EAORC BULLETIN 1,188 – 22 March 2026

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 – Evidence for Septarian Numbers and Measures along the Atlantic Façade

Roslyn M. Frank (2026).

ROSLYN M. FRANK – Evidence for Septarian Numbers and Measures along the Atlantic Façade: Reassessing Commonalities in Basque and Celtic Metrological Landscape Inhabitation Traditions

Until now the pre-decimal metric units of linear measure employed traditionally in the Basque Country have not been compared to similar ones documented along the Atlantic façade, most particularly in former and current Celtic-speaking zones. These base units are distinctive in that they are septenary in nature, consisting of units of seven and multiples of it. In this brief study several of the remarkable correspondences that characterize these traditional linear measures are discussed. First, we briefly explore their use in laying out land holdings in the Basque Country, circular sites called saroiak and then move on to examine the base-twenty counting system that is an intrinsic element of Euskara (the Basque language). Remarkably, elements from this vigesimal counting system are encountered across the Atlantic façade. And as will be suggested, these elements may derive from what is the same much older shared ethnocultural and metrological substrate. The implications that can be drawn from the wide geographical reach of the system are significant. The fact that evidence for the use of these septenary units is encountered not only in Euskal Herria but also all along the Atlantic façade calls for an explanation and a revision of how we currently view the Basque language and culture themselves. The ethnomathematical evidence presented in this study contradicts the traditional view, the one that portrays the Basque language is an isolate and consequently states that it should have no connections to the equally unique septenary counting and metrological practices found outside the geographic zone in which the Basque language is spoken today. The presence of this shared evidence throughout the Atlantic façade also raises questions concerning the time-depth that should be assigned to the septenary system itself.

{Hence the French eighty (quatre-vingts) versus the Belgian and Swiss eighty (huitante)?}

https://www.academia.edu/165204938/Evidence_for_Septarian_Numbers_and_Measures_along_the_Atlantic_Fa%C3%A7ade_Reassessing_Commonalities_in_Basque_and_Celtic_Metrological_Landscape_Inhabitation_Traditions

ACADEMIA.EDU – What I thought about Neanderthals then vs. what I think now (and why)

paper for the 2026 Gibraltar CALPE Conference on Neanderthals (2026).

JOHN J. SHEA – Now, then: What I thought about Neanderthals then vs. what I think now (and why)

I used to think Neanderthals became extinct because humans killed them. Now I think they froze and starved to death.

https://www.academia.edu/165212773/Now_then_What_I_thought_about_Neanderthals_then_vs_what_I_think_now_and_why

NEWS

NATURE BRIEFING – The case for pre-Clovis Americans

An archeological site that overturned the history of humans in South America might just do it again. Radiocarbon dating pegged artefacts from Monte Verde, in southern Chile, at 14,500 years old — suggesting that people arrived along the continent's coast, before the 'Clovis people' travelled through an ice-free corridor in North America. Not so, says a new study: those artefacts were mis-dated and originated no more than 8,200 years ago. "This is going to cause a furor in the field," says retired archaeologist Stuart Fiedel, a critic of pre-Clovis sites, including Monte Verde. "There's going to be a fight."

https://www.science.org/content/article/debate-explodes-over-age-key-south-american-archaeological-site

NATURE BRIEFING – Know your tech bros

In Gilded Rage, journalist Jacob Silverman describes how some of the United States' wealthiest men, who have enriched themselves during the technology boom of the past 20 years, are branding themselves as ideological 'rage pundits'. "Silverman shows how some of the world's most powerful figures have recast themselves as the most aggrieved," writes reviewer Ramesh Srinivasan, the founder and director of the Digital Cultures Lab at the University of California, Los Angeles. "Amid this spectacle, Silverman identifies a broader bait and switch" in which hostility to 'big government' and the undermining of democracy relies on public contracts, subsidies, regulatory advantages and taxpayer support.

https://www.nature.com/articles/d41586-026-00840-1

SCIENCEADVISER – Ravens and wolves

In Norse mythology, the god Odin sent two ravens named Huginn and Muninn—Thought and Memory—across the world each morning to gather intelligence while accompanied by his wolves. And according to new research published in Science, there may be some truth to this ancient tale: Rather than shadowing wolf packs to fresh kills, ravens rely on spatial memory to navigate toward landscapes where wolves are most likely to hunt.

The study overturns a widely held assumption about how scavengers find food. Ravens are a constant presence at Yellowstone wolf kills, sometimes arriving before the pack has even finished feeding. Rangers, naturalists, and wildlife documentarians have long concluded that the birds must be following the wolves. But nobody had ever tracked both species simultaneously across a landscape for long enough to know.

https://www.science.org/doi/10.1126/science.adz9467

SCIENCEADVISER – Music to our ears

Charles Darwin once declared that birds, which he described as "the most aesthetic of all animals" besides humans, have "nearly the same taste for the beautiful as we have." Indeed, many of the signals animals use to attract mates—from the peacock's dazzling tail to the humpback whale's song—also delight humans. Now, a new study suggests our acoustic preferences overlap with a range of other species, lending additional support to Darwin's hypothesis.

