

EAORC BULLETIN 1,169 – 9 November 2025

CONTENTS

NOTICES.....	2
FORMATTED VERSION OF THIS BULLETIN	2
PUBLICATION ALERTS	2
EDITORIAL INTERJECTIONS	3
ONLINE ARCHIVES – The edge of sentence: risk and precaution in humans, other animals, and AI	3
J. BIRCH – The edge of sentence: risk and precaution in humans, other animals, and AI	3
NEWS.....	3
JOHN TEMPLETON FOUNDATION – What’s It Like To Be a Bee?	3
NEWS FROM SCIENCE – New evidence? No problem. Chimps can weigh conflicting clues, just like humans	3
SAPIENS – The Strange Power of Laughter	3
SCIENCEADVISER – Chimps can weigh conflicting evidence—just like us	3
PUBLICATIONS.....	4
Current Biology	4
PAPERS.....	4
SAMANTHA L. COX et al – Effects of ancestry, agriculture, and lactase persistence on the stature of prehistoric Europeans	4
QINGFANG LIU et al – Distinct contributions of anterior and posterior orbitofrontal cortex to outcome-guided behavior.....	4
Frontiers in Communication.....	4
PAPERS.....	4
MOJCA BRGLEZ & KRISTINA PAHOR DE MAITI TEKAV – Enhancing transparency in source domain disambiguation for metaphor analysis: a cross-lingual approach integrating lexical resources, word embeddings, and human annotation	4
Frontiers in Human Neuroscience	5
PAPERS.....	5
HANS-PETER LIPP – The cost of language: functionally over-dominant language circuits in the human brain may limit cognitive abilities and non-verbal executive functions	5
iScience.....	5
PAPERS.....	5
LUUK L. SNIJDER, JÖRG GROSS & CARSTEN K.W. DE DREU – How defense rhetoric escalates intergroup conflict	5
VALENTINA SILVESTRI et al – Newborns' attention to socio-emotional prosodic cues from voices	5
Mind & Language	5
PAPERS.....	5
RONALD J. PLANER – Gricean metacommunication	5
ALEJANDRO VESGA et al – Explaining value: The principle of sufficient reason and the realm of value in ordinary cognition	6
OLIVIER LEMEIRE, JAN HEYLEN & LEANDER VIGNERO – Generics are not existentially quantified.....	6
ALEX GRZANKOWSKI – Do emotions represent values and how can we tell?.....	6
COMMENTARIES.....	6
TIM BAYNE – Deference, development, and large language models: Issues at the edge of sentence	6
MONA-MARIE WANDREY & MARTA HALINA – Sentience and society: Towards a more values-informed approach to policy	6
JONATHAN BIRCH – Sentience and the science–policy nexus: Replies to Wandrey and Halina, and Bayne	6
Nature	7
PAPERS.....	7
TOMASZ J. NOWAKOWSKI et al – The new frontier in understanding human and mammalian brain development	7
Nature Communications	7
PAPERS.....	7
DAVID R. BRAUN et al with SUSANA CARVALHO – Early Oldowan technology thrived during Pliocene environmental change in the Turkana Basin, Kenya	7
Nature NPJ Mental Health Research	7
PAPERS.....	7
FRANCESCO PAGNINI et al – Unexpected events and prosocial behavior: the Batman effect	7
Nature Scientific Data	8
PAPERS.....	8
LAURA B. HENSEL, STEPHANIE CHENG & STACY MARSELLA – A richly annotated dataset of co-speech hand gestures across diverse speaker contexts	8

Nature Scientific Reports.....	8
PAPERS.....	8
EYAL AHARONI et al – Attributions toward artificial agents in a modified Moral Turing Test	8
ANDREA AMADEI, GIULIA LIN & SIMONE FATTORINI – A simple analytical model for Neanderthal disappearance due to genetic dilution by recurrent small-scale immigrations of modern humans.....	8
KATHRYN E. SCHERTZ et al – The frequency, form, and function of self-talk in everyday life	8
GUS COONEY & ANDREW REECE – NaturalTurn: a method to segment speech into psychologically meaningful conversational turns	9
COMMENTARIES.....	9
KALIL WARREN et al – Stylistic language drives perceived moral superiority of LLMs	9
EYAL AHARONI & EDDY NAHMIAS – Reply to: Stylistic language drives perceived moral superiority of LLMs.....	9
Neuron.....	9
PAPERS.....	9
JONAS TERLAU, JAN MARTINI & RANDOLPH F. HELFRICH – Structure in noise: Recurrent connectivity shapes neural variability to balance perceptual and cognitive demands in the human brain	9
YIZHEN ZHANG et al – Human cortical dynamics of auditory word form encoding	9
New Scientist	10
NEWS	10
Prehistoric crayons provide clues to how Neanderthals created art.....	10
What we’re learning about consciousness from master meditators’ brains	10
ARTICLES.....	10
MICHAEL MARSHALL – Denisovans may have interbred with mysterious group of ancient humans.....	10
MICHAEL MARSHALL – Does the family tree of ancient humans need a drastic rewrite?	10
FLORENCE GAUB & LIYA YU – Human minds abhor uncertainty. This is a problem for liberal democracy	10
Physics of Life Reviews.....	10
PAPERS.....	10
CHRISTOPHER J. WHYTE et al – On the Minimal Theory of Consciousness Implicit in Active Inference	10
PLoS One.....	10
PAPERS.....	10
ANNE REBOUL et al – Testing semantic compositionality in baboons (Papio papio) through relearning and generalization	10
AMY E. CLARK et al – Exploring proxies for occupation intensity in hunter-gatherer settlement systems: A combination of ethnohistoric and archaeological data	11
ALEXANDER GENEVSKY – Social credit scores reduce interpersonal cooperation and trust.....	11
Science Advances.....	11
PAPERS.....	11
TOMOYASU HORIKAWA – Mind captioning: Evolving descriptive text of mental content from human brain activity	11
Trends in Cognitive Sciences	12
ARTICLES.....	12
SHIHUI HAN – Culture and in-group favoritism in social decision-making	12
PAPERS.....	12
MARTIN GIURFA – The cognitive side of communication in social insects	12
Trends in Ecology and Evolution.....	12
PAPERS.....	12
JACOB JOHNSON, KIRSTEN SHEEHY & KATE L. LASKOWSKI – Playing dice with behavior: drivers of stochastic individuality.....	12
SUBSCRIBE to the EAORC Bulletin	12
UNSUBSCRIBE from the EAORC Bulletin	12
PRODUCED BY AND FOR THE EAORC EMAIL GROUP.....	12

