# EAORC BULLETIN 1,176 – 28 December 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.

## ACADEMIA.EDU – Whole-bone shape of hominoid manual proximal phalanges

*In T. Breyer (ed.), The Phenomenology of Thinking. Routledge. PREPRINT. (2015).*

**DEANNA M. GOLDSTEIN et al – Whole-bone shape of hominoid manual proximal phalanges**

Functional morphologists have long noted that skeletal adaptations in primate phalanges reflect locomotor behavior. While most studies have successfully used two-dimensional measurements to quantify general features of phalanx shape, a whole-bone three-dimensional analysis may better capture more subtle aspects of phalanx morphology that have not been quantifiable but are functionally meaningful. Here, we compare linear measurement (LM) and weighted spherical harmonic/sliding semilandmark (SPHARM-sliding) analyses of the manual third proximal phalanx (PP3) in extant hominoids (Homo, Pan, Gorilla, Pongo, Symphalangus, Hylobates; n = 292) and specimens attributed to Australopithecus afarensis (n = 2) and Homo neanderthalensis (n = 2). Morphological variation was summarized using principal component (PC) analysis. Differences between extant taxa were tested for using non-parametric MANOVAs (LM) and Procrustes distance resampling (SPHARM-sliding). Linear discriminant analyses (LDA) were performed using PC scores to assess whether the SPHARM-sliding or LM analysis better predicts group memberships of extant and fossil specimens. In both analyses, PC1 separates taxa along a locomotor gradient, and all extant genera are significantly different from one another ($p >= 0.01$) aside from Pongo versus Symphalangus in the LM analysis ($p = 0.053$). Only the SPHARM-sliding analysis found significant differences between taxa

within each genus (p >= 0.04), and differences were even significant among Gorilla subspecies (p < 0.001). LDAs indicated that accuracy, separation effectiveness, and confidence were greater for the SPHARM-sliding analysis in predicting group membership among extant specimens, as well as fossil memberships to an extant group. Overall, results demonstrate that whole-bone, high-density landmark analyses can highlight nuanced features of PP3 morphology and may serve better for making inferences about fossils.

https://www.academia.edu/144602086/Whole_bone_shape_of_hominoid_manual_proximal_phalanges

# NEWS

## NEWS FROM SCIENCE – When creating images, AI keeps remixing the same 12 stock photo clichés

In a game of visual telephone, models converge on ecstatic sports wins, romantic nights in Paris, and other cultural chestnuts.

https://www.science.org/content/article/when-creating-images-ai-keeps-remixing-same-12-stock-photo-cliches

## SCIENCEADVISER – Becoming dogs

*Evin, A et al. The emergence and diversification of dog morphology. Science 390 (2025)*

*Zhang, SJ et al. Genomic evidence for the Holocene co-dispersal of dogs and humans across Eastern Eurasia. Science 390 (2025)*

*Fuerborn, TR et al. Origin and diversity of Greenland's Qimmit revealed with genomes of ancient and modern sled dogs. Science 389 (2025)*

When I was an undergraduate, with my eyes set on becoming a researcher, I wanted to study dogs, their history, genetics, and behavior. I was told that nobody should study dogs as there was nothing interesting going on—they were just a domesticated species. Thankfully, times have changed! Today there are tons of exciting and interesting work being done to explore these topics in dogs, and other domesticated species, too. This year Science featured three different studies that advanced our understanding of how dogs started to look like dogs, and their ancient co-existence with humans.

Evin et al., studied ancient and modern dog and wolf skulls, finding that dogs had already started to diverge morphologically from wolves by the early Holocene. Though not as diverse as later Victorian breeding would lead them to be, ending in the various species we recognize today, this study clearly showed that by this time dogs had already significantly diverged, likely reflecting selection (be it human or natural) shaping them to best live with us. Along these lines, Zhang et al.and Fuerborn et al., looked at genomes of ancient dogs, in East Asia and Greenland, respectively, finding evidence of their association, and movement, with human populations. In both cases, the relationship between the dogs and people revealed not just patterns displayed in the dogs, but patterns in people indicative of where they were moving and how this movement, in turn, shaped their dogs.

