# EAORC BULLETIN 1,168 – 2 November 2025

## CONTENTS

# 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.

# NEWS

## NEWS FROM SCIENCE – Sumerian civilization may have been jump-started by the rise and fall of tides

Millennia before the first cities, early Mesopotamians probably harnessed tides to irrigate crops.
https://www.science.org/content/article/sumerian-civilization-may-have-been-jump-started-rise-and-fall-tides

## 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

## SCIENCEADVISER – Happy buzz: Bumblebees' optimism is contagious

You might think there's little joy in a busy bee's life. But science suggests otherwise: Not only can bumblebees become optimistic when life seems to go their way, they can spread their positive attitude to other bees, according to new research. This phenomenon, known as affective contagion, had previously been demonstrated in a variety of social animals—but only ones with bones. Meanwhile, wee bumblebees have demonstrated remarkable cognitive complexity, including different emotional states, learning by watching, and even a penchant for play. So, researchers wondered if these bees might similarly pick up on their hive members' vibes.
They trained bees to associate certain colored flowers with a food reward, then put some of them in a good mood by giving them an extra sugary treat. The bees that received this yummy bonus more readily landed on ambiguously colored flowers,

indicating they were feeling optimistic about getting a treat. But so, too, did bees that simply observed their fellow insects excitedly rushing towards these flowers.

That may be because the group benefits when many individual bees are successful at finding food. “Based on our results, we speculate that a conspecific-occupied flower may serve not only as a cue for reward location but also as an opportunity for social interaction that can result in the transfer of positive affect,” the team wrote. “This positive affect could then reduce vigilance, enabling bumble bees to exploit local rewards more efficiently.”

https://www.science.org/doi/10.1126/science.adr0216

### SCIENCENEWS – DNA reveals Neandertals traveled thousands of kilometers into Asia

DNA and stone tool comparisons suggest Eastern European Neandertals trekked 3,000 kilometers to Siberia, where they left a genetic and cultural mark.

https://www.sciencenews.org/article/dna-neandertals-traveled-asia

### THE CONVERSATION – The hardest part of creating conscious AI might be convincing ourselves it’s real

A philosopher on how and whether we’ll ever decide if AI has sentience.

https://theconversation.com/the-hardest-part-of-creating-conscious-ai-might-be-convincing-ourselves-its-real-268123

### THE CONVERSATION – Fossil hand from human relative has mix of human- and gorilla-like features

The fossils from Kenya belong to a species called Paranthropus boisei.

https://theconversation.com/fossil-hand-from-human-relative-puzzles-scientists-with-mix-of-human-and-gorilla-like-features-267871

### THE CONVERSATION – Why we used to sleep in two segments

There’s a reason you sometimes wake up in the middle of the night.

https://theconversation.com/why-we-used-to-sleep-in-two-segments-and-how-the-modern-shift-changed-our-sense-of-time-267909

### THE CONVERSATION – Were Neanderthals capable of making art?

Art has sometimes thought to be exclusive to modern humans.

https://theconversation.com/were-neanderthals-capable-of-making-art-268239

## PUBLICATIONS

### American Journal of Biological Anthropology

**PAPERS**

**HYUNWOO JUNG et al – Evaluating the Evolvability of Paranthropus Cranial Morphology in Relation to Feeding Biomechanics**

Although disagreement persists as to the precise nature of the diet of Paranthropus, there is a consensus that the food resources consumed by Paranthropus were in some way mechanically challenging to process (i.e., by being “hard” and/or “tough”). While the highly derived feeding apparatus of Paranthropus likely conferred biomechanical performance advantages while consuming certain types of foods, it may also have limited the ability of these early hominins to respond to selection and evolve rapidly toward new adaptive peaks (i.e., reduced their evolvability).

