell.

Hallowell was able to draw on and cite the research carried out previously by Speck. In this respect, there is little doubt that Speck’s work helped to inspire Hallowell to take up the topic of bear ceremonialism. However, when one reads Hallowell’s monumental work it becomes clear that he was more influenced by the theoretical and methodological orientation of his mentor Franz Boas than that of his dissertation director. In the years that followed the publication of Hallowell’s monumental tome, Speck was busy forging his own path and developing a collaborative approach to doing research on indigenous cultures, an approach that allowed the voices of his informants to be heard. This is an approach that only now is gaining

currency where indigenous voices are allowed to enter into a fruitful dialogue with non-indigenous investigators (Żerkowski, 2020).

In the pages that follow three of Speck's publications will be front and center as we delve into the cultural underpinnings of the Munsee-Mahican of Canada and the Unami, the Lenape Delaware people of Oklahoma. These works include the extensive research Speck did documenting the ceremonial performances that took place inside the Big House and analogous structures. Especially noteworthy in this respect is his extensive study entitled "The Celestial Bear Comes Down to Earth: The Bear Ceremony of the Munsee-Mahican in Canada as Related by Nekatcit" (Speck, 1945). That volume was preceded by Speck's two ethnographic investigations of the Lenape Delaware of Oklahoma, "A Study of the Delaware Indian Big House Ceremony: In Native Text Dictated by Wi tapanóxwe" (1931) and "Oklahoma Delaware Ceremonies, Feasts and Dances" (1937). In the abstract to the latter study, Speck situates his own contributions within the larger frame of work that had been done on these Algonquian groups, emphasizing the dearth of serious studies: "Since the appearance of the works of the educated Moravian missionaries, David Zeisberger and John Heckewelder, in the latter part of the eighteenth century, the religious systems, philosophies and rituals of the Delaware Nation have been allowed to rest in oblivion [...]" (Speck, 1937: 3). https://www.academia.edu/125147730/The_Skylore_of_an_Indigenous_People_The_Case_of_the_Performance_Art_and_Traditional_Beliefs_of_the_Lenape_Delaware_Algonquian_of_the_Northeastern_Woodlands

NEWS

JOHN TEMPLETON FOUNDATION – Why We Wonder

Dr. Helen De Cruz is a philosophy professor and Danforth Chair of Humanities at Saint Louis University. Helen holds doctorate degrees in philosophy as well as archaeology and art studies. Her research attempts to understand why humans engage in philosophy, religious reflection, mathematics, science, and art. She explores these themes in her new book *Wonderstruck: How Wonder and Awe Shape the Way We Think*. Helen joins the podcast to explain why activities like art, music, and spirituality are nearly universal among humans, even though they don't seem necessary for survival.

<https://www.templeton.org/news/why-we-wonder>

JOHN TEMPLETON FOUNDATION – Wise Guise

In their everyday lives, people are constantly making judgements as to where — and with whom — wisdom might be found. Sociologists have long assumed that the nature of those judgements would vary significantly across cultures, with different groups defining and recognizing wisdom quite differently. That was the starting assumption for a group of social scientists led by Maxim Rudnev, a researcher at the University of Waterloo in Canada, when they set out to survey perceptions of wisdom among people in 12 countries across five continents, representing 13 languages and a range of ages and socioeconomic groups. What they found, though, was a surprising agreement across cultures. A person's expected wisdom, knowledge and understanding tends to be assessed along two key dimensions — one of which functions in an unexpected manner.

<https://www.templeton.org/news/wise-guise>

NATURE BRIEFING – Cylinder symbols hint to origins of writing

Symbols engraved on cylinders that were used by traders to print motifs on clay tablets might have influenced the earliest-known form of writing. Researchers examined some of these cylinders from Mesopotamia, now southern Iraq, dating back to 4400 BC, around 1,000 years before the known invention of writing. They identified several symbols they think later developed into signs in 'proto-cuneiform', the precursor to the earliest version of written script. The findings support a theory first suggested in the 1990s by archaeologist Holly Pittman, but other experts caution that although some symbols on the cylinders might resemble those in proto-cuneiform, there is no obvious causal relationship linking them.

<https://www.livescience.com/archaeology/origins-of-worlds-earliest-writing-point-to-symbols-on-seals-used-in-mesopotamian-trade>

SCIENCEADVISER – Is there a 'natural law' of evolution?

Late last month, perhaps the most interdisciplinary group of researchers I've ever seen in one room assembled on the leafy campus of Carnegie Science in DC. From memory, there were evolutionary biologists, anthropologists, philosophers, chemists, astrobiologists, mineralogists, neuroscientists, microbiologists, computer scientists, and more. And they were all there to gnaw on one question: Is there a need for a broader "law" of evolution in the universe?

The workshop was organized by two Carnegie researchers, who, last year, proposed one such stab at a law, building off work that has shown how minerals—the crystalline structures that make up rocks and much else—evolved over Earth's history, from a few dozen at the start to thousands today. Broadened into a law of "increasing functional information," the proposal suggests that any system made up of units that can be reconfigured in many ways will evolve when put under selective pressure. More and more functions will emerge that enable it to persist, be it discovering new crystalline forms, or seeding new descendants.

This is abstract stuff, and conversations at the workshop often got bogged down in definitional debates and interdisciplinary incomprehensibility. Many attending agreed the Carnegie group's proposal had merit, but were uncertain if it rose to the

level of a “law.” And whether this proposal could ever be as functionally useful as classic, Darwinian evolution in guiding hypotheses to be tested remains to be seen—in other words, its own persistence is not yet assured.

<https://www.science.org/content/article/life-evolves-so-do-minerals-how-about-everything-else>

SCIENCE DAILY – Brain stars hold our memories

A new study changes the way we understand memory. Until now, memories have been explained by the activity of brain cells called neurons that respond to learning events and control memory recall. Neurologists have now expanded this theory by showing that non-neuronal cell types in the brain called astrocytes -- star-shaped cells -- also store memories and work in concert with groups of neurons called engrams to regulate storage and retrieval of memories.

<https://www.sciencedaily.com/releases/2024/11/241106132226.htm>

SCIENCE DAILY – Toddlers understand concept of possibility

Children too young to know words like 'impossible' and 'improbable' nonetheless understand how possibility works, finds new work with two- and three-year-olds. The findings demonstrate that young children distinguish between improbable and impossible events, and learn significantly better after 'impossible' occurrences.

<https://www.sciencedaily.com/releases/2024/11/241104150527.htm>

SCIENCE DAILY – What makes human culture unique?

Why is human culture -- the shared body of knowledge passed down across generations -- so much more powerful than animal cultures?

<https://www.sciencedaily.com/releases/2024/11/241107115259.htm>

SCIENCE DAILY – New insights into the Denisovans

Scientists believe individuals of the most recently discovered 'hominin' group (the Denisovans) that interbred with modern day humans passed on some of their genes via multiple, distinct interbreeding events that helped shape early human history. Scientists outline evidence suggesting that several Denisovan populations, who likely had an extensive geographical range from Siberia to Southeast Asia and from Oceania to South America, were adapted to distinct environments. They further outline a number of genes of Denisovan origin that gave modern day humans advantages in their different environments.

