

## EAORC BULLETIN 1,198 – 31 May 2026

## CONTENTS

<b>NOTICES</b> .....	<b>2</b>
FORMATTED VERSION OF THIS BULLETIN .....	2
PUBLICATION ALERTS .....	2
EDITORIAL INTERJECTIONS .....	2
ACADEMIA.EDU – Individual Self versus Collective Self .....	3
KATE THUY MAI & ZAHIRUL HOQUE – Individual Self versus Collective Self: Performance Measures for Academics in a Collectivist Culture .....	3
ACADEMIA.EDU – Eastern African stone tool evidence & Plio-Pleistocene hominin extinctions .....	3
JOHN J. SHEA – What the eastern African stone tool evidence tells us about Plio-Pleistocene hominin extinctions .....	3
<b>NEWS</b> .....	<b>3</b>
JOHN TEMPLETON FOUNDATION – What’s It Like To Be a Bee? .....	3
SCIENCEADVISER – If you give a mouse a cookie... Well, it depends on the size of the cookie .....	3
SCIENCEADVISER – Stone Age cultures shared genes while maintaining distinct traditions .....	4
THE CONVERSATION – Psychopathy: here’s why we may be looking at it all wrong .....	4
<b>PUBLICATIONS</b> .....	<b>4</b>
Animal Behaviour.....	4
<b>PAPERS</b> .....	4
SAM F. WALMSLEY, LAURA J. FEYRER & HAL WHITEHEAD – Social structure in northern bottlenose whales: stable relationships without stable groups.....	4
eLife.....	4
<b>PAPERS</b> .....	4
MICHAEL C. FRANK et al – Continuous developmental changes in word recognition support language learning across early childhood .....	4
FRANCOIS STOCKART et al – Neural correlates of perceptual consciousness from within: a narrative review of human intracranial research .....	5
Evolutionary Anthropology .....	5
<b>PAPERS</b> .....	5
MATTHEW LOMAS et al with FRANCESCA HAPPÉ – The Cognitive Foundations of Teaching .....	5
Frontiers in Behavioral Neuroscience .....	5
<b>PAPERS</b> .....	5
KAREN L. BALES et al – A holistic review of fatherhood in humans and non-human animals: mechanisms of fatherhood, effects on fathers themselves, and interactions of fathers with others .....	5
Frontiers in Communication.....	5
<b>PAPERS</b> .....	5
IVÁN SÁNCHEZ-LÓPEZ, ARNAU GIFREU-CASTELLS & ANTONI ROIG – AI storytelling across media: synthetic agency and the force vectors of narrative world-making .....	5
SVEN BERNECKER & THOMAS GRUNDMANN – How communicative trust shapes cognitive trust .....	6
Frontiers in Human Neuroscience .....	6
<b>PAPERS</b> .....	6
VIKTORS VELIKS et al – Processing of different word list lengths during encoding and retrieval in Broca’s area .....	6
Frontiers in Language Sciences.....	6
<b>PAPERS</b> .....	6
DIETER HILLERT – Adaptive trait package for mind reading and language .....	6
Mind & Language .....	6
<b>PAPERS</b> .....	6
JUAN CARLOS GÓMEZ – Ostensive communication in great apes: The evolution of Gricean intent .....	6
MICHAEL TOMASELLO – The evolutionary psychology of the human pointing gesture .....	7
Nature Humanities & Social Sciences Communications .....	7
<b>PAPERS</b> .....	7
ZHENG WANG – Plural intelligence: Chinese philosophy, intercultural semantics, and the future of AI.....	7
YAFANG JIANG et al – Learnability and individual-society distinction: unveiling the multidimensional representation and categorization of Chinese abstract concepts .....	7
Nature Machine Intelligence .....	8
<b>ARTICLES</b> .....	8
ANDREIA SOFIA TEIXEIRA, SUKHWINDER SINGH SHERGILL & GUY LABAN – Human–AI interactions reshape the self and our social networks .....	8

Nature Reviews Psychology.....	8
<b>ARTICLES</b> .....	8
YUEQING HU – Machine ‘culture’ beyond language.....	8
Nature Scientific Reports.....	8
<b>PAPERS</b> .....	8
SABRINA KRIEF et al – First evidence of underground extractive tool use by chimpanzees in Kibale National Park, Uganda .....	8
Neuron.....	8
<b>PAPERS</b> .....	8
PATRICK STEVEN HOSFORD et al – Control of representation updating by higher-order thalamus enables history-based decision-making .....	8
VINCENT TASCHEREAU-DUMOUCHEL et al with JOSEPH E. LEDOUX – The ethical impasse of current consciousness science.....	9
New Scientist .....	9
<b>ARTICLES</b> .....	9
LEGO EDUCATION – How play shapes future thinkers.....	9
PeerJ.....	9
<b>PAPERS</b> .....	9
KIKI E. SPOELSTRA et al – Purr-ceiving feelings: domestic cats respond to intraspecific cues of emotion .....	9
Philosophical Transactions of the Royal Society A .....	9
<b>PAPERS</b> .....	9
LAUREN N. GIROUARD & SUSAN A. GELMAN – Hidden processes of workflow in cognitive developmental psychology.....	9
PLoS One.....	9
<b>PAPERS</b> .....	9
MIKAYLA CUTLER et al – Three-dimensional shape cues affect human and artificial recognition systems differently .....	9
ANJANA WELIKALA et al – Sri Lankan maternal ancestry reveals early migrations from Africa along the Indian Ocean .....	10
Proceedings of the Royal Society B.....	10
<b>PAPERS</b> .....	10
VELDON-JAMES LAURIE et al – Persistent decision-making in mice, monkeys and humans.....	10
JUTTA SCHICKORE, SARA MAGALHÃES & MARIANA GÓMEZ-SCHIAVON – Harnessing complexity may strangle it: what is a well-controlled experiment? .....	10
Royal Society Open Science.....	11
<b>PAPERS</b> .....	11
EMANUELA CAMPISI, ANITA SLONIMSKA & ASLI OZYUREK – Showing how: adults across cultures use similar representational gestural strategies in demonstrations for children.....	11
Science Advances.....	11
<b>PAPERS</b> .....	11
WATARU KOYAMA et al – The cerebellum implements structured representation of valence to support adaptive behavior control .....	11
Trends in Cognitive Sciences .....	11
<b>CORRECTIONS</b> .....	11
CÉDRIC SUEUR, RICARD SOLÉ & JEAN-LOUIS DENEUBOURG – Collective social niche construction shaping adaptive social networks.....	11
<b>SUBSCRIBE to the EAORC Bulletin</b> .....	<b>11</b>
<b>UNSUBSCRIBE from the EAORC Bulletin</b> .....	<b>11</b>
<b>PRODUCED BY AND FOR THE EAORC EMAIL GROUP</b> .....	<b>11</b>