We employed viability selection modeling to test this hypothesis. Viability selection simulations were performed using Paranthropus boisei (OH 5), Australopithecus afarensis (A.L. 444-2), and Homo habilis (KNM-ER 1813) specimens. We simulated the generation-to-generation evolution of biomechanically informative linear dimensions in a population where an individual's probability of survival (i.e., viability) was determined by its distance to a predetermined adaptive peak. The number of generations required for an evolving population to reach a new adaptive peak was used as a measure of evolvability.

The results showed that the mean number of generations from P. boisei to H. habilis was larger than in the reverse direction when modeled using either chimpanzee or human estimates of population variance/covariance. It took longer for P. boisei to evolve toward Au. afarensis than in the reverse direction, but only with the chimpanzee estimates of population variance/covariance.

The results suggest that P. boisei faced limitations in cranial evolvability, particularly if selection favored a cranial morphology similar to H. habilis.

https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.70136

## Animal Behaviour

### PAPERS

**MEGAN PETERSDORF et al – Is there evidence for the Bruce effect in white-faced capuchins?**

Infanticide by males is an extreme form of sexual conflict that can increase male reproductive success at a cost to female reproductive success. Females have evolved a variety of strategies to reduce the occurrence and the cost of infanticide, including the termination of pregnancy after nontraumatic exposure to nonsire males, known as the Bruce effect. A recent model proposed that the Bruce effect will evolve in populations if the risk of infanticide is high and alpha male replacements occur routinely but infrequently relative to gestation length. We tested this model using 38 years of demographic data from a population of wild white-faced capuchins, Cebus imitator, in Sector Santa Rosa of the Área de Conservación Guanacaste, Costa Rica. We found that this population has a high rate of infanticide associated with alpha male replacements that occur every 2.9 years on average. Applying this model to our population leads to the prediction that capuchins should exhibit the Bruce effect, as the associated reproductive costs would be lower than the expected costs of future infanticide. However, we did not find evidence of any type of male-mediated prenatal loss in this species: female birth rates after alpha male replacements were not lower compared to stable periods. Possible explanations include that white-faced capuchins do not respond to extreme events with reproductive inhibition, or that other female strategies such as allonursing better mitigate the costs of infanticide. Finally, the evolution of female reproductive strategies may not be labile enough that it can be predicted from population-specific social and demographic patterns without regard to phylogenetic constraints. More studies are needed to understand the conditions that determine the occurrence and evolution of the Bruce effect in wild mammalian populations.
https://www.sciencedirect.com/science/article/pii/S000334722500243X

**REMI SAKAMOTO & TADATOSHI OGURA – Indian peafowls can count numbers: experimental evidence of numerical cognition in peafowls**

The Indian peafowl, Pavo cristatus, shows sexual dimorphism. Adult males have bright blue bodies and elaborate ornamental feathers with an eyespot pattern called trains. This morphological feature is believed to have evolved through sexual selection, and it serves as a cue for mate choice by females. However, previous research findings do not support this hypothesis, and the debate remains unresolved. To answer this question from a new perspective, the numerical cognition of Indian peafowl with regard to mate choice based on train morphology was explored in this study. Two-choice tasks with operant conditioning were used to evaluate the ability of six peafowls to discriminate visual stimuli based on the quantity of dots (1–5) while controlling for nonnumerical factors such as dot area. The subjects selected the correct quantity within the range of 1–5, which is significantly more than by chance. They relied on numerical cues for discrimination rather than nonnumerical attributes. They also compared dot quantities based on the relationship between the two stimuli (larger or smaller). Experimental results revealed that the accuracy of judgement follows Weber's law, in which discrimination accuracy decreases as the numerical ratio between stimuli decreases. These results provide evidence of numerical competence in peafowl, thereby contributing to the broader debate on the evolution of male train morphology in peafowl and highlighting the need for further studies to examine the role of numerical cognition in sexual selection and its potential sex differences.
https://www.sciencedirect.com/science/article/abs/pii/S0003347225002751