<https://www.sciencedaily.com/releases/2024/11/241108113302.htm>

SCIENCE DAILY – Chimpanzees perform better on challenging computer tasks with an audience

When people have an audience watching them, it can change their performance for better or worse. Now, researchers have found that chimpanzees' performance on computer tasks is influenced by the number of people watching them. The findings suggest that this 'audience effect' predates the development of reputation-based human societies, the researchers say.

<https://www.sciencedaily.com/releases/2024/11/241108113207.htm>

SCIENCE DAILY – Memories are not only in the brain, new research finds

It's common knowledge that our brains -- and, specifically, our brain cells -- store memories. But a team of scientists has discovered that cells from other parts of the body also perform a memory function, opening new pathways for understanding how memory works and creating the potential to enhance learning and to treat memory-related afflictions.

<https://www.sciencedaily.com/releases/2024/11/241107193111.htm>

SCIENCENEWS – A digital exam reels in engraved scenes of Stone Age net fishing

The images may be the only known Upper Paleolithic representations of net-fishing practices.

<https://www.sciencenews.org/article/engraved-scenes-stone-age-net-fishing>

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

MICHAL STRUŠKA et al – Impact of relative lower-limb length on heat loss and body temperature during running

Long lower limbs relative to body size are thought to be an adaptation to prevent excessive increases in body temperature during running in hot climate. The advantage of long lower limbs relative to body size is usually explained by an increase in body surface area relative to mass; however, the influence of limb length on relative body surface area was shown to be minor. We aimed to experimentally test the effect of relative lower-limb length (LLL) on body temperature changes during running. Furthermore, we tested the effect of relative LLL on relative body surface area.

Adult men (n = 37) ran for 40 min on a treadmill, while their core temperature (ingestible thermometer), skin temperature (infrared thermography), and oxygen consumption (indirect calorimetry) were measured. Relative LLL was calculated as

residuals from linear regression of LLL on stature. Linear regression was used to test the effect of relative LLL on standardized heat loss (heat loss/heat production), mean body temperature (weighted mean of skin and core temperatures), and body surface area.

Relative LLL had a positive effect on standardized heat loss and a negative effect on mean body temperature change during running. Relative LLL had a positive effect on the proportion of body surface area allocated to the lower limbs but not on the relative body surface area.

The reduced increase in mean body temperature associated with long lower limbs suggests an advantage of relatively long lower limbs for greater endurance and speed during persistence hunting or contemporary running events.

<https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.25036>

Biology Letters

PAPERS

ELIZABETH TEMEROLI, SARAH A. JELBERT & MEGAN L. LAMBERT – Do kea parrots infer the weight of objects from their movement in a breeze?

Weight, though it cannot be seen directly, pervades nearly every aspect of an animal's life. However, the extent to which non-human animals reason about the property of weight remains poorly understood. Recent evidence highlights birds as a promising group for testing this ability: for example, New Caledonian crows can infer the weight of objects after observing their movements in a breeze. Here, we tested for similar weight inference abilities in kea (*Nestor notabilis*), a parrot species known for its sophisticated problem-solving skills. Subjects were trained to exchange objects of a target weight (light or heavy) for a food reward. They were then allowed to observe pairs of novel objects (one light and one heavy) hung in front of an electric fan in both an experimental condition (fan on, light object moving) and a control condition (fan off, both objects motionless). The birds were subsequently presented with test trials in which they could use the information from the demonstration to select an object of their target weight. We found that, unlike New Caledonian crows, kea did not perform significantly better on trials in which they observed the objects' movements and discussed our findings within the context of the kea's highly explorative nature.

<https://royalsocietypublishing.org/doi/10.1098/rsbl.2024.0405>

Current Anthropology

PAPERS

EUGÈNE MORIN et al with REBECCA BLIEGE BIRD – Why Do Humans Hunt Cooperatively? Ethnohistoric Data Reveal the Contexts, Advantages, and Evolutionary Importance of Communal Hunting

We analyze a new ethnographic and ethnohistoric database of quantitative cases ($n = 139$) and qualitative information on a neglected form of forager subsistence—communal drive hunts (CDHs)—using a human behavioral ecology perspective. Among our key findings are that (i) in specific contexts, CDHs achieve higher return rates or lower odds of failure than encounter hunting; (ii) CDHs increase the rate of success for hunting large ungulates that cluster and have long flight initiation distances and high predator escape velocities; (iii) CDHs engage the benefits and problems of collaborative, sometimes community-wide behavior at scales from the small and opportunistic to the large and institutionalized; (iv) although formerly commonplace, CDHs largely disappeared by the late nineteenth century because of colonial impacts on Indigenous societies and the adoption of repeating rifles and dogs, favoring encounter hunting; (v) cooperative hunting by great apes and indirect archaeological evidence suggest that collaborative hunting is potentially a practice of considerable antiquity and is thus important in the evolution of hominin prosocial behavior; and (vi) while human behavioral ecology has robust models for the analysis of the social distribution of subsistence resources, the development of complementary models for social production is just beginning.

<https://www.journals.uchicago.edu/doi/abs/10.1086/732354>

Current Biology

PAPERS

ISABEL LEVIN et al – A left-lateralized white matter tract associated with communication in domestic dogs

The ability to communicate with conspecifics is an adaptive behavior important for survival and reproduction, particularly in lineages that evolved enlarged brains and complex social behavior. In humans, language is supported by a robust, left-lateralized white matter fiber tract called the arcuate fasciculus, which links Broca's and Wernicke's areas, the core neocortical language regions located in the frontal and temporal lobes, respectively¹. This tract is also present in chimpanzees, less substantial than in humans and either weakly leftwardly-asymmetric or not asymmetric². Other mammalian lineages have evolved large brains, complex behavior and social communication in parallel with primates, notably including carnivores. In dogs (*Canis familiaris*), domestication has almost certainly involved additional selective pressures and environmental factors that have shaped the evolution and development of neural circuits for communication. We report that the dog brain possesses a large, left-lateralized white matter tract that links cortical centers for productive and receptive communication, and that this tract is positively associated with individual variation in receptive vocabulary size.

[https://www.cell.com/current-biology/abstract/S0960-9822\(24\)01232-6](https://www.cell.com/current-biology/abstract/S0960-9822(24)01232-6)

RACHEL CARAYON & PIERRE-PASCAL LENCK-SANTINI – Cognitive development: Sudden integration of abstract concepts in a hippocampal map

The mechanisms responsible for the late development of episodic memories are still elusive. A new study shows that the sudden improvement of memory performance during development is paralleled by the integration, by hippocampal neurons, of abstract information about the task.