---

## 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](http://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.

**ACADEMIA.EDU – Individual Self versus Collective Self***Behavioral Research in Accounting 35:2, 1-19 (2023).***KATE THUY MAI & ZAHIRUL HOQUE – Individual Self versus Collective Self: Performance Measures for Academics in a Collectivist Culture**

This article examines how an individual-level academic performance measurement system interacts with the collective self in a collectivist cultural context. The qualitative study of a Vietnamese public university involved 53 interviews, participant observations, and document analysis. The findings show that performance measurement systems in the university produced both an autonomous self and a collective self. They do so by measuring individual performance and suggesting that individuals are autonomously responsible and able to influence such performance. Thus, although a performance measurement system is typically imposed by others (which shows one's dependence on others and subjection to their power), the nature of the performance measurement system is such that it promotes individual actions and a sense of individual performance. Therefore, people feel they have control over "their" performance. However, while trying to control such performance, they depend more on others whose recognition appears to link with such performance measurement systems.

[https://www.academia.edu/105433023/Individual\\_Self\\_versus\\_Collective\\_Self\\_Performance\\_Measures\\_for\\_Academics\\_in\\_a\\_Collectivist\\_Culture](https://www.academia.edu/105433023/Individual_Self_versus_Collective_Self_Performance_Measures_for_Academics_in_a_Collectivist_Culture)

**ACADEMIA.EDU – Eastern African stone tool evidence & Plio-Pleistocene hominin extinctions***Cambridge Prisms: Extinction 4, e6, 1-10 (2026).***JOHN J. SHEA – What the eastern African stone tool evidence tells us about Plio-Pleistocene hominin extinctions**

This paper examines the stone tool evidence associated with extinctions among Australopithecus, Paranthropus, and Homo in Eastern Africa between 0.8 and 3.5 Ma. It does this using Stoneworking Modes A-I, a relatively new framework for comparing stone tool evidence, and data from the Eastern African Prehistoric Stoneworking Survey. While the evolutionary transition between early Homo and H. ergaster/erectus seems correlated with a shift from occasional to habitual stoneworking, Australopithecus' and Paranthropus' last appearance dates do not appear correlated with major changes in the archaeological record.

[https://www.academia.edu/167833241/What\\_the\\_eastern\\_African\\_stone\\_tool\\_evidence\\_tells\\_us\\_about\\_Plio\\_Pleistocene\\_hominin\\_extinctions](https://www.academia.edu/167833241/What_the_eastern_African_stone_tool_evidence_tells_us_about_Plio_Pleistocene_hominin_extinctions)

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

The most haunting phrase in the Star Trek Universe is, "You will be assimilated. Resistance is futile." The terror of the Borg—an alien cybernetic collective seeking to assimilate other species into a unified hive mind—is that they rob their victims of their individuality and experience of subjectivity.

In contrast to the Borg stands the image of the humble honeybee. While the Borg embody the tyranny of the collective, the beehive has classically represented an economic and social ideal where individuals work together for the good of the whole. But is a single bee really an individual agent, or more like a cell within a larger organism? 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>

**SCIENCEADVISER – If you give a mouse a cookie... Well, it depends on the size of the cookie**

Scientists have long believed that training an animal, even to perform simple tasks, is a painstaking process requiring hundreds of repetitions. Under standard protocols, animals receive only a small reward after each attempt, maximizing the number of reinforcements per training session. Accumulated experience, at least according to conventional wisdom, is more important than the size of the incentive. New experiments in mice, however, may upend this long-held assumption.

"I mean this quite literally, no one ever checked," neuroscientist Josh Dudman said in a statement. For the new study, his lab trained mice to complete a range of navigation, motor skill, and decision-making tasks. Thirsty mice that received a few large gulps of water as a reward, the team reported, became experts much faster than animals that got many tiny sips. "As neuroscientists, we resign ourselves to knowing that we're going to have to train this animal for a few weeks and eventually, they're going to start to look like they know what's up," said study co-author Luke Coddington. "But instead, now in a day, I'm watching these mice just nail it." Bigger rewards also appeared to even the playing field on tasks where individual mice tend to vary, with some mastering it in a week and others taking a whole month.

Brain imaging revealed that bigger rewards triggered larger, longer-lasting boosts of dopamine, leading the mice to learn more during each trial and stay more engaged in the task. By shortening training time and reducing variability between animals, bigger rewards could make it easier for scientists to study skill-based learning—and perhaps enable them to teach mice more complex tasks than previously thought possible.