Researchers gathered 110 pairs of sounds produced by 16 nonhuman animal species—spanning insects, frogs, birds, and mammals—and played them for more than 4000 human study participants, who were asked to rate which of the two sounds they liked more. In general, human preferences for animal sounds lined up with what the animals themselves found attractive, and the agreement was higher when the animals had stronger preferences. While the team didn't find any significant difference between humans with experience identifying animal sounds, such as birders, and nonexperts, people who spent more time listening to music tended to agree more with animals. Humans and animals alike also preferred sounds with acoustic adornments, such as trills and clicks.

"Taken together, these results confirm that a single species can harbor similar preferences to a taxonomically broad range of species," the study authors explained. The findings also serve as a reminder, they added, "that much of the beauty we find in nature was intended for receivers other than ourselves."

https://www.science.org/doi/10.1126/science.aea1202

THE CONVERSATION – Human vision: what we actually see – and don't see – tells us about consciousness

The information your eyes takes in is only half the story.

https://theconversation.com/human-vision-what-we-actually-see-and-dont-see-tells-us-a-lot-about-consciousness-276310

PUBLICATIONS

Academia Mental Health and Well-Being

PAPERS

WANYING SUN & WEN LIU – Children's group altruistic preferences: the moderating effect of self-esteem and left-behind status

The altruistic behavior of left-behind children, a vulnerable population, plays a crucial role in their moral and social development, yet it remains understudied. This study investigated how group identity influences altruistic behavior in children, examining the moderating roles of left-behind status and self-esteem.

A total of 660 children aged 7–12 participated in an adapted dictator game measuring sticker donations to in-group and out-group members, alongside completing a self-esteem scale.

The results demonstrated significant in-group favoritism in altruistic giving. Altruistic behavior increased with age, with a steeper developmental trajectory observed for in-group targets. Critically, both left-behind status and self-esteem independently moderated the relationship between group identity and altruism. Further analysis revealed a significant interaction between these two moderators, supporting a dual moderation model: the moderating strength of self-esteem on the group identity–altruism link varied markedly according to left-behind status. This synergistic effect indicates that the influence of self-esteem on group-based altruism is contingent upon a child's left-behind status.

These findings highlight left-behind status and self-esteem as critical, interacting determinants of children's differential altruism towards social groups, offering new insights into the social development of this population. A key limitation is the cross-sectional design, which precludes causal inferences.

https://www.academia.edu/2997-9196/3/1/10.20935/MHealthWellB8206

Cell Reports

PAPERS

TOBIAS MACHTS & ANDREAS NIEDER – Coordinated parieto-frontal neuronal communication is critical for abstract quantity judgments in primates

Accurate numerical cognition relies on representing and comparing quantities, a fundamental skill for adaptive behavior. In nonhuman primates, the parieto-frontal network, including the ventral intraparietal area (VIP) and prefrontal cortex (PFC), supports this process, but the functional dynamics and directionality of communication between these regions remain unclear. We examine population-level interactions of simultaneously recorded neuronal activity between VIP and PFC in two male macaques performing a numerosity task. Using time-lagged canonical correlation analyses, we show that correct trials exhibit sustained correlations driven by numerosity-selective neurons, with early feedforward dominance from VIP to PFC following sample onset. By contrast, error trials show weaker correlations, reduced VIP-to-PFC feedforward signaling, and transient breakdowns during the late working memory period. These findings show that coordinated parieto-frontal population activity enables accurate numerical judgments, whereas disrupted interactions impair performance, highlighting the critical role of dynamic, task-dependent interareal communication in categorical decisions.
https://www.cell.com/cell-reports/fulltext/S2211-1247(26)00225-1

eLife

PAPERS

INÉS SCHÖNMANN et al – Stimulus dependencies—rather than next-word prediction—can explain pre-onset brain encoding in naturalistic listening designs

The human brain is thought to constantly predict future words during language processing. Recently, a new approach emerged that aims to capture neural prediction directly by using vector representations of words (embeddings) to predict brain activity prior to word onset. Two findings have been proposed as hallmarks of neural next-word prediction: (i) significant encoding prior to word onset and (ii) its modulation by word predictability. However, natural language is rife with temporal correlations, where upcoming words share statistical information with preceding ones. This raises a critical question: do these these hallmarks emerge from the brain actively predicting future content, or might they be equally well explained by the regression model exploiting these inherent stimulus dependencies? To distinguish between these alternatives, we applied the same encoding analysis to passive control systems, i.e., representational systems that encode the stimulus but cannot predict upcoming words. We show that both hallmarks emerge in two such control systems, namely in word embeddings themselves and in speech acoustics. We further show that proposed methods to correct for these dependencies are insufficient, as the effects persist even after such corrections. Together, these results suggests that pre-onset prediction of brain activity might reflect dependencies in natural language rather than predictive computations. This questions the extent to which this new encoding-based method can be used to study prediction in the brain.
https://elifesciences.org/reviewed-preprints/106543

ARTHUR PRAT-CARRABIN & MICHAEL WOODFORD – Endogenous Precision of the Number Sense

