

## EAORC BULLETIN 1,051 – 6 August 2023

## CONTENTS

<b>NOTICES</b> .....	<b>2</b>
PUBLICATION ALERTS.....	2
EDITORIAL INTERJECTIONS.....	2
ACADEMIA.EDU – Metaphors taken for granted .....	3
HELENA TUŽINSKÁ – Metaphors taken for granted .....	3
ACADEMIA.EDU – Personal Memory, the Scaffolded Mind, and Cognitive Change.....	3
JOHN SUTTON – Personal Memory, the Scaffolded Mind, and Cognitive Change .....	3
CONFERENCE ALERT – Animal Behaviour Live: Annual Online Conference 2023.....	3
IN MEMORIAM – Professor Emeritus Peter H. Fries 1937-2023 (From LSA Update) .....	4
<b>NEWS</b> .....	<b>4</b>
NATURE BRIEFING – AI brings back Neanderthal protein snippets.....	4
SAPIENS – Raising Up African Paleoanthropologists .....	4
SAPIENS – Visitor Log Chronicled for the Denisovan Family Home.....	4
SCIENCEADVISER – Might not: Science papers include less hedging now than two decades ago .....	4
SCIENCEADVISER – Searching for our ancient tongue.....	4
SCIENCE.ORG NEWS – AI helps geneticists uncover the roots of upright walking in humans .....	4
<b>PUBLICATIONS</b> .....	<b>4</b>
American Journal of Biological Anthropology.....	4
<b>PAPERS</b> .....	4
MIRANDA NICOLE COSMAN et al – Intraspecific variation of long bone cross-sectional properties in Pan troglodytes troglodytes and Gorilla gorilla gorilla .....	4
DANIEL P. LONGMAN, JONATHAN C. K. WELLS & JAY T. STOCK – Human energetic stress associated with upregulation of spatial cognition.....	5
EMMA E. BIRD et al – Trabecular bone structure of the proximal capitate in extant hominids and fossil hominins with implications for midcarpal joint loading and the dart-thrower's motion .....	5
Current Biology.....	5
<b>PAPERS</b> .....	5
DAVID J.-N. MAISSON et al – Widespread coding of navigational variables in prefrontal cortex .....	5
eLife.....	6
<b>PAPERS</b> .....	6
JIE LIN et al – Human-specific lncRNAs contributed critically to human evolution by distinctly regulating gene expression .....	6
SHIRA M LUPKIN & VINCENT B MCGINTY – Monkeys exhibit human-like gaze biases in economic decisions .....	6
SOPHIE BAVARD & STEFANO PALMINTERI – The functional form of value normalization in human reinforcement learning.....	6
FAN WANG et al – Fine-grained functional parcellation maps of the infant cerebral cortex.....	6
Frontiers in Psychology.....	7
<b>PAPERS</b> .....	7
GUIDA VEIGA et al – OUT to IN: a body-oriented intervention program to promote preschoolers' self-regulation and relationship skills in the outdoors .....	7
STEPHEN GROSSBERG – How children learn to understand language meanings: a neural model of adult-child multimodal interactions in real-time.....	7
Nature Communications Psychology.....	7
<b>PAPERS</b> .....	7
KENNY YU et al – Humans display interindividual differences in the latent mechanisms underlying fear generalization behaviour .....	7
Nature Human Behaviour.....	8
<b>PAPERS</b> .....	8
TAYLOR WEBB, KEITH J. HOLYOAK & HONGJING LU – Emergent analogical reasoning in large language models .....	8
JIANXIAO WU et al – The challenges and prospects of brain-based prediction of behaviour .....	8
Nature Humanities & Social Sciences Communications.....	8
<b>PAPERS</b> .....	8
JUNRU WU & JUNYUAN ZHAO – Systematic correspondence in co-evolving languages .....	8
YUZHU LIANG et al – Languages in China link climate, voice quality, and tone in a causal chain .....	8
Nature Scientific Data.....	9
<b>PAPERS</b> .....	9

KRISTINA T. JOHNSON et al – ReCANVo: A database of real-world communicative and affective nonverbal vocalizations .....	9
<b>Nature Scientific Reports</b> .....	<b>9</b>
<b>PAPERS</b> .....	<b>9</b>
ARTHUR GICQUEAU et al with JEAN-JACQUES HUBLIN – Anatomically modern human in the Châtelperronian hominin collection from the Grotte du Renne (Arcy-sur-Cure, Northeast France).....	9
JAMES R. DAVIES & ELIAS GARCIA-PELEGRIN – Bottlenose dolphins are sensitive to human attentional features, including eye functionality .....	9
FEDERICA BADINO et al – High-resolution ecosystem changes pacing the millennial climate variability at the Middle to Upper Palaeolithic transition in NE-Italy.....	9
<b>New Scientist</b> .....	<b>10</b>
<b>NEWS</b> .....	<b>10</b>
Origin of Indo-European languages traced back to 8000 years ago .....	10
<b>PLoS Biology</b> .....	<b>10</b>
<b>PAPERS</b> .....	<b>10</b>
TOMAS KAY et al – Social network position is a major predictor of ant behavior, microbiota composition, and brain gene expression.....	10
<b>PLoS One</b> .....	<b>10</b>
<b>PAPERS</b> .....	<b>10</b>
HALA ALARASHI et al – Threads of memory: Reviving the ornament of a dead child at the Neolithic village of Ba`ja (Jordan) .....	10
BRUCE C. PETERSEN – An economic model and evidence of the evolution of human intelligence in the Middle Pleistocene: Climate change and assortative mating .....	11
KIMBERLY T. MAI et al – Warning: Humans cannot reliably detect speech deepfakes .....	11
JONATHAN R. GOODMAN, ANDREW CAINES & ROBERT A. FOLEY – Shibboleth: An agent-based model of signalling mimicry.....	11
ANDREW W. KANDEL et al with NICHOLAS J. CONARD – The ROCEEH Out of Africa Database (ROAD): A large-scale research database serves as an indispensable tool for human evolutionary studies.....	11
ALESSANDRO ALEO et al – The dynamic lives of osseous points from Late Palaeolithic/Early Mesolithic Doggerland: A detailed functional study of barbed and unbarbed points from the Dutch North Sea .....	12
RICARDO SANTA et al – The impact of emotional intelligence on operational effectiveness: The mediating role of organizational citizenship behavior and leadership.....	12
JOHANNA SCHOPPMANN et al – The effect of picture book reading on young children’s use of an emotion regulation strategy .....	12
EMMELINE R. I. HOWARTH et al – Genetic polymorphisms in the serotonin, dopamine and opioid pathways influence social attention in rhesus macaques (Macaca mulatta).....	13
<b>PNAS</b> .....	<b>13</b>
<b>PAPERS</b> .....	<b>13</b>
ANJA KASSECKER, STEPHAN A. VERSCHOOR & MARCO F. H. SCHMIDT – Human infants are aroused and concerned by moral transgressions.....	13
<b>CORRECTIONS</b> .....	<b>13</b>
ABEL RUIZ-GIRALT – Correction for Ruiz-Giralt et al., On the verge of domestication: Early use of C4 plants in the Horn of Africa .....	13
<b>Proceedings of the Royal Society B</b> .....	<b>14</b>
<b>PAPERS</b> .....	<b>14</b>
PAULO B. CHAVES, KAREN B. STRIER & ANTHONY DI FIORE – Paternity data reveal high MHC diversity among sires in a polygynandrous, egalitarian primate .....	14
LIZA R. MOSCOVICE et al – Spontaneous helping in pigs is mediated by helper’s social attention and distress signals of individuals in need .....	14
<b>Trends in Cognitive Sciences</b> .....	<b>14</b>
<b>PAPERS</b> .....	<b>14</b>
GARRIY SHTEYNBERG et al – Theory of collective mind .....	14
<b>SUBSCRIBE to the EAORC Bulletin</b> .....	<b>14</b>
<b>UNSUBSCRIBE from the EAORC Bulletin</b> .....	<b>14</b>
<b>PRODUCED BY AND FOR THE EAORC EMAIL GROUP</b> .....	<b>14</b>