<https://www.science.org/doi/10.1126/science.aeb0813>

## SCIENCEADVISER – Stone Age cultures shared genes while maintaining distinct traditions

Some 5000 years ago, in what is now Germany, different groups of people erected giant stone monuments, each with their own architectural style. Similarities in these impressive works have long been considered evidence of cultural ties between peoples. But not all is written in stone, researchers have now discovered.

A team compared dozens of genomes from human remains at Sorsum, a site of the Western Funnel Beaker culture, with dozens from five nearby but architecturally distinct Wartberg culture sites. They found unexpected genetic ties, including a father and son that were buried over 200 kilometers apart in tombs with non-relatives. “Despite ... cultural distinctions, genetically the groups were remarkably closely related,” co-author Ben Krause-Kyora told The Debrief, adding that these communities “were much more interconnected than previously assumed.” In other parts of Europe, tombs generally contain nuclear families, noted co-author Almut Nebel in a statement. “We are evidently dealing with graves of patchwork communities.”

What the scientists failed to find was genetic ties to other, previously sequenced Funnel Beaker people with much more similar stonework who lived farther away—which “indicates that monumentality spread culturally rather than through biological networks,” they explained.

As for how the father and son ended up so far apart—“A plausible scenario could be that [the son] may have been residing in Sorsum, possibly as a fostered or adopted child or as an apprentice,” the authors wrote—perhaps the Stone Age version of studying abroad.

<https://www.science.org/doi/10.1126/science.aeb2926>

---

## THE CONVERSATION – Psychopathy: here’s why we may be looking at it all wrong

Could psychopathy be something we’ve just imagined because it’s convenient? Some experts believe so.

<https://theconversation.com/psychopathy-some-experts-now-say-it-doesnt-exist-heres-why-we-may-be-looking-at-it-all-wrong-279791>

---

## PUBLICATIONS

---

### Animal Behaviour

#### PAPERS

#### **SAM F. WALMSLEY, LAURA J. FEYRER & HAL WHITEHEAD – Social structure in northern bottlenose whales: stable relationships without stable groups**

Uncovering the drivers and function(s) of social relationships across a wide range of species is key to understanding the ecology and evolution of social behaviour. Northern bottlenose whales, *Hyperoodon ampullatus*, have been identified as a particularly important case study for social evolution. Unlike other large, toothed whale species that live in kin-based social units, northern bottlenose whales appear to form fluid, fission–fusion communities. However, this understanding has not been revisited in over 20 years, and new lines of evidence suggest that female relationships may have been underestimated in previous work. Drawing on 35 years of photographic identification data, we used Bayesian social network and binomial mixture models to quantify social relationships between individuals. Northern bottlenose whale social networks had very low modularity but high social differentiation, indicating strong social preferences in the absence of stable groups or community partitions. Contrary to previous work, we found evidence for strong, long-lasting relationships among females, not just males. Although kinship had little influence on social relationships, age differences and residency influenced patterns of association. Broadly, this analysis supports the hypothesis that northern bottlenose whales exhibit a social system more similar to smaller, less sexually dimorphic toothed whales such as dolphins. This work highlights the value of long-term ecological research for quantifying the social lives of long-lived species.

<https://www.sciencedirect.com/science/article/pii/S0003347226001053>

---

### eLife

#### PAPERS

#### **MICHAEL C. FRANK et al – Continuous developmental changes in word recognition support language learning across early childhood**

Being a fluent language user involves recognizing words as they unfold in time. How does this skill develop over the course of early childhood? And how does facility in word recognition relate to the growth of vocabulary knowledge? We address these questions using data from Peekbank, an open database of experiments measuring children’s eye movements during early word recognition. In an observational study of 26 datasets from over 2,500 children ages 6 months – 6 years, we show that word recognition becomes faster, more accurate, and less variable across development, consistent with a process of skill learning. Factor analysis reveals covariation of word recognition speed and accuracy with children’s vocabulary size in cross-sectional analysis. Further, across a range of longitudinal models, speed, accuracy, and vocabulary were coupled. Children with overall faster word recognition tended to show faster vocabulary growth, though developmental growth in word recognition skill was not specifically associated with growth in vocabulary. Together, these findings support the view that

---

word recognition is a skill that develops gradually across early childhood and that this skill is deeply intertwined with early language learning.

<https://elifesciences.org/reviewed-preprints/109636>

### **FRANCOIS STOCKART et al – Neural correlates of perceptual consciousness from within: a narrative review of human intracranial research**

Despite many years of research, the quest to identify neural correlates of perceptual consciousness (NCC) remains unresolved. One major obstacle lies in methodological limitations: most studies rely on non-invasive neural measures with limited spatial or temporal resolution making it difficult to disentangle proper NCCs from concurrent cognitive processes. Additionally, the relatively low sensitivity of non-invasive neural measures limits the interpretation of null findings in studies targeting proper NCCs. In this review, we discuss how human intracranial recordings can advance the search for NCCs, by offering high spatiotemporal resolution, improved signal sensitivity, and broad cortical and subcortical coverage. We review studies that have examined NCCs at the level of single neurons and populations of neurons, and evaluate their implications on the debates between cognitive and sensory theories of consciousness. Finally, we highlight the limits of current intracranial human recordings and propose future directions based on emerging technologies and novel experimental paradigms.