NOTICES

FORMATTED VERSION OF THIS BULLETIN

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

PUBLICATION ALERTS

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

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

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

EDITORIAL INTERJECTIONS

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

ONLINE ARCHIVES – The edge of sentience: risk and precaution in humans, other animals, and AI *BOOK: Oxford University Press (2024).*

J. BIRCH – The edge of sentience: risk and precaution in humans, other animals, and AI

Can octopuses feel pain and pleasure? What about crabs, shrimps, insects, or spiders? How do we tell whether a person unresponsive after severe brain injury might be suffering? When does a fetus in the womb start to have conscious experiences? Could there even be rudimentary feelings in miniature models of the human brain, grown from human stem cells? And what about AI? These are questions about the edge of sentience, and they are subject to enormous, disorienting uncertainty. The stakes are immense, and neglecting the risks can have terrible costs. We need to err on the side of caution, yet it's often far from clear what 'erring on the side of caution' should mean in practice. When are we going too far? When are we not doing enough? The Edge of Sentience presents a comprehensive precautionary framework designed to help us reach ethically sound, evidence-based decisions despite our uncertainty.

https://scholar.google.com/scholar_lookup?hl=en&publication_year=2024&author=J.+Birch&title=The+edge+of+sentience%3A+Risk+and+precaution+in+humans%2C+other+animals%2C+and+AI

NEWS

JOHN TEMPLETON FOUNDATION – What's It Like To Be a Bee?

The beehive has classically represented an economic and social ideal where individuals work together for the good of the whole. As Saint John Chrysostom reflected, "The bee is more honored than other animals, not because she labors, but because she labors for others." But is a single bee really an individual agent, or more like a cell within a larger organism? The tension between the individual and the collective is as old as culture and as ancient as multicellularity itself. If a bee is an individual, does it think for itself? And if so, does it have its own subjective experience? How does this all relate to humans? Are we, as humans, essentially collectives, too?

<https://www.templeton.org/news/whats-it-like-to-be-a-bee>

NEWS FROM SCIENCE – New evidence? No problem. Chimps can weigh conflicting clues, just like humans

Study is first to suggest our closest relatives think about their own thoughts.

<https://www.science.org/content/article/new-evidence-no-problem-chimps-can-weigh-conflicting-clues-just-humans>

SAPIENS – The Strange Power of Laughter

An anthropologist explores laughter as a far more complex phenomenon than simple delight—reflecting on its surprising power to disturb and disrupt.

<https://www.sapiens.org/culture/uncontrollable-laughter-culture-meaning/>

SCIENCEADVISER – Chimps can weigh conflicting evidence—just like us

When a jury weighs witness testimony in a trial—or when we decide what to wear based on a look out the window—we make use of a complex ability once thought to be uniquely human: judging the merits of different pieces of evidence. But it turns out that our closest living relatives, chimpanzees, can weigh the evidence they encounter to make rational decisions, too.

To test whether chimps—and by extension, any non-human animals—are conscious of their own thinking, researchers visited the Ngamba Island Chimpanzee Sanctuary in Uganda, where they ran experiments on chimps who chose to engage with them. When presented with various boxes that may or may not have held food, the chimps consistently chose the box that had the strongest evidence of holding a piece of food. A glass-paneled box that revealed any food inside was taken as the strongest evidence; a rattling box with an unseen object inside, by contrast, was treated more hesitantly. Crucially, when presented with different kinds of boxes in different orders, the chimps updated their selections when they saw a box that displayed better evidence of containing food: a hallmark of rational thinking, and the first result of its kind.

The results strengthen the case that these great apes think about their own thoughts; they appear to have awareness of what they do and don't know. "It's super exciting to recognize that we're sharing the planet with other intensely intelligent beings," said Kristin Andrews, a philosopher who studies animal cognition but who was not involved with the new research.

<https://www.science.org/doi/10.1126/science.adq5229>

PUBLICATIONS

Current Biology

PAPERS

SAMANTHA L. COX et al – Effects of ancestry, agriculture, and lactase persistence on the stature of prehistoric Europeans

Ancient DNA has revolutionized our understanding of human evolutionary history, but studies focusing solely on genetic variation tell an incomplete story by neglecting phenotypic outcomes. The relationships between genotype and phenotype can change over time, making it desirable to study them directly in ancient populations rather than in present-day data. Here, we present a large-scale integration of ancient genomic and phenotypic data, analyzing femur length as a proxy for stature in 659 individuals with published whole-genome ancient DNA data across western Eurasia. Polygenic scores derived from modern European and East Asian genome-wide association studies retain predictive power in ancient populations, explaining up to 10% of phenotypic variance. Contrary to long-standing archaeological hypotheses, we find that Neolithic populations were only modestly shorter than preceding Mesolithic groups, with differences at least partly attributable to genetic rather than environmental factors, challenging narratives of systematic stature decline following the transition to agriculture. Finally, we find that the lactase persistence allele had a large positive effect on stature in ancient individuals (0.20 standard deviations), even though it shows no association with height in present-day populations. This gene-environment interaction highlights the limitation of using present-day genetic data to infer past phenotypic relationships. Our results underscore the value of integrating genetic and morphological data from ancient populations to reconstruct the dynamics of human adaptation.