**HANCHI ZHANG et al – Long-distance, goal-directed movements in western black crested gibbons, Nomascus concolor**

Spatial memory is crucial for animals that live in complex environments and need to move efficiently between different important resources. Animals may travel in goal-directed movement patterns by remembering the location and related information of specific resources, which gives animals a number of advantages. Here, in Mount Wuliang Nature Reserve, Yunnan, China, we analysed the goal-directed movement patterns of two groups of western black crested gibbons to food, sleep and call resource places to illustrate their ability to remember information related to different important resources within their large home ranges. Gibbons were more likely to travel through goal-directed movements to food resource places associated with leaf resources, greater travel distance and fewer revisit events. As the distance to sleep resource places increased, gibbons were more likely to travel in goal-directed movements to the sleep resource places located on steep slopes, which might help to reduce the risk of being spotted and followed by predators. When adopting goal-directed movements to sleep resource places, gibbons travelled at faster speeds and with greater linearity compared to when travelling to nongoal sleep resource places. No ecological factors in our study affected goal-directed movements to call resource places. Our results showed that biologically important food and sleep resource places jointly shape goal-directed movement patterns in gibbons, reflecting the integration of long-term memories in gibbons' access to relevant important resources.
https://www.sciencedirect.com/science/article/abs/pii/S0003347225002635

**CHUN-CHIEH LIAO et al with ANDREW N. RADFORD – Functionally referential communication about danger in cooperatively breeding white-winged choughs**

Effectively communicating information about danger can enhance the antipredator benefits of group living. Many social mammals use functionally referential alarm calls to convey predator-specific information, such as predator type and threat urgency, enabling appropriate responses. However, relatively few bird species, particularly cooperative breeders, have been

subjected to experimental assessment. White-winged choughs, Corcorax melanorhamphos, are obligate cooperative breeders living in groups year-round. They have a complex yet barely studied vocal repertoire. We carried out field observations, acoustic analyses and a playback experiment to test whether chough alarm calls are functionally referential. Additionally, we explored the occurrence of a possible visual display when responding to threats. Choughs produced three different alarm calls in response to different threats: terrestrial alarm calls for ground-based predators, aerial whistles for high-flying hawks and flee alarm calls for immediate, high-urgency threats. Blind scoring of video revealed that birds responded appropriately to playbacks of alarm calls alone, typically looking around in response to terrestrial alarms, looking up to aerial whistles and fleeing to flee alarms. Furthermore, birds were much more likely to display 'bulging eyes' in response to aerial whistles compared to terrestrial alarms, suggesting that bulging eyes might be a visual signal associated with aerial threats. Our findings demonstrate that white-winged choughs, a highly social bird species, possess a functionally referential alarm call system that conveys information about the type of threat and urgency. We propose that integrating information from multiple sensory modalities in alarm communication, such as auditory and visual signals/cues, may be common in social animals and warrants further investigation.
https://www.sciencedirect.com/science/article/pii/S000334722500257X

## Evolutionary Human Sciences

### PAPERS

**GEORGE BRILL & MARK DYBLE – The fitness costs and benefits of hunter-gatherer locomotor engagement**

Bipedalism is a distinguishing feature of our species and, as such, there has been much interest in the energetic costs and foraging returns of walking and running, especially among hunter-gatherer societies. However, humans routinely exhibit extensive locomotor versatility, with hunter-gatherers consistently also swimming, diving, and climbing. Additionally, the fitness costs and benefits of locomotion extend well beyond energy income and expenditure. Here, we review evidence from over 900 ethnographic documents across a worldwide sample of more than 50 hunter-gatherer societies to examine the fitness costs and benefits of walking, running, climbing, swimming, and diving. We show that the fitness costs and benefits of locomotor engagement consistently extend well beyond energetics to include, for example, currencies of status, protection from hazards, and risks of injury or death. These fitness factors differ in significance between locomotor modalities, with implications for the comparison of bipedal and non-bipedal locomotion. For example, while energetic demands represent the major cost of most bipedal engagements, the fitness implications of potential fall injuries may outweigh those of energetics in tree climbing. These results inform existing debates relating to hominin locomotor evolution and hunter-gatherer behavioural ecology.
https://www.cambridge.org/core/journals/evolutionary-human-sciences/article/fitness-costs-and-benefits-of-huntergatherer-locomotor-engagement/CE77AE0F71199306D0C5F2CE7F73317A