<https://elifesciences.org/reviewed-preprints/109604>

## Evolutionary Anthropology

### PAPERS

#### **MATTHEW LOMAS et al with FRANCESCA HAPPÉ – The Cognitive Foundations of Teaching**

The propensity to teach is vital to human cultural evolution and to our ecological dominance of the planet, but its cognitive foundations remain poorly understood. Traditional explanations argue that teaching hinges on particular cognitive prerequisites, such as Theory of Mind. However, such explanations conflate the function of teaching—promoting learning in others—with how it is achieved, and overlook the role of comparatively simple mechanisms like the heuristics known to underpin teaching in some non-human animals. We propose a novel framework integrating evolutionary and psychological perspectives to understand the diversity of teaching by focusing on the cognitive requirements for flexibility and sensitivity to pupil needs. Synthesizing theory and evidence across disciplines, our framework evaluates the contributions of different mechanisms in determining who and what is taught, and how teaching is achieved. This allows us to understand the cognitive foundations of teaching across different species, in diverse human societies, and neurodiverse populations.

<https://onlinelibrary.wiley.com/doi/full/10.1002/evan.70032>

## Frontiers in Behavioral Neuroscience

### PAPERS

#### **KAREN L. BALES et al – A holistic review of fatherhood in humans and non-human animals: mechanisms of fatherhood, effects on fathers themselves, and interactions of fathers with others**

Fathers are often the forgotten parent in mammals; due to the necessity of lactation for the survival of infants, mothers and motherhood are by far the better studied sex (a rather unusual phenomenon among most topics). However, the study of fathers has experienced a recent surge in interest. Here we review literature from a neuroscience, endocrine, and psychological perspective, on the mechanisms of fatherhood and roles of fathers across species, including the ways that fathering affects mental health, interactions with others, and partner relationships in humans and animals. Limitations and fundamental gaps remaining in the literature on fatherhood are identified.

<https://www.frontiersin.org/journals/behavioral-neuroscience/articles/10.3389/fnbeh.2026.1779750/full>

## Frontiers in Communication

### PAPERS

#### **IVÁN SÁNCHEZ-LÓPEZ, ARNAU GIFREU-CASTELLS & ANTONI ROIG – AI storytelling across media: synthetic agency and the force vectors of narrative world-making**

Artificial intelligence is reshaping narrative forms and content across the creative industries, transforming how stories are conceived, produced, distributed, and experienced. This article maps dominant framings in high-impact scholarship (2020–2025) through a citation-informed targeted review of Scopus and Web of Science records, focusing on the most influential discourses shaping the field. Selection and screening procedures are reported with an informed flow diagram. The 100 most-cited records per database were retrieved, de-duplicated, and screened against eligibility. 37 studies met inclusion criteria. The synthesis combines discourse analysis with a grounded theory-informed constant comparative method in Atlas.ti to identify dominant framings. Findings point to a predominantly techno-optimistic orientation, tempered by concerns about opacity, bias, homogenization, and attribution. Four force vectors emerge from the literature: synthetic participation, as AI expands from instrument to embodied narrative and social agent; redistributed authorship, as creative labor, authority, and accountability are dispersed across humans, systems, and infrastructures; adaptive procedural storytelling, as narrative becomes increasingly multilayered, scalable, and responsive to interaction and context; and personalized affective

governance, as storytelling is modulated through data-driven customization and emotional engagement under opaque and asymmetric conditions of power. In conclusion, according to the most impactful literature, synthetic narrative participation is emerging as a multidimensional agent of unprecedented relevance in the creative industries. By operating across diegetic, performative, and emotional dimensions—and acquiring embodied forms through robots and interfaces—AI is increasingly positioned not merely as a tool, but as a narrative and social agent. This phenomenon marks a fundamental ontological shift: AI intervenes and participates—while remaining an object—in the construction of human fictions, realities and imaginaries.

<https://www.frontiersin.org/journals/communication/articles/10.3389/fcomm.2026.1821118/full>

### **SVEN BERNECKER & THOMAS GRUNDMANN – How communicative trust shapes cognitive trust**

This paper introduces the concept of communicative trust, defined as trust in a speaker's cooperative linguistic behavior. Communicative trust is distinguished from both cognitive trust and rapport. The distinction between communicative and cognitive trust is elucidated through Grice's maxims of communication. Although communicative trust is neither necessary nor sufficient for cognitive trust, it can nonetheless promote or generate cognitive trust. The paper also addresses the more specifically epistemological question, whether and to what extent the transition from communicative to cognitive trust can be rational or reliable.

<https://www.frontiersin.org/journals/communication/articles/10.3389/fcomm.2026.1665595/full>

---

## Frontiers in Human Neuroscience

### PAPERS

#### **VIKTORS VELIKS et al – Processing of different word list lengths during encoding and retrieval in Broca's area**

Broca's area is a region of the brain involved in the processing of verbal information, including memory encoding and retrieval. This study examined differences in the neural correlates of encoding and retrieval in Broca's area using word lists of varying lengths. Differences in the encoding and retrieval processes were assessed using word lists of different lengths: short (2–29), medium (30–59), and long (60–225) Latvian language nouns. In total, 23 participants completed the memory task. Each participant performed memory tasks with two short lists, two medium lists, and one long list, with varying list lengths within each diapacon. We considered the activity of the F3 and F7 to represent our region of interest. We compared time-frequency (TF) data from encoding and retrieval across list lengths. The results revealed significant differences in TF plots for encoding and for correct and incorrect retrieval of information up to a list length of 50 words. Further increases in list length indicated greater similarity in brain functional patterns. For correct stimulus recognition or rejection of a distractor, the observed differences in TF depended on list length, and these differences were more pronounced under correct stimulus recognition. Encoding and correct answers during retrieval also showed statistically significant differences from incorrect answers (misses or false alerts) at different list lengths. Spectral power changes exhibited a nonlinear shape during both encoding and retrieval. The possible mechanisms differed during encoding and correct recognition versus mistakes.