Our increasing understanding of dogs not only tells us about our closest animal companion, and its history, but ourselves as well, and there is much left for us to learn.

https://www.science.org/doi/10.1126/science.adt0995
https://www.science.org/doi/10.1126/science.adu2836
https://www.science.org/doi/10.1126/science.adu1990

## SCIENCEADVISER – Three ancient humanoids once shared the same valley. Did they meet and compete?

Today, our species, Homo sapiens, is the last hominin standing on this pale blue dot. That singularity can give us a bit of a solipsistic view of our place in the span of human history. But new research is revealing that our distant forebears lived among a motley company of different types of early humans, each occupying a different niche and more than likely overlapping in time and space. Ann Gibbons's delightful story about a trio of hominins who lived roughly 2 million years ago—an early species of Homo, a species of Paranthropus and a species of Australopithecus sheds light on a crowded landscape in a site known as the Cradle of Humankind in South Africa.

All of these early hominins likely had short, hairy bodies, walked upright, and used stone and bone tools. But they diverged in fascinating ways. P. robustus, as its name suggests, was a short, squat, sturdy sort of fellow. "If you saw Paranthropus walking around, the first thing you'd notice was its enormous freaking jaws and disproportionately huge head," paleoanthropologist David Strait told Ann. A. africanus, meanwhile, was more chimplike. Both it and Paranthropus climbed trees. Then there was early Homo , with smaller jaws and molars and a flatter midface than its contemporaries, and with body proportions more similar to humans today. Scientists speculate that while each species was adaptable and munched on a variety of different foods, they specialized in certain niches, allowing all three to thrive together in a relatively small area. Finally, Ann's story highlights the care, passion and dedication that drives the researchers—some of whom were in the past rivals of a sort—to work together, hunt for, and painstakingly excavate these precious fossils. It's a story of the best of humanity, then and now.

https://www.science.org/content/article/three-ancient-human-relatives-once-shared-same-valley-did-they-meet-and-compete

## THE CONVERSATION – Is democracy always about truth? We need to loosen our views to heal divisions

In practice, most of our experiences of shared realities are not involved in truth. Think of myths, neighbourly feeling, or the sense of community.

https://theconversation.com/is-democracy-always-about-truth-why-we-may-need-to-loosen-our-views-to-heal-our-divisions-269038

# PUBLICATIONS

## American Journal of Biological Anthropology

### PAPERS

### BRITTANY N. FLORKIEWICZ, ELLIOT KEMP & MATTHEW W. CAMPBELL – Gibbon Gestures: Hylobatid Facial Signals and Insights into Language Evolution

The evolution of human language is a subject of ongoing debate. Some researchers suggest that language developed gradually from earlier forms of communication, akin to the manual gestures of great apes. Great ape manual gestures are produced intentionally and flexibly to achieve specific goals. Recent research on chimpanzees has demonstrated that they also use facial signals as gestures, raising the possibility that such facial gesturing may be present in other species. In our present study, we examined whether hylobatid facial signals also qualify as gestures.

We studied the facial signaling behavior of 20 captive hylobatids. We observed 484 facial signals spanning six types. We assessed all coded facial signals based on four key gesture properties: communicative, intentional, flexible, and goal-associated, along with their 12 related variables identified in prior research.

Our findings suggest that hylobatid facial signals may be used in a communicative and flexible manner. However, hylobatid facial signals do not meet the essential criteria for intentionality or goal association. We found statistically significant differences were observed in intentional and goal-oriented facial signaling among genera of hylobatids, with members of Hylobates being significantly more likely to exhibit variables associated with these two traits compared to Hoolock.

Our study suggests that some properties of great ape manual gesturing (and language) are present in hylobatid facial signals. However, there are numerous interpretations of our results. We therefore suggest directions for future research on the facial gesturing capabilities of hylobatids and monkeys to clarify the ambiguities our data have raised.