The behavioral variability in psychophysical experiments and the stochasticity of sensory neurons have revealed the inherent imprecision in the brain's representations of environmental variables. Numerosity studies yield similar results, pointing to an imprecise 'number sense' in the brain. If the imprecision in representations reflects an optimal allocation of limited cognitive resources, as suggested by efficient-coding models, then it should depend on the context in which representations are elicited. Through an estimation task and a discrimination task, both involving numerosities, we show that the scale of subjects' imprecision increases, but sublinearly, with the width of the prior distribution from which numbers are sampled. This sublinear relation is notably different in the two tasks. The double dependence of the imprecision — both on the prior and on the task — is consistent with the optimization of a tradeoff between the expected reward, different for each task, and a resource cost of the encoding neurons' activity. Comparing the two tasks allows us to clarify the form of the resource constraint. Our results suggest that perceptual noise is endogenously determined, and that the precision of percepts varies both with the context in which they are elicited, and with the observer's objective.
https://elifesciences.org/reviewed-preprints/101277

Frontiers in Language Sciences

PAPERS

MELISSA TROYER & KARA D. FEDERMEIER – Shifting expectations: when knowledge-based predictions and linguistic context collide

To cope with the demands of language comprehension, young adults often actively engage in prediction of upcoming information—which may be more or less successful depending on each individual's specific knowledge. However, limited research has directly investigated the link between existing knowledge and real-time mechanisms of prediction. Here, we focus on a specific knowledge domain, the fictional world of Harry Potter (HP). Participants with varying degrees of HP knowledge read sentences about general topics and then about HP, each containing a predictable, unexpected-but-plausible, or implausible critical word, while we recorded event-related brain potentials. As expected, HP knowledge modulated N400

amplitudes (an ERP known to index availability of word meaning) to predictable words in HP sentences. HP knowledge also modulated late frontal positivities (LFPs; associated with shifting meaning interpretation upon encountering prediction violations) to unexpected-but-plausible words. The extent to which domain knowledge modulated both N400s and LFPs to unexpected-but-plausible continuations depended on how generally well-known the content in the sentence was. High-knowledge individuals showed reduced initial facilitation (i.e., larger N400 amplitudes) for unexpected-but-plausible words when the sentence contents were generally well-known (compared to less well-known), suggesting that they used their domain knowledge to "override" a more generic interpretation. They additionally showed a greater frontal positivity when sentence contents were less (compared to more) well known, suggesting a willingness to consider alternate interpretations when knowledge is weaker and/or more uncertain—but less so when knowledge is strong. We conclude that possessing relevant knowledge may shape predictive processes during language comprehension, suggesting people may shift their "mode" of language processing depending on existing knowledge and comprehension demands.
https://www.frontiersin.org/journals/language-sciences/articles/10.3389/flang.2026.1768590/full

Frontiers in Psychology

PAPERS

INGEBORG VAN DEN BOLD, SANNEKE DE HAAN & JENNY SLATMAN – Language-games in live mindfulness-based stress reduction: a philosophy of language analysis of participant-trainer dialogue

It is important to explore how words are given to body awareness in Mindfulness-Based Stress Reduction (MBSR), as this impacts health and illness, while the literature on this topic is scarce. This study is the first to explore the learning process of enhancing one's body awareness live in MBSR sessions through a philosophy of language lens. It is the first known application of Wittgenstein and Austin to full-course, live MBSR dialogue, and it analyzes language-games and all three speech acts in context. This is a suitable approach, as these philosophers focus on how language is used in real-life conversations.
We analyzed the full transcript of a complete MBSR training with interpretative phenomenological analysis.
The results indicate that verbalizing body awareness was difficult for MBSR participants. Participants talked about emotions or they made rational judgments, while they found it hard to express what bodily sensations they felt. We suggest, using Wittgenstein's concept of "language-games," that in this case study, learning to verbalize one's body awareness can be understood as learning a language-game of "reporting sense perceptions." Referring to Austin's concept, our findings also show what type of "speech acts" are done in MBSR.
The results of this study align with insights on emotion regulation therapy. The first step in these therapies is learning to feel bodily sensations instead of making rational judgments. In conclusion, we suggest that our results contribute to the scientific debate on the relation between language and body awareness. We also hypothesize the implications for the widespread use of mindfulness apps and recorded versions of the body scan, that both lack the feedback of the living trainer-participant dialogue.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2026.1660807/full

Frontiers in Virtual Reality

CORRECTIONS

SAMANTHA B. LORENZO & LEILA OKAHATA – Correction: Empathy in action: cultivating altruism through immersive game experiences

The title of the games referenced were erronously [sic] given as the company name. "Journey" was incorrectly given as "Game Company"; "Never Alone" was incorrectly given as "Upper One Games"; and "Papers, Please" was incorrectly given as "LLC".
A correction has been made to the section 1 Introduction, Paragraph 1:
"Digital games have increasingly been recognized as tools for promoting social learning and moral engagement. Prosocial games, which emphasize cooperation, helping, and moral decision-making, have been shown to foster empathy, altruism, and teamwork (Gentile et al., 2009; Greitemeyer and Osswald, 2010). Immersive games, in particular, have been integral to studying social and psychological interactions. In this current study, the term immersive games is used to describe digital games whose design features aim to generate a robust sense of presence and foster deeper involvement within a virtual world, resulting in detachment from physical reality (Han et al., 2023; Jennett et al., 2008; Pine and Gilmore, 2001). For example, games such as Journey (thatgamecompany, 2012) encourage nonverbal cooperation (du Bois, 2022); Never Alone (Upper One Games, 2014) fosters understanding while reinforcing the importance of community through cultural exploration (Evren, 2025); and Papers, Please (Pope, 2013) challenges players with moral dilemmas that balance loyalty and empathy (Cabellos et al., 2022)."
The original article has been updated.
Original article: https://www.frontiersin.org/journals/virtual-reality/articles/10.3389/frvir.2025.1716138/full
[EAORC Bulletin 1,179 – 18 January 2026.]
https://www.frontiersin.org/journals/virtual-reality/articles/10.3389/frvir.2026.1810187/full