[https://www.cell.com/current-biology/abstract/S0960-9822\(24\)01345-9](https://www.cell.com/current-biology/abstract/S0960-9822(24)01345-9)

MICHAEL L. SMITH et al – Form, function, and evolutionary origins of architectural symmetry in honey bee nests

Symmetry is pervasive across the tree of life, and organisms (including humans) build symmetrical structures for reproduction, locomotion, or aesthetics. Symmetry, however, does not necessarily span across levels of biological organization (e.g., symmetrical body plans often have asymmetric organs).¹⁰ If and how symmetry exists in structures built by social insect collectives, where there is no blueprint or central organizer, remains an open question.¹¹ Here, we show that honey bees actively organize nest contents symmetrically on either side of their double-sided comb; 79% ± 7% of cell contents match their backside counterpart, creating a mirror image inside the nest. Experimentally restricting colonies to opposite sides of comb, we find that independent colonies will symmetrically mimic each other's nest organization. We then examine the mechanism by which independent colonies can indirectly coordinate nest symmetry, showing that 100% of colonies (n = 6) perfectly co-localize their brood nest with a randomly positioned heat source, indicating that heat drives nest site initiation and early brood production. Nest symmetry also has adaptive benefits: two-sided nests grow more quickly, rear more brood, and have a more stable thermal environment than one-sided nests do. Finally, examining the evolutionary origins, we show that symmetry persists in three-dimensional (3D) nests of *Apis mellifera* and across multiple *Apis* species, coinciding with the onset of double-sided combs, which made it possible to symmetrically stockpile nest contents. This work shows that, similar to molecular mechanisms that create symmetry in multicellular organisms, there are behavioral processes that create functional symmetry in the collective organization of animal architecture.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(24\)01376-9](https://www.cell.com/current-biology/fulltext/S0960-9822(24)01376-9)

REVIEWS

DAMIEN FARINE – Nature's social network

Humans have seemingly always been interested in animal groups. Prehistoric cave art, for example, often depicts social animals in groups and solitary animals alone. The paintings in Lascaux, France even capture agonistic interactions between aurochs and bison as well as herding behaviours between horses and deer. Such evocative illustrations suggest close observation of animal social behaviours. That humans were already carefully observing the behaviour of animals 40,000+ years ago is perhaps unsurprising. Hunters would have been heavily dependent on understanding the behaviour of animals so that they could anticipate what an individual animal might do next — and thus return from their hunt successful.

Review of 'The Well-Connected Animal: Social Networks and the Wondrous Complexity of Animal Societies' by Lee Alan Dugatkin, University of Chicago Press, 2024.

[https://www.cell.com/current-biology/abstract/S0960-9822\(24\)01291-0](https://www.cell.com/current-biology/abstract/S0960-9822(24)01291-0)

Evolutionary Anthropology

PAPERS

FRANCIS THACKERAY – A biochronological date of 3.6 million years for “Little Foot” (StW 573, Australopithecus prometheus from Sterkfontein, South Africa)

A debate has developed with regard to geological ages of hominin fossils attributed to *Australopithecus africanus* and *Australopithecus prometheus* in South African Plio-Pleistocene cave deposits. For the Sterkfontein caves (Members 2 and 4), cosmogenic nuclide isochron (¹⁰Be/²⁶Al) dating has yielded age estimates ranging from 3.4 to 3.7 million years ago (Ma). However, biochronological approaches using nonhominin primates suggest an alternative age range between 2 and 2.6 Ma. Based on a new method of hominin biochronology, Thackeray and Dykes have recognized that Sterkfontein Member 4 has a mean age of 2.76 Ma associated with a wide range (circa 2.0–3.5 Ma). In this study, the Sterkfontein skull and skeleton (StW 573), nicknamed “Little Foot” from Member 2 and attributed to *A. prometheus*, is reassessed. A regression model applied to estimate its age provides a hypothesized date of 3.6 Ma, which compares favorably with the existing cosmogenic dates.

<https://onlinelibrary.wiley.com/doi/full/10.1002/evan.22049>

Frontiers in Psychiatry

PAPERS

CHIARA FAILLA et al – Autism, intelligence, language, and adaptive behavior, disentangling a complex relationship

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder characterized by a range of intellectual and language abilities. Its heterogeneity is acknowledged in modern diagnostics, complicating research and necessitating precision medicine and a multidimensional approach for individualized treatment and accurate assessment. Intellectual and

language functioning influence adaptive skills and symptomatology. Thus, assessing adaptive functioning in a multidimensional and multi-informant manner is crucial, highlighting the importance of comprehensive evaluations. This study explores the interplay between autistic traits, demographic variables, IQ, adaptive functioning, and the applicability of ICD-11 classifications.

We analyzed data from the initial global evaluation of 60 diverse autistic children (aged 35 to 120 months; IQ range 16 to 118). Parent-reports using the Vineland Adaptive Behavior Scale (VABS-II) were compared with standardized assessments from the PsychoEducational Profile (PEP-3). Children's intellectual levels were assessed using Griffiths Scales of Child Development (Griffiths III) and the Autism Diagnostic Observation Schedule (ADOS-2) was used for autistic traits. They were further classified according to the ICD-11 diagnostic system, functional language, and intellectual functioning levels. Correlations among variables, group comparisons, and multivariate analyses were performed.

The analysis indicates a linear effect of IQ on all adaptive scales and the impact of autistic traits on directly measured adaptive functioning. A factorial effect was observed due to changes concerning specific age, intellectual, and linguistic levels, which do not completely align with ICD-11 categorization. Additionally, a negative correlation between intelligence and measured autistic traits was found. Parental age, education level, and age at childbirth were also found to affect various adaptive scales.

The study questions the ICD-11's proposed distinctions in IQ and language functioning for ASD, advocating for more refined categorization and developmental considerations. It underscores the intricate relationship between autistic traits, IQ, and communication skills, casting doubt on the precision of diagnostic tools across the spectrum. Parental reports and direct assessments are essential for comprehensive evaluation, with parental education and age influencing children's behaviors and skills. The study calls for a nuanced approach to ASD assessment, integrating various metrics and sources of information for a detailed phenotyping necessary for personalized interventions and biological research.

<https://www.frontiersin.org/journals/psychiatry/articles/10.3389/fpsy.2024.1411783/full>

Heliyon

PAPERS

XULIU REN et al – The effects of prediction representations on implicit learning: Evidence from sentence reading and perceptual identification

Predicting errors can facilitate implicit learning, but the long-term consequences of prediction errors are not yet fully understood. Especially when predictions are disconfirmed, it remains unclear whether initially correct prediction representations persist or are suppressed. In this study, participants first engaged in a sentence reading task and then performed a perceptual identification task after completing an N-back task or after a 24-h delay. The perceptual identification task presented previously expected and unexpected words and previously predicted but not presented words to measure implicit memory for the critical items. This study aims to investigate the mechanisms underlying the persistence of prediction representations and the long-term effects of prediction errors on implicit learning. Our results indicate that prediction errors can promote implicit learning and can persist for more than 24 h. Furthermore, originally correct but not seen in reality prediction representations persist to facilitate performance on the implicit memory task after 24 h. This may reflect long-term changes in the internal representation probabilities of prediction representations.

[https://www.cell.com/heliyon/fulltext/S2405-8440\(24\)15287-5](https://www.cell.com/heliyon/fulltext/S2405-8440(24)15287-5)

iScience

PAPERS

CHRISTEN LIN, AKIHO MURAMATSU & SHINYA YAMAMOTO – Audience presence influences cognitive task performance in chimpanzees

Human cognitive performance can be significantly influenced by the presence of audience members. While often associated with reputation management, which is considered uniquely human, it is unclear to what degree this phenomenon is shared with non-human animals. To investigate such audience effects in chimpanzees, we recorded the performance of six chimpanzees on three different numerical touch screen tasks varying in difficulty and cognitive demand, in the presence of variable audience member compositions over six years. Our results indicated that chimpanzee performance was influenced by the number and types of audience present. Performance increased for the most difficult task as the experimenter count increased, while for the easiest task, performance decreased as familiar audience and experimenter count increased. This suggests that audience effects on cognitive processing can be found in chimpanzees and that the evolutionary roots of this trait may date back to before the development of reputation-based normative societies in humans.