## Journal of Linguistics

### REVIEWS

**ROBERT D. BORSLEY – Deconstructing syntactic theory: A critical review**

Review of 'Deconstructing syntactic theory: A critical review' by Peter W. Culicover & Giuseppe Varaschin. Oxford University Press (2025).
https://www.cambridge.org/core/journals/journal-of-linguistics/article/abs/peter-w-culicover-giuseppe-varaschin-deconstructing-syntactic-theory-a-critical-review-oxford-oxford-university-press-381-x/8A65150503DAE0F26550C1EE7C9E129E

## Mind & Language

### PAPERS

**MARK PHELAN – Attribution functionalism**

People rely on functional information when deciding which mental states to attribute to an entity. Some researchers claim that nonfunctional bodily cues also independently shape ordinary attributions of phenomenally conscious mental states—such as seeing red or feeling pain. Across two studies, I show that the key embodiment experiments systematically confound bodily cues with unbalanced inferences about function: Their "embodied" conditions embed richer functional affordances than their controls. Once this error is identified, little compelling evidence remains against extreme attribution functionalism, the view that functional information alone proximally guides attributions of both non-phenomenal and phenomenal mental states.
https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.70000

**JAY RICHARDSON – Slow switching and the psychology of memory**

This article presents elements of a theory of the representational contents of episodic memory and a new perspective on the relationship between memory and self-knowledge. These two interrelated outcomes fall out of a novel naturalistic treatment of the debate concerning the compatibility between semantic externalism and a priori self-knowledge. In particular, the article offers a response to the memory argument, which leverages the slow switching thought experiment against semantic

externalism. All parties in the debate have, so far, overlooked scientific insights into memory. This lacuna is remedied and an empirically informed defence of externalism is proposed.
https://onlinelibrary.wiley.com/doi/full/10.1111/mila.70007

## Nature Humanities & Social Sciences Communications

### PAPERS

**ANDRZEJ PORĘBSKI & JAKUB FIGURA – There is no such thing as conscious artificial intelligence**

The claim that so-called artificial intelligence (AI) can gain consciousness is on the verge of becoming mainstream. The thesis of this conceptual study is simple: There is no such thing as conscious AI. We argue that the association between consciousness and the computer algorithms used today (primarily large language models, LLMs), as well as those that would be invented in the foreseeable future, is deeply flawed. We believe that these flawed associations arise from a lack of technical knowledge and the way several new technologies (especially LLMs) work, which can create the illusion of consciousness. Moreover, we argue that the public discourse about AI is skewed by "sci-fitisation", which involves the unsubstantiated influence of fictional content on perceptions of this technology. To justify our claim, we reveal the incoherence in the argument that several computer algorithms are treated differently from other computer algorithms despite congruent modes of operation and a reliance on binary code and semiconductors. We believe that mathematical algorithms implemented on graphics cards cannot become conscious because they lack a complex biological substrate. We emphasise that the recognition of the consciousness of LLMs on the basis of their assertions is flawed because the language usage of LLMs is strictly probabilistic. Unfortunately, because the remarkable linguistic abilities of LLMs are increasingly capable of misleading people, people may attribute imaginary qualities to LLMs. Thus, a socially dangerous phenomenon referred to as "semantic pareidolia" is reinforcing.
https://www.nature.com/articles/s41599-025-05868-8

## Nature Neuroscience

### PAPERS

**JUNDA ZHU et al – Longitudinal measures of monkey brain structure and activity through adolescence predict cognitive maturation**