iScience

PAPERS

KOKI MIMURA et al – Altered kinship vocal dynamics in marmosets with valproic acid–induced model of autism

Autism spectrum disorder (ASD) involves social communication impairments and repetitive behaviors. Language abnormalities in ASD, such as echolalia and idiosyncratic speech, heighten caregiver stress and affect communication dynamics within the kinship system. However, the influence of ASD-related traits on family-level interactions remains poorly understood in animal models. Here, we established an ASD model in common marmoset via prenatal valproic acid (VPA) exposure, and analyzed 28,418 kinship vocalizations from VPA-exposed and unexposed (UE) pups with their parents. VPA families exhibited increased isolation calls, decreased affiliative calls, disrupted repetition patterns, and reduced developmental maturations. These alternations intensified after weaning and correlated with parental weight loss, suggesting heightened caregiver stress. VPA pups also displayed premature locomotion independence, indicating broader social disruptions. Our findings highlight VPA marmosets as valuable models for investigating ASD-like traits at both individual and kinship-level, with kinship vocalizations serving as potential non-invasive biomarkers of ASD-related communication impairments and family stress.
https://www.cell.com/iscience/fulltext/S2589-0042(26)00794-7

Nature Communications Biology

PAPERS

FILIZ TEZCAN et al – Linguistic structure and language familiarity sharpen phoneme encoding in the brain

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.
How does the brain turn a physical signal like speech into meaning? It draws on two key sources: linguistic structure (e.g., phonemes, syntax) and statistical regularities from experience. Yet how these jointly shape neural representations of language remains unclear. We used MEG to track phonemic and acoustic encoding during spoken language comprehension in native Dutch, Mandarin-Chinese, and Turkish speakers. Phoneme-level encoding is stronger during sentence comprehension than in word lists, and more robust within words than random syllables. Surprisingly, similar encoding emerges even in an uncomprehended language but only with prior exposure. In contrast, acoustic edges are briefly suppressed early in comprehension. This suggests that the brain's alignment to speech (in phase and power) is robustly tuned by structure and by learned statistical patterns. Our findings show how structured knowledge and experience-based learning interact to shape neural responses to language, offering insight into how the brain processes complex, meaningful signals.
https://www.nature.com/articles/s42003-026-09865-8

Nature Machine Intelligence

ARTICLES

VITTORIA DENTELLA, MARCO MARELLI & LUCA RINALDI – LLMs displaying less cognitive bias are not necessarily better decision makers

Large language models (LLMs) include not only social stereotypes but also cognitive biases. As researchers work to identify, characterize and rectify these biases, we encourage the scientific community to recognize that, although often seen as errors, cognitive biases can also reflect functional, context-specific adaptations in reasoning.
https://www.nature.com/articles/s42256-026-01208-w

Nature Neuroscience

PAPERS

ERIC G. CEBALLOS et al – Organization of neuropeptide systems in the human brain

Neuropeptides are functionally diverse signaling molecules in the brain, regulating a wide range of basal bodily and cognitive processes. Despite their importance, the distribution and function of neuropeptides in the human brain remains underexplored. Here we comprehensively map the organization of human whole-brain neuropeptide receptors across multiple levels of description, including molecular and cellular embedding, mesoscale connectivity and macroscale cognitive specialization. Using gene transcription as a proxy, we reconstruct a topographical cortical and subcortical atlas of 38 neuropeptide receptors across 14 different neuropeptide families. We find that most neuropeptide receptors are highly expressed either in the cortex or subcortex, delineating an anatomical cortical–subcortical gradient. Mapping neuropeptide receptors onto hypothalamic nuclei, we demonstrate that neuropeptide receptor gene expression recapitulates fundamental anatomical divisions in the hypothalamus. Neuropeptides preferentially colocalize with metabotropic neurotransmitters, suggesting a system-wide correspondence between slow-acting molecular signaling mechanisms. To investigate the behavioral consequences of distributed neuropeptide systems, we apply meta-analytical decoding to neuropeptide maps and show a spectrum of functions, from sensory-cognitive to reward and bodily functions. Finally, using evolutionary analysis we find extended positive selection for neuropeptides in early mammals, suggesting that refinement of neuropeptides coincides

with the emergence of neocortex and higher cognitive function. Collectively, these results show that neuropeptide receptors are highly organized across the human brain and closely intertwined with multiple features of brain structure and function.
https://www.nature.com/articles/s41593-026-02236-w