[https://www.cell.com/iscience/fulltext/S2589-0042\(24\)02416-7](https://www.cell.com/iscience/fulltext/S2589-0042(24)02416-7)

SACHA C. ENGELHARDT, NIKLAS I. PAULSSON & MICHAEL TABORSKY – Norway rats recruit cooperation partners based on previous receipt of help while disregarding kinship

Norway rats are known to liberate trapped conspecifics, which implies an empathic response to the deplorable situation of the captive. If this is an altruistic behaviour reflecting an evolved decision rule, the requisite fitness enhancement to the actor may result either from close relatedness or the expectation of future returns. Neither potential effects of relatedness nor of reciprocal returns have yet been examined. Our two-stage experiment revealed that wild-type Norway rats preferably

collaborated with partners that had previously freed them from a trap and subsequently cooperated with each other, indicating that expected future benefits may underlie the deliverance of trapped companions. Relatedness had no effect on their cooperative propensity. These results show that rats recruit partners to coordinate cooperation by direct reciprocity but not kin discrimination, suggesting that the evolutionary mechanism responsible for the altruistic liberation behaviour of Norway rats may be reciprocal altruism rather than kin selection.

[https://www.cell.com/science/fulltext/S2589-0042\(24\)02539-2](https://www.cell.com/science/fulltext/S2589-0042(24)02539-2)

Journal of Linguistics

PAPERS

ELIZABETH RITTER & MARTINA WILTSCHKO – Pronouns beyond phi-features: the speaker–addressee relation in Japanese pronouns and its implications for formal pronouns

Greenberg's Universal 42 states that all languages have pronominal categories involving at least three persons and two numbers. However, this characterization fails to capture the properties of pronouns in Japanese, which are not bundles of person, number and gender features (so-called phi-features); rather, they contain sociolinguistic information about the interlocutors. We propose that these properties are structurally determined. Following Ritter and Wiltschko, we assume that the highest layer of structure in nominals is interactional structure. As for phi-features, we adopt the standard assumption that they are represented internal to the determiner phrase (DP). We propose that the distinctive properties of Japanese pronouns follow from the hypothesis that they spell out elements of the interactional structure and not the DP. We show that the lack of phi-features in Japanese pronouns correlates with other properties of this language's grammar. Support for this analysis comes from languages where pronouns with phi-features can optionally be used to encode formality (e.g. German and French). We propose that in these languages, formal pronouns originate within the DP but are interpreted in the interactional structure. Finally, we suggest that this analysis may extend to imposters and vocatives in that they may also be interpreted in the interactional structure.

<https://www.cambridge.org/core/journals/journal-of-linguistics/article/pronouns-beyond-phi-features-the-speakeraddressee-relation-in-japanese-pronouns-and-its-implications-for-formal-pronouns/5EFA92D436057BF7696A7B6307865131>

Mind & Language

PAPERS

JOHN COLLINS – Disunity of personal taste

The article argues that, linguistically speaking, there is no uniform class of personal taste predicate. There is an F(un)-type PPT that takes infinitive complements expressing events. In effect, these PPTs are predicates of events involving participants. There is also a T(asty)-type that cannot take an infinitive complement and does not enter into the alternation pattern of the F-type predicates. These predicates express dispositions of objects to generate experiences or responses. Some experiencer/judge is involved in the truth of the respective kinds of claims, but for different reasons, and in neither case is such a role encoded linguistically as an index for the predicate.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12528>

ALICE DAMIRJIAN – The social significance of slang

It is well-established within linguistics that slang serves a group-identifying function. In this paper, a new understanding of the notion of lexical metadata is developed to provide a philosophical treatment of said function. The proposed account explains the group-identifying function of slang in terms of certain inferences about a speaker's group affiliations that people competent with a slang word will be disposed to make given the lexical metadata related to the word in question. The resulting view is theoretically simple and may extend to a whole range of linguistic phenomena that speakers utilize to position themselves in social space.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12530>

Nature Biomedical Engineering

PAPERS

SAEHYUCK OH et al – A stealthy neural recorder for the study of behaviour in primates

By monitoring brain neural signals, neural recorders allow for the study of neurological mechanisms underlying specific behavioural and cognitive states. However, the large brain volumes of non-human primates and their extensive range of uncontrolled movements and inherent wildness make it difficult to carry out covert and long-term recording and analysis of deep-brain neural signals. Here we report the development and performance of a stealthy neural recorder for the study of naturalistic behaviours in non-human primates. The neural recorder includes a fully implantable wireless and battery-free module for the recording of local field potentials and accelerometry data in real time, a flexible 32-electrode neural probe with a resorbable insertion shuttle, and a repeater coil-based wireless-power-transfer system operating at the body scale. We used the device to record neurobehavioural data for over 1 month in a freely moving monkey and leveraged the recorded data to train an artificial intelligence model for the classification of the animals' eating behaviours.

<https://www.nature.com/articles/s41551-024-01280-w>

Nature Communications

ARTICLES

CHRISTOPHER J. BAE & XIUJIE WU – Making sense of eastern Asian Late Quaternary hominin variability

A greater degree of Late Quaternary hominin morphological variability is present in eastern Asia than previously assumed. Indeed, a number of distinct populations are present, some that now have new specific names: *Homo floresiensis*; *H. luzonensis*; *H. longi*; *H. juluensis*. With this piece, we describe the various groupings based on the current hominin fossil record of eastern Asia.

<https://www.nature.com/articles/s41467-024-53918-7>

PAPERS

G. BALL et al – Molecular signatures of cortical expansion in the human foetal brain

The third trimester of human gestation is characterised by rapid increases in brain volume and cortical surface area. Recent studies have revealed a remarkable molecular diversity across the prenatal cortex but little is known about how this diversity translates into the differential rates of cortical expansion observed during gestation. We present a digital resource, μ Brain, to facilitate knowledge translation between molecular and anatomical descriptions of the prenatal brain. Using μ Brain, we evaluate the molecular signatures of preferentially-expanded cortical regions, quantified in utero using magnetic resonance imaging. Our findings demonstrate a spatial coupling between areal differences in the timing of neurogenesis and rates of neocortical expansion during gestation. We identify genes, upregulated from mid-gestation, that are highly expressed in rapidly expanding neocortex and implicated in genetic disorders with cognitive sequelae. The μ Brain atlas provides a tool to comprehensively map early brain development across domains, model systems and resolution scales.

<https://www.nature.com/articles/s41467-024-54034-2>

Nature Ecology & Evolution

CORRECTIONS

Publisher Correction: SHI-XIA YANG et al with FRANCESCO D'ERRICO & MICHAEL PETRAGLIA – Reply to: An Initial Upper Palaeolithic attribution is not empirically supported at Shiyu, northern China

In the version of the article initially published, in the key to Fig. 2a, the filled box next to “Blank face” should have been an empty box. In addition, the arrows for “Negative scars with an impact point” and “Negative scars without an impact point” were inadvertently switched. The errors have been corrected in the HTML and PDF versions of the article.