<https://www.frontiersin.org/journals/human-neuroscience/articles/10.3389/fnhum.2026.1757160/full>

---

## Frontiers in Language Sciences

### PAPERS

#### **DIETER HILLERT – Adaptive trait package for mind reading and language**

Human language likely emerged from pre-symbolic social cognition rather than from a sudden, language-specific innovation. Across social animals and human infants, gaze following, affective attunement, and intention reading point to early forms of mind reading that precede explicit theory of mind and symbolic communication. In development, language and theory of mind appear to support each other: prelinguistic social cognition scaffolds later belief reasoning, while growing linguistic competence enables more flexible representations of others' mental states. In evolution, this trajectory may be explained by a neural threshold hypothesis, according to which quantitative increases in hominin brain size and connectivity yielded qualitatively new computational capacities. On this view, *Homo erectus* may have marked a critical transition, with expanded working memory, hierarchical integration, and social inference supporting rudimentary symbolic thought and early language. Rather than attributing language to a single mutation or an isolated neural mechanism, this account proposes that it emerged from an interacting trait package, a synthesis shaped by ecology, energetics, development, and social behavior. Modern language is therefore best understood as a culturally elaborated expression of a deeper neurobiological capacity rooted in early hominin evolution.

<https://www.frontiersin.org/journals/language-sciences/articles/10.3389/flang.2026.1851229/full>

---

## Mind & Language

### PAPERS

#### **JUAN CARLOS GÓMEZ – Ostensive communication in great apes: The evolution of Gricean intent**

I discuss the evolution of ostensive behaviours (behaviours that display the communicative intent to influence others through the perception of signals and actions addressed to them). Ostensive communication evolved out of evolutionary adaptations to the challenges and opportunities created by the evolutionary scenario of the meeting of intentionalities (in Brentano's sense of "aboutness") between two agents. Apes evolved specialised ostensive behaviours for managing "attention contact"

situations with the structure of Gricean communicative intentions. Apes' ostensive communication consists of "behavioural utterances" combining both species-specific signals (with naturally selected meaning) and ordinary behaviours made to function communicatively to convey Gricean non-natural meaning.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.70036>

### **MICHAEL TOMASELLO – The evolutionary psychology of the human pointing gesture**

The human pointing gesture is a species-unique and species-universal form of communication that depends on humans' especially powerful forms of cooperative cognition and motivation. I have previously hypothesized that the pointing gesture evolved as a behavioral tool empowering individuals to better coordinate their interdependent collaborative activities by informing one another of things helpfully. Here I provide new data in support of this hypothesis, focusing on the different ways in which human children and nonhuman great apes communicate to initiate, coordinate, and self-regulate their collaborative activities. All great apes collaborate and communicate, but humans collaborate and communicate in coordinated ways.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.70030>

## **Nature Humanities & Social Sciences Communications**

### **PAPERS**

#### **ZHENG WANG – Plural intelligence: Chinese philosophy, intercultural semantics, and the future of AI**

*We are providing an unedited version of this manuscript to give early access to its findings. Before final publication, the manuscript will undergo further editing. Please note there may be errors present which affect the content, and all legal disclaimers apply.*

This article rethinks the foundations of artificial intelligence (AI) by challenging both the logocentric assumptions of "good old-fashioned AI" and the ungrounded empiricism of contemporary large language models. Instead of treating language as an abstract, universal code, it reconstructs a plural genealogy of empirical semantics that runs through Wittgenstein and Margaret Masterman into Yuen Ren Chao's continuity-based Chinese linguistics and the cybernetic reconfiguration of language as signal and information. Chao's analyses of tone, vernacular writing, and script reform reveal a Chinese-inflected empiricism in which categories are graded, usage-based, and technologically mediated. The paper then turns to contemporary Chinese thought—translingual practice and cosmotechnics, figure–landscape semiotics and classifier-driven ontology, verb-centred models of existence and tianxia politics—to show how different linguistic and cosmotechnical traditions carve up continua of experience in non-identical ways. On this basis, it proposes plural intelligence as an alternative horizon for AI: not a single, disembodied AGI, but an ecology of situated, culturally responsive intelligences whose operations are continuous, figural, and relational rather than anchored in a universal logos.

<https://www.nature.com/articles/s41599-026-07830-8>

#### **YAFANG JIANG et al – Learnability and individual-society distinction: unveiling the multidimensional representation and categorization of Chinese abstract concepts**

*We are providing an unedited version of this manuscript to give early access to its findings. Before final publication, the manuscript will undergo further editing. Please note there may be errors present which affect the content, and all legal disclaimers apply.*

According to multiple representation theory, abstract concepts emerge from multiple, partially overlapping representational systems shaped by sensorimotor experience, language, emotion, and social context, rather than from disembodied propositional thought alone. Unlike concrete concepts, they are typically less directly grounded in immediate perceptual or motor experience and more strongly shaped by linguistic, emotional, social, and cultural information. However, most multidimensional rating studies on abstract concepts have focused on European languages, and cross-linguistic work has revealed variability in the experiential "core" and associative structure of ostensibly equivalent abstract terms, suggesting that their internal organization may differ systematically across language communities. Therefore, this study aims to explore the features and representational categories of Chinese abstract concepts by feature rating 503 Chinese abstract words across 19 dimensions. Results showed four semantic components: entity, inner grounding, sociality, and learnability. Seven categories were then clustered: basic abstract terms, intrinsic human attributes and spiritual concepts, emotional concepts, disciplinary terminology, physical and spatiotemporal and quantitative concepts, interpersonal communication concepts, and social concepts. These findings suggested that learnability is an important feature in the semantic processing of Chinese abstract concepts and that Chinese people draw a clearer distinction between the individual and society. This data-driven study empirically confirms the distinctive features in the semantic construct of Chinese abstract concepts, likely reflecting the cultural influence on individuals' conceptual processing.

