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CONTENTS

NOTICES **2**
PUBLICATION ALERTS 2
EDITORIAL INTERJECTIONS 2
ACADEMIA.EDU – Embodied and Enactive Approaches to Cognition 3
SHAUN GALLAGHER – Embodied and Enactive Approaches to Cognition 3
ACADEMIA.EDU – Metaphor and Materiality in earliest Prehistory 3
FIONA COWARD & CLIVE GAMBLE – Metaphor and Materiality in earliest Prehistory 3
FUNDING ALERT – Progress Meetings in Evolutionary Biology 3
NEWS **3**
SCIENCE.ORG NEWS – Common Alzheimer's disease gene may have helped our ancestors have more kids 3
SCIENCE.ORG NEWS – Wandering Seeds 3
THE CONVERSATION – The evolutionary reasons humans love pets – and nine benefits of having one 3
PUBLICATIONS **4**
American Journal of Biological Anthropology 4
PAPERS **4**
J. RYAN-DESPRAZ et al – Multivariate assessments of activity-related skeletal changes: Interpreting Bell Beaker specialized male archery and social organization in Central Europe 4
Biolinguistics 4
COMMENTARIES **4**
JEFFREY WATUMULL & IAN ROBERTS – Rebuttal to "Merge Is Not 'Lerge'" 4
Cell 4
PAPERS **4**
DANIEL W. BAYLESS et al – A neural circuit for male sexual behavior and reward 4
Cell Reports 4
PAPERS **4**
HAO WANG et al – Chromosomal inversion polymorphisms shape human brain morphology 4
Current Biology 5
ARTICLES **5**
MORIAH J. DEIMEKE & CHRISTOPHER B. STURDY – Animal cognition: Wild mountain chickadees follow the abstract rules 5
CLAUDIA A.F. WASCHER – Cognition: Crows are natural statisticians 5
MICHAEL GROSS – Music on our minds 5
eLife 5
PAPERS **5**
BINGJIANG LYU et al – Finding structure during incremental speech comprehension 5
JÖRN K POMPER et al – Non-shared coding of observed and executed actions prevails in macaque ventral premotor mirror neurons 5
Evolutionary Anthropology 6
NEWS **6**
Addressing the growing fossil record of subadult hominins by reaching across disciplines 6
PAPERS **6**
ANNA WARRENER – The multifactor pelvis: An alternative to the adaptationist approach of the obstetrical dilemma 6
OBITUARIES **6**
LAURIE R. GODFREY & DAVID A. BURNEY – William L. Jungers, a gentle giant in Madagascar 6
Frontiers in Psychology 6
PAPERS **6**
TUOXIONG WANG & HAOMIN ZHANG – Examining the dimensionality of morphological knowledge and morphological awareness and their effects on second language vocabulary knowledge 6
MICHELE I. FEIST & SARAH E. DUFFY – To each their own: a review of individual differences and metaphorical perspectives on time 6
Frontiers in Systems Neuroscience 7
PAPERS **7**
GABRIEL D. NOEL, LIONEL E. MUGNO & DANIELA S. ANDRES – From signals to music: a bottom-up approach to the structure of neuronal activity 7
Nature Communications Biology 7

PAPERS 7
TIINA M. MATTILA, et al – Genetic continuity, isolation, and gene flow in Stone Age Central and Eastern Europe 7
Nature Scientific Reports 7
PAPERS 7
FRANCESCO D'ERRICO et al – A 36,200-year-old carving from Grotte des Gorges, Amange, Jura, France 7
New Scientist 8
ARTICLES 8
MICHAEL MARSHALL – How prehistoric people settled one of Earth's most extreme places 8
REVIEWS 8
ALISON GEORGE – Cave of Bones review: Lee Berger on the discovery of Homo naledi 8
Philosophical Transactions of the Royal Society B 8
PAPERS 8
ADAM ZAIDEL & ROY SALOMON – Multisensory decisions from self to world 8
STEVEN J. JERJIAN, DEVIN R. HARSCH & CHRISTOPHER R. FETSCH – Self-motion perception and sequential decision-making: where are we heading? 8
Philosophy Now 8
ARTICLES 8
NURANA RAJABOVA – John Locke & Personal Identity 8
PLoS One 9
PAPERS 9
ANNA SEYDELL-GREENWALD et al – Spoken language processing activates the primary visual cortex 9
XIAOPING FANG et al – Time separating spatial memories does not influence their integration in humans 9
SHEILA J. CUNNINGHAM et al – The cost of social influence: Own-gender and gender-stereotype social learning biases in adolescents and adults 9
DANIEL KRÄHMER, LAURA SCHÄCHTELE & ANDREAS SCHNECK – Care to share? Experimental evidence on code sharing behavior in the social sciences 10
Proceedings of the Royal Society B 10
PAPERS 10
JOSH J. ARBON et al – Competition and generalization impede cultural formation in wild jackdaws 10
JULIE THÉVENET et al – Crocodile perception of distress in hominid baby cries 10
Science 10
NEWS 10
Wandering Seeds 10
ARTICLES 10
EMILY J. BEVERLY – Using climate to model ancient human migration 10
PAPERS 11
JIAOYANG RUAN et al – Climate shifts orchestrated hominin interbreeding events across Eurasia 11
VASILIKI MARGARI et al with SIMON A. PARFITT – Extreme glacial cooling likely led to hominin depopulation of Europe in the Early Pleistocene 11
Trends in Cognitive Sciences 11
ARTICLES 11
MASAKI ISODA – Decoding social rewards via inter-areal coordination frequency in the brain 11
PAPERS 11
KEVIN BERRYMAN, SARA W. LAZAR & JAKOB HOHWY – Do contemplative practices make us more moral? 11
SUBSCRIBE to the EAORC Bulletin 11
UNSUBSCRIBE from the EAORC Bulletin 11
PRODUCED BY AND FOR THE EAORC EMAIL GROUP 11