<https://www.nature.com/articles/s41559-024-02590-7>

Nature Genetics

PAPERS

LINDA ONGARO & EMILIA HUERTA-SANCHEZ – A history of multiple Denisovan introgression events in modern humans

The identification of a new hominin group in the Altai mountains called Denisovans was one of the most exciting discoveries in human evolution in the last decade. Unlike Neanderthal remains, the Denisovan fossil record consists of only a finger bone, jawbone, teeth and skull fragments. Leveraging the surviving Denisovan segments in modern human genomes has uncovered evidence of at least three introgression events from distinct Denisovan populations into modern humans in the past. Each of them presents different levels of relatedness to the sequenced Altai Denisovan, indicating a complex relationship between these sister lineages. Here we review the evidence suggesting that several Denisovan populations, who likely had an extensive geographical range, were adapted to distinct environments and introgressed into modern humans multiple times. We further discuss how archaic variants have been affected by demographic history, negative and positive selection and close by proposing possible new lines of future research.

<https://www.nature.com/articles/s41588-024-01960-y>

Nature Human Behaviour

PAPERS

THOMAS J. H. MORGAN & MARCUS W. FELDMAN – Human culture is uniquely open-ended rather than uniquely cumulative

Theories of how humans came to be so ecologically dominant increasingly centre on the adaptive abilities of human culture and its capacity for cumulative change and high-fidelity transmission. Here we revisit this hypothesis by comparing human culture with animal cultures and cases of epigenetic inheritance and parental effects. We first conclude that cumulative change and high transmission fidelity are not unique to human culture as previously thought, and so they are unlikely to explain its adaptive qualities. We then evaluate the evidence for seven alternative explanations: the inheritance of acquired characters, the pathways of inheritance, the non-random generation of variation, the scope of heritable variation, effects on organismal fitness, effects on genetic fitness and effects on evolutionary dynamics. From these, we identify the open-ended

scope of human cultural variation as a key, but generally neglected, phenomenon. We end by articulating a hypothesis for the cognitive basis of this open-endedness.

<https://www.nature.com/articles/s41562-024-02035-y>

Nature Humanities & Social Sciences Communications

PAPERS

MIKHAIL ORDIN et al – Cultural influence on metacognition: comparison across three societies

We tested the hypothesis that metacognition—the ability to evaluate one’s own cognitive processes and mental states—is modulated by cultural values. We used retrospective confidence ratings to objectively measure metacognition in a mental rotation task in three culturally different regions: the Middle East (Saudi Arabia), Western Europe (Portugal) and the Far East (China). Our data support the theory that metacognition is social in nature, at least to some extent, and is influenced by culture. Differences in metacognition between societies can be accounted for by cultural values pertaining to individualism and uncertainty avoidance. Lower individualism and greater uncertainty avoidance tend to be associated with higher metacognitive abilities. Sex-based differences typically observed in mental rotation do not emerge at the metacognitive level, with both males and females in all three societies efficiently detecting those responses when they are more likely to make a mistake. Metacognitive bias—the tendency to be over- or underconfident in one’s own decisions—might be modulated by cultural differences in the masculinity cultural dimension. However, this bias seems to be independent of metacognitive sensitivity and detecting decisions with a heightened likelihood of an error.

<https://www.nature.com/articles/s41599-024-04013-1>

Nature NPJ Biofilms and Microbiomes

PAPERS

ZÉLIA BONTEMPS et al – Microbial diversity and secondary metabolism potential in relation to dark alterations in Paleolithic Lascaux Cave

Tourism in Paleolithic caves can cause an imbalance in cave microbiota and lead to cave wall alterations, such as dark zones. However, the mechanisms driving dark zone formation remain unclear. Using shotgun metagenomics in Lascaux Cave’s Apse and Passage across two years, we tested metabarcoding-derived functional hypotheses regarding microbial diversity and metabolic potential in dark zones vs unmarked surfaces nearby. Taxonomic and functional metagenomic profiles were consistent across years but divergent between cave locations. Aromatic compound degradation genes were prevalent inside and outside dark zones, as expected from past biocide usage. Dark zones exhibited enhanced pigment biosynthesis potential (melanin and carotenoids) and melanin was evidenced chemically, while unmarked surfaces showed genes for antimicrobials production, suggesting that antibiosis might restrict the development of pigmented microorganisms and dark zone extension. Thus, this work revealed key functional microbial traits associated with dark zone formation, which helps understand cave alteration processes under severe anthropization.

<https://www.nature.com/articles/s41522-024-00589-3>

Nature Scientific Reports

PAPERS

FABIO CREPALDI et al with MARINA DAVILA-ROSS – Orangutans and chimpanzees produce morphologically varied laugh faces in response to the age and sex of their social partners

Laugh faces of humans play a key role in everyday social interactions as a pervasive tool of communication across contexts. Humans often vary the degree of mouth opening and teeth exposure when producing these facial expressions, which may depend on who their social partner is (e.g., their gender and age as well as their social relationship), serving this way different functions. Although it was found that laugh faces show evolutionary continuity across humans and non-human great apes according to the Principle of Maximum Parsimony, little is known about the function of laugh face variations from an evolutionary perspective. Hence, the present work examined the morphology of laugh faces in orangutan and chimpanzee dyadic play to test if they are modified with dependence on the playmate’s characteristics (sex, age and social relationship). In total, we analysed over 600 facial expressions of 14 orangutans and 17 chimpanzees by coding the specific muscle activations (Action Units, i.e. AUs) contributing to these expressions, using OrangFACS and ChimFACS, respectively. Our results suggest that age difference and, to a lesser extent, playmate sex influence laugh face morphology in both taxa, but in opposite ways. While the orangutans of our study seem to expose their upper teeth (with AU10) and to pull the mouth corners (with AU12) more towards weaker partners (younger and female), possibly to communicate non-hostility, the chimpanzees showed both upper and lower teeth exposure (with AU10 and AU16) more often when interacting with the stronger partners (older individuals), possibly to communicate submissiveness. These findings suggest that the ability of humans to modify laugh faces with dependence on social partner characteristics has most likely evolved from pre-existing traits, going back at least to the last common ancestor of today’s great apes, including humans.

<https://www.nature.com/articles/s41598-024-74089-x>

DARJA GRIGOREVA & BENEC SZASZKÓ – Minority stress and psychological well-being in queer populations

Queer individuals experience unique stressors related to their minority status, negatively impacting their mental health. One factor contributing to these disparities is exposure to minority stress, which involves social stressors related to minority status. Previous research has focused on the negative impacts of minority stress, with less attention to its impact on positive psychological functioning. This study explored the relationship between minority stress and psychological well-being among 270 queer individuals in German-speaking countries. Participants completed an online survey assessing minority stress and psychological well-being. Analyses of Covariance indicated that proximal factors of minority stress—such as self-stigma, concealment, and expectations of rejection—had a particularly negative impact on psychological well-being, but no effects could be found for gender and sexual orientation. Additionally, gender identity but not sexual orientation had a significant effect on minority stress, with non-binary and other gender identities reporting higher minority stress compared to females. Thematic analysis revealed concerns about survey inclusivity, gender identity challenges, and intersectionality of minority identities. Our findings emphasize the significant impact of minority stress on the psychological well-being of queer individuals, particularly non-binary people and those with diverse gender identities, while demonstrating the need for inclusive research methodologies, tailored interventions, and policies addressing the diverse experiences within the queer community.