---

## NOTICES

### 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.

### ACADEMIA.EDU – Metaphors taken for granted

*In Slovak Ethnology 2:70, 297-301 (2022).*

#### HELENA TUŽINSKÁ – Metaphors taken for granted

*Review of 'Ritual in Human Evolution and Religion. Psychological and Ritual Resources' by Matt J. Rossano, Routledge 2021.*

Matt J. Rossano is a Professor of Psychology at Southeastern Louisiana University, recognised as a scholar in the evolutionary study of religion. In his new book, Rossano offers a re-capitulation of evolutionary anthropological arguments and claims that human ritual had emerged to support psychological resources centred around social capital. Moreover, he takes the reader from the oldest archaeological sites from South Africa to Greece, to rituals in Russia, including Soviet ones, concluding with the cults of Native Americans. In this contribution, I will consider his red thread and its jargon.

[https://www.academia.edu/105146632/Metaphors taken for granted Matt J Rossano Ritual in Human Evolution and Religion Psychological and Ritual Resources?email work card=title](https://www.academia.edu/105146632/Metaphors_taken_for_granted_Matt_J_Rossano_Ritual_in_Human_Evolution_and_Religion_Psychological_and_Ritual_Resources?email_work_card=title)

---

### ACADEMIA.EDU – Personal Memory, the Scaffolded Mind, and Cognitive Change

*In Ian Hodder (ed.), Consciousness, Creativity, and Self at the Dawn of Settled Life, ch10, 209-229 (2022).*

#### JOHN SUTTON – Personal Memory, the Scaffolded Mind, and Cognitive Change

'The Çatalhöyük evidence as a whole', write Hodder and Pels, 'gives many indications that, indeed, people began to link themselves to specific pasts, by burying pots, tools, humans and hunting trophies in ways that indicate particular memories rather than a generic reference to a group' (2010, 182). Hodder draws on his multidisciplinary team's impressive studies of a wide range of artifacts and practices – household symbols, pit-digging, burial, figurines, tools, decoration, and more – to argue that forms of remembering emerged or consolidated at Çatalhöyük that were neither merely routinized and habitual, nor merely traditional and generic, and that took as their objects neither repeated activities nor wide-spread factual knowledge. Rather, the new forms of social memory being constructed at Çatalhöyük were 'conscious, specific, and commemorative', as household groups 'began to make specific connections between the present and the past' (Hodder & Cessford 2004, 35; Hodder 2006, 143).

[https://www.academia.edu/42916861/Personal memory the scaffolded mind and cognitive change in the Neolithic](https://www.academia.edu/42916861/Personal_memory_the_scaffolded_mind_and_cognitive_change_in_the_Neolithic)

---

### CONFERENCE ALERT – Animal Behaviour Live: Annual Online Conference 2023

Our annual online conference is back for the fourth year in a row on 16-17 November 2023!

It will be a fantastic platform for animal behaviour researchers from around the world to come together, share their research and insights to make our community sustainable and inclusive.

As always, this conference will be FREE to attend but we ask you to register by clicking here

<https://forms.gle/kTwRxqjKh1h3GFbH7> or visiting our website <https://animalbehaviour.live/>.

ABSTRACT SUBMISSIONS are also open now to present at the conference (deadline: September 11 2023) and you can submit one by clicking <https://forms.gle/7GexDA3DgTLwqxsm9> or visiting our website <https://animalbehaviour.live/conference/2023/>.

Our organisation is small (we are a few early career researchers working on a voluntary basis) and the success of this event is based on the support of our community. For this reason, we would be particularly grateful if you could spread the word about this event to your colleagues and collaborators who you think may benefit from participating in the congress. To do so, you can forward this email to anyone you think would be interested in attending the event, or use the flyer of the event that you can find by clicking here [https://drive.google.com/drive/folders/1PU7yTTF3Rws2ZpdKclJdm4ozfTY\\_Pm2V?usp=drive\\_link](https://drive.google.com/drive/folders/1PU7yTTF3Rws2ZpdKclJdm4ozfTY_Pm2V?usp=drive_link) or on our website <https://animalbehaviour.live/conference>. In addition, you can also follow us on our different social media <https://linktr.ee/animalbehaviourlive> and forward our announcements about the congress.

We would like to thank you for your help, and hope to see you at the Animal Behaviour Live: Annual Online Conference 2023.

The organising committee:

\*Alexis Buatois [https://www.researchgate.net/profile/Alexis\\_Buatois](https://www.researchgate.net/profile/Alexis_Buatois)

\*Amanda Faccioli [https://www.researchgate.net/profile/Amanda\\_Faccioli](https://www.researchgate.net/profile/Amanda_Faccioli)

\*David McCluskey

\*Ebi Antony George <https://ebiantonygeorge.com/>

\*Valentin Lecheval <http://vlecheval.eu/>

\*Kenzy Peña <https://www.researchgate.net/profile/Kenzy-Pena>

\*Laure Cauchard <https://www.researchgate.net/profile/Laure-Cauchard>

\*Natacha Rossi [https://www.researchgate.net/profile/Natacha\\_Rossi](https://www.researchgate.net/profile/Natacha_Rossi)

\*Saeed Shafiei Sabet [https://www.researchgate.net/profile/Saeed\\_Shafiei\\_Sabet](https://www.researchgate.net/profile/Saeed_Shafiei_Sabet)

**IN MEMORIAM – Professor Emeritus Peter H. Fries 1937-2023 (From LSA Update)**

LSA regrets to report a longtime member and supporter, Professor Peter H. Fries, 85, of Mt Pleasant, passed away unexpectedly on Saturday, June 10, 2023, at My Michigan Medical Center Midland.

<https://www.linguisticsociety.org/news/2023/07/28/memorial-professor-peter-h-fries-1937-2023>

**NEWS****NATURE BRIEFING – AI brings back Neanderthal protein snippets**

Artificial intelligence (AI) has helped scientists to resurrect Neanderthal peptides — protein subunits that could be an untapped resource of new antibiotics. An algorithm was trained to recognize sites on human proteins where they are cut into peptides. When the algorithm and other tools were applied to publicly available protein sequences of Neanderthals and Denisovans, it found several peptides that halted the growth of certain bacteria in mice.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=4ac8f46986&e=1db4b9a19b>

**SAPIENS – Raising Up African Paleoanthropologists**

Generations of scholars from around the world have converged to study human evolution in East Africa. Now a new training program seeks to bring more African students into the field.

<https://www.sapiens.org/biology/african-paleoanthropologists/>

**SAPIENS – Visitor Log Chronicled for the Denisovan Family Home**

New studies write the history of a famous Siberian cave and unearth the oldest jewelry in the region.

<https://www.sapiens.org/biology/denisova-cave-jewelry/>

**SCIENCEADVISER – Might not: Science papers include less hedging now than two decades ago**

Scientists are often careful about how they state their findings—experiments may mean this, findings probably indicate that. But a broad analysis of Science papers from 1997 to 2021 finds that such hedging language has decreased significantly, a trend some experts find concerning.

<https://www.science.org/content/article/some-scientific-papers-words-expressing-uncertainty-have-decreased>

**SCIENCEADVISER – Searching for our ancient tongue**

The largest database of Indo-European words provides clues as to when and where people first spoke the language that would evolve into the diversity of tongues spoken today by more than 3 billion people.