Our study examined whether hylobatids produce facial gestures like great apes. Our findings suggest that hylobatid facial signals are likely communicative and flexible but not intentional or goal-associated, indicating they may not qualify as gestures.

https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.70185

## iScience

### PAPERS

### LANG MARTIN et al – Intuitive and Deliberative Processes underlying Commitment Signaling for Cooperative Assortment

Whie costly signals of commitment were proposed to facilitate cooperative assortment in humans, little is known about cognitive processes facilitating the reliability of such commitment signals. Across three studies (total N = 2,223), we test whether this reliability is supported by intuitive processes or by deliberative cost-benefit evaluations. Participants played a public goods game in which they could send variously costly signals of commitment and the signaling decision was made either under time pressure or delay. Under pressure, signals separated cooperators from selfish players only when signal cost was high. However, these intuitive, high-cost signals did not consistently predict subsequent cooperation. By contrast, when participants had time to deliberate, cooperators selectively chose the low-cost signal and contributed more than selfish players. These findings suggest that reliable commitment signaling depends less on intuitive attraction to costly displays and more on deliberative cost–benefit evaluation where cooperators optimize signal cost.

https://www.cell.com/iscience/fulltext/S2589-0042(25)02810-X

### SAYORI TAKEDA et al – The basal ganglia mediate the inter-hemispheric transfer of complex tool-use skill

Motor skills learned in one hand generalize to the other hand via plastic changes in motor systems. Such "intermanual transfer" may arise during complex tool-use learning, but its neural underpinnings remain unknown. Using resting-state fMRI, we explored neurobehavioral effects occurring while right-handed participants were trained to use a novel complex tool with their left hand. Behaviorally, training improved tool-use performance equally for both hands, demonstrating a robust effect of intermanual transfer. For both hands, this behavioral effect correlated with functional connectivity changes between right dorsal premotor cortex (PMd) and intraparietal sulcus (IPS). For the untrained right hand, additional change emerged in right basal ganglia (BG), which showed increased behavior-connectivity correlation with bilateral PMd. Thus, tool-use skill learned by left-hand training is represented in the right PMd-IPS network and transferred to left PMd responsible for right-hand performance, pointing to a pivotal role of BG in generalizing complex tool-use skill across hands.

https://www.cell.com/iscience/fulltext/S2589-0042(25)02784-1

## Language and Cognition
### PAPERS

### KAJSA GULLBERG, VICTORIA JOHANSSON & ROGER JOHANSSON – Producing deceit: the influence of veracity on linguistic processes in speaking and writing

This experimental study explored how adopting a deceptive stance affects linguistic processes during real-time production of multi-sentence texts in speaking and writing. Language production involves planning, monitoring and editing – processes that give rise to and are shaped by fluctuations in processing demands. Deception is assumed to influence these processes as speakers and writers manage competing communicative goals: to be coherent while concealing the truth. Narratives were elicited by asking participants to account for events from four short films: two truthful and two deceitful, in both speaking and writing. In speaking, deception decreased the total number of pauses, but in longer deceptive texts, pausing instead increased, suggesting adaptive adjustments to regulate overt cues to lying. In writing, deception decreased text revisions and altered pause behaviour, suggesting that writers modified their production patterns when altering information. Together, these findings suggest that deceptive language production involves shifts in planning, monitoring and editing processes that manifest differently across modalities: while speech shows suppression of pauses, writing reveals subtle changes in revision and pausing behaviour. These results highlight modality-specific signatures of deception and demonstrate how speakers and writers dynamically adapt their language production processes to align with communicative intent.

https://www.cambridge.org/core/journals/language-and-cognition/article/producing-deceit-the-influence-of-veracity-on-linguistic-processes-in-speaking-and-writing/00996FEC967DADB9710C002161CD7F29

### CHLOE R. NEWBURY, PADRAIC MONAGHAN & FRANCESCA M.M. CITRON – Emotive content and sleep enhance memory for metaphorical language

Memory for emotional information is greater than for non-emotional information and is enhanced by sleep-related consolidation. Previous studies have focused on emotional arousal and valence of established stimuli, but what is the effect of sleep on newly acquired emotional information? Figurative expressions, which are pervasive in everyday communication, are often rated as higher in emotionality than their literal counterparts, but the effect of emotionality on the learning of metaphors, and the effect of sleep on newly acquired emotionally negative, positive and neutral language, is as yet poorly understood. In this study, participants were asked to memorise conventional (e.g. 'sunny disposition') and novel (e.g. 'cloudy disposition') metaphorical word pairs varying in valence, accompanied by their definitions. After a 12-hour period of sleep or wake, participants were tested on their recognition of word pairs and recall of definitions. We found higher arousal ratings were related to increased recognition and recall performance. Furthermore, sleep increased the accurate recognition of all word pairs compared to wake but also reduced the valence of word pairs. The results indicate better memory for newly acquired emotional stimuli, a benefit of sleep for memory, but also a reduction in emotional arousal as a consequence of sleep consolidation.