Nature Reviews Neuroscience

PAPERS

STEPHAN POHL et al with NED BLOCK – Clarifying the conceptual dimensions of representation in neuroscience
Despite the centrality of the notion of representation in neuroscience, the field lacks a unified framework for the concepts used to characterize representation, leading to disparate use of both terminology and the measures associated with it. To offer clarification, we propose a core set of conceptual dimensions that characterize representations in neuroscience. These dimensions describe relations between a neural response, features that may be represented and downstream effects of the neural response. A neural response may be shown to be sensitive or specific to a feature, invariant to other features or functional (it is used downstream in the brain). We use information-theoretic measures to illustrate these conceptual dimensions and explain how they relate to data analysis methods such as correlational analyses, decoding and encoding models, representational similarity analysis, and tests of statistical dependence or adaptation. We consider several canonical examples, including models of the representation of orientation, numerosity and spatial location, which illustrate how the evidence put forth in support or criticism of these models is systematized by our framework. By offering a unified conceptual framework to characterize representation in neuroscience, we hope to aid the comparison and integration of results across studies and research groups and to help to determine when evidence for a neural representation is strong.
https://www.nature.com/articles/s41583-026-01030-8

Nature Scientific Reports

PAPERS

A. F. BLACKWOOD et al – Regional variability in the Acheulian to Middle Stone Age transition in southern Africa
Homo sapiens emerged in Africa around 300 – 200 thousand years ago (ka). Although the earliest H. sapiens fossils are associated with the Middle Stone Age (MSA), lithic technologies considered diagnostic of the MSA have been found alongside Acheulian technology in eastern Africa and the interior of southern Africa by ~ 500 – 400 ka, suggesting a deep evolutionary history of our species in these regions. The southern coastal plain of South Africa, geographically separated from the interior by the Cape Fold Belt and Great Escarpment, has one of the best documented records of the MSA in Africa; however, only a single site is older than 125 ka and little is known about the origins of the MSA in this region. Here, we report a stratified sequence of Acheulian to MSA lithic assemblages from the open-air site of Amanzi Springs covering the period between ~ 379 to 95 ka. We show that the MSA emerged around 230 ± 18 ka, significantly earlier than previously documented along the southern coast. The pattern of technological change also differs to the interior, with no diagnostic MSA elements found in the late Acheulian, although persistent methods of flake production indicate a gradual transition and continuity into the MSA. The relatively late emergence of the MSA along the southern coast highlights the variable and complex nature of demographic and behavioural change during this period, with regionally distinct technological trajectories extending into the Middle Pleistocene in southern Africa.
https://www.nature.com/articles/s41598-026-40075-8

New Scientist

ARTICLES

MICHAEL LE PAGE – Human populations evolved in similar ways after we began farming
An analysis of ancient and modern DNA suggests the extent of convergent evolution in different peoples around the world is even greater than we thought.
https://www.newscientist.com/article/2518181-human-populations-evolved-in-similar-ways-after-we-began-farming/

MICHAEL MARSHALL – Our extinct Australopithecus relatives may have had difficult births
Simulations of Australopithecus hominins' anatomy suggest that when they gave birth, they may have exerted tremendous pressure on their pelvic floors, putting them at risk of tearing.
https://www.newscientist.com/article/2519325-our-extinct-australopithecus-relatives-may-have-had-difficult-births/

JO MARCHANT – Forget the multiverse. In the pluriverse, we create reality together
A radical idea that resolves many quantum paradoxes suggests there is no objective view of reality. How can the cosmos be stitched together from interlocking perspectives?
https://www.newscientist.com/article/2518470-forget-the-multiverse-in-the-pluriverse-we-create-reality-together/

MICHAEL MARSHALL – We've only just confirmed that Homo habilis really existed
Their species name is well known, but until recently we've understood very little for certain about Homo habilis. Columnist Michael Marshall reveals what new fossils are telling us about the hominins that have been considered the first humans.

https://www.newscientist.com/article/2518316-weve-only-just-confirmed-that-homo-habilis-really-existed/

DAVID ROBSON – Why are we so suspicious of do-gooders?
A growing body of research shows that we tend to discount a person's good deeds if they stand to benefit from them. Where does this instinct comes from – and should we resist it?
https://www.newscientist.com/article/2518983-why-are-we-so-suspicious-of-do-gooders/

NPJ Artificial Intelligence

PAPERS

NICOLA ZOMER & MANLIO DE DOMENICO – Unraveling the emergence of collective behavior in networks of cognitive agents
Cognitive agents, powered by Large Language Models (LLMs), possess advanced reasoning and communication capabilities that fundamentally distinguish them from non-cognitive particles, which rely solely on formal rules. While their ability to replicate human individual and social behaviors is still under scrutiny, the impact of their embedded "intelligence" on emergent behaviors remains poorly understood. Here, by comparing cognitive agents with classic particles, we investigate how LLM capabilities shape emergent phenomena in two tasks: function optimization and social organization emerging from the Schelling model of segregation. To this aim, we introduce LLM Agent Swarm Optimization (llmASO), where a swarm of interacting LLM agents acts as an optimizer. Our findings reveal that, while individual agents outperform particles in decision-making, their consensus tendencies and ability to exploit patterns can make them prone to premature convergence. Adjusting network topology can alleviate this effect, but typically at the cost of slower overall convergence compared to classical Particle Swarm Optimization (PSO). In contrast, in the Schelling model, we demonstrate that local interactions and homophilic mechanisms allow cognitive agents to generate distinct emergent behaviors, underscoring the importance of realistic communication architectures in complex social simulations. This work clarifies how LLM capabilities introduce new mechanisms for collective behavior and has implications for future applications of LLM agents in swarm robotics, social experiments, and complex decision-making tasks.
https://www.nature.com/articles/s44387-026-00091-5