<https://www.science.org/content/article/new-language-database-narrows-search-first-speakers-indo-european>

**SCIENCE.ORG NEWS – AI helps geneticists uncover the roots of upright walking in humans**

New study maps the parts of the genome that create a bipedal skeleton.

<https://www.science.org/content/article/ai-helps-geneticists-uncover-roots-upright-walking-humans>

**PUBLICATIONS****American Journal of Biological Anthropology****PAPERS****MIRANDA NICOLE COSMAN et al – Intraspecific variation of long bone cross-sectional properties in *Pan troglodytes troglodytes* and *Gorilla gorilla gorilla***

Morphological intraspecific variation is due to the balance between skeletal plasticity and genetic constraint on the skeleton. Osteogenic responses to external stimuli, such as locomotion, have been well documented interspecifically across the primate order, but less so at the intraspecific level. Here, we examine the differences in cross-sectional variability of the femur, humerus, radius, and tibia in *Pan troglodytes troglodytes* versus *Gorilla gorilla gorilla*. We investigate whether there are sex, species, bone, and trait differences in response to variable body size and locomotion.

Adult male and female *P. t. troglodytes* and *G. g. gorilla* long bones from the Cleveland Museum of Natural History were scanned with a peripheral quantitative computer tomography system. Scans were taken at the midshaft of each bone according to functional bone length. Coefficients of variation were used to provide a size-independent measure of variation. We applied a Bonferroni correction to account for the multiple pairwise tests.

There were limited significant differences between males and females, however, females tended to be more variable than males. Variation in *Gorilla*, when significant, was greater than in *Pan*, although significant differences were limited. There were no differences between bone variability in male and female *Gorilla*, and female *Pan*.

Increased female variability may be due to more variable locomotor behavior, particularly during periods of pregnancy, lactation, and caring for an offspring compared to consistent locomotion over the life course by males. Body size may be a contributing factor to variability; more work is needed to understand this relationship.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24823>

**DANIEL P. LONGMAN, JONATHAN C. K. WELLS & JAY T. STOCK – Human energetic stress associated with upregulation of spatial cognition**

Evolutionary life history theory has a unique potential to shed light on human adaptive capabilities. Ultra-endurance challenges are a valuable experimental model allowing the direct testing of phenotypic plasticity via physiological trade-offs in resource allocation. This enhances our understanding of how the body prioritizes different functions when energetically stressed. However, despite the central role played by the brain in both hominin evolution and metabolic budgeting, cognitive plasticity during energetic deficit remains unstudied.

We considered human cognitive plasticity under conditions of energetic deficit by evaluating variability in performance in three key cognitive domains. To achieve this, cognitive performance in a sample of 48 athletes (m = 29, f = 19) was assessed before and after competing in multiday ultramarathons.

We demonstrate that under conditions of energetic deficit, performance in tasks of spatial working memory (which assessed ability to store location information, promoting landscape navigation and facilitating resource location and calorie acquisition) increased. In contrast, psychomotor speed (reaction time) remained unchanged and episodic memory performance (ability to recall information about specific events) decreased.

We propose that prioritization of spatial working memory performance during conditions of negative energy balance represents an adaptive response due to its role in facilitating calorie acquisition. We discuss these results with reference to a human evolutionary trajectory centred around encephalisation. Encephalisation affords great plasticity, facilitating rapid responses tailored to specific environmental conditions, and allowing humans to increase their capabilities as a phenotypically plastic species.

<https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.24820>

**EMMA E. BIRD et al – Trabecular bone structure of the proximal capitate in extant hominids and fossil hominins with implications for midcarpal joint loading and the dart-thrower's motion**

This research examines whether the distribution of trabecular bone in the proximal capitates of extant hominids, as well as several fossil hominin taxa, is associated with the oblique path of the midcarpal joint known as the dart-thrower's motion (DTM).

We analyzed proximal capitates from extant (Pongo n = 12; Gorilla n = 11; Pan n = 10; fossil and recent *Homo sapiens* n = 29) and extinct (*Australopithecus sediba* n = 2; *Homo naledi* n = 1; *Homo floresiensis* n = 2; Neandertals n = 3) hominids using a new canonical holistic morphometric analysis, which quantifies and visualizes the distribution of trabecular bone using relative bone volume as a fraction of total volume (rBV/TV).

*Homo sapiens* and Neandertals had a continuous band of high rBV/TV that extended across the scaphoid, lunate, and hamate subarticular regions, but other fossil hominins and extant great apes did not. *A. sediba* expressed a distinct combination of human-like and Pan-like rBV/TV distribution. Both *H. floresiensis* and *H. naledi* had high rBV/TV on the ulnar-side of the capitate but low rBV/TV on the radial-side.

The proximal capitates of *H. sapiens* and Neandertals share a distinctive distribution of trabecular bone that suggests that these two species of *Homo* regularly load(ed) their midcarpal joints along the full extent of the oblique path of the DTM. The observed pattern in *A. sediba* suggests that human-like stress at the capito-scaphoid articular surface was combined with Pan-like wrist postures, whereas the patterns in *H. floresiensis* and *H. naledi* suggest their midcarpal joints were loaded differently from that of *H. sapiens* and Neandertals.

<https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.24824>

## Current Biology

### PAPERS

**DAVID J.-N. MAISSON et al – Widespread coding of navigational variables in prefrontal cortex**

To navigate effectively, we must represent information about our location in the environment. Traditional research highlights the role of the hippocampal complex in this process. Spurred by recent research highlighting the widespread cortical encoding of cognitive and motor variables previously thought to have localized function, we hypothesized that navigational variables would be likewise encoded widely, especially in the prefrontal cortex, which is associated with volitional behavior. We recorded neural activity from six prefrontal regions while macaques performed a foraging task in an open enclosure. In all regions, we found strong encoding of allocentric position, allocentric head direction, boundary distance, and linear and angular velocity. These encodings were not accounted for by distance, time to reward, or motor factors. The strength of coding of all variables increased along a ventral-to-dorsal gradient. Together, these results argue that encoding of navigational variables is not localized to the hippocampus and support the hypothesis that navigation is continuous with other forms of flexible cognition in the service of action.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(23\)00931-4](https://www.cell.com/current-biology/fulltext/S0960-9822(23)00931-4)



eLife

**PAPERS****JIE LIN et al – Human-specific lncRNAs contributed critically to human evolution by distinctly regulating gene expression**

What genomic sequences make protein-coding genes generate divergent expression in closely related species, specifically, differentiate humans from apes, puzzle many researchers. Many studies examined species-specific gene birth, gene loss, and changes in promoters and transcription factor binding sites, but the identification and impact of human-specific lncRNAs remain unexplored. This study identified human-specific lncRNAs from GENCODE-annotated human lncRNAs, predicted their DNA binding sites (DBSs) genome-wide, and analyzed the DBSs and their counterparts in modern humans (CEU, CHB, and YRI), archaic humans (Altai Neanderthals, Denisovans, and Vindija Neanderthals), and chimpanzees. The results reveal how human-specific lncRNAs and their DBSs have transcriptionally regulated gene expression human-specifically. The rewiring of gene expression has undergone continuous evolution, significantly changed gene expression in the brain, promoted the adaptive evolution of humans, and influenced differences in modern humans. These results reveal the importance of human-specific lncRNAs (for human evolution) and highlight the importance of other species-specific lncRNAs.