[https://www.cell.com/current-biology/abstract/S0960-9822\(25\)01401-0](https://www.cell.com/current-biology/abstract/S0960-9822(25)01401-0)

QINGFANG LIU et al – Distinct contributions of anterior and posterior orbitofrontal cortex to outcome-guided behavior

The lateral orbitofrontal cortex (OFC) is critical for flexibly adjusting choices when outcome values change. The anterior and posterior parts of the human lateral OFC differ in cytoarchitecture and connectivity, but whether these subregions make differential contributions to outcome-guided (i.e., goal-directed) behavior remains unclear. Outcome-guided behavior requires (1) representations of stimulus-outcome associations and (2) inferring the current value of options when making decisions. Here, we test whether these two functions are differentially supported by the posterior (pOFC) and anterior (aOFC) parts of the lateral OFC, using transcranial magnetic stimulation (TMS) to selectively disrupt activity in functional networks centered on the pOFC and aOFC during a 2-day outcome devaluation task. Participants (n = 48) received pOFC or aOFC network-targeted TMS either on day 1 before learning associations between visual stimuli and sweet or savory food odors or on day 2 before a meal that selectively devalued one of these outcomes, followed by a choice test. TMS targeting the pOFC, but not the aOFC, before the meal on day 2 disrupted outcome-guided behavior, as measured by choices of stimuli predicting non-sated rewards in the post-meal choice test. In contrast, TMS targeting aOFC, but not pOFC, before learning on day 1 similarly impaired behavior in the post-meal choice test on day 2. These findings demonstrate that anterior and posterior parts of the lateral OFC make distinct contributions to outcome-guided behavior by supporting learning of stimulus-outcome associations and inferring the current value of options, respectively.

[https://www.cell.com/current-biology/abstract/S0960-9822\(25\)01315-6](https://www.cell.com/current-biology/abstract/S0960-9822(25)01315-6)

Frontiers in Communication

PAPERS

MOJCA BRGLEZ & KRISTINA PAHOR DE MAITI TEKAV – Enhancing transparency in source domain disambiguation for metaphor analysis: a cross-lingual approach integrating lexical resources, word embeddings, and human annotation

Contemporary cognitive-linguistic research often seeks to consolidate metaphorical expressions into systematic mappings between source and target domains. However, the formulation of such mappings in natural language remains insufficiently systematized, frequently relying on intuition or on lexical resources that are not available for all languages. In this study, we propose a systematic, semi-automatic approach to source domain identification that enhances transparency, objectivity, and replicability in metaphor analysis while reducing annotator reliance on intuition. We build on an established semantic ontology, bilingual lexical resources, and distributional semantic representations to assign semantic domains to words, which serve as proxies for conceptual source domains. We manually validate the data and quantitatively evaluate the method via automatic metrics. Furthermore, we perform a qualitative evaluation of annotation disagreements and a detailed error analysis. Results indicate that the approach provides a promising foundation for semantic tagging and metaphor analysis in Slovene. The qualitative analysis of disagreements demonstrates how individual linguistic variation and cognitive biases influence domain attribution, and often prevent reaching a complete consensus between annotators. The error analysis further identifies specific limitations of the proposed approach, which arise from gaps in lexical resources and from the inherent properties of distributional semantic modeling. Overall, the findings underscore both the methodological challenges of automatic domain attribution and the cognitive complexity of source domain mapping in metaphor analysis.

<https://www.frontiersin.org/journals/communication/articles/10.3389/fcomm.2025.1696818/full>

Frontiers in Human Neuroscience

PAPERS

HANS-PETER LIPP – The cost of language: functionally over-dominant language circuits in the human brain may limit cognitive abilities and non-verbal executive functions

Evolutionarily, the most recent connective system in the human brain is the language circuitry. However, its presence may impose restrictions on higher executive functions apparent as non-verbal talents in art, science, and management—essentially a conflict between talking and doing. Since the associative cortex underlies thinking, the question then is how much of it is assigned to language functions, and how much is left for associative networks that support non-verbal functions such as planning and parallel processing. Arguments: (i) The determinant of neocortical network organization is the motor cortex, which acts as the main attractor for all processes in the hemispheres yet is split in two sub-attractors formed by disproportionately enlarged zones of origins for two bundles, the corticospinal tract co-driving movements of arms and hands, and the corticobulbar tract to the motor nuclei of the cranial nerves innervating the vocal tract, tongue and face. (ii) This arrangement must entail different functional properties of the associated networks. The language network faces executive limits because the linear generation of words becomes dominated by cerebellar feedback from lingual processing (“one word generates the next”), while the non-verbal networks have more freedom in generating mental goals and movements. (iii) Functional imbalance between these neocortical networks results from altered connections caused by neuronal competition during brain development, either by epigenetic events or by selectable genetic factors. (iv) The descent of the larynx in humans during the paleolithic period and the following self-domestication and neoteny during the last 30,000 years have favored the expansion of the cerebral language network. Voices gained prosody and melody, thereby transmitting fine-grained levels of emotions between individuals, facilitating the evolution of collective cooperation in agricultural economies. On the other hand, with the advent of densely populated kingdom states, emotional voicing also enabled mass control of people for warfare and social stratification of societies. This new environment entailed genetic adaptation of a large population segment resulting in moderately lowered cognition, firstly by expansion of the language network permitting emotional association of simple memes and words, possibly supported by additional mechanisms conserving a child-like stage of brain development responsible for word-linked beliefs.