In humans and other primates, adolescence is associated with improvement in cognitive abilities and with changes in brain structure and connectivity. However, how these changes affect neural activity underlying cognitive performance remains unknown. Here we conducted a multilevel, longitudinal study of monkey adolescent neurocognitive development by tracking behavior, neuronal activity and anatomical imaging measures. The trajectory of prefrontal neural activity accounted well for working memory improvements. Complex aspects of activity changed progressively during adolescence, but even simpler attributes, such as baseline rate and variability, had predictive power over behavior. Trajectories of neural activity and cognitive performance were well predicted by maturation of long-distance white matter tracts linking the frontal lobe with other brain areas but, surprisingly, not by decreases in brain volume and thickness, which underlie cognitive changes in humans. Our results link white matter maturation to neural activity changes in adolescent cognitive development.
https://www.nature.com/articles/s41593-025-02076-0

## Nature NPJ Heritage Science

### PAPERS

**ANTONIA ZALBIDEA-MUÑOZ et al – Remote monitoring of rock art shelters: an innovative application in the Cultural Park of Albarracín**

The Sierra de Albarracín (Teruel, Spain) hosts notable post-Palaeolithic rock art, including the Toros del Prado del Navazo shelter. Although the Rock Art of the Mediterranean Arc is a World Heritage Site, its conservation faces environmental and human threats. Since 2013, monitoring in Aragón's cultural parks has depended on periodic on-site data collection, limiting timely analysis. The integration of Internet of Things (IoT) technology at Toros del Prado del Navazo has improved conservation by enabling continuous remote environmental monitoring. This reduces the need for physical visits, lowering annual greenhouse gas emissions by 75% (from 197.20 to 49.30 kg $CO_2$eq) and minimising data gaps from 36% with traditional dataloggers to 5.9% in this particular case. IoT-based diagnostics allow faster decision-making, enhancing the preservation of rock paintings and promoting a sustainable, integrated management model for long-term protection of cultural heritage.
https://www.nature.com/articles/s40494-025-02123-w

## Nature Scientific Reports

### PAPERS

**AKIMASA ITO et al – Gorilla knuckle-walking mechanics suggest independent evolution in African great apes**

Gorillas and chimpanzees both use knuckle-walking (KW). Whether this behavior is a homologous trait inherited from their last common ancestor or the result of convergent evolution remains debated. This study investigated the biomechanics of

gorilla KW by measuring ground reaction forces (GRFs) and comparing them with previously reported chimpanzee data. GRFs were recorded using two in-series force plates embedded in a horizontal beam in the outdoor enclosure of Kyoto City Zoo. Three adult gorillas voluntarily performed KW during normal activity, and 90 steady-state trials were analyzed. The results revealed interspecific differences: chimpanzees exhibited greater peak vertical GRFs in the hindlimbs, approximately 1.5 times those in the forelimbs, suggesting greater hindlimb weight support. In contrast, gorillas showed comparable peak GRFs in both limbs, with slightly higher values in the hindlimbs, indicating a more balanced weight distribution. Moreover, two individuals showed out-of-phase fluctuations in gravitational and kinetic energy of the center of mass, indicating an inverted pendulum mechanism and relatively efficient energy recovery. The distinct GRF patterns and apparent mechanical efficiency suggest that gorilla KW differs biomechanically from that of chimpanzees. These findings appear to be consistent with the hypothesis that KW in gorillas and chimpanzees evolved independently, which may suggest convergent evolution rather than shared ancestry.
https://www.nature.com/articles/s41598-025-21780-2

## New Scientist

### ARTICLES

**LAURA SPINNEY – How a surge in ancient plagues 5000 years ago shaped humanity**
Plague, leprosy, smallpox and other diseases didn't jump from animals to humans when we thought. Ancient DNA is revealing where they come from and how they changed history.
https://www.newscientist.com/article/2500060-how-a-surge-in-ancient-plagues-5000-years-ago-shaped-humanity/