<https://elifesciences.org/reviewed-preprints/89001>

**SHIRA M LUPKIN & VINCENT B MCGINTY – Monkeys exhibit human-like gaze biases in economic decisions**

In economic decision-making individuals choose between items based on their perceived value. For both humans and nonhuman primates, these decisions are often carried out while shifting gaze between the available options. Recent studies in humans suggest that these shifts in gaze actively influence choice, manifesting as a bias in favor of the items that are viewed first, viewed last, or viewed for the overall longest duration in a given trial. This suggests a mechanism that links gaze behavior to the neural computations underlying value-based choices. In order to identify this mechanism, it is first necessary to develop and validate a suitable animal model of this behavior. To this end, we have created a novel value-based choice task for macaque monkeys that captures the essential features of the human paradigms in which gaze biases have been observed. Using this task, we identified gaze biases in the monkeys that were both qualitatively and quantitatively similar to those in humans. In addition, the monkeys' gaze biases were well-explained using a sequential sampling model framework previously used to describe gaze biases in humans—the first time this framework has been used to assess value-based decision mechanisms in nonhuman primates. Together, these findings suggest a common mechanism that can explain gaze-related choice biases across species, and open the way for mechanistic studies to identify the neural origins of this behavior.

<https://elifesciences.org/articles/78205>

**SOPHIE BAVARD & STEFANO PALMINTERI – The functional form of value normalization in human reinforcement learning**

Reinforcement learning research in humans and other species indicates that rewards are represented in a context-dependent manner. More specifically, reward representations seem to be normalized as a function of the value of the alternative options. The dominant view postulates that value context-dependence is achieved via a divisive normalization rule, inspired by perceptual decision-making research. However, behavioral and neural evidence points to another plausible mechanism: range normalization. Critically, previous experimental designs were ill-suited to disentangle the divisive and the range normalization accounts, which generate similar behavioral predictions in many circumstances. To address this question, we designed a new learning task where we manipulated, across learning contexts, the number of options and the value ranges. Behavioral and computational analyses falsify the divisive normalization account and rather provide support for the range normalization rule. Together, these results shed new light on the computational mechanisms underlying context-dependence in learning and decision-making.

<https://elifesciences.org/articles/83891>

**FAN WANG et al – Fine-grained functional parcellation maps of the infant cerebral cortex**

Resting-state functional MRI (rs-fMRI) is widely used to examine the dynamic brain functional development of infants, but these studies typically require precise cortical parcellation maps, which cannot be directly borrowed from adult-based functional parcellation maps due to the substantial differences in functional brain organization between infants and adults. Creating infant-specific cortical parcellation maps is thus highly desired but remains challenging due to difficulties in acquiring and processing infant brain MRIs. In this study, we leveraged 1064 high-resolution longitudinal rs-fMRIs from 197 typically developing infants and toddlers from birth to 24 months who participated in the Baby Connectome Project to develop the first set of infant-specific, fine-grained, surface-based cortical functional parcellation maps. To establish meaningful cortical functional correspondence across individuals, we performed cortical co-registration using both the cortical folding geometric features and the local gradient of functional connectivity (FC). Then we generated both age-related and age-independent cortical parcellation maps with over 800 fine-grained parcels during infancy based on aligned and averaged local gradient maps of FC across individuals. These parcellation maps reveal complex functional developmental patterns, such as changes in local gradient, network size, and local efficiency, especially during the first 9 postnatal months.

Our generated fine-grained infant cortical functional parcellation maps are publicly available at <https://www.nitrc.org/projects/infantsurfatlas/> for advancing the pediatric neuroimaging field. <https://elifesciences.org/articles/75401>

## Frontiers in Psychology

### PAPERS

#### **GUIDA VEIGA et al – OUT to IN: a body-oriented intervention program to promote preschoolers' self-regulation and relationship skills in the outdoors**

Time for movement and outdoor experiences has decreased in children's daily lives. Nevertheless, a growing body of research has shown that body-oriented interventions and outdoor time benefit preschoolers' social-emotional development, a foundation for mental health. OUT to IN is a body-oriented intervention program implemented outdoors, designed to promote preschoolers' social-emotional competence. This study aimed to evaluate the effects of OUT to IN on preschoolers' self-regulation and relationship skills.

A cluster randomized trial with multi-method and multi-informant assessment was implemented including 233 children between 3 and 6 years (122 boys, Mage = 5.07 years), from 4 preschools (8 groups with OUT to IN intervention, 4 groups without intervention – control group). The 153 children allocated to the OUT to IN group participated in biweekly sessions for 10 weeks. OUT to IN sessions followed a body-oriented approach comprising exercise play, relaxation, and symbolization activities, implemented outdoors by a psychomotor therapist and the preschool teacher. Sessions enabled children to feel, observe and control their bodily states and understand the relationship between their bodies and emotions. Teachers participated in a brief course and on 20 biweekly relaxation sessions. Children's self-regulation was measured through specific tasks and a parent questionnaire. Relationship skills (i.e., empathy, communication, cooperation and sociability) were measured through parents' and preschool teachers' questionnaires. Mann-Whitney test was used to study differences at baseline between the OUT to IN group and the control group, and to study differences in the 10-week changes between both groups. Wilcoxon Test was used for intragroup comparisons.

After the 10-week intervention period, children who participated in OUT to IN showed significant improvements on self-regulation and relationship skills (empathy, cooperation and sociability), in comparison to the control group who did not show any significant improvements. Large size effects ( $\eta^2 > 0.14$ ) were found for most of the variables related to self-regulation and small ( $\eta^2 > 0.01$ ), medium ( $\eta^2 > 0.06$ ) and large size effects ( $\eta^2 > 0.14$ ) were found for the variables related to relationship skills.

OUT to IN showed to be an effective body-oriented intervention program in improving children's self-regulation and relationship skills, which are recognized foundations for mental health and well-being.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1195305/full>

#### **STEPHEN GROSSBERG – How children learn to understand language meanings: a neural model of adult-child multimodal interactions in real-time**

This article describes a biological neural network model that can be used to explain how children learn to understand language meanings about the perceptual and affective events that they consciously experience. This kind of learning often occurs when a child interacts with an adult teacher to learn language meanings about events that they experience together. Multiple types of self-organizing brain processes are involved in learning language meanings, including processes that control conscious visual perception, joint attention, object learning and conscious recognition, cognitive working memory, cognitive planning, emotion, cognitive-emotional interactions, volition, and goal-oriented actions. The article shows how all of these brain processes interact to enable the learning of language meanings to occur. The article also contrasts these human capabilities with AI models such as ChatGPT. The current model is called the ChatSOME model, where SOME abbreviates Self-Organizing MEaning.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1216479/full>

## Nature Communications Psychology

### PAPERS

#### **KENNY YU et al – Humans display interindividual differences in the latent mechanisms underlying fear generalization behaviour**

Human generalization research aims to understand the processes underlying the transfer of prior experiences to new contexts. Generalization research predominantly relies on descriptive statistics, assumes a single generalization mechanism, interprets generalization from mono-source data, and disregards individual differences. Unfortunately, such an approach fails to disentangle various mechanisms underlying generalization behaviour and can readily result in biased conclusions regarding generalization tendencies. Therefore, we combined a computational model with multi-source data to mechanistically investigate human generalization behaviour. By simultaneously modelling learning, perceptual and generalization data at the individual level, we revealed meaningful variations in how different mechanisms contribute to generalization behaviour. The current research suggests the need for revising the theoretical and analytic foundations in the field to shift the attention away from forecasting group-level generalization behaviour and toward understanding how such phenomena emerge at the

individual level. This raises the question for future research whether a mechanism-specific differential diagnosis may be beneficial for generalization-related psychiatric disorders.