<https://www.nature.com/articles/s41598-024-78545-6>

WILLIAM PADILHA LEMES & FEDERICA AMICI – Contagious yawning and scratching in captive lemurs

Behavioral contagion is thought to play a significant role in social synchronization and coordination across animal taxa. While there is extensive evidence of behavioral contagion in Haplorrhines (i.e. monkeys and apes), limited research exists in Strepsirrhines (i.e. lemurs). Here, we aimed to investigate the presence of contagious yawning and scratching in two captive groups of black-and-white ruffed lemurs (*Varecia variegata*) (N = 4) and red ruffed lemurs (*Varecia rubra*) (N = 4), and further test whether behavioral contagion is modulated by the model's social integration in the group. We conducted all occurrence sampling to examine whether individuals observing a yawning or scratching event (i.e. trigger event) were more likely to yawn or scratch in the following 2 min, as compared to individuals who did not observe it. We ran generalized linear mixed models and found that the likelihood of yawning and scratching was higher for subjects observing the trigger event than for subjects who did not observe the event, although the model's social integration had no modulating effect on the probability of showing behavioral contagion. Our findings represent the first evidence of behavioral contagion in this genus and contribute to shed light on the distribution and the possible adaptive function of this phenomenon in primates.

<https://www.nature.com/articles/s41598-024-77805-9>

NOEL AMANO et al with MICHAEL PETRAGLIA – Early Sri Lankan coastal site tracks technological change and estuarine resource exploitation over the last ca. 25,000 years

The island of Sri Lanka was part of the South Asian mainland for the majority of the past 115,000 years, and connected most recently during the Last Glacial Maximum via the now submerged Palk Strait. The degree to which rising sea levels shaped past human adaptations from the Pleistocene and into the mid to late Holocene in Sri Lanka has remained unclear, in part because the earliest reliable records of human occupation come from the island's interior, where cave sites have revealed occupation of tropical forest ecosystems extending back to 48 thousand years (ka). The island's earliest known open-air sites are all much younger in date, with ages beginning at 15 ka and extending across the Holocene. Here we report the earliest well-dated open-air coastal site in Sri Lanka, Pathirajawela, which records human occupation back to ca. 25,000 years ago. We show that humans at Pathirajawela consistently adapted to changing ecosystems linked to sea level transgression and coastal evolution from the Last Glacial Maximum into the Holocene. The presence of anthropogenic shell midden deposits at the site from ca. 4.8 ka, focused almost exclusively on a single taxon, indicates intensification of estuarine resource exploitation, as humans responded to opportunities presented by the formation of new coastal ecosystems.

<https://www.nature.com/articles/s41598-024-77504-5>

LUIS SEBASTIAN CONTRERAS-HUERTA et al – A reward self-bias leads to more optimal foraging for ourselves than others

People are self-biased for rewards. We place a higher value on rewards if we receive them than if other people do. However, existing work has ignored one of the most powerful theorems from behavioural ecology of how animals seek resources in everyday life, the Marginal Value Theorem (MVT), which accounts for optimal behaviour for maximising resources intake rate. Does this self-bias help humans maximise rewards when foraging for their own benefit compared to foraging for the benefit of others? Participants had to decide when to leave patches where reward intake was gradually depleting, in environments with different average reward rates. Half of the time participants foraged for themselves, and in the other half they collected rewards for an anonymous stranger. The optimal MVT derived solution states people should leave when the instantaneous reward intake in a patch equals the average rate in an environment. Across two studies, people were more optimal when foraging for self, showing a reduced sensitivity to instantaneous rewards when foraging for other. Autistic traits were linked to reduced sensitivity to reward rates when foraging for self but not for other. These results highlight that the self-bias may be adaptive, helping people maximise reward intake.

<https://www.nature.com/articles/s41598-024-69452-x>

New Scientist

ARTICLES

MICHAEL MARSHALL – Ancient Mesopotamian clay seals offer clues to the origin of writing

Before Mesopotamian people invented writing, they used cylinder seals to press patterns into wet clay – and some of the symbols used were carried over into proto-writing.

<https://www.newscientist.com/article/2454631-ancient-mesopotamian-clay-seals-offer-clues-to-the-origin-of-writing/>

SOPHIE BERDUGO – Before the Stone Age: Were the first tools made from plants not rocks?

Our ancestors probably used a wide range of plant-based tools that have since been lost to history. Now we're finally getting a glimpse of this Botanic Age.

<https://www.newscientist.com/article/mg26435164-200-before-the-stone-age-were-the-first-tools-made-from-plants-not-rocks/>

PLoS One

PAPERS

VALÉRIE CHARRON et al – In search of prosociality in rodents: A scoping review

Studying prosociality in rodents can provide insight into brain mechanisms potentially related to neurodevelopmental disorders known to impact social behaviors (e.g., autism spectrum disorder). While many studies have been published suggesting promising models, current knowledge remains scattered, including potential factors mediating prosocial behaviors in rodents. Prosocial behavior is characterized by an action done to benefit another or promote their well-being. The goal of this scoping review is to characterize current findings regarding prosocial paradigms in rodents, highlight current gaps in reporting, and identify factors shown to be important in mediating prosocial responses in rodents. Five databases were consulted in search of relevant studies published between 2000 and 2020 (APA PsycInfo, Embase, MEDLINE, Scopus, Web of Science). An update using a semi-supervised machine learning approach (ASReview) was then conducted to collect studies from 2021–2023. In total, 80 articles were included. Findings were the following: (1) Three categories of prosocial paradigm were extracted: cooperation, helping, and sharing tasks, (2) Rodents showed the ability to perform prosocial actions in all three categories, (3) Significant gaps in reported methodologies (e.g., failure to report animals' characteristics, housing conditions, and/or experimental protocol) and mediating factors (e.g., sex, strain, housing, food restriction) were found, and (4) Behaviors are determinant when investigating prosociality in rodents, however many studies omitted to include such analyses. Together these results inform future studies on the impact of mediating factors and the importance of behavioral analyses on the expression of prosocial behaviors in rodents.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0310771>

JÉRÔME ROBITAILLE et al – Upper Palaeolithic fishing techniques: Insights from the engraved plaquettes of the Magdalenian site of Gönnersdorf, Germany

The ~15,800 year-old Magdalenian site of Gönnersdorf, in Germany, has produced 406 engraved schist plaquettes which have been extensively studied in the past. The introduction of advanced imaging technologies, notably Reflectance Transformation Imaging (RTI), has now precipitated a re-evaluation of these artifacts, uncovering nuanced depictions of fishing practices previously unrecorded for the Upper Palaeolithic. Our investigation harnesses RTI to elucidate fine engraving details on the plaquettes, revealing depictions of fish and accompanying grid motifs. The analytical process enabled by RTI has exposed an intricate link between the grid patterns and fish figures, showing that they were a deliberate combination portraying the use of fishing nets. This discovery posits a significant departure from earlier interpretations of the site's iconography, which predominantly emphasized more naturalistic representations of fauna. Furthermore, these findings illuminate aspects of Magdalenian cultural praxis, suggesting that representations of aquatic life and fishing technologies were not merely utilitarian in nature but were embedded within a broader symbolic framework. This study enhances our comprehension of Magdalenian peoples' interaction with the aqueous milieu, revealing a sophisticated symbiosis between ecological adaptation and artistic expression.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0311302>