<https://www.frontiersin.org/journals/human-neuroscience/articles/10.3389/fnhum.2025.1654703/full>

iScience

PAPERS

LUUK L. SNIJDER, JÖRG GROSS & CARSTEN K.W. DE DREU – How defense rhetoric escalates intergroup conflict

The first victim of conflict is often the truth. Using 261 manifestos from real-world conflicts, we show that leaders frequently misrepresent strategic intentions in their calls to arms and that such misrepresentation is asymmetric. Leaders of attacking parties hide their primary objective for exploitation behind claims of self-defense. Experiments show that self-defense rhetoric, true and false, is readily believed by naive participants ($n = 252$ and 312 ; pre-registered) and large language models (2,162 resamples), and boosts support for leaders' stated cause. Leaders in intergroup contests frequently invoke the need for self-defense even when outgroups pose no actual threat. This leads followers to increase their costly contributions to fight non-threatening outgroups, making their (deceptive) leaders prevail in increasingly intense and wasteful intergroup conflicts. Our findings elucidate when leaders resort to false signaling, why they do so, and how it can escalate conflicts that benefit warring leaders at significant cost to society.

[https://www.cell.com/iscience/fulltext/S2589-0042\(25\)02010-3](https://www.cell.com/iscience/fulltext/S2589-0042(25)02010-3)

VALENTINA SILVESTRI et al – Newborns' attention to socio-emotional prosodic cues from voices

Voices are among the most salient stimuli for social interactions. From birth, we can process both linguistic and socio-emotional aspects of voices, but it is not clear how these cues contribute to voice processing. Using non-nutritive sucking, we examined newborns' attention to a nursery rhyme narrated by an actress, hummed by the same actress, and narrated by a synthesizer, thereby manipulating the weight of linguistic and socio-emotional cues. The role of prenatal auditory experiences in newborns' response and the relation between sucking variables as well as the cognitive underlying mechanisms were also explored. Results showed an inhibition of sucking behavior in the absence of socio-emotional prosodic cues and a relationship between sucking behavior and the prenatal exposure to maternal speech and music. Moreover, sucking variables clustered into two dimensions of effort and temporal regulation. Overall, these results underscore the role of socio-emotional prosodic cues in early voice processing and its relation with prenatal auditory experience.

[https://www.cell.com/iscience/fulltext/S2589-0042\(25\)02200-X](https://www.cell.com/iscience/fulltext/S2589-0042(25)02200-X)

Mind & Language

PAPERS

RONALD J. PLANER – Gricean metacommunication

Three main approaches exist for finessing the cognitive demands of Grice's model of communication (a notorious problem): namely, deflationism, modularity, and interpretivism. Here, I consider each in light of human metacommunication, a phenomenon that has been neglected in foundational discussions of Gricean communication. This neglect is surprising, as

metacommunication is central to human communication and is also something quite young children appear to engage in. I argue that metacommunication bears upon the plausibility of these three approaches very differently. More specifically, both deflationism and an intuitive version of the modularity approach are significantly challenged. Interpretivism, in contrast, is left unaffected.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.70008>

ALEJANDRO VESGA et al – Explaining value: The principle of sufficient reason and the realm of value in ordinary cognition

Folk explanatory judgements seem to conform to the principle of sufficient reason (PSR), according to which if x is a fact, x must have an explanation. That is, children and adults judge that facts across a wide variety of descriptive domains must have an explanation. We test whether PSR-conforming judgements extend to the realm of value. Across four studies, we find that adults are less willing to judge that claims about moral and aesthetic value must have an explanation, compared to descriptive claims. Moreover, explanatory judgements about moral and aesthetic claims diverge from judgements about claims concerning affective responses.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.70006>

OLIVIER LEMEIRE, JAN HEYLEN & LEANDER VIGNERO – Generics are not existentially quantified

According to the standard view, generics such as “ravens are black” express quite strong generalizations, even if they do allow for some exceptions. Nickel, however, defends a semantic theory for generics that radically departs from this standard view, claiming that they express existentially quantified generalizations. We argue against this existential view and in favor of a more standard view according to which generics express universally quantified normality generalizations. We consider five phenomena involving generic sentences and argue that our universal view explains each of these phenomena better than or at least equally well as Nickel's existential view.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12564>

ALEX GRZANKOWSKI – Do emotions represent values and how can we tell?

Do emotions represent values? The dominant “content view” has it that they do. But there is a newcomer on scene: the “attitude view”. According to it, rather than representing value properties, there is a value-relevant way you represent the targets of emotion. For example, in feeling angry with someone, you stand to them in the relation of representing-as-having-wronged you. But the central considerations in favour of these competing views are left wanting and it is hard to see how to choose amongst these alternatives. I argue that there is an empirical path to a decision.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12544>

COMMENTARIES

TIM BAYNE – Deference, development, and large language models: Issues at the edge of sentience

[See Online Archives above.]

This article is a commentary on Jonathan Birch's *The edge of sentience*. It considers the role of deference to consciousness experts in the citizens' assemblies that he calls for; evaluates his claim that the human fetus is a sentience candidate from 12 weeks' gestation; and explores some of the issues raised by his approach to sentience in large language models and other AI systems.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12537>

MONA-MARIE WANDREY & MARTA HALINA – Sentience and society: Towards a more values-informed approach to policy

In *The edge of sentience*, Jonathan Birch proposes a democratically inclusive framework for protecting potentially sentient beings. While experts assess and communicate evidence of sentience, the public deliberates on proportionate policy responses to avoid causing gratuitous suffering. While we think there are many virtues to Birch's analysis and approach, in this commentary, we raise the concern that the proposed framework fails to sufficiently account for the presence of non-epistemic values in science. We discuss strategies from the values in science literature for evaluating and managing these values in a democratic and inclusive way.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12541>