<https://www.nature.com/articles/s44271-023-00005-0>

## Nature Human Behaviour

### PAPERS

#### **TAYLOR WEBB, KEITH J. HOLYOAK & HONGJING LU – Emergent analogical reasoning in large language models**

The recent advent of large language models has reinvigorated debate over whether human cognitive capacities might emerge in such generic models given sufficient training data. Of particular interest is the ability of these models to reason about novel problems zero-shot, without any direct training. In human cognition, this capacity is closely tied to an ability to reason by analogy. Here we performed a direct comparison between human reasoners and a large language model (the text-davinci-003 variant of Generative Pre-trained Transformer (GPT)-3) on a range of analogical tasks, including a non-visual matrix reasoning task based on the rule structure of Raven's Standard Progressive Matrices. We found that GPT-3 displayed a surprisingly strong capacity for abstract pattern induction, matching or even surpassing human capabilities in most settings; preliminary tests of GPT-4 indicated even better performance. Our results indicate that large language models such as GPT-3 have acquired an emergent ability to find zero-shot solutions to a broad range of analogy problems.

<https://www.nature.com/articles/s41562-023-01659-w>

#### **JIANXIAO WU et al – The challenges and prospects of brain-based prediction of behaviour**

Relating individual brain patterns to behaviour is fundamental in system neuroscience. Recently, the predictive modelling approach has become increasingly popular, largely due to the recent availability of large open datasets and access to computational resources. This means that we can use machine learning models and interindividual differences at the brain level represented by neuroimaging features to predict interindividual differences in behavioural measures. By doing so, we could identify biomarkers and neural correlates in a data-driven fashion. Nevertheless, this budding field of neuroimaging-based predictive modelling is facing issues that may limit its potential applications. Here we review these existing challenges, as well as those that we anticipate as the field develops. We focus on the impacts of these challenges on brain-based predictions. We suggest potential solutions to address the resolvable challenges, while keeping in mind that some general and conceptual limitations may also underlie the predictive modelling approach.

<https://www.nature.com/articles/s41562-023-01670-1>

## Nature Humanities & Social Sciences Communications

### PAPERS

#### **JUNRU WU & JUNYUAN ZHAO – Systematic correspondence in co-evolving languages**

Language co-evolution is an influential cultural force, impacting the past, present, and future of human languages. Systematic correspondence identifies corresponding features in languages evolving together, such as English "d" and German "t" in word pairs like "deed–Tat" and "deep–tief". This study examines how social ecology influences lexical-phonological systematic correspondence using a vector-based measurement—weighted cosine systematicity—across two co-evolutionary lexical datasets for comparison: old to recent English-German related words, and thirty-year sliced morphemic transcriptions for Chinese dialects in Shanghai. Results show that even when related but socially independent languages evolve in different directions, they can maintain an equilibrium in systematic correspondence over centuries. In contrast, dialects can rapidly converge towards their national high variety in terms of lexical-phonological similarities, and the regional standard in terms of systematic correspondence within decades. This suggests that self-regulation of cross-linguistic systematic correspondence has its own, yet complementary, mechanism compared to the similarity-based co-evolutionary mechanism, making it a meaningful indicator and predictor for cross-linguistic lexical co-evolution.

<https://www.nature.com/articles/s41599-023-01975-6>

#### **YUZHU LIANG et al – Languages in China link climate, voice quality, and tone in a causal chain**

Are the sound systems of languages ecologically adaptive like other aspects of human behavior? In previous substantive explorations of the climate–language nexus, the hypothesis that desiccation affects the tone systems of languages was not well supported. The lack of analysis of voice quality data from natural speech undermines the credibility of the following two key premises: the compromised voice quality caused by desiccated ambient air and constrained use of phonemic tone due to a desiccated larynx. Here, the full chain of causation, humidity → voice quality → number of tones, is for the first time strongly supported by direct experimental tests based on a large speech database (China's Language Resources Protection Project). Voice quality data is sampled from a recording set that includes 997 language varieties in China. Each language is represented by about 1200 sound files, amounting to a total of 1,174,686 recordings. Tonally rich languages are distributed throughout China and vary in their number of tones and in the climatic conditions of their speakers. The results show that, first, the effect of humidity is large enough to influence the voice quality of common speakers in a naturalistic environment; secondly, poorer voice quality is more likely to be observed in speakers of non-tonal languages and languages with fewer tones. Objective measures of phonatory capabilities help to disentangle the humidity effect from the contribution of



phylogenetic and areal relatedness to the tone system. The prediction of ecological adaptation of speech is first verified through voice quality analysis. Humidity is observed to be related to synchronic variation in tonality. Concurrently, the findings offer a potential trigger for diachronic changes in tone systems.

<https://www.nature.com/articles/s41599-023-01969-4>

## Nature Scientific Data

### PAPERS

#### **KRISTINA T. JOHNSON et al – ReCANVo: A database of real-world communicative and affective nonverbal vocalizations**

Nonverbal vocalizations, such as sighs, grunts, and yells, are informative expressions within typical verbal speech. Likewise, individuals who produce 0–10 spoken words or word approximations (“minimally speaking” individuals) convey rich affective and communicative information through nonverbal vocalizations even without verbal speech. Yet, despite their rich content, little to no data exists on the vocal expressions of this population. Here, we present ReCANVo: Real-World Communicative and Affective Nonverbal Vocalizations - a novel dataset of non-speech vocalizations labeled by function from minimally speaking individuals. The ReCANVo database contains over 7000 vocalizations spanning communicative and affective functions from eight minimally speaking individuals, along with communication profiles for each participant. Vocalizations were recorded in real-world settings and labeled in real-time by a close family member who knew the communicator well and had access to contextual information while labeling. ReCANVo is a novel database of nonverbal vocalizations from minimally speaking individuals, the largest available dataset of nonverbal vocalizations, and one of the only affective speech datasets collected amidst daily life across contexts.

<https://www.nature.com/articles/s41597-023-02405-7>

## Nature Scientific Reports

### PAPERS

#### **ARTHUR GICQUEAU et al with JEAN-JACQUES HUBLIN – Anatomically modern human in the Châtelperronian hominin collection from the Grotte du Renne (Arcy-sur-Cure, Northeast France)**

Around 42,000 years ago, anatomically modern humans appeared in Western Europe to the detriment of indigenous Neanderthal groups. It is during this period that new techno-cultural complexes appear, such as the Châtelperronian that extends from northern Spain to the Paris Basin. The Grotte du Renne (Arcy-sur-Cure) is a key site for discussing the biological identity of its makers. This deposit has yielded several Neanderthal human remains in its Châtelperronian levels. However, the last inventory of the paleoanthropological collection attributed to this techno-complex allowed the identification of an ilium belonging to a neonate (AR-63) whose morphology required a thorough analysis to assess its taxonomic attribution. Using geometric morphometrics, we quantified its morphology and compared it to that of 2 Neanderthals and 32 recent individuals deceased during the perinatal period to explore their morphological variation. Our results indicate a morphological distinction between the ilia of Neanderthals and anatomically modern neonates. Although AR-63 is slightly outside recent variability, it clearly differs from the Neanderthals. We propose that this is due to its belonging to an early modern human lineage whose morphology differs slightly from present-day humans. We also explore different hypotheses about the presence of this anatomically modern neonate ilium among Neanderthal remains.

<https://www.nature.com/articles/s41598-023-39767-2>

#### **JAMES R. DAVIES & ELIAS GARCIA-PELEGRIN – Bottlenose dolphins are sensitive to human attentional features, including eye functionality**

The ability to attribute attentional states to other individuals is a highly adaptive socio-cognitive skill and thus may have evolved in many social species. However, whilst humans excel in this ability, even chimpanzees appear to not accurately understand how visual attention works, particularly in regard to the function of eyes. The complex socio-ecological background and socio-cognitive skill-set of bottlenose dolphins (*Tursiops* sp.), alongside the specialised training that captive dolphins typically undergo, make them an especially relevant candidate for an investigation into their sensitivity to human attentional states. Therefore, we tested 8 bottlenose dolphins on an object retrieval task. The dolphins were instructed to fetch an object by a trainer under various attentional state conditions involving the trainer’s eyes and face orientation: ‘not looking’, ‘half looking’, ‘eyes open’, and ‘eyes closed’. As the dolphins showed an increased latency to retrieve the object in conditions where the trainer’s head and eyes cued a lack of attention to the dolphin, particularly when comparing ‘eyes open’ vs ‘eyes closed’ conditions, we demonstrate that dolphins can be sensitive to human attentional features, namely the functionality of eyes. This study supports growing evidence that dolphins possess highly complex cognitive abilities, particularly those in the social domain.