<https://www.nature.com/articles/s41599-026-07690-2>

---

## Nature Machine Intelligence

### ARTICLES

#### **ANDREIA SOFIA TEIXEIRA, SUKHWINDER SINGH SHERGILL & GUY LABAN – Human–AI interactions reshape the self and our social networks**

Large language models (LLMs) have rapidly entered everyday life as companions, advisors and sources of knowledge. Unlike earlier forms of digital media, they do not merely transmit information: they adapt to prompts, simulate empathy and provide interaction that feels personalized and reciprocal. This shift requires urgent attention in how social practices are learned and propagated: habits formed in interaction with LLMs do not stay on-screen but diffuse through alignment-driven exchanges, potentially reshaping human behaviour, mental well-being and social connection at different scales.

<https://www.nature.com/articles/s42256-026-01248-2>

---

## Nature Reviews Psychology

### ARTICLES

#### **YUEQING HU – Machine ‘culture’ beyond language**

I usually interact with large language models (LLMs) in Chinese. Then I kept hearing the same claim: “Try English. Answers get sharper.” So I ran a quick test. What changed was not just the grammar, but the voice. In English, the model’s outputs seemed more self-oriented and decisive. In Chinese, the outputs were more context attuned and often gave ranges instead of definitive conclusions. That distinction made me wonder whether language is just a wrapper for the model or whether it reliably steers what content the system outputs.

<https://www.nature.com/articles/s44159-026-00582-x>

---

## Nature Scientific Reports

### PAPERS

#### **SABRINA KRIEF et al – First evidence of underground extractive tool use by chimpanzees in Kibale National Park, Uganda**

*We are providing an unedited version of this manuscript to give early access to its findings. Before final publication, the manuscript will undergo further editing. Please note there may be errors present which affect the content, and all legal disclaimers apply.*

Chimpanzee behavior, including tool use, varies widely among communities and populations. Tools made by chimpanzees for extracting products from the underground nests of stingless bees are among the most complex used by the species. They have rarely been described in East Africa and have never been observed in three chimpanzee communities in the Kibale National Park, Uganda—two at Ngogo and one at Kanyawara community—that have been studied for over 30 years. In the current study, we present the results of a 15-year study of a fourth community of chimpanzees ranging at Sebitoli, in the northern part of Kibale, and the insects they consume. We identified the stingless bees and carpenter bee species on which they feed. In addition, we collected the tools used by the Sebitoli chimpanzees. Of the 443 tools used in 152 episodes to extract products from insect nests, 332 were used by chimpanzees to explore or exploit underground or arboreal nests of *Meliponula* sp.. In addition, individuals sometimes left sticks vertically inserted into the entrances of underground bee nests. We discuss the implications for the transmission of the tool use behavior for subterranean extractive task within this social group, given that it appears to be absent in the other three Kibale Forest communities being studied. Our results highlight the importance of taking small-scale cultural variation into account in understanding chimpanzee behavioral repertoires as well as planning and implementing conservation strategies. We dedicate this article to the chimpanzee Hugo, who loved honey the most. He was slaughtered with machetes by poachers on April 3, 2026.

<https://www.nature.com/articles/s41598-026-50645-5>

---

## Neuron

### PAPERS

#### **PATRICK STEVEN HOSFORD et al – Control of representation updating by higher-order thalamus enables history-based decision-making**

When sensory information is ambiguous, we must interpret current inputs based on a representation constructed from our previous experiences. Although appropriately updating this internal representation to track environmental changes is essential for behavior, the neural basis of this dynamic integration remains unknown. Using a combination of multi-area single-unit recordings and optogenetic techniques in mice under both behavioral and passive conditions, we find that interactions between the posterior parietal cortex (PPC) and its higher-order thalamic counterpart, the pulvinar (PUL), are necessary to stably maintain representations underlying decision-making based on sensory history. We also identify a mechanism by which shifts in statistical patterns across recent sensory experiences engage inhibitory control of the PUL by the thalamic reticular nucleus (TRN) to facilitate the updating of encoded sensory history. Our results establish a framework in which complementary operations in the thalamus and cortex act in concert to allow internal representations to adaptively track changing conditions.

[https://www.cell.com/neuron/fulltext/S0896-6273\(26\)00340-5](https://www.cell.com/neuron/fulltext/S0896-6273(26)00340-5)

---

**VINCENT TASCHEREAU-DUMOUCHEL et al with JOSEPH E. LEDOUX – The ethical impasse of current consciousness science**

Rising media attention regarding consciousness in animals, fetuses, organoids, and AI has led to some rather strong statements. Most of these claims are based on “markers” of consciousness that track the general capacity for information processing rather than subjective experience per se. Accordingly, their relevance for theory arbitration may actually be limited.

[https://www.cell.com/neuron/abstract/S0896-6273\(26\)00276-X](https://www.cell.com/neuron/abstract/S0896-6273(26)00276-X)

---

**New Scientist****ARTICLES****LEGO EDUCATION – How play shapes future thinkers**

By giving children the agency to explore and the freedom to fail, toy designers and neuroscientists are tapping into the fundamental mechanisms of how the human brain learns.