https://www.cambridge.org/core/journals/language-and-cognition/article/emotive-content-and-sleep-enhance-memory-for-metaphorical-language/4089541B73D777D9DDFD549BDEF3EC69

## Nature Communications Psychology
### PAPERS

### MAJA LINKE & MICHAEL RAMSCAR – Sequence structure in children's speech reveals non-linear development of relations between word categories

*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.*

Why do children learn some words earlier than others? Can children's speech patterns reveal how their evolving models of language determine what they learn? This study presents a systemic analysis of children's speech using low-dimensional embeddings to examine how the contextual knowledge reflected in their utterances reorganizes as linguistic experience increases. We analyzed age-stratified samples from the CHILDES database (18–36 months: n = 1,693,641 tokens; 3–6 years: n = 1,750,007; 5–12 years: n = 1,721,828) and adult speech from the SUBS2VEC subtitle corpus (n = 1,742,885). Our results suggest that the order and position of words in sequences produced by children from different age groups reflect changes in the way they represent categories of words. Rather than being ungrammatical, children's utterances appear to be structured by temporary grammars that optimize the distribution of information in sequences. The results point to shifts in how words are organized in semantic space, reflecting the gradual alignment of lexical categories during learning; this restructuring appears to draw on functionally ambiguous (multipurpose) categories in English. These findings are somewhat counterintuitive, as they suggest that not knowing the exact meaning of words can facilitate both learning and communication.

https://www.nature.com/articles/s44271-025-00380-w

## Nature Human Behaviour
### PAPERS

**DAWEI WANG et al – A large-scale comparison of divergent creativity in humans and large language models**

Human–machine partnerships are increasingly used to address grand societal challenges, yet knowledge of the comparative strengths of humans and machines to innovate is nascent. Here we compare the ability of humans (N = 9,198) and large language models (LLMs, N = 215,542 observations) to generate novel ideas in an established creativity task. We present three key results. First, human creativity on average is slightly higher than that of LLMs. Second, creativity differences are pronounced at the extremes of the distribution, with humans exhibiting greater variability and higher levels of creativity in the right-hand tail of the distribution. Third, attempts to increase the creativity of LLMs through instructing LLMs to take on genius personas or different demographic roles lifted performance up to a threshold beyond which the output became opposite real-life patterns, whereas strategic prompt-engineering efforts yielded mixed to negative results. We discuss the implications of our findings for human–machine collaboration and problem solving.
https://www.nature.com/articles/s41562-025-02331-1

## Nature Humanities & Social Sciences Communications
### PAPERS

**LINGXI FAN et al – Testing the simplification universal in game localization: a quantitative comparison of linguistic complexity in black myth, Sekiro, and RDR2**

*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 study explores the universal hypothesis by analyzing game localization. Specifically, we compare the linguistic complexity of three popular video games: Black Myth: Wukong (China), Sekiro: Shadows Die Twice (Japan), and Red Dead Redemption 2 (USA). Using entropy and mean dependency distance as measures of lexical and syntactic complexity, we investigate whether localized versions (L2) exhibit simplification when compared with original (L1) game texts. The results show that the localized games, Black Myth and Sekiro, demonstrate greater lexical complexity and comparable or greater syntactic complexity relative to Red Dead Redemption 2. These findings challenge the traditional simplification hypothesis in translation studies by suggesting that localization processes can lead to complexification rather than simplification. The study concludes that the multifaceted demands of localization, including cultural adaptation, technical considerations, and interactive engagement, result in unique linguistic profiles that defy expectations of universal simplification. This highlights the need for more nuanced frameworks to understand localization phenomena in the context of modern digital media.
https://www.nature.com/articles/s41599-025-06424-0

## Nature Scientific Reports
### PAPERS

**ELLIOT MURPHY et al – Merge-based syntax is mediated by distinct neurocognitive mechanisms in 84,000 individuals with language deficits across nine languages**