JONATHAN BIRCH – Sentience and the science-policy nexus: Replies to Wandrey and Halina, and Bayne

The edge of sentience is a book about what we should do when a decision problem forces us to draw a pragmatic line between the sentient and the non-sentient. The commentaries from Wandrey and Halina and from Bayne analyse both my precautionary framework and my claims about specific cases. My responses start with the case of large language models (LLMs), zoom out to general issues about the science-policy relationship, then zoom in again on the case of fetuses.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12552>

Nature**PAPERS****TOMASZ J. NOWAKOWSKI et al – The new frontier in understanding human and mammalian brain development**

Neurodevelopmental disorders that cause cognitive, behavioural or motor impairments affect around 15% of children and adolescents worldwide, with diagnoses of profound autism and attention deficit hyperactivity disorder increasing in the USA and contributing to a major economic burden. Yet the origins and mechanisms of these conditions remain poorly understood, limiting progress in therapies. Comprehensive cell atlases of the developing human brain, alongside those of model organisms such as mice and non-human primates, are now providing high-resolution measures of gene expression, cell-type abundance and spatial distribution. In this Perspective, we highlight recent studies that have identified novel developmental cell populations, revealed conserved and divergent patterns of cell genesis, migration and maturation across species, and begun testing hypotheses that link them to processes ranging from transcriptional control of cell fate specification to the emergence of complex behaviours. We present remaining conceptual and technical challenges and provide an outlook on how further studies of human and mammalian brain development can empower a deeper understanding of neurodevelopmental and neuropsychiatric disorders. Future efforts expanding to additional developmental stages, including adolescence, as well as whole-brain, multimodal and cross-species integration, will yield new insights into how development shapes the brain. These atlases promise to serve as essential references for unravelling mechanisms of brain function and disease vulnerability, and for advancing precision medicine.

<https://www.nature.com/articles/s41586-025-09652-1>

Nature Communications**PAPERS****DAVID R. BRAUN et al with SUSANA CARVALHO – Early Oldowan technology thrived during Pliocene environmental change in the Turkana Basin, Kenya**

Approximately 2.75 million years ago, the Turkana Basin in Kenya experienced environmental changes, including increased aridity and environmental variability. Namotutukunan is a newly discovered archaeological site which provides a window into hominin behavioral adaptations. This site lies within the upper Tulu Bor and lower Burgi members of the Koobi Fora Formation (Marsabit District, Kenya), presently a poorly understood time interval due to large-scale erosional events. Moreover, this locale represents the earliest known evidence of Oldowan technology within the Koobi Fora Formation. Oldowan sites, older than 2.6 million years ago, are rare, and these typically represent insights from narrow windows of time. In contrast, Namotutukunan provides evidence of tool-making behaviors spanning hundreds of thousands of years, offering a unique temporal perspective on technological stability. The site comprises three distinct archaeological horizons spanning approximately 300,000 years (2.75 – 2.44 Ma). Our findings suggest continuity in tool-making practices over time, with evidence of systematic selection of rock types. Geological descriptions and chronological data, provide robust age control and contextualize the archaeological finds. We employ multiple paleoenvironmental proxies, to reconstruct past ecological conditions. Our study highlights the interplay between environmental shifts and technological innovations, shedding light on pivotal factors in the trajectory of human evolution.

<https://www.nature.com/articles/s41467-025-64244-x>

Nature NPJ Mental Health Research**PAPERS****FRANCESCO PAGNINI et al – Unexpected events and prosocial behavior: the Batman effect**

Prosocial behavior, the act of helping others, is essential to social life, yet spontaneous environmental triggers for such behavior remain underexplored. This study tested whether an unexpected event, such as the presence of a person dressed as Batman, could increase prosocial behavior by disrupting routine and enhancing attention to the present moment. We conducted a quasi-experimental field study on the Milan metro, observing 138 rides. In the control condition, a female experimenter, appearing pregnant, boarded the train with an observer. In the experimental condition, an additional experimenter dressed as Batman entered from another door. Passengers were significantly more likely to offer their seat when Batman was present (67.21% vs. 37.66%, OR = 3.393, $p < 0.001$). Notably, 44% of those who offered their seat in the experimental condition reported not seeing Batman. These findings suggest that unexpected events can promote prosociality, even without conscious awareness, with implications for encouraging kindness in public settings. Trial registration: ClinicalTrials.gov n° NCT06481748; registered on July 1, 2024.

<https://www.nature.com/articles/s44184-025-00171-5>

Nature Scientific Data**PAPERS****LAURA B. HENSEL, STEPHANIE CHENG & STACY MARSELLA – A richly annotated dataset of co-speech hand gestures across diverse speaker contexts**

Hand gestures form an integral part of human communication and their complexity makes their study and generation difficult. Here, we present a dataset comprising 2373 annotated gestures, designed to facilitate in-depth analysis of human communication. We captured these gestures from nine speakers across three distinct categories: University lecturers, Politicians, and Psychotherapists. The annotations encompass various aspects, including gesture types (e.g., metaphoric, iconic), descriptive terms characterizing each gesture (e.g., 'sweep', 'container'), and their corresponding verbal utterances. The dataset also includes detailed physical properties such as hand height, distance to the body, arm angle, hand configuration, palm orientation, repetitions, size, and speed, alongside 3D pose tracking data. Where possible, video recordings provide additional multimodal context. Notably, we identified several previously undocumented lexemes, expanding the current lexicon of gesture research. This dataset offers a valuable resource for studying human communication, training models for gesture recognition and generation, and designing socially intelligent virtual agents.