<https://www.newscientist.com/article/2527501-how-play-shapes-future-thinkers/>

---

**PeerJ****PAPERS****KIKI E. SPOELSTRA et al – Purr-ceiving feelings: domestic cats respond to intraspecific cues of emotion**

Successful interpretation of emotion expressions is a critical aspect of communication in both solitary and group-living species, although it is seldom investigated in the former. Because of their flexible sociality, domestic cats (*Felis silvestris catus*) are an interesting species within which to study intraspecific emotion perception.

Adopting a multidimensional approach, we presented cats ( $n = 24$ ) with visual and auditory stimuli that represented two levels of valence and activity, which served as a proxy for arousal. Thus, each cat experienced four auditory and four visual stimulus presentations lasting 2 min each in which we measured the cats' gaze duration and frequency, proximity duration, approach latency, and duration of stimulus interaction. Additionally, we applied a data-driven cluster analysis to investigate the occurrence of a wide range of other behaviours in response to the different stimuli.

Valence and activity levels did not affect cats' responses to auditory stimuli. However, cats gazed longer and more frequently at negatively valenced visual stimuli depicting higher levels of activity compared to all other stimulus categories. Stimulus interaction was longer for active stimuli, independent of valence. However, cats displayed more fear-related behaviours in response to the negatively compared to positively valenced active stimuli, indicating that they interpreted these as being fundamentally different from each other.

Our findings suggest that cat emotion perception in the visual domain is modulated by both valence and activity, highlighting the need to incorporate arousal in further emotion research.

<https://peerj.com/articles/21292/>

---

**Philosophical Transactions of the Royal Society A****PAPERS****LAUREN N. GIROUARD & SUSAN A. GELMAN – Hidden processes of workflow in cognitive developmental psychology**

In the study of children's thinking, the research process includes not just the visible steps of study design, data collection, data analyses and write-up but also hidden yet crucial steps that have consequences throughout the workflow process. These steps include informal observations, pilot testing, decisions about inclusion and exclusion criteria and decisions about how to communicate the results. In this article, we critically evaluate the benefits and challenges of these often invisible steps, provide suggestions for determining how best to avoid potential pitfalls and encourage researchers to more transparently communicate decisions that often fall outside traditional method sections. Although we situate this discussion within the context of our specific field of inquiry, we believe that the lessons apply across a range of research endeavours. We end by suggesting that a critical look at this aspect of workflow may provide insights into some of the resistance to methodological reforms in the social sciences.

<https://royalsocietypublishing.org/rsta/article/384/2321/20240611/481926/Hidden-processes-of-workflow-in-cognitive>

---

**PLoS One****PAPERS****MIKAYLA CUTLER et al – Three-dimensional shape cues affect human and artificial recognition systems differently**

Humans and neural networks use shape and texture information differently. While humans weigh shape heavily in their ultimate classification decision, neural networks are more biased towards texture cues. Many tests of shape vs. texture bias have focused on shape recognition from an object's external contour. However, shape information is also conveyed through internal contours, shading, and attached shadows, especially when an object is viewed from noncanonical perspectives.

Using models from ShapeNet, we created datasets of 120,000 texture-substituted images of objects from many viewpoints

---

with and without shading and attached shadows. We tested humans' and several neural networks' ability to classify these objects by both their shape and their texture. Humans were much better at classifying texture-substituted objects by their shape than any network, although these differences were greater when shape was defined only by the external contour than when 3D cues were included. Our findings suggest that networks' texture bias is reduced when 3D cues are included in images. We next tested whether the inclusion of 3D cues benefitted humans and neural networks more for images of objects viewed from canonical or noncanonical perspectives. Consistent with earlier research, we found that 3D cues primarily benefitted humans for noncanonical images. For neural networks, the greatest performance gains were for canonical images. These findings suggest fundamental differences in how humans and networks use shading and attached shadows for object recognition. We argue that humans use these cues to infer objects' 3D structures while neural networks use them as another surface-level cue like texture.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0338885>

### **ANJANA WELIKALA et al – Sri Lankan maternal ancestry reveals early migrations from Africa along the Indian Ocean**

The African origin of anatomically modern humans is widely accepted. However, there is ongoing debate about the route they took and whether the early expansion into Oceania was through South Asia. Despite Sri Lanka being an island South Asian nation with the earliest known human fossils in South Asia and strategically located along a putative 'southern route', a comprehensive examination of its temporal settlement using high-resolution complete mitochondrial DNA analysis has never been conducted. To address this gap, 139 mitogenomes were sequenced in this study from the Sinhalese, Sri Lankan Tamil, and Vedda populations in Sri Lanka and integrated with 247 previously published global mitogenomes, resulting in the largest mitogenome dataset analyzed thus far. Phylogeographic analyses revealed four distinct settlement phases in Sri Lanka, with the earliest phase overlapping with the initial entry of modern humans into South Asia, thus supporting the southern dispersal route. The introduction of West Eurasian lineages into Sri Lanka was mediated via India. A significant decline in effective population size was observed across all studied populations, reflecting the demographic history of the island. Findings from the present study provide valuable insights into the long-standing debate on the southern and inland migration routes out of Africa and subsequent migrations from across Eurasia, thus highlighting the complex settlement patterns of Sri Lanka and broader Asia.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0350045>

## Proceedings of the Royal Society B

### PAPERS

### **VELDON-JAMES LAURIE et al – Persistent decision-making in mice, monkeys and humans**

Humans have the capacity to persist in behavioural policies, even in challenging environments that lack immediate reward. Persistence is the scaffold on which many higher executive functions are built. However, it remains unclear whether humans are uniquely persistent or, instead, if this capacity is widely conserved across species. To address this question, we compared humans with mice and monkeys in harmonized versions of a dynamic decision-making task. The task encouraged all species to strike a balance between persistently exploiting one policy and exploring alternative policies that could become better at any moment. Although all three species had similar strategies, we found that both primate species—humans and monkeys—were able to persist in exploitation for longer than the mice. The similarities in persistence patterns in humans and monkeys, as opposed to mice, may be related to the various ecological, neurobiological or cognitive factors that differ systematically between these species.