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 – Embodied and Enactive Approaches to Cognition

Cambridge University Press (2023).

SHAUN GALLAGHER – Embodied and Enactive Approaches to Cognition

This Element discusses contemporary theories of embodied cognition, including what has been termed the "4Es" (embodied, embedded, extended, and enactive cognition). It examines diverse approaches to questions about the nature of the mind, the mind's relation to the brain, perceptual experience, mental representation, sensemaking, the role of the environment, and social cognition, and it considers the strengths and weaknesses of the theories in question. It contrasts embodied and enactive views with classic cognitivism, and discusses major criticisms and their possible resolutions. This Element also provides a strong focus on enactive theory and the prospects for integrating enactive approaches with other embodied and extended theories, mediated through recent developments in predictive processing and the free-energy principle. It concludes with a brief discussion of the practical applications of embodied cognition. This title is also available as Open Access on Cambridge Core.

https://www.academia.edu/105323806/Gallagher_S_2023_Embodied_and_Enactive_Approaches_to_Cognition_Cambridge_Cambridge_University_Press

ACADEMIA.EDU – Metaphor and Materiality in earliest Prehistory

In L. Malafouris & C. Renfrew, (eds.), The Cognitive Life of Things: recasting the boundaries of the mind. McDonald Institute Monographs, 47-58, (2010).

FIONA COWARD & CLIVE GAMBLE – Metaphor and Materiality in earliest Prehistory

In this paper we argue for a relational perspective based on metaphorical rather than semiotic understandings of human and hominin1 material culture. The corporeality of material culture and thus its role as solid metaphors for a shared experience of embodiment precedes language in the archaeological record. While arguments continue as to both the cognitive abilities that underpin symbolism and the necessary and sufficient evidence for the identification of symbolic material culture in the archaeological record, a symbolic approach will inevitably restrict the available data to sapiens or even to literate societies. However, a focus on material culture as material metaphor allows the consideration of the ways in which even the very earliest archaeological record reflects hominins' embodied, distributed relationships with heterogeneous forms of agent, as will be demonstrated by two case studies.

https://www.academia.edu/826089/Coward_F_and_Gamble_C_Metaphor_and_Materiality_in_earliest_Prehistory

FUNDING ALERT – Progress Meetings in Evolutionary Biology

The Percy Sladen Memorial Fund is a charity associated with the Linnean Society of London that offers small travel & subsistence grants (up to £2000) for fieldwork in Natural History (anthropology, archaeology, botany, geology, palaeontology and zoology). There are two application deadlines per year: 30th January and 30th September. Prospective applicants should email the fund's secretary, Elizabeth Rollinson, erollinson13@gmail.com, for an application form in good time before a deadline.

Further information can be found here:
https://www.linnean.org/the-society/medals-awards-prizes-grants/percy-sladen-memorial-fund-grants

With regret, the fund does not support conference attendance, training or student studies that are part of student projects (undergrad, masters or PhD).