<https://www.nature.com/articles/s41598-023-39031-7>

#### **FEDERICA BADINO et al – High-resolution ecosystem changes pacing the millennial climate variability at the Middle to Upper Palaeolithic transition in NE-Italy**

Observation of high-resolution terrestrial palaeoecological series can decipher relationships between past climatic transitions, their effects on ecosystems and wildfire cyclicity. Here we present a new radiocarbon dated record from Lake

Fimon (NE-Italy) covering the 60–27 ka interval. Palynological, charcoal fragments and sediment lithology analysis were carried out at centennial to sub-centennial resolutions. Identification of the best modern analogues for MIS 3 ecosystems further enabled to thoroughly reconstruct structural changes in the vegetation through time. This series also represents an “off-site” reference record for chronologically well-constrained Palaeolithic sites documenting Neanderthal and Homo sapiens occupations within the same region. Neanderthals lived in a mosaic of grasslands and woodlands, composed of a mixture of boreal and broad-leaved temperate trees analogous to those of the modern Central-Eastern Europe, the Southern Urals and central-southern Siberia. Dry and other grassland types expanded steadily from 44 to 43 ka and peaked between 42 and 39 ka, i.e., about the same time when Sapiens reached this region. This vegetation, which finds very few reliable modern analogues in the adopted Eurasian calibration set, led to the expansion of ecosystems able to sustain large herds of herbivores. During 39–27 ka, the landscape was covered by steppe, desert-steppe and open dry boreal forests similar to those of the modern Altai-Sayan region. Both Neanderthal and Sapiens lived in contexts of expanded fire-prone ecosystems modulated by the high-frequency climatic cycles of MIS 3.

<https://www.nature.com/articles/s41598-023-38081-1>

---

## New Scientist

### NEWS

#### **Origin of Indo-European languages traced back to 8000 years ago**

An analysis of related words in 161 languages suggests their shared roots lie in the Middle East – a conclusion that also fits with DNA evidence.

<https://www.newscientist.com/article/2385057-origin-of-indo-european-languages-traced-back-to-8000-years-ago/>

---

## PLoS Biology

### PAPERS

#### **TOMAS KAY et al – Social network position is a major predictor of ant behavior, microbiota composition, and brain gene expression**

*This is an uncorrected proof.*

The physiology and behavior of social organisms correlate with their social environments. However, because social environments are typically confounded by age and physical environments (i.e., spatial location and associated abiotic factors), these correlations are usually difficult to interpret. For example, associations between an individual’s social environment and its gene expression patterns may result from both factors being driven by age or behavior. Simultaneous measurement of pertinent variables and quantification of the correlations between these variables can indicate whether relationships are direct (and possibly causal) or indirect. Here, we combine demographic and automated behavioral tracking with a multiomic approach to dissect the correlation structure among the social and physical environment, age, behavior, brain gene expression, and microbiota composition in the carpenter ant *Camponotus fellah*. Variations in physiology and behavior were most strongly correlated with the social environment. Moreover, seemingly strong correlations between brain gene expression and microbiota composition, physical environment, age, and behavior became weak when controlling for the social environment. Consistent with this, a machine learning analysis revealed that from brain gene expression data, an individual’s social environment can be more accurately predicted than any other behavioral metric. These results indicate that social environment is a key regulator of behavior and physiology.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3002203>

---

## PLoS One

### PAPERS

#### **HALA ALARASHI et al – Threads of memory: Reviving the ornament of a dead child at the Neolithic village of Ba`ja (Jordan)**

In 2018, a well-constructed cist-type grave was discovered at Ba`ja, a Neolithic village (7,400–6,800 BCE) in Southern Jordan. Underneath multiple grave layers, an 8-year-old child was buried in a fetal position. Over 2,500 beads were found on the chest and neck, along with a double perforated stone pendant and a delicately engraved mother-of-pearl ring discovered among the concentration of beads. The first was found behind the neck, and the second on the chest. The meticulous documentation of the bead distribution indicated that the assemblage was a composite ornament that had gradually collapsed, partly due to the burying position. Our aim was to challenge time degradation and to reimagine the initial composition in order to best explore the significance of this symbolic category of material culture, not as mere group of beads, but as an ornamental creation with further aesthetic, artisanal and socioeconomic implications. The reconstruction results exceeded our expectations as it revealed an imposing multi-row necklace of complex structure and attractive design. Through multiple lines of evidence, we suggest that the necklace was created at Ba`ja, although significant parts of beads were made from exotic shells and stones, including fossil amber, an unprecedented material never attested before for this period. The retrieval of such an ornament from life and its attribution to a young dead child highlights the significant social status of this individual. Beyond the symbolic functions related to identity, the necklace is believed to have played a key role in performing the inhumation rituals, understood as a public event gathering families, relatives, and people from other

---

villages. In this sense, the necklace is not seen as belonging completely to the realm of death but rather to the world of the living, materializing a collective memory and shared moments of emotions and social cohesion.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0288075>

**BRUCE C. PETERSEN – An economic model and evidence of the evolution of human intelligence in the Middle Pleistocene: Climate change and assortative mating**

A main objective of this paper is to provide the first model of how climate change, working through sexual selection, could have led to dramatic increases in hominin brain size, and presumably intelligence, in the Middle Pleistocene. The model is built using core elements from the field of family economics, including assortative mating and specialization and complementarities between mates. The main assumptions are that family public goods (e.g., conversation, shelter, fire) were particularly cognitively intensive to produce and became increasingly important for child survival during glacial phases. Intermediate climates (e.g., not the depths of severe glacial phases) create the largest gains from specialization, encouraging negative assortative mating. In contrast, severe glacial phases encourage positive assortative mating because of the rising importance of family public goods. One testable hypothesis is that absence of severe glacial phases should have led to stasis in brain size. Two other testable hypotheses are that severe glacial phases should have led to speciation events, as well as increases in brain size. The evidence shows that there was a million-year stasis in cranial size prior to the start of the severe glacial phases. This stasis is broken by a speciation event (*Homo heidelbergensis*), with the oldest fossil evidence dated near the close of the first severe glacial phase. In the next 300 kyr, there are two additional severe glacial phases, accompanied by considerable increases in cranial capacity. The last speciation event is *Homo sapiens*, with the earliest fossils dated near the end of the last of these two glacial phases.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0287964>

**KIMBERLY T. MAI et al – Warning: Humans cannot reliably detect speech deepfakes**

Speech deepfakes are artificial voices generated by machine learning models. Previous literature has highlighted deepfakes as one of the biggest security threats arising from progress in artificial intelligence due to their potential for misuse. However, studies investigating human detection capabilities are limited. We presented genuine and deepfake audio to  $n = 529$  individuals and asked them to identify the deepfakes. We ran our experiments in English and Mandarin to understand if language affects detection performance and decision-making rationale. We found that detection capability is unreliable. Listeners only correctly spotted the deepfakes 73% of the time, and there was no difference in detectability between the two languages. Increasing listener awareness by providing examples of speech deepfakes only improves results slightly. As speech synthesis algorithms improve and become more realistic, we can expect the detection task to become harder. The difficulty of detecting speech deepfakes confirms their potential for misuse and signals that defenses against this threat are needed.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0285333>