In the modern language sciences, the core computational operation of syntax, 'Merge', is defined as an operation that combines two linguistic units (e.g., 'brown', 'cat') to form a categorized constituent structure ('brown cat', a Noun Phrase). This structure can be further combined with additional linguistic units based on this categorial information, respecting non-associativity such that abstract grouping is preserved. Some linguists have embraced the view that Merge is an elementary, indivisible operation that emerged in a single evolutionary step. From a neurocognitive standpoint, different mental objects constructed by Merge may be supported by distinct tiers of processing demands: (1) simple command constructions (e.g., "eat apples"); (2) the merging of adjectives and nouns ("red boat"); and (3) the merging of nouns with spatial prepositions ("laptop behind the sofa"). Here, we systematically investigate participants' comprehension of sentences with increasing levels of syntactic complexity. Clustering analyses revealed behavioral evidence for three distinct structural types, which we discuss as potentially emerging at different developmental stages and subject to selective impairment. While a Merge-based syntax may have emerged suddenly in evolutionary time, responsible for the structured symbolic turn our species took, different processing tiers seem to underwrite the comprehension of various types of Merge-based objects.
https://www.nature.com/articles/s41598-025-28008-3

**MARIANA NABAIS et al with DAVID GONÇALVES – Experimental analysis of roasted and raw turtle butchery and implications for early human cognition and behaviour**

*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.*

Chelonid exploitation – including tortoises and freshwater turtles – has been increasingly recognised as a significant element of Palaeolithic subsistence in the Mediterranean and Iberian Peninsula. This study offers an experimental assessment of fire's role in processing these reptiles, contrasting raw and roasted specimens to evaluate impacts on butchery efficiency, surface

modifications, skeletal representation and lithic use-wear. The roasting process markedly reduced disarticulation effort and time, irrespective of the operator's experience. Cut marks and percussion traces were more frequent in raw-processed individuals, while burnt specimens displayed extensive thermal damage, particularly on carapace plates. However, Fourier-Transform Infrared Spectroscopy (FTIR) revealed limited diagnostic potential for low-intensity thermal exposure. Conversely, lithic tools used in processing exhibited macroscopic edge damage and minor polishes, paralleling wear patterns documented in the butchery of other small fauna. These results align with archaeological evidence from multiple Iberian and Mediterranean sites, suggesting a culturally structured practice of in-shell roasting and anatomical disarticulation. The finds highlight fire's role in labour optimisation and knowledge transmission, supporting broader discussions on small game exploitation and cognitive planning in early human behaviour.
https://www.nature.com/articles/s41598-025-31738-z

# Neuron

## PAPERS

### JINSU LEE & MICHAEL A. WHEELER – Immune-brain plasticity underpins stress and affective behaviors

The lifetime prevalence of mood disorders such as major depressive disorder (MDD) is thought to approach up to 50% of the world's population. Traditionally, research into the mechanisms of these disorders has focused on neurotransmission, but emerging evidence highlights neuroimmune interactions—the molecular signaling between immune and brain cells—as key regulators of brain plasticity, affective behavior, and potential vulnerability to mood disorders. Chronic stress models have unearthed how immune cell responses modify neural circuit activity, synaptic connectivity, and behaviors relevant for mood disorders by acting on brain-resident cell types. This perspective synthesizes basic principles of neuroimmune communication derived from animal studies relevant for mood disorders and assesses their relevance in MDD and post-traumatic stress disorder (PTSD). We describe cellular neuroimmune interactions important for behavior as well as the molecular mechanisms that govern immune-brain plasticity across different cell types. We also explore how therapeutic interventions, including anti-inflammatory biologics and psychedelics, can target these pathways. Finally, we chart how the field could dissect neuroimmune interactions across biological scales in the near future by highlighting the conceptual frontiers and emerging technologies. Understanding the modulation of neuroimmune interactions promises to inform next-generation treatments for mood disorders.
https://www.cell.com/neuron/abstract/S0896-6273(25)00893-1

# New Scientist

## NEWS

### Killer whales and dolphins are 'being friends' to hunt salmon together

White-sided dolphins seem to help killer whales "scout" and catch Chinook salmon near Vancouver Island, then eat the leftovers.
https://www.newscientist.com/article/2508338-killer-whales-and-dolphins-are-being-friends-to-hunt-salmon-together/