<https://www.nature.com/articles/s41597-025-06020-6>

Nature Scientific Reports**PAPERS****EYAL AHARONI et al – Attributions toward artificial agents in a modified Moral Turing Test**

Advances in artificial intelligence (AI) raise important questions about whether people view moral evaluations by AI systems similarly to human-generated moral evaluations. We conducted a modified Moral Turing Test (m-MTT), inspired by Allen et al. (Exp Theor Artif Intell 352:24–28, 2004) proposal, by asking people to distinguish real human moral evaluations from those made by a popular advanced AI language model: GPT-4. A representative sample of 299 U.S. adults first rated the quality of moral evaluations when blinded to their source. Remarkably, they rated the AI's moral reasoning as superior in quality to humans' along almost all dimensions, including virtuousness, intelligence, and trustworthiness, consistent with passing what Allen and colleagues call the comparative MTT. Next, when tasked with identifying the source of each evaluation (human or computer), people performed significantly above chance levels. Although the AI did not pass this test, this was not because of its inferior moral reasoning but, potentially, its perceived superiority, among other possible explanations. The emergence of language models capable of producing moral responses perceived as superior in quality to humans' raises concerns that people may uncritically accept potentially harmful moral guidance from AI. This possibility highlights the need for safeguards around generative language models in matters of morality.

<https://www.nature.com/articles/s41598-024-58087-7>

ANDREA AMADEI, GIULIA LIN & SIMONE FATTORINI – A simple analytical model for Neanderthal disappearance due to genetic dilution by recurrent small-scale immigrations of modern humans

The disappearance of Neanderthals remains a subject of intense debate, with competing hypotheses attributing their demise to demographic decline, environmental change, competition with *Homo sapiens*, or genetic assimilation. Here, we present a mathematical model demonstrating that small-scale *Homo sapiens* immigrations into Neanderthal populations, providing recurrent gene mixing, could have led to almost complete genetic substitution over 10,000–30,000 years. Our model, grounded in neutral species drift, does not require selective advantage or catastrophic events but shows that sustained gene flow from a demographically larger species could account for Neanderthals' genetic absorption into modern humans within a time-frame consistent with archaeological evidence. This scenario aligns with growing evidence of interbreeding and genetic introgression through recurrent *H. sapiens* immigration waves, providing a parsimonious explanation for the observed patterns of Neanderthal ancestry in present-day Eurasian populations. Although other factors may have contributed to the decline of Neanderthals, our results highlight genetic admixture as a possible key mechanism driving their disappearance.

<https://www.nature.com/articles/s41598-025-22376-6>

KATHRYN E. SCHERTZ et al – The frequency, form, and function of self-talk in everyday life

Talking to oneself is a common phenomenon; yet research on spontaneous self-talk overlooks nuances in the self-perspective people adopt when engaging in this process. Laboratory research suggests that distanced (vs. immersed) self-talk has regulatory benefits, but we know little about how often and to what effect people use distanced (or immersed) self-talk in daily life, and whether this varies based on individual differences. We conducted a two-week ecological momentary assessment study (12,966 surveys from 208 participants) to examine distanced and immersed self-talk use in response to four situation types: feeling critical of oneself, needing to prepare for what to say or do, wanting to feel better, or feeling pleased with oneself. Distanced self-talk was less common than immersed self-talk across all situation types, and neither were associated with trait-level emotional distress or narcissism. Distanced (vs. immersed) self-talk was associated with improved momentary affect when implemented in the context of needing to prepare what to say or do, but results did not indicate similar functionality in other situations. These findings shed light on how people intuitively adopt different

perspectives in self-talk to navigate their daily lives and suggest that distanced self-talk may have emotion regulation benefits for preparatory situations.

<https://www.nature.com/articles/s41598-025-22647-2>

GUS COONEY & ANDREW REECE – NaturalTurn: a method to segment speech into psychologically meaningful conversational turns

Conversation is a subject of increasing interest in the social, cognitive, and computational sciences. Yet as conversational datasets continue to increase in size and complexity, researchers lack scalable methods to segment speech-to-text transcripts into conversational “turns”—the basic building blocks of social interaction. We discuss this challenge and then introduce “NaturalTurn,” a turn-segmentation algorithm designed to accurately capture the dynamics of conversational exchange. NaturalTurn operates by distinguishing speakers’ primary conversational turns from listeners’ secondary utterances, such as backchannels, brief interjections, and other forms of parallel speech that characterize human conversation. Using data from a large conversation corpus, we show that NaturalTurn captures conversational turns more accurately than a baseline model. For example, it produces turns with durations and gaps that match empirical literature, reveals stronger linguistic alignment patterns between speakers, and uncovers otherwise hidden relationships between turn-taking and affective outcomes. NaturalTurn thus represents a pragmatic development in machine-generated transcript-processing methods, or “turn models”, that will enable researchers to link turn-taking dynamics with important outcomes of social interaction, a central goal of conversation science.

<https://www.nature.com/articles/s41598-025-24381-1>

COMMENTARIES

KALIL WARREN et al – Stylistic language drives perceived moral superiority of LLMs

[See above.]

In this paper, we are responding to a recent article published in Scientific Reports by Aharoni et al. titled, “Attributions toward artificial agents in a modified Moral Turing Test.” Aharoni et al. tested how humans evaluate the quality of moral reasoning in human-generated and LLM-generated responses to moral questions. The human responses were sourced from university undergraduates, while the LLM responses were generated using OpenAI’s ChatGPT-4. The prompts used to elicit the responses asked whether and why certain actions were morally wrong or acceptable. Ten pairs of human-generated responses and LLM-generated responses were then used as stimuli in a modified Moral Turing Test (m-MTT) in which different human participants rated the quality of these responses. Participants rated the LLM-generated stimuli as showing higher quality of moral virtuousness, trustworthiness, and intelligence. However, the participants were able to distinguish between the human-generated and the LLM-generated responses.