PeerJ

PAPERS

MADAWI SAQER ALOTAIBI & MOHAMED EL BACHIR MENAI – Candidate entity generation in lexical semantics
Candidate entity generation plays a pivotal role in various Natural Language Processing tasks, particularly in lexical semantics, where identifying and selecting relevant entities is crucial for effective understanding and processing of text. This article provides an in-depth review of the use of candidate generation in key lexical semantics, including Named Entity Recognition and Disambiguation, Automatic Term Extraction, and Word Sense Disambiguation. This article examines the challenges with candidate entity generation accuracy, selection methods, and how candidate entity generation improves overall performance. Additionally, we review emerging trends, advancements, and the potential impact of candidate entity generation on lexical semantics and Natural Language Processing applications. Through this study, we conclude that advanced contextual models for candidate entity generation extensively incorporate statistical approaches along with deep contextual embeddings and attention-based mechanisms. We also find that integrating structured knowledge sources, including knowledge graphs, external databases, and ontologies, can significantly improve the performance of candidate entity generation systems. However, optimizing candidate lists while ensuring the consistent inclusion of ground truth entities for lexical semantics remains a central challenge.
https://peerj.com/articles/cs-3726/

MARIO KASOVIC, NIKOLA STRAČÁROVÁ & MATEJA OČIĆ – Self-reported physical activity and attention performance in children aged 10–11 years
Previous research suggests a possible relationship between physical activity and cognitive functioning in children. However, the findings remain inconsistent, and few studies have examined this link using standardized instruments in preadolescent populations. This study aimed to determine the association between self-reported physical activity and cognitive performance in 10–11-year-old school children.
A total of 423 children (213 girls and 210 boys; 10.66 ± 0.43 years) participated in this study. The level of physical activity was assessed using the Physical Activity Questionnaire for Children (PAQ-C), while cognitive performance was measured with the d2-R Test of Attention. Data were analyzed using Pearson correlations and a multivariate general linear model (GLM). Statistically significant correlations were found between PAQ-C scores and two d2-R variables, the total number of items processed (PRZ) and concentration performance (VS), whereas the association with percentage of errors (Ch%) was not significant. The multivariate GLM confirmed these patterns: PAQ-C was significantly associated with PRZ ($\beta = 2.596$, $p = 0.003$) and VS ($\beta = 1.973$, $p = 0.012$), but not with Ch% ($p = 0.281$). Gender was also a significant predictor of PRZ and VS. Self-reported physical activity showed small but statistically significant associations with selected attention outcomes, particularly processing speed and concentration. Given the cross-sectional design and reliance on self-report, causal

inference is not possible; however, these findings highlight the potential relevance of physical activity for attentional functioning in school settings and underscore the need for longitudinal and intervention-based research.
https://peerj.com/articles/20867/

Philosophical Transactions of the Royal Society B

PAPERS

TORBEN GÖPEL – How should we address non-reproducibility?

Inter-experimental variability poses a significant challenge to reproducibility in experimental biology, hindering scientific progress and the translation of research findings. This variability arises from numerous factors, including subtle differences in reagents, equipment calibration, environmental conditions and unaccounted biological variation. Despite the existence of guidelines such as ARRIVE (Animal Research: Reporting of In Vivo Experiments) and MDAR (Materials Design Analysis Reporting), the reporting of crucial experimental details often remains incomplete or inconsistent across studies. Recent analyses have suggested that the insufficient reporting of materials and methods may substantially contribute to non-reproducibility in biological research. This underscores the need for more comprehensive and standardized reporting practices as the best approach to ensure good science. To address this issue, publishers, editors and reviewers must enforce existing standards more rigourously, while authors and researchers should prioritize the comprehensive reporting of experimental details. Innovative approaches such as experimental heterogenization and open science initiatives are emerging to enhance reproducibility. A multifaceted approach involving stricter guideline enforcement, recognition of replication studies and fostering a culture that values reproducibility over publication speed and sensationalization is essential for improving the reliability and credibility of experimental biology research.
https://royalsocietypublishing.org/rstb/article/381/1946/20250057/480988/How-should-we-address-non-reproducibility

PLoS One

PAPERS

KAYLEY DOTSON & MICHAEL TOMASELLO – When revealed after the fact, selfish intentions undermine prosocial actions in 5-year-olds

Early in ontogeny, children show a preference for prosocial others and for those with helpful intentions. Here, we investigate how children reason about prosocial actions when a selfish intention is revealed only after a prosocial behavior has benefitted them. 5-year-old children (N = 48) played a game with a puppet who acted prosocially by letting the child take a turn in a game. After the game, the puppet revealed either a selfish intention of getting a cookie for letting the child play (Undermining condition) or a prosocial intention of wanting the child to have fun (Prosocial condition). When given a chance to reciprocate a prosocial act, children shared less when the puppet had an Undermining versus a Prosocial intention. Children did not show any condition differences in their explicit social evaluations of the puppet, however. Our results indicate that an agent's initially hidden selfish intention, revealed only after a prosocial action, negatively impacts a child's willingness to later reciprocate with that agent.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0344731