**JONATHAN R. GOODMAN, ANDREW CAINES & ROBERT A. FOLEY – Shabboleth: An agent-based model of signalling mimicry**

Mimicry is an essential strategy for exploiting competitors in competitive co-evolutionary relationships. Protection against mimicry may, furthermore, be a driving force in human linguistic diversity: the potential harm caused by failing to detect mimicked group-identity signals may select for high sensitivity to mimicry of honest group members. Here we describe the results of five agent-based models that simulate multi-generational interactions between two groups of individuals: original members of a group with an honest identity signal, and members of an outsider group who mimic that signal, aiming to pass as members of the in-group. The models correspond to the Biblical story of Shabboleth, where a tribe in conflict with another determines tribe affiliation by asking individuals to pronounce the word, 'Shabboleth.' In the story, failure to reproduce the word phonetically resulted in death. Here, we run five different versions of a 'Shabboleth' model: a first, simple version, which evaluates whether a composite variable of mimicry quality and detection quality is a superior predictor to the model's outcome than is cost of detection. The models thereafter evaluate variations on the simple model, incorporating group-level behaviours such as altruistic punishment. Our results suggest that group members' sensitivity to mimicry of the Shabboleth-signal is a better predictor of whether any signal of group identity goes into fixation in the overall population than is the cost of mimicry detection. Thus, the likelihood of being detected as a mimic may be more important than the costs imposed on mimics who are detected. This suggests that theoretical models in biology should place greater emphasis on the likelihood of detection, which does not explicitly entail costs, rather than on the costs to individuals who are detected. From a language learning perspective, the results suggest that admission to group membership through linguistic signals is powered by the ability to imitate and evade detection as an outsider by existing group members.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0289333>

**ANDREW W. KANDEL et al with NICHOLAS J. CONARD – The ROCEEH Out of Africa Database (ROAD): A large-scale research database serves as an indispensable tool for human evolutionary studies**

Large scale databases are critical for helping scientists decipher long-term patterns in human evolution. This paper describes the conception and development of such a research database and illustrates how big data can be harnessed to formulate new ideas about the past. The Role of Culture in Early Expansions of Humans (ROCEEH) is a transdisciplinary research center

whose aim is to study the origins of culture and the multifaceted aspects of human expansions across Africa and Eurasia over the last three million years. To support its research, the ROCEEH team developed an online tool named the ROCEEH Out of Africa Database (ROAD) and implemented its web-based applications. ROAD integrates geographical data as well as archaeological, paleoanthropological, paleontological and paleobotanical content within a robust chronological framework. In fact, a unique feature of ROAD is its ability to dynamically link scientific data both spatially and temporally, thereby allowing its reuse in ways that were not originally conceived. The data stem from published sources spanning the last 150 years, including those generated by the research team. Descriptions of these data rely on the development of a standardized vocabulary and profit from online explanations of each table and attribute. By synthesizing legacy data, ROAD facilitates the reuse of heritage data in novel ways. Database queries yield structured information in a variety of interoperable formats. By visualizing data on maps, users can explore this vast dataset and develop their own theories. By downloading data, users can conduct further quantitative analyses, for example with Geographic Information Systems, modeling programs and artificial intelligence. In this paper, we demonstrate the innovative nature of ROAD and show how it helps scientists studying human evolution to access datasets from different fields, thereby connecting the social and natural sciences. Because it permits the reuse of “old” data in new ways, ROAD is now an indispensable tool for researchers of human evolution and paleogeography. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0289513>

**ALESSANDRO ALEO et al – The dynamic lives of osseous points from Late Palaeolithic/Early Mesolithic Doggerland: A detailed functional study of barbed and unbarbed points from the Dutch North Sea**

Osseous barbed and unbarbed points are commonly recovered from the Dutch North Sea and other Mesolithic sites of northern Europe. Interpreted as elements of projectile weaponry, barbed points are considered by archaeologists to be a technological innovation in the hunting equipment of hunter-gatherers. However, debate about their exact use and identification of the targeted prey species is still ongoing. To shed light on the function of these tools, we analysed a sample of 17 artefacts from the Netherlands with a multi-disciplinary approach encompassing morphometric, functional, and chemical analysis. <sup>14</sup>C-AMS dating yielded the oldest date for a barbed point from the Dutch coast (~13000 cal. BP). The observation of microwear traces preserved on the tools provides solid evidence to interpret the function of barbed and unbarbed points. We show that there were two distinct tool categories. 1) Barbed points hafted with birch tar and animal or vegetal binding were likely projectile tips for terrestrial and aquatic hunting. We provide strong clues to support the link between small barbed points and fishing using wear traces. 2) Points without barbs served as perforators for animal hides. Our results highlight the importance of use-wear and residue analysis to reconstruct prehistoric hunting activities. The functional interpretation of projectile points must also rely on microwear traces and not merely on the association with faunal remains, historical sources, and ethnographic comparisons.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0288629>

**RICARDO SANTA et al – The impact of emotional intelligence on operational effectiveness: The mediating role of organizational citizenship behavior and leadership**

This article examines the influence of emotional intelligence on organizational citizenship behavior and transformational and transactional leadership, and the impact of these dimensions on operational effectiveness. The analysis was based on 180 valid questionnaires from organizations in Colombia’s manufacturing sector of the Valle del Cauca region. The variables were analyzed using structural equation modeling to identify the relationships among the studied constructs.

The results suggest that emotional intelligence positively affects organizational citizenship behavior. Nevertheless, emotional intelligence does not impact transformational leadership and only partially affects transactional leadership and operational effectiveness. Emotional intelligence has a strong and positive impact on operational effectiveness when mediated by organizational citizenship behavior, which does have a strong and positive predictive power on operational effectiveness. Hence, in the search for competitive advantage, leaders should seek to improve operational effectiveness by focusing on developing emotional intelligence and organizational citizenship behaviour skills. Interestingly, of the two leadership styles examined in this study, only transactional leadership impacts operational effectiveness, which is inconsistent with the current literature and indicates a need for further leadership training.

The value of this paper lies in discerning the current capabilities and strategies that individuals in an organization must address for proper transactional and transformational leadership. However, before operational effectiveness and a sustainable competitive advantage can be achieved, the role of leaders should be managed through the appropriate application of the concepts of emotional intelligence and organizational leadership behavior.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0284752>

**JOHANNA SCHOPPMANN et al – The effect of picture book reading on young children’s use of an emotion regulation strategy**

Picture book reading is an enjoyable everyday activity for many young children with well-known benefits for language development. The present study investigated whether picture book reading can support young children’s social-emotional development by providing a learning opportunity for the usage of emotion regulation strategies. Three-year-old children participated in two waiting situations designed to elicit negative affect. Between these waiting situations they read a picture



book. In two experimental conditions, the book depicted how a protagonist (same-aged peer or young adult, respectively) waited for a desired object and distracted herself with toys while waiting. Children in an additional control condition read a picture book that was unrelated to waiting. Use of distraction did not differ between conditions. Parents often read picture book interactively with their children. Therefore, in an additional condition (Exp. 2), the experimenter read the picture book featuring the same-aged peer protagonist in an interactive way intended to facilitate transfer. Apart from the reading style, the design was identical to experiment 1. Experiment 2 intended to test whether changes in reading style lead to differences in three-year old children's social-emotional learning from picture books. When controlling for the children's picture book experience, children in the experimental conditions exhibited an increase in distraction in contrast to children in the control condition. In sum, results suggest that picture book reading could be an ecologically valid and versatile method for supporting 3-year-old children in their use of an age-appropriate adaptive emotion regulation strategies such as distraction. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0289403>