Proceedings of the Royal Society B

PAPERS

H. S. SATHYA CHANDRA SAGAR et al – Global analysis of acoustic frequency characteristics in birds

Animal communication plays a crucial role in biology, yet the wide variability in vocalizations is not fully understood. Previous studies in birds have been limited in taxonomic and analytical breadth. Here, we analyse an extensive dataset of >140 000 recordings of vocalizations from 8450 bird species, representing nearly every avian order and family, under a structural causal model framework, to explore the influence of eco-evolutionary traits on acoustic frequency characteristics. We find that body mass, beak size, habitat associations and geography influence acoustic frequency characteristics, with varying degrees of interaction with song acquisition type. We find no evidence for the influence of vegetation density, sexual

dimorphism, range size and competition on our measures of acoustic frequency characteristics. Our results, built on decades of researchers' empirical observations collected across the globe, provide a new breadth of evidence about how eco-evolutionary processes shape bird communication.

<https://royalsocietypublishing.org/doi/10.1098/rspb.2024.1908>

J. CARTER LOFTUS et al – Sharing sleeping sites disrupts sleep but catalyses social tolerance and coordination between groups

Sleeping refuges—like other important, scarce and shareable resources—can serve as hotspots for animal interaction, shaping patterns of attraction and avoidance. Where sleeping sites are shared, individuals balance the opportunity for interaction with new social partners against their need for sleep. By expanding the network of connections within animal populations, such night-time social interactions may have important, yet largely unexplored, impacts on critical behavioural and ecological processes. Here, using GPS and tri-axial accelerometry to track the movements and sleeping patterns of wild olive baboon groups (*Papio anubis*), we show that sharing sleeping sites disrupts sleep but appears to catalyse social tolerance and coordinated movement between groups. Individual baboons experienced shorter and more fragmented sleep when groups shared a sleeping site. After sharing sleeping sites, however, otherwise independent groups showed a strong pattern of spatial attraction, moving cohesively for up to 3 days. Our findings highlight the influence of night-time social interactions on daytime social relationships and demonstrate how a population's reliance on, and need to share, limiting resources can drive the emergence of intergroup tolerance.

<https://royalsocietypublishing.org/doi/10.1098/rspb.2024.1330>

Royal Society Open Science

PAPERS

ALEXANDRA B. BOSSHARD et al with JUDITH M. BURKART & SIMON W. TOWNSEND – Beyond bigrams: call sequencing in the common marmoset (*Callithrix jacchus*) vocal system

Over the last two decades, an emerging body of research has demonstrated that non-human animals exhibit the ability to combine context-specific calls into larger sequences. These structures have frequently been compared with language's syntax, whereby linguistic units are combined to form larger structures, and leveraged to argue that syntax might not be unique to language. Currently, however, the overwhelming majority of examples of call combinations are limited to simple sequences comprising just two calls which differ dramatically from the open-ended hierarchical structuring of the syntax found in language. We revisit this issue by taking a whole-repertoire approach to investigate combinatoriality in common marmosets (*Callithrix jacchus*). We use Markov chain models to quantify the vocal sequences produced by marmosets providing evidence for structures beyond the bigram, including three-call and even combinations of up to eight or nine calls. Our analyses of these longer vocal sequences are suggestive of potential further internal organization, including some amount of recombination, nestedness and non-adjacent dependencies. We argue that data-driven, whole-repertoire analyses are fundamental to uncovering the combinatorial complexity of non-human animals and will further facilitate meaningful comparisons with language's combinatoriality.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.240218>

CAMILA BRUDER, KLAUS FRIELER & PAULINE LARROUY-MAESTRI – Appreciation of singing and speaking voices is highly idiosyncratic

Voice preferences are an integral part of interpersonal interactions and shape how people connect with each other. While a large number of studies have investigated the mechanisms behind (speaking) voice attractiveness, very little research was dedicated to other types of vocalizations. In this Registered Report, we proposed to investigate voice preferences with an integrative approach. To this end, we used a newly recorded and validated stimulus set of contrasting vocalizations by 22 highly trained female singers speaking and singing the same material (in Brazilian Portuguese) in contrasting styles (sung as a lullaby, as a pop song or as an opera aria; and spoken aloud as if directed to an adult audience and as if directed to an infant). We asked 62 participants to rate these vocalizations in terms of how much they liked them; and we compared the amount of shared taste (that is, how much participants agreed in their preferences) across styles. We found highly idiosyncratic preferences across all styles. Our predictions concerning shared taste were not confirmed: although shared taste was higher for lullaby than for pop singing, it was unexpectedly higher for operatic than pop singing, and higher for infant-directed than adult-directed speech. Conversely, our prediction of limited consistency in average preferences for some singers across styles was confirmed, contradicting sexual selection-based ideas of singing and speaking as 'backup' signals of individual fitness. Our findings draw attention to the role of individual differences in voice preferences and highlight the need for a broader approach to understanding the underlying mechanisms of voice preferences.

Stage 1 recommendation and review history: <https://rr.peercommunityin.org/articles/rec?id=357>.

Stage 2 recommendation and review history: <https://rr.peercommunityin.org/articles/rec?id=802>.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.241623>

NATALIA ZARZECZNA et al – Space as a mental toolbox in the representation of meaning

The experience of meaning has been found to be mapped onto spatial proximity whereby coherent—in contrast to incoherent—elements in a set are mentally represented as closer together in physical space. In a series of four experiments, we show that spatial representation of coherence is malleable and can employ other meaningful concrete dimensions of space that are made salient. When given task instructions cueing verticality, participants represented coherence in the upper vertical location when making judgements about the logical validity of realistic (Experiments 1 and 4) and unrealistic syllogistic scenarios (Experiment 3). When the task instruction made the spatial proximity between the stimuli materials and the participant salient (subjective proximity), participants represented coherence as spatially close to themselves (Experiment 2). We also found that being accurate in judging the validity of syllogisms was associated with representing coherence in the upper visual field or close to oneself. Overall, our findings show that identifying semantic links between an abstract concept and a given spatial dimension involves using that dimension to create spatial metaphoric mappings of the concept.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.240985>

AUDUN ROSSLUND et al – A longitudinal investigation of the acoustic properties of infant-directed speech from 6 to 18 months

Caregivers often modulate their speech when interacting with infants, adapting a register that has been suggested to have attentional, affective and didactic purposes. The present preregistered study examined the longitudinal trajectories of a diverse range of acoustic features of infant-directed speech (IDS) and compared these with adult-directed speech (ADS), in Norwegian parents of 6- to 18-month-old infants. Sixty-nine families participated. Throughout five laboratory visits across one year, parents were recorded reading a picture-book to their infant (IDS) and an experimenter (ADS). The book was designed to tightly control for the linguistic content and context of speech between participants, timepoints and registers. Analyses of a total of 54 594 vowels and 22 958 phrases revealed, first, an overall effect of register: parents used higher pitch, wider pitch range, slower articulation rate, longer vowel duration and more variable and less distinct vowels in IDS than in ADS. Second, significant register-by-age interactions indicated that parents' IDS, compared with their ADS, featured wider pitch range, larger vowel space and shorter vowel duration in older as compared with younger infants, while pitch, articulation rate and vowel variability and distinctiveness remained relatively stable with age. Results are discussed in the context of the proposed functions of IDS.