IVETA ŠTOLHOFEROVÁ et al – Subjective and psychophysiological response to pictures of ancestral and modern threats: Not all evolutionary threats are alike

After encountering a potentially dangerous stimulus, the human body and mind might react with a cascade of physiological, emotional, and cognitive responses to minimize impending harm. However, whether this system can be activated by modern (ontogenetic) threats to the same extent as by ancestral (evolutionary) threats remains uncertain, since the existing results are ambiguous. In this study, we aimed to compare the skin resistance (SR) response to ancestral and modern threats; the focal categories were venomous snakes, heights, airborne diseases, and firearms. We collected recordings of 119 participants, about 30 per threat category, supplemented by participants' rating of the stimuli according to elicited fear. Results showed that participants reacted (SR change) with higher probability to all experimental categories than to control stimuli, with the most frequent reactions to photos simulating the threat of heights, followed by snakes, firearms, and airborne diseases. The largest amplitudes, indicating response intensity, were observed for heights but also for venomous snakes. Further examination showed that higher subjective fear corresponded to an increased probability of SR change. Although the results suggest a slight advantage for ancestral threats, responses to the threat of heights differed in several respects from responses to snakes, demonstrating that ancestrality-based categorisation cannot capture all aspects of the response. Moreover, both ancestral and modern threats can evoke similar electrodermal responses, depending on subjective stimulus salience and/or threat relevance.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0343680

TJAARK SIEMSSEN et al – Antibacterial properties of experimentally produced birch tar and its medicinal affordances in the Pleistocene

Birch tar is well-documented for its use as an adhesive in the Middle Palaeolithic of Europe, but other uses remain poorly explored. Drawing from recent arguments suggesting multimodal uses of products such as ochre and birch tar, this study

tests the antibiotic properties of birch tar produced experimentally with methods reconstructed from Middle Palaeolithic birch tar finds from Europe. Made from the bark of Betula pendula and Betula pubescens, widely documented for the European Late Pleistocene, we produced birch tar samples using an underground pit method, a condensation method, and a modern tin can method. The birch tar samples were tested for antibiotic properties using the modified Kirby-Bauer disc diffusion antibiotic assay. The resulting inhibition zones, ranging from no effect to 10.5 ± 0.7 mm with a mean of 7.5 ± 0.17 mm, indicate a moderate effect against the Gram-positive Staphylococcus aureus, a bacterium widely known for its role in wound infections. We further establish that the efficacy of antibiotic properties is not related to the production method, with all methods showing a degree of variation. This supports a coevolutionary relationship between medicinal and technological use and production of birch tar during the Pleistocene. The antibiotic properties documented in this study are consistent with the use of birch tar as a wound dressing and skin ointment in Mi'kmaq communities in Eastern Canada, and the use of birch tar in Saami communities of Lapland. Arguing from an underexplored angle between experimental archaeology and ethnopharmacology, we suggest that similar to the ethnographic examples, a use of birch tar beyond exclusively technological contexts must be considered for the Middle Palaeolithic.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0343618

Proceedings of the Royal Society B

PAPERS

YNGWIE A. NIELSEN et al with MORTEN H. CHRISTIANSEN – Conversational alignment as an individual difference
Speakers in conversation reuse each other's words, structures, meanings, sounds and gestures. This phenomenon—known as conversational alignment—is regarded as a cornerstone of successful communication and has garnered attention from researchers studying individual differences. The concept of individual differences in alignment, however, lacks both a theoretical and empirical foundation. To test whether alignment exhibits the stability expected from a trait-like individual difference, we analysed four corpora with repeated measures, comprising 1375 adult–adult and parent–child conversations. Lexical, structural and semantic alignment scores exhibited correlations of approximately 0.50 within conversations and 0.20–0.25 across time, interlocutor and conversational context, providing little evidence for trait-like stability. Stability was generally higher in less conversationally skilled populations and across similar contexts. Based on our results, we hypothesize that individual differences in alignment reflect a skill, not a trait, and outline challenges for developing better measures.
https://royalsocietypublishing.org/rspb/article/293/2067/20252205/480949/Conversational-alignment-as-an-individual

Royal Society Open Science

CORRECTIONS

MATILDE ELLEN SIMONETTI et al – Correction to: 'The influence of bilingualism on statistical word learning: a registered report' (2025) by Simonetti et al.
In the introduction of the above article, a sentence cited references in a way that could be misinterpreted as direct empirical support for the stated claim. The original sentence read:
'Word learning may be more complex for bilinguals than monolinguals: consistent with this argument, some studies reported that bilingual children have a smaller vocabulary than monolingual ones (e.g. De Houwer et al., 2014; Montanari et al., 2018).'
The sentence should read:
'Word learning may be more complex for bilinguals than monolinguals: consistent with this argument, some studies reported that bilingual children have a smaller vocabulary than monolingual ones (see Montanari et al., 2018, for a discussion).'
This correction clarifies that the cited work refers to a review and discussion of the literature rather than direct empirical evidence for the claim. One citation was removed.
[EAORC Bulletin 1,175 – 21 December 2025]
Original article: https://royalsocietypublishing.org/rsos/article/12/12/251768/366131/The-influence-of-bilingualism-on-statistical-word
https://royalsocietypublishing.org/rsos/article/13/3/260300/480968/Correction-to-The-influence-of-bilingualism-on