<https://royalsocietypublishing.org/rspb/article/293/2071/20251983/481899/Persistent-decision-making-in-mice-monkeys-and>

### **JUTTA SCHICKORE, SARA MAGALHÃES & MARIANA GÓMEZ-SCHIAVON – Harnessing complexity may strangle it: what is a well-controlled experiment?**

This article discusses a core ideal of biological experimentation, the goal of controlling as strictly as possible. We present the epistemological argument underlying the ideal of a perfectly controlled experiment. While most scientists agree that the ideal is unattainable in practice, they still uphold the pragmatic goal that one should strive to approximate the ideal as much as possible in all cases. We argue that this desire for strict control is problematic and outline an alternative understanding of control in experimentation. First, we distinguish four different ways in which real-world biological experiments can fall short of the ideal of perfect control. Then, we argue that strict control does not always yield better experimental results. Certain core features of biological systems actually suggest that strict control can be counterproductive for learning from experiments. We thus argue for 'controlling well', for striking a balance between holding variables fixed while allowing some degrees of freedom. What it means to control well cannot be specified in general terms; it is context- and purpose-dependent and needs to be determined relative to a particular experimental project.

<https://royalsocietypublishing.org/rspb/article/293/2071/20253130/481950/Harnessing-complexity-may-strangle-it-what-is-a>

## Royal Society Open Science

### PAPERS

#### **EMANUELA CAMPISI, ANITA SLONIMSKA & ASLI OZYUREK – Showing how: adults across cultures use similar representational gestural strategies in demonstrations for children**

Human communication often involves spontaneous teaching, a capacity central to cultural evolution, in which representational gestures (e.g. showing how to break an egg) play a crucial role in conveying semantic information. While representational gestures have been studied towards young children, less is known about how they differ for older children versus adults and their cross-cultural variation. We asked 16 Italian and 16 Dutch adults, likely to differ in their gesture use, to demonstrate two novel logic puzzles to 9–10-year-old children and to other adults. Results show that even though Italian participants produced more representational gestures overall than Dutch participants, neither group increased them for children compared to adults. However, across both cultures, two-handed representational gestures were more frequent in child-directed demonstrations. Within representational gestures, Italians used fewer bracketed gestures (gestures in which one hand remains on hold while the other moves) than Dutch participants for adults, possibly to support grounding of reference on previous information. However, both groups used bracketed gestures for children at similar rates. Overall, the findings reveal that even though cultures differ in their gesture use, similar strategies enhancing iconicity seem to be employed in demonstrations to children.

<https://royalsocietypublishing.org/rsos/article/13/5/251813/481936/Showing-how-adults-across-cultures-use-similar>

---

## Science Advances

### PAPERS

#### **WATARU KOYAMA et al – The cerebellum implements structured representation of valence to support adaptive behavior control**

Animals are thought to form internal models in the brain representing safety and danger, enabling avoidance through learned associations. Although the cerebellum has been implicated in active avoidance, its role in constructing internal models remains unclear. Here, we combined calcium imaging and closed-loop virtual reality in adult zebrafish to examine cerebellar circuits underlying avoidance learning. Fish learned to associate visual cues with safety or danger in a cerebellum-dependent manner using electric shocks as instructive signals. Cerebellar output neurons and Purkinje cells in the dorsal cerebellum developed cue-selective responses. Output neurons encoded both valence states, with danger-preferring cells prevalent, whereas Purkinje cells showed stronger danger bias. After cue reversal, neural selectivity adapted to the new rule. Safety- and danger-selective output neurons were spatially segregated, indicating anatomically dedicated units for valence processing. Optogenetic inhibition of shock-related inputs to Purkinje cells impaired rule updating. Together, our results indicate that the cerebellum forms an internal model of safety and danger, enabling adaptive avoidance.

<https://www.science.org/doi/10.1126/sciadv.aeb5860>

---

## Trends in Cognitive Sciences

### CORRECTIONS

#### **CÉDRIC SUEUR, RICARD SOLÉ & JEAN-LOUIS DENEUBOURG – Collective social niche construction shaping adaptive social networks**

*[Original Article: EAORC Bulletin 1,193]*

The authorship of the initial version of this article was incorrect, with Ricard Solé being omitted. The correct authorship is shown above. The authors apologise for any inconvenience this may have caused.

[https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(26\)00117-5](https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(26)00117-5)

---

## SUBSCRIBE to the EAORC Bulletin

If you would like to subscribe to this free weekly newsletter, please contact [martin.edwardes@btopenworld.com](mailto:martin.edwardes@btopenworld.com).

---

## UNSUBSCRIBE from the EAORC Bulletin

Send an email to [martin.edwardes@btopenworld.com](mailto:martin.edwardes@btopenworld.com) with the subject "EAORC unsubscribe".

---

## PRODUCED BY AND FOR THE EAORC EMAIL GROUP

EAORC is a fee-free academic internet news service and has no commercial sponsorship or other commercial interests.

EAORC website information is at <http://martinedwardes.me.uk/eaorc/>

If you have received this bulletin, and are unhappy about receiving it, please contact [martin.edwardes@btopenworld.com](mailto:martin.edwardes@btopenworld.com).

---