### REVIEWS

**THOMAS LEWTON – Provocative book sets out to solve the hard problem of consciousness**
Can sea slugs form abstract thoughts? Do we dare to see any "purpose" in evolution? Is the subjective just a complicated form of the objective? Nikolay Kukushkin's One Hand Clapping is a bold voyage around the mysteries of the human mind. Review of 'One Hand Clapping' by Nikolay Kukushkin. Swift Press (UK), Prometheus Books (US) (2025).
https://www.newscientist.com/article/mg26835672-000-provocative-book-sets-out-to-solve-the-hard-problem-of-consciousness/

## Physics of Life Reviews

### PAPERS

**FRIEDEMANN PULVERMÜLLER & MICHAEL PAUEN – Making the Private Public: External Grounding In Inner States**
Recent discussions about the nature of meaning and concepts focus on abstract semantic knowledge including key information about inner states of the individual. Classic cognitive approaches anchor the meaning of words in universal concepts, semantic networks or semantic features encapsulated in the individual's own mind. However, this does not explain how symbols become interpretable during language development. Embodiment theorists acknowledge the relevance of semantic grounding of concrete referential symbols in perceptions and actions during learning, but, similar to classic cognitivism, assume internal anchoring of mental terms in introspection, thus once again implicating a main role of privileged access to 'private' inner states in language learning. This raises the basic question as to how a public language can be founded in private inner access.
Here, we argue that, in semantic learning, a purely introspection-based classification of inner states is neither possible nor required, and even less so a first-person privilege in accessing these states. Rather, classification and semantic learning of symbols for mentalistic concepts is an interactive process between the learner and an external observer who can employ contextual knowledge and behavioral information for recognizing and categorizing the learner's mental states. In support of this 'extrospective' mental grounding account, we review observations that, in case of doubt about internal states, third-person evidence can play a decisive role. We also highlight supporting empirical studies showing that individuals in whom the link between first-person experience and externally observable behavior is broken may suffer from deficits in processing and understanding the related mentalistic vocabulary.
https://www.sciencedirect.com/science/article/abs/pii/S1571064525001563

## PLoS One

### PAPERS

**LIVIU GIOSAN & REED GOODMAN – Morphodynamic Foundations of Sumer**
Economic mechanisms behind the emergence of ancient Sumer remain unavoidably speculative and should benefit from a better understanding of their environmental context. Abundance sustaining increased social complexity during the Uruk period (c. 6,000–5,200 y BP) has been traditionally ascribed to pastoralism, trade, and/or resource diversity. However, contemporary agricultural surpluses are hard to explain before adoption of large-scale irrigation systems. Here we use high-resolution satellite-based topography and paleoenvironmental proxies from a new drill core at Lagash/Tell Al Hiba, together with previous geological and archaeological data, to reconstruct the morphodynamic evolution of coastal Sumer. We propose that tidal irrigation offers a plausible jumpstarting mechanism for high-yield, diversified agriculture providing an impetus for

urbanization. As access to sea was restricted by delta build-up and tides shifted with the advancing deltaic coast, intensified reliance on mercurial river regimes eventually led to the expansive fluvial irrigation network of Early Dynastic city-states. By positioning coastal morphodynamics as a pivotal factor in urbanization and political ecology, we underscore the intricate interconnections between naturally evolving systems and collective human agency.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0329084

**SILVER MCKIE et al – Reaching internal consensus: Decision-making by transgender and plural people**
People who identify as both transgender and plural (more than one person sharing a body), including those with a diagnosis of Dissociative Identity Disorder, make decisions related to gender identity and presentation, and may engage with healthcare providers to receive gender affirming care. Internal decision-making by people experiencing plurality has not been studied extensively. Furthermore, the existing literature on plural decision-making does not address the intersection of transgender identity and the associated choices to be made about external gender expression or shared body modifications. Using a community-based participatory research design and a non-pathologizing lens, the research team interviewed 15 transgender and plural participants. Through thematic analysis, three themes were developed, describing the context of conflict, collective decision-making processes, and solutions that promoted harmony within plural systems. Plural participants were able to effectively navigate decision-making regarding harmful societal narratives about transgender identity, external gender presentation, and receiving gender-affirming medical care. Recommendations from the data serve to assist clinicians in understanding and supporting affirming, autonomous and informed decision-making by trans and plural clients.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0335714