Science

NEWS

Debate explodes over age of key South American archaeological site
New study argues Monte Verde is far younger than once thought, challenging when people arrived in the Americas.
https://www.science.org/content/article/debate-explodes-over-age-key-south-american-archaeological-site

ARTICLES

JASON RECH – A later debut for humans
Stratigraphic analysis resets the time of human arrival in Monte Verde, Chile
https://www.science.org/doi/10.1126/science.aef9954

PAPERS

MATTHIAS-CLAUDIO LORETTO et al – Ravens anticipate wolf kill sites across broad scales

Scavengers generally rely on patchily distributed, unpredictable carrion. A long-standing hypothesis suggests scavenging ravens reliably locate such food by directly following large carnivores to their kills. However, by satellite tracking 69 ravens, 20 wolves, and 11 cougars in Yellowstone National Park, we found that following of predators over large distances rarely occurred. Instead, ravens routinely revisited sites where wolf kills were common—returning from distances of up to 155 kilometers to find carrion. Much like navigating to permanent anthropogenic subsidies, ravens appear to remember potential sources of carrion shaped by previous encounters with wolves or their kills. These findings suggest that spatial memory and navigation play a considerably greater role than previously assumed among scavengers, and possibly other wide-ranging species, in search of ephemeral resources.
https://www.science.org/doi/10.1126/science.adz9467

LOGAN S. JAMES et al – Humans share acoustic preferences with other animals

Many animals produce courtship sounds, and receivers prefer some sounds over others. Shared ancestry and convergent evolution may generate similarities in preference across species and underlie Darwin's conjecture that some animals "have nearly the same taste for the beautiful as we have." In this study, we show that humans share acoustic preferences with a range of animals, that the strength of human preferences correlates with that in other animals, and that humans respond faster when in agreement with animals. Furthermore, we found greatest agreement in preference for adorned, ancestral, and lower-frequency sounds. Humans' music listening experience was associated with preferences. These results are consistent with theories arguing that biases in processing sculpt acoustic preferences, and they confirm Darwin's century-old hunch about the conservation of aesthetics in nature.
https://www.science.org/doi/10.1126/science.aea1202

TODD A. SUROVELL et al – A mid-Holocene age for Monte Verde challenges the timeline of human colonization of South America

Our understanding of the timing of the human colonization of South America has been anchored by the Monte Verde II site in Chile, reported to date to ~14,500 years before the present (B.P.) and regarded as one of the most secure pre-Clovis archeological sites. We report the first independent investigation of Monte Verde in the nearly 50 years since initial excavations. We argue that radiocarbon and luminescence dates from alluvial exposures, in combination with the identification of a tephra dated to 11,000 years B.P. stratigraphically underlying the archaeological component, suggest that Monte Verde cannot be older than the Middle Holocene (8200 to 4200 years B.P.). With colonization no longer anchored by Monte Verde, our revised chronology supports a more recent date of human arrival to South America.
https://www.science.org/doi/10.1126/science.adw9217

REVIEWS

MICHAEL A. GOLDMAN – Genes enter the garden of good and evil

A geneticist confronts how we think about free will, character, and wrongdoing.
A letter from a prisoner in the J. Dale Wainwright Unit of the Texas Department of Criminal Justice—a facility that once served as a holding place for Clyde Barrow of "Bonnie and Clyde" infamy—frames the central inquiry of Kathryn Paige Harden's new book, Original Sin. Incarcerated since age 16 for aggravated kidnapping, robbery, and sexual assault, the man asks Harden, whose lab studies how genes and environments shape thoughts, feelings, and actions, why he committed the crime. "What would drive a boy to do such a thing? What makes a child go bad, is it nature or nurture?" These questions echo throughout the book, setting the tone for a work that weaves together genomics, criminal justice, and theology.
Review of 'Original Sin: On the Genetics of Vice, the Problem of Blame, and the Future of Forgiveness' by Kathryn Paige Harden, Random House (2026).
https://www.science.org/doi/10.1126/science.aef2245

Trends in Cognitive Sciences

PAPERS

APRIL H. BAILEY & RACHEL A. LESHIN – People think of women as one thing, men as many

People seem to represent men and women in a conceptually balanced manner: for example, seeing women as warm (not agentic) and men as agentic (not warm). Emerging evidence, however, suggests people might represent them as imbalanced: women as one thing and men as many things. We argue that people describe men and women as balanced, symmetrical opposites when thinking of them in terms of their gender category—a gender framing often evoked by common methods. However, in the absence of this framing (e.g., in naturalistic contexts), women stand out as a gender category more than men, creating conceptual imbalance. In these contexts, people represent women more narrowly while affording men a wider array of attributes—even attributes traditionally linked to women (e.g., warmth).
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(26)00033-1

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