<https://royalsocietypublishing.org/doi/10.1098/rsos.240572>

GABRIELLA VIGLIOCCO et al – Ecological brain: reframing the study of human behaviour and cognition

The last decade has seen substantial advances in the capacity to record behaviour and neural activity in humans in real-world settings, to simulate real-world situations in laboratory settings and to apply sophisticated analyses to large-scale data. Along with these developments, a growing number of groups has begun to advocate for real-world neuroscience and cognitive science. Here, we review the arguments and the available methods for real-world research and outline an overarching framework that embeds key ideas proposed in the literature integrating them into a cyclic process of 'bringing the lab to the real world' (recording behavioural and neural activity in real-world settings) and 'bringing the real-world to the lab' (manipulating the environments in which behaviours occur in the laboratory) that combines exploratory and confirmatory research and is interdisciplinary (including those sciences concerned with the natural, built or virtual environment). We highlight the benefits brought by this framework emphasizing the greater potential for novel discovery, theory development and human-centred applications to the environment.

<https://royalsocietypublishing.org/doi/10.1098/rsos.240762>

EDWARD D. LEE et al – Information consumption and firm size

Social and biological collectives exchange information through internal networks to function. Less studied is the quantity and variety of information transmitted. We characterize the information flow into organizations, primarily business firms. We measure online reading using a large dataset of articles accessed by employees across millions of firms. We measure and relate quantitatively three aspects: reading volume, variety and firm size. We compare volume with size, showing that firm sizes grow sublinearly with reading volume. This is like an economy of scale in information consumption that exaggerates the classic Zipf's law inequality for firm economics. We connect variety and volume to show that reading variety is limited. Firms above a threshold size read repetitively, consistent with the onset of a coordination problem between teams of employees in a simple model. Finally, we relate reading variety to size. The relationship is consistent with large firms that accumulate interests as they grow. We argue that this reflects structural constraints. Taking the scaling relations as a baseline, we show that excess reading is strongly correlated with returns and valuations. The results indicate how information consumption reflects internal structure, beyond individual employees, as is likewise important for collective information processing in other systems.

<https://royalsocietypublishing.org/doi/10.1098/rsos.240027>

Science

ARTICLES

XUEMEI BAI – A case for altruistic cities

Intercity cooperation appears to be thriving, as evidenced by the growing number of regional and international intercity networks. However, a closer examination of these interactions reveals that their scope and depth are often limited, with information sharing, delegation visits, and mutual learning being the most common forms of engagement. Consequently, cities are frequently perceived as participating in intercity networks to “add flowers to the brocade”—a gesture of enhancement—rather than to achieve any substantial improvement in their functional capacities.

<https://www.science.org/doi/10.1126/science.adt4139>

T. CHRISTINA ZHAO – Bringing music back to our children: Greater exposure to music can benefit language learning in infants

In the pool of my childhood memories, I often recall biking through busy streets in China, rushing to get home so that I could show my mom a new way that I could make my voice sound funny. Later, when my classmates asked me how to pronounce those foreign sounds in our English class, I always said that it was easier to sing them. I was trained in music, and I play the piano, so it seemed natural to use music as a way to learn new sounds. But I wondered, was there any truth in what I recommended?

<https://www.science.org/doi/10.1126/science.ads7364>

Science Advances

PAPERS

MAXIMILIAN JERDEE & M.E.J. NEWMAN – Luck, skill, and depth of competition in games and social hierarchies

Patterns of wins and losses in pairwise contests, such as occur in sports and games, consumer research and paired comparison studies, and human and animal social hierarchies, are commonly analyzed using probabilistic models that allow one to quantify the strength of competitors or predict the outcome of future contests. Here, we generalize this approach to incorporate two additional features: an element of randomness or luck that leads to upset wins, and a “depth of competition” variable that measures the complexity of a game or hierarchy. Fitting the resulting model, we estimate depth and luck in a range of games, sports, and social situations. In general, we find that social competition tends to be “deep,” meaning it has a pronounced hierarchy with many distinct levels, but also that there is often a nonzero chance of an upset victory. Competition in sports and games, by contrast, tends to be shallow, and in most cases, there is little evidence of upset wins.

<https://www.science.org/doi/10.1126/sciadv.adn2654>

Trends in Cognitive Sciences

ARTICLES

SARA HALMANS, MILOU STRAATHOF & ELSELINE A. HOEKZEMA – Dynamic brain plasticity during the transition to motherhood

Earlier research has established strong evidence for structural brain changes across pregnancy. Pritschet et al. now enhanced our understanding of pregnancy-induced brain plasticity by following one woman throughout her pregnancy and the postpartum period, revealing insights into the dynamics of grey and white matter alterations across the transition to motherhood.

[https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613\(24\)00286-9](https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(24)00286-9)

PAPERS

HAYOUNG SONG, JEONGJUN PARK & MONICA D. ROSENBERG – Understanding cognitive processes across spatial scales of the brain

Cognition arises from neural operations at multiple spatial scales, from individual neurons to large-scale networks. Despite extensive research on coding principles and emergent cognitive processes across brain areas, investigation across scales has been limited. Here, we propose ways to test the idea that different cognitive processes emerge from distinct information coding principles at various scales, which collectively give rise to complex behavior. This approach involves comparing brain–behavior associations and the underlying neural geometry across scales, alongside an investigation of global and local scale interactions. Bridging findings across species and techniques through open science and collaborations is essential to comprehensively understand the multiscale brain and its functions.

[https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613\(24\)00252-3](https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(24)00252-3)

JOHAN LIND & ANNA JON-AND – A sequence bottleneck for animal intelligence and language?

We discuss recent findings suggesting that non-human animals lack memory for stimulus sequences, and therefore do not represent the order of stimuli faithfully. These observations have far-reaching consequences for animal cognition, neuroscience, and studies of the evolution of language and culture. This is because, if non-human animals do not remember

or process information about order faithfully, then it is unlikely that non-human animals perform mental simulations, construct mental world models, have episodic memory, or transmit culture faithfully. If this suggested sequence bottleneck proves to be a prevalent characteristic of animal memory systems, as suggested by recent work, it would require a re-examination of some influential concepts and ideas.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(24\)00269-9](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(24)00269-9)

REMINGTON MALLETT et al – New strategies for the cognitive science of dreaming

Dreams have long captivated human curiosity, but empirical research in this area has faced significant methodological challenges. Recent interdisciplinary advances have now opened up new opportunities for studying dreams. This review synthesizes these advances into three methodological frameworks and describes how they overcome historical barriers in dream research. First, with observable dreaming, neural decoding and real-time reporting offer more direct measures of dream content. Second, with dream engineering, targeted stimulation and lucidity provide routes to experimentally manipulate dream content. Third, with computational dream analysis, the generation and exploration of large dream-report databases offer powerful avenues to identify patterns in dream content. By enabling researchers to systematically observe, engineer, and analyze dreams, these innovations herald a new era in dream science.

[https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613\(24\)00264-X](https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(24)00264-X)

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