## Science

### ARTICLES

**BRIAN HARE – Chimpanzees are natural scientists**
Humans and chimpanzees share the potential to rationally revise their beliefs
https://www.science.org/doi/10.1126/science.aeb7565

### PAPERS

**HANNA SCHLEIHAUF et al with JOSEP CALL – Chimpanzees rationally revise their beliefs**
The selective revision of beliefs in light of new evidence has been considered one of the hallmarks of human-level rationality. However, tests of this ability in other species are lacking. We examined whether and how chimpanzees (Pan troglodytes) update their initial belief about the location of a reward in response to conflicting evidence. Chimpanzees responded to counterevidence in ways predicted by a formal model of rational belief revision: They remained committed to their initial belief when the evidence supporting the alternative belief was weaker, but they revised their initial belief when the supporting evidence was stronger. Results suggest that this pattern of belief revision was guided by the explicit representation and weighing of evidence. Taken together, these findings indicate that chimpanzees metacognitively evaluate conflicting pieces of evidence within a reflective process.
https://www.science.org/doi/10.1126/science.adq5229

## Science Advances

### PAPERS

**FRANCESCO D'ERRICO et al – Evidence for symbolic use of ochre by Micoquian Neanderthals in Crimea**
Ochre use is widely regarded as a potential marker of symbolic behavior in Paleolithic societies. We conducted a multiproxy analysis of 16 ochre pieces from Middle Paleolithic Micoquian sites in Crimea [Zaskalnaya V (ZSKV), ZSKVI, and Prolom II] and mainland Ukraine (Mukhovets), spanning up to 70,000 years. Using portable x-ray fluorescence, scanning electron microscopy coupled to energy-dispersive spectroscopy, and technological analysis, we identified deliberate modifications including grinding, scoring, flaking, and scraping. Three pieces (ZSKV-05, ZSKV-06, and ZSKV-07) show features exceeding utilitarian use: One is shaped into a crayon-like tool with repeated resharpening, another appears to be a crayon fragment, and a third bears engraved, polished surfaces. These traits suggest the intentional production of marks and curated use. While practical applications (e.g., hide processing) remain plausible for other specimens, the evidence supports symbolic use among some Crimean Neanderthals. Our results highlight their cognitive complexity and underscore the importance of regional, multiproxy approaches in evaluating the emergence of symbolic material culture.
https://www.science.org/doi/10.1126/sciadv.adx4722

## Trends in Cognitive Sciences

**PAPERS**

**BRADLEY D. OHLINGER & TAKAO SASAKI – How miscommunication can improve collective performance in social insects**

Communication errors are typically viewed as detrimental, yet they can benefit collective foraging in social insects. Temnothorax ants provide a powerful model for studying how such errors arise during tandem running and how they might improve group performance under certain environmental conditions.
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(25)00280-3

**TALYA SADEH, LILACH LIEBERMAN & IAN G. DOBBINS – How do we evaluate and learn from others' memories?**

A fundamental question regarding the human mind is how we derive knowledge from others' episodic memories, to learn about things we did not experience directly. This learning is vital for understanding the world around us and guides our actions and decisions. We propose a novel framework to investigate how people learn from others' episodic memories, hypothesizing that in such learning, people take an evaluative stance to avoid acquiring misleading information. Information evaluated as more veridical will be more likely to be learned from. We review the cues used to evaluate others' memories. These cues may be conveyed and interpreted automatically (e.g., various aspects of prosody), or more deliberatively (e.g., description of recollective content, overt metacognitive claims of certainty or specificity).
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(25)00277-3

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