## ARTICLES

### ALEX WILKINS – Ancient rock art revealed in all its glory in stunning photographs

Images capture the remarkable variety of petroglyphs etched into rock across a wide swathe of land, from Mongolia to the Sahara
https://www.newscientist.com/article/mg26835752-000-ancient-rock-art-revealed-in-all-its-glory-in-stunning-photographs/

### ROWAN HOOPER – Bill Bryson on why he has updated A Short History of Nearly Everything

With the human family tree now more like a hedge and twice as many known moons, Bill Bryson talks to the New Scientist podcast about refreshing his 2003 bestselling book on science.
https://www.newscientist.com/article/mg26835752-100-bill-bryson-on-why-he-has-updated-a-short-history-of-nearly-everything/

## REVIEWS

### MICHAEL MARSHALL – Can a new book crack one of neuroscience's hardest problems? Not quite

The ideas presented in George Lakoff and Srini Narayanan's The Neural Mind are fascinating, but the writing is far less compelling.
Review of 'The Neural Mind: How brains think' by George Lakoff & Srini Narayanan, University of Chicago Press (2025).
https://www.newscientist.com/article/mg26835750-100-can-a-new-book-crack-one-of-neurosciences-hardest-problems-not-quite/

### ELLE HUNT – Why do we feel the need to humanise everything, from dogs to cars?

Our tendency to anthropomorphise our pets and possessions reveals the baggage we bring to our relationship with the natural world.

Review of 'Human-ish: How Anthropomorphism Makes Us Smart, Weird and Delusional' by Justin Gregg, One World (2025).
https://www.newscientist.com/article/mg26835752-200-why-do-we-feel-the-need-to-humanise-everything-from-dogs-to-cars/

## PLoS One
### PAPERS

### BASRAN BURHAN et mul – A near-continuous archaeological record of Pleistocene human occupation at Leang Bulu Bettue, Sulawesi, Indonesia

Prior research has indicated that the Indonesian island of Sulawesi was host to archaic hominins of unknown taxonomic affinity from at least 1.04 million years ago (Ma), while members of our own species (Homo sapiens) were probably established on this Wallacean landmass from at least 51.2 thousand years ago (ka), and possibly as early as 65 ka. Despite this, the paucity of well-dated Pleistocene archaeological sites from Sulawesi means that very little has been known about the pattern and timing of early human occupation of the island, including whether there is any evidence for overlap between archaic hominins and modern humans, and when and how the former went extinct. Here, we report the results of multiple seasons of deep-trench excavations at Leang Bulu Bettue, a limestone cave rock-shelter complex in the Maros-Pangkep karst region of South Sulawesi. Leang Bulu Bettue is the only site presently known on the island with an archaeological record ranging in age from the Middle to Late Pleistocene to late Holocene periods. Investigations at this site since 2013 have revealed an extensive sequence of stratified deposits down to a depth of about 8 m below the surface. Notably, there is evidence for animal butchery and stone artefact production including a stone 'pick' at around 132.3–208.4 ka followed by a major shift in human cultural activity during the Late Pleistocene. By around 40 ka, an earlier occupation phase (Phase I) characterised by a straightforward cobble-based core and flake technology and faunal assemblages dominated by extant dwarf bovids (Bubalus sp., anoas), but including now-extinct proboscideans, had been replaced by an entirely new occupation phase (Phase II) with a markedly distinct archaeological signature, including the first evidence for artistic expression and symbolic culture. We consider the implications of this behavioural disconformity for our understanding of the history of humans on Sulawesi, including the possibility it reflects the replacement of archaic hominins by modern humans.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0337993

### KURUSETTI VINAY GUPTA et al – Self-reflection, sense of agency, and underlying neural correlates: A pilot study

The sense of agency refers to the feeling of controlling one's actions to influence the outside world. The association between an individual's sense of agency and their psychological or behavioral characteristics has been extensively studied in recent years. However, the direct impact of self-reflection, a key strategy for modulating one's cognitive state, on implicit measures of agency remains largely unexplored. We employed a between-subjects experimental design, to investigate the effect of two types of self-reflection - self-centered and selfless upon the implicit sense of agency. Additionally, we explored neural activity during self-reflection to see if there are any correlations with the sense of agency. Agency was measured using intentional time binding experiments, assessing the ability to perceive event sequences over time. Results indicated that self-centered reflection enhances time binding and agency, while selfless reflection has the opposite effect. Traditional spectral density measures and topological data analysis revealed distinct neural patterns for each type of reflection. Specifically, selfless reflection showed increased Hodge spectral entropy and persistent entropy compared to self-centered and control groups, indicating greater topological complexity in EEG time series. A significant negative correlation between second-order Hodge spectral entropy and time binding effect was observed. The study provided initial evidence that topological EEG features could serve as potential neural markers of the sense of agency modulated through self-reflection.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0335276