<https://www.nature.com/articles/s41598-025-25046-9>

EYAL AHARONI & EDDY NAHMIAS – Reply to: Stylistic language drives perceived moral superiority of LLMs

In their response to Aharoni et al. (2024) on the modified Moral Turing Test, Warren and colleagues make two core claims: (1) the semantic content of our stimuli were confounded with linguistic differences, and (2) the differences observed in our study can be fully explained by these low-level linguistic features rather than by the perceived quality of moral reasoning. They make these claims on the basis of a novel linguistic analysis of our stimuli.

<https://www.nature.com/articles/s41598-025-25047-8>

Neuron

PAPERS

JONAS TERLAU, JAN MARTINI & RANDOLPH F. HELFRICH – Structure in noise: Recurrent connectivity shapes neural variability to balance perceptual and cognitive demands in the human brain

Human behavior is remarkably complex, balancing the seemingly opposing traits of reliability and flexibility. In contrast, neural population activity is inherently time-varying, raising the question of how ever-changing activity supports both stable and adaptive behaviors. Using large-scale human intracranial electroencephalography (iEEG) covering the cortical hierarchy from sensory to association areas, we tested whether neural variability shapes perceptual and cognitive performance in a context- and demand-dependent manner. Our results show that neural variability is not random noise but hierarchically structured by a cortical gradient of recurrent connectivity, supporting the spatiotemporal unfolding from perceptual to cognitive processing. Reduced variability in sensory areas enhances the fidelity of sensory representations, whereas increased variability in association cortex reflects recurrent dynamics that support memory maintenance. In sum, neural variability captures the duality of human behavior—consistent during sensory processing, yet adaptable when needed.

[https://www.cell.com/neuron/abstract/S0896-6273\(25\)00796-2](https://www.cell.com/neuron/abstract/S0896-6273(25)00796-2)

YIZHEN ZHANG et al – Human cortical dynamics of auditory word form encoding

We perceive continuous speech as a series of discrete words, despite the lack of clear acoustic boundaries. The superior temporal gyrus (STG) encodes phonetic elements like consonants and vowels, but it is unclear how whole words are encoded. Using high-density cortical recordings and spoken narratives, we investigated how the human brain represents

auditory word forms. STG activity exhibits a distinctive reset at word boundaries, marked by a sharp drop in cortical activity. Between resets, STG encodes acoustic-phonetic, prosodic, and lexical features, supporting integration of phonological features into coherent word forms. This process tracks the relative elapsed time within words, independent of absolute duration, providing a flexible encoding of variable word lengths. Similar dynamics were found in deeper layers of a self-supervised artificial speech network. Finally, a bistable word perception task revealed trial-by-trial STG responses to perceived word boundaries. Together, these findings support a new dynamical model of auditory word forms.

[https://www.cell.com/neuron/fulltext/S0896-6273\(25\)00792-5](https://www.cell.com/neuron/fulltext/S0896-6273(25)00792-5)

New Scientist

NEWS

Prehistoric crayons provide clues to how Neanderthals created art

Ochre artefacts found in Crimea show signs of having been used for drawing, adding to evidence that Neanderthals used pigments in symbolic ways.

<https://www.newscientist.com/article/2501950-prehistoric-crayons-provide-clues-to-how-neanderthals-created-art/>

What we're learning about consciousness from master meditators' brains

Neuroscientist Matthew Sacchet is revealing how mastering meditation can not only enable transcendental states of bliss, but also reshape how we experience pain and emotion.

<https://www.newscientist.com/article/2501144-what-were-learning-about-consciousness-from-master-meditators-brains/>

ARTICLES

MICHAEL MARSHALL – Denisovans may have interbred with mysterious group of ancient humans

We now have only the second high-quality genome from an ancient Denisovan human, which reveals there were more populations of this species than we thought.

<https://www.newscientist.com/article/2502409-denisovans-may-have-interbred-with-mysterious-group-of-ancient-humans/>

MICHAEL MARSHALL – Does the family tree of ancient humans need a drastic rewrite?

Anthropologist Christopher Bae has recently suggested we add two new species of ancient human to our family tree. The plans break the conventions for how species should be named – but Bae argues the rules themselves are flawed.

<https://www.newscientist.com/article/2500833-does-the-family-tree-of-ancient-humans-need-a-drastic-rewrite/>

FLORENCE GAUB & LIYA YU – Human minds abhor uncertainty. This is a problem for liberal democracy

Neurologically, the flexibility of the future promised by liberal democracy can be a challenge because it brings with it uncertainty. But there are solutions.

<https://www.newscientist.com/article/mg26835682-500-human-minds-abhor-uncertainty-this-is-a-problem-for-liberal-democracy/>

Physics of Life Reviews

PAPERS

CHRISTOPHER J. WHYTE et al – On the Minimal Theory of Consciousness Implicit in Active Inference

The multifaceted nature of subjective experience poses a challenge to the study of consciousness. Traditional neuroscientific approaches often concentrate on isolated facets, such as perceptual awareness or the global state of consciousness and construct a theory around the relevant empirical paradigms and findings. Theories of consciousness are, therefore, often difficult to compare; indeed, there might be little overlap in the phenomena such theories aim to explain. Here, we take a different approach: starting with active inference, a first principles framework for modelling behaviour as (approximate) Bayesian inference, and building up to a minimal theory of consciousness, which emerges from the shared features of computational models derived under active inference. We review a body of work applying active inference models to the study of consciousness and argue that there is implicit in all these models a small set of theoretical commitments that point to a minimal (and testable) theory of consciousness.