**EMMELINE R. I. HOWARTH et al – Genetic polymorphisms in the serotonin, dopamine and opioid pathways influence social attention in rhesus macaques (*Macaca mulatta*)**

Behaviour has a significant heritable component; however, unpicking the variants of interest in the neural circuits and molecular pathways that underpin these has proven difficult. Here, we present a comprehensive analysis of the relationship between known and new candidate genes from identified pathways and key behaviours for survival in 109 adult rhesus macaques (*Macaca mulatta*). Eight genes involved in emotion were analysed for variation at a total of nine loci. Genetic data were then correlated with cognitive and observational measures of behaviour associated with wellbeing and survival using MCMC-based Bayesian GLMM in R, to account for relatedness within the macaque population. For four loci the variants genotyped were length polymorphisms (SLC6A4 5-hydroxytryptamine transporter length-polymorphic repeat (5-HTTLPR), SLC6A4 STin polymorphism, Tryptophan 5-hydroxylase 2 (TPH2) and Monoamine oxidase A (MAOA)) whilst for the other five (5-hydroxytryptamine receptor 2A (HTR2A), Dopamine Receptor D4 (DRD4), Oxytocin receptor (OXTR), Arginine vasopressin receptor 1A (AVPR1a), Opioid receptor mu( $\mu$ ) 1 (OPRM1)) SNPs were analysed. STin genotype, DRD4 haplotype and OXTR haplotype were significantly associated with the cognitive and observational measures of behaviour associated with wellbeing and survival. Genotype for 5-HTTLPR, STin and AVPR1a, and haplotype for HTR2A, DRD4 and OXTR were significantly associated with the duration of behaviours including fear and anxiety. Understanding the biological underpinnings of individual variation in negative emotion (e.g., fear and anxiety), together with their impact on social behaviour (e.g., social attention including vigilance for threat) has application for managing primate populations in the wild and captivity, as well as potential translational application for understanding of the genetic basis of emotions in humans. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0288108>

**PNAS**

**PAPERS**

**ANJA KASSECKER, STEPHAN A. VERSCHOOR & MARCO F. H. SCHMIDT – Human infants are aroused and concerned by moral transgressions**

Humans reason and care about ethical issues, such as avoiding unnecessary harm. But what enables us to develop a moral capacity? This question dates back at least to ancient Greece and typically results in the traditional opposition between sentimentalism (the view that morality is mainly driven by socioaffective processes) and rationalism [the view that morality is mainly driven by (socio)cognitive processes or reason]. Here, we used multiple methods (eye-tracking and observations of expressive behaviors) to assess the role of both cognitive and socioaffective processes in infants' developing morality. We capitalized on the distinction between moral (e.g., harmful) and conventional (e.g., harmless) transgressions to investigate whether 18-mo-old infants understand actions as distinctively moral as opposed to merely disobedient or unexpected. All infants watched the same social scene, but based on prior verbal interactions, an actor's tearing apart of a picture (an act not intrinsically harmful) with a tool constituted either a conventional (wrong tool), a moral (producing harm), or no violation (correct tool). Infants' anticipatory looks differentiated between conventional and no violation conditions, suggesting that they processed the verbal interactions and built corresponding expectations. Importantly, infants showed a larger increase in pupil size (physiological arousal), and more expressions indicating empathic concern, in response to a moral than to a conventional violation. Thus, infants differentiated between harmful and harmless transgressions based solely on prior verbal interactions. Together, these convergent findings suggest that human infants' moral development is fostered by both sociocognitive (inferring harm) and socioaffective processes (empathic concern for others' welfare).

<https://www.pnas.org/doi/full/10.1073/pnas.2306344120>

**CORRECTIONS**

**ABEL RUIZ-GIRALT – Correction for Ruiz-Giralt et al., On the verge of domestication: Early use of C4 plants in the Horn of Africa**

The authors note that, due to a production error, Table 1 appeared incorrectly.

Additionally, a typographical error has been corrected. On page 1, first full paragraph, line 11, "Saudi Arabia" should instead appear as "South Arabia."



Finally, due to a production error, several in-line reference callouts to the SI Appendix appeared incorrectly throughout the article.

The online version has been corrected.

<https://www.pnas.org/doi/full/10.1073/pnas.2310986120>

View the original article: <https://www.pnas.org/doi/10.1073/pnas.2300166120>

---

## Proceedings of the Royal Society B

### PAPERS

#### **PAULO B. CHAVES, KAREN B. STRIER & ANTHONY DI FIORE – Paternity data reveal high MHC diversity among sires in a polygynandrous, egalitarian primate**

Evidence from human and nonhuman primates suggests that females avoid breeding with close kin and may choose mates based on MHC diversity, which can improve offspring survival. In despotic societies, female mate choice may be hindered by male sexual coercion, but in egalitarian societies, females may be less constrained. Among northern muriquis—an egalitarian, polygynandrous primate with male philopatry—analyses of new data on paternity and variation at microsatellite and MHC loci, combined with behavioural and life-history data, revealed that sires showed higher MHC diversity than expected by chance and were never close kin of dams, consistent with predictions of female mate choice and close inbreeding avoidance. However, females did not differentially reproduce with males who were more distantly related to them or more dissimilar at the MHC than expected by chance, nor with those who had more MHC alleles distinct from their own. The lack of male dominance may permit females to identify and reproduce preferentially with non-offspring males and with males who are more diverse at the MHC. Nonetheless, the absence of disassortative mating at the MHC and neutral loci suggests that female mate choice may be limited by other factors impacting male fertilization success.

<https://royalsocietypublishing.org/doi/10.1098/rspb.2023.1035>

#### **LIZA R. MOSCOVICE et al – Spontaneous helping in pigs is mediated by helper's social attention and distress signals of individuals in need**

Helping behaviour is of special interest for prosociality because it appears to be motivated by the needs of others. We developed a novel paradigm to investigate helping in pigs (*Sus scrofa domestica*) and tested 75 individuals in eight groups in their home pens. Two identical compartments were attached to the pen, equipped with a window, and a door that could be opened from the outside by lifting a handle. Pigs in all groups spontaneously opened doors during a 5-day familiarization. During testing, each pig was isolated once from its group and placed in one of the two compartments, in a counter-balanced order. In 85% of cases, pigs released a trapped group member from the test compartment within 20 min (median latency = 2.2 min). Pigs were more likely and quicker to open a door to free the trapped pig than to open a door to an empty compartment. Pigs who spent more time looking at the window of the compartment containing the trapped pig were more likely to help. Distress signals by the trapped pig increased its probability of being helped. Responses are consistent with several criteria for identifying targeted helping, but results can also be explained by selfish motivations.

<https://royalsocietypublishing.org/doi/10.1098/rspb.2023.0665>

---

## Trends in Cognitive Sciences

### PAPERS

#### **GARRIY SHTEYNBERG et al – Theory of collective mind**

Theory of mind research has traditionally focused on the ascription of mental states to a single individual. Here, we introduce a theory of collective mind: the ascription of a unified mental state to a group of agents with convergent experiences. Rather than differentiation between one's personal perspective and that of another agent, a theory of collective mind requires perspectival unification across agents. We review recent scholarship across the cognitive sciences concerning the conceptual foundations of collective mind representations and their empirical induction through the synchronous arrival of shared information. Research suggests that representations of a collective mind cause psychological amplification of co-attended stimuli, create relational bonds, and increase cooperation, among co-attendees.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(23\)00168-7#%20](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00168-7#%20)

---

## SUBSCRIBE to the EAORC Bulletin

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

---

## UNSUBSCRIBE from the EAORC Bulletin

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

---

## PRODUCED BY AND FOR THE EAORC EMAIL GROUP

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

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

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