## PNAS
### ARTICLES

### DEANNA M. KAPLAN, ROMAN PALITSKY & CHARLES L. RAISON – The "machinal bypass" and how we're using AI to avoid ourselves

This past summer, we—a psychiatrist and two clinical psychologists—found ourselves sitting in a scientific meeting with a looming sense of dread. We were with some of the world's most accomplished scientists and mental health clinicians, and the conversation had turned to the question that has come to feel inevitable: How can artificial intelligence (AI) systems efficiently solve the mental health problems that brought us together? Someone argued that human-delivered mental health services are becoming obsolete. Another suggested that only AI-driven research initiatives are worth funding moving forward. We were surprised by how willing some were to outsource the most nuanced, sensitive, and relational aspects of our work to chatbots. As psychological scientists, we also wondered why. This was the moment we found ourselves reaching for a term we've come to call "machinal bypass"—the use of generative AI not just to support human innovation or connection, but to sidestep it altogether.
https://www.pnas.org/doi/full/10.1073/pnas.2518999122

**ALEXANDER D'AMOUR – Advancing evaluation of AI systems when humans make the decisions**

AI systems have become increasingly flexible, making it feasible to integrate them into a wide range of human decision-making processes, from criminal justice, healthcare, and financial services to personal administrative tasks. As a result, questions about how AI systems can improve or automate human decision-making are on the rise. These decisions can have high stakes, which makes careful evaluation of new AI-assisted or automated systems essential. However, these stakes also complicate evaluation: How can we evaluate unproven AI systems in domains where we currently only trust humans to make decisions?

https://www.pnas.org/doi/full/10.1073/pnas.2523997122

## PAPERS

**KATHRYN A. LORD et al – A universally applicable definition for domestication**

The process of domestication is commonly perceived as a human achievement, and domestic species are typically assumed to be those under human control. Domestic species have emerged from a greater diversity of interactions than this perspective allows, and none of the many definitions proposed for domestication can readily, reliably, and consistently distinguish domestic and nondomestic populations. Here, we propose that the process of domestication should instead be defined solely as evolution of a nonhuman population in response to an anthropogenic niche and that a domestic population is one that cannot sustain itself outside of an anthropogenic niche. As a result, this definition does not require comparisons with a presumed and largely unobservable ancestor. Instead, it focuses on the observable relationship between a nonhuman population and humans. It also avoids making assumptions about how domestication happens, thus enabling an exploration of the mechanisms underlying the process of adaptation to an anthropogenic niche. By applying this definition to plants, animals, and microbes, we illustrate its utility for investigating the evolution of the relationship between humans and other species and for anticipating which species are likely to survive in an increasingly human-influenced world. Domestication is simply an evolutionary process resulting from the interaction between two species, one of which is human. As we work to protect Earth's biodiversity, this definition allows us to understand why, in response to the conditions human societies create, some species survive and thrive, while others struggle and go extinct.

https://www.pnas.org/doi/10.1073/pnas.2413207122

## COMMENTARIES

**PATRICK L. KOHL – Domestication is adaptive evolution in response to human use**

According to a new definition of domestication, bed bugs and house sparrows are domesticated, whereas racing horses and broiler chickens are not. Lord et al. suggest that domesticated populations are reliably distinguished from nondomesticated populations solely based on their current relationships with humans. Specifically, populations should be considered domesticated if they are obligately synanthropic (i.e., only exist within an anthropogenic niche) and self-sustaining.