<https://www.sciencedirect.com/science/article/pii/S1571064525001617>

PLoS One

PAPERS

ANNE REBOUL et al – Testing semantic compositionality in baboons (*Papio papio*) through relearning and generalization

This study investigates whether baboons are capable of semantic compositionality, specifically, whether they can apply compositional rules to new situations (generalization). In language, semantic compositionality is linked to productivity, the generalization of a rule to new combinations. Across four experiments, baboons were trained to match visual stimuli based

on either shape or color depending on symbolic cues. Experiments 1–3 tested generalization under different task complexities but consistently failed to show evidence that baboons understood or applied the matching rules beyond memorized combinations. Only in Experiment 4, which used a relearning paradigm rather than generalization, did baboons show improved performance when the rule remained consistent across phases. Four hypotheses were explored to explain the lack of generalization: an iconicity-novelty bias, the possibility that compositionality is present, but that training was not sufficient for generalization, rote memorization of cue-sample pairs, and a difference between implicit and explicit learning. The findings do not allow us to discriminate between these hypotheses.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0334726>

AMY E. CLARK et al – Exploring proxies for occupation intensity in hunter-gatherer settlement systems: A combination of ethnohistoric and archaeological data

A primary concern for hunter-gatherer archaeology is whether occupation intensity can be broken down into its constituent components: group size, length of stay(s), and frequency of reoccupation. This article contributes to this discussion with settlement pattern data from the traditional homeland of the Hia-Ced O’odham. We employ multiple material proxies of occupation intensity in addition to site area. Our approach highlights that patterns produced by logistically mobile systems with significant levels of site reuse present unique obstacles that contrast with the residentially mobile systems that underpin much current discussion and most ethnographic baselines. We provide one simple measure for identifying the relative magnitude of site reuse in settlement pattern data. Our multiple proxy landscape scale analysis also allows us to move beyond broad characterizations of economic strategies and identify site specific roles and strategies within larger settlement systems. Rather than viewing sites with anomalous relationships between proxies as problematic, they provide an avenue for identifying unique components of settlement systems and the impact of social negotiations intrinsic to human landscape use.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0333870>

ALEXANDER GENEVSKY – Social credit scores reduce interpersonal cooperation and trust

Social credit systems (SCS) are increasingly used by government agencies and private firms to assign scores to individuals based on social status and behavior. These scores subsequently impact access to social and economic opportunities, resources, and interactions. The ethical and privacy concerns of SCS are frequently overlooked due to their purported, yet unverified, social and economic benefits. In this paper, we examine the impact of social credit scores on cooperation, trust, and partner selection in economic decision-making. Contrary to the intuitive notion that social credit scores facilitate interactions by increasing transparency, we find that the availability of SCS information leads to lower trust and reduced cooperation between individuals. Additionally, we find that social credit scores create persistent biases in the perception of interaction partners, which remain resistant to change even when directly contradicted by relevant behavioral evidence. These effects disproportionately disadvantage individuals with lower scores, exacerbating existing social and economic inequalities, and demonstrate that reputational systems can amplify polarization rather than promote fairness and cooperation. These findings provide important insights for policymakers, regulators, and businesses considering the adoption of social credit systems by highlighting the potential for unintended negative consequences in both public and commercial domains.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0335810>

Science Advances

PAPERS

TOMOYASU HORIKAWA – Mind captioning: Evolving descriptive text of mental content from human brain activity

A central challenge in neuroscience is decoding brain activity to uncover mental content comprising multiple components and their interactions. Despite progress in decoding language-related information from human brain activity, generating comprehensive descriptions of complex mental content associated with structured visual semantics remains challenging. We present a method that generates descriptive text mirroring brain representations via semantic features computed by a deep language model. Constructing linear decoding models to translate brain activity induced by videos into semantic features of corresponding captions, we optimized candidate descriptions by aligning their features with brain-decoded features through word replacement and interpolation. This process yielded well-structured descriptions that accurately capture viewed content, even without relying on the canonical language network. The method also generalized to verbalize recalled content, functioning as an interpretive interface between mental representations and text and simultaneously demonstrating the potential for nonverbal thought–based brain-to-text communication, which could provide an alternative communication pathway for individuals with language expression difficulties, such as aphasia.

<https://www.science.org/doi/10.1126/sciadv.adw1464>

Trends in Cognitive Sciences

ARTICLES

SHIHUI HAN – Culture and in-group favoritism in social decision-making

Although cultural differences in cognition and behavior are well-documented, collecting data from multiple cultural samples to explore relevant cognitive processes remains challenging. Rahal and Schulze Spüntrup address this by applying webcam-based eye-tracking to adults from 20 countries, revealing cultural variations in the cognitive processes underlying in-group favoritism during social decision-making.

[https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613\(25\)00243-8](https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(25)00243-8)

PAPERS

MARTIN GIURFA – The cognitive side of communication in social insects

Social insects rely on multiple communication channels. These channels have traditionally been considered innate, eliciting stereotyped responses. However, recent research has shown that cognitive modulation occurs in communication contexts long assumed to be entirely genetically encoded, thus revealing a previously unrecognized cognitive plasticity in social insect communication.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(25\)00227-X](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(25)00227-X)

Trends in Ecology and Evolution

PAPERS

JACOB JOHNSON, KIRSTEN SHEEHY & KATE L. LASKOWSKI – Playing dice with behavior: drivers of stochastic individuality

Animal behavior is often viewed as stemming from predictable genetic and environmental factors. However, despite our best attempts to control genetic and environmental influences on behavior, variation among individuals still persists: what we call 'stochastic individuality'. Increasing research suggests that this might be more than just measurement error, and might instead be rich in biological insights. In this review we examine what is known about stochastic individuality, including potential biological mechanisms and its potential adaptive value, and we provide guidance for how to quantify and test outstanding questions about its role in driving patterns of behavioral diversity. Incorporating stochasticity may be a key missing component in mapping the links from genotype to phenotype and predicting the interplay between phenotype and fitness.

[https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(25\)00288-5](https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(25)00288-5)

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