While this radically new view seems liberating, it contradicts the basic consensus that domestication is a special case of evolution. In fact, according to their view, populations could switch from "human-tolerant" to "obligate synanthrope" and thus become "domestic" solely based on environmental, rather than evolutionary, change. As Lord et al. review, house cats (Felis catus) are obligate synanthropes in Europe. However, they thrive as wild populations in natural habitats when introduced to Australia, where they have no competitors and find abundant prey. Factual switches along the (ecological) synanthrope spectrum can also be realized by alterations of the original habitat. For example, populations that tolerate human disturbance can become obligate synanthropes simply because humans destroy natural landscapes (consider cavity-nesting species that depend on artificial nest boxes after the loss of pristine forests). Lord et al. contradict themselves when appreciating the possibility of "domestication through […] changes in environment," while at the same time implying that domestic populations depend on their anthropogenic niches for evolutionary reasons.

https://www.pnas.org/doi/full/10.1073/pnas.2518220122

**KATHRYN A. LORD et al – Reply to Kohl: Moving beyond the 19th-century view of domestication**

We recently provided a new definition for domestication as "the process in which nonhuman populations adapt to an environment created through human activity". It brings domestication fully into an evolutionary framework, obviates the need for assumptions about how domestication occurred, and can be applied equally to plants, animals, and microbes.

In response, Kohl argues that our definition does not recognize domestication as a "special case of evolution." However, as we describe in our article, extensive literature demonstrates that under modern evolutionary theory, domestication is not a special case of evolution, contrary to views held by many scientists in the 19th and early 20th centuries. Our observation that a population can change its relationship to the anthropogenic niche as a result of environmental shifts is fully consistent with this framework. As R. A. Fisher noted in The Genetical Theory of Natural Selection, "fitness may be increased or decreased by changes in the environment." Because evolution by natural selection proceeds through changes in fitness, alterations in the environment, like genetic change, are integral components of the evolutionary process.

https://www.pnas.org/doi/full/10.1073/pnas.2526445122

## Proceedings of the Prehistoric Society
### PAPERS

**LAURA SOPHIE BASELL & MERRICK POSNANSKY – Excavations at the Stone Age Site of Nyabusora in the western Lake Victoria-Nyanza Basin, Tanzania**

This paper presents excavation results from Nyabusora, northern Tanzania, conducted by M. Posnansky and W.W. Bishop (1959) and M. Posnansky (1961). Only preliminary reports have previously been published. It synthesises the site's history, incorporating previously unpublished analyses and information from Posnansky's original field notes, and presents new 2014 field survey results and new archival research. Nyabusora holds particular significance as the only Early to Middle Stone Age (ESA/MSA) site in the region to have yielded both lithic and faunal remains, which gain new relevance in light of recent developments in ESA/MSA archaeology in eastern Africa. Nyabusora's 'Sangoan' lithic assemblage is now largely decontextualised and associated finds have been lost, so this study presents the only available lithic and faunal analyses, alongside interpretations of the stratigraphic sequence and site. Such stratified assemblages are exceptionally rare and are generally attributed to the Middle Pleistocene. This research enhances understanding of Plio-Pleistocene landscape evolution in the Kagera River and western Lake Victoria-Nyanza Basin. It contributes important new data on ESA/MSA lithic variability and, via ongoing investigations by Basell within the Kagera catchment, offers huge potential for clarifying Middle Pleistocene palaeoenvironments.
https://www.cambridge.org/core/journals/proceedings-of-the-prehistoric-society/article/excavations-at-the-stone-age-site-of-nyabusora-in-the-western-lake-victorianyanza-basin-tanzania/E91436C245066E97AF86A44B15A7F03C

## Science
### PAPERS

**ARNE GÜLLICH et al – Recent discoveries on the acquisition of the highest levels of human performance**

Scientists have long debated the origins of exceptional human achievements. This literature review summarizes recent evidence from multiple domains on the acquisition of world-class performance. We review published papers and synthesize developmental patterns of international top scientists, musicians, athletes, and chess players. The available evidence is highly consistent across domains: (i) Young exceptional performers and later adult world-class performers are largely two discrete populations over time. (ii) Early (e.g., youth) exceptional performance is associated with extensive discipline-specific practice, little or no multidisciplinary practice, and fast early progress. (iii) By contrast, adult world-class performance is associated with limited discipline-specific practice, increased multidisciplinary practice, and gradual early progress. These discoveries advance understanding of the development of the highest echelons of human achievement.
https://www.science.org/doi/10.1126/science.adt7790

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