Prof. J.M. Pemberton
Institute of Ecology and Evolution, School of Biological Sciences, University of Edinburgh, Charlotte Auerbach Road, EH9 3FL

NEWS

SCIENCE.ORG NEWS – Common Alzheimer's disease gene may have helped our ancestors have more kids

Study of traditional society in Amazon suggests why evolution hasn't purged harmful variant.

https://www.science.org/content/article/common-alzheimer-s-disease-gene-may-have-helped-our-ancestors-have-more-kids

SCIENCE.ORG NEWS – Wandering Seeds

Millennia before Europeans arrived in Australia, humans helped shape the distribution of the continent's plants.

https://www.science.org/content/article/indigenous-people-shaped-australias-curious-geography-plants

THE CONVERSATION – The evolutionary reasons humans love pets – and nine benefits of having one

It's not just cats and dogs – we often feel a deep emotional bond with small animals like rabbits and guinea-pigs too

https://theconversationuk.cmail20.com/t/r-l-tthdhykk-khhlilahh-f/

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

J. RYAN-DESPRAZ et al – Multivariate assessments of activity-related skeletal changes: Interpreting Bell Beaker specialized male archery and social organization in Central Europe

The Bell Beaker period witnessed the rise of individual inhumations with “wealthy” burial contexts containing archery-related grave goods, leading archaeologists to label the individuals in these tombs as “archers.” This study looks to (1) compare the skeletons from male “archer” burials with those from male “non-archer” burials—those not having archery-related grave goods—in order to assess a possible link between burial context and physical activity, and (2) apply a biomechanics profile to evaluate whether the individuals associated with these “archer” burials practiced specialized archer activity.
https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.24817

Biolinguistics

COMMENTARIES

JEFFREY WATUMULL & IAN ROBERTS – Rebuttal to "Merge Is Not 'Lerge'"

This paper is a rebuttal to Gärtner (2023, https://doi.org/10.5964/bioling.11715).
It was our contention in “Leibnizian Linguistics” (Roberts & Watumull, 2015) that one could read Leibniz to have formulated a precursor to Merge—the basic set-formation operation of I-language posited within the minimalist program (see Seely et al., 2022). Lo, these many years later, Gärtner (2023) asserts to the contrary that “Merge is Not ‘Lerge’” because Lerge, unlike Merge, is associative.
https://bioling.psychopen.eu/index.php/bioling/article/view/12393

Cell

PAPERS

DANIEL W. BAYLESS et al – A neural circuit for male sexual behavior and reward

Male sexual behavior is innate and rewarding. Despite its centrality to reproduction, a molecularly specified neural circuit governing innate male sexual behavior and reward remains to be characterized. We have discovered a developmentally wired neural circuit necessary and sufficient for male mating. This circuit connects chemosensory input to BNSTprTac1 neurons, which innervate POATacr1 neurons that project to centers regulating motor output and reward. Epistasis studies demonstrate that BNSTprTac1 neurons are upstream of POATacr1 neurons, and BNSTprTac1-released substance P following mate recognition potentiates activation of POATacr1 neurons through Tacr1 to initiate mating. Experimental activation of POATacr1 neurons triggers mating, even in sexually satiated males, and it is rewarding, eliciting dopamine release and self-stimulation of these cells. Together, we have uncovered a neural circuit that governs the key aspects of innate male sexual behavior: motor displays, drive, and reward.
https://www.cell.com/cell/fulltext/S0092-8674(23)00798-5

Cell Reports

PAPERS

HAO WANG et al – Chromosomal inversion polymorphisms shape human brain morphology

The impact of chromosomal inversions on human brain morphology remains underexplored. We studied 35 common inversions classified from genotypes of 33,018 adults with European ancestry. The inversions at 2p22.3, 16p11.2, and 17q21.31 reach genome-wide significance, followed by 8p23.1 and 6p21.33, in their association with cortical and subcortical morphology. The 17q21.31, 8p23.1, and 16p11.2 regions comprise the LRRC37, OR7E, and NPIP duplicated gene families. We find the 17q21.31 MAPT inversion region, known for harboring neurological risk, to be the most salient locus among common variants for shaping and patterning the cortex. Overall, we observe the inverted orientations decreasing brain size, with the exception that the 2p22.3 inversion is associated with increased subcortical volume and the 8p23.1 inversion is associated with increased motor cortex. These significant inversions are in the genomic hotspots of neuropsychiatric loci. Our findings are generalizable to 3,472 children and demonstrate inversions as essential genetic variation to understand human brain phenotypes.
https://www.cell.com/cell-reports/fulltext/S2211-1247(23)00907-5

Current Biology

ARTICLES

MORIAH J. DEIMEKE & CHRISTOPHER B. STURDY – Animal cognition: Wild mountain chickadees follow the abstract rules

Abstract concept formation is a cognitive skill that nonhuman animals have been shown to possess. Most often, this ability has been shown in laboratory tasks; a new study sheds light on what role abstract concept formation may play in the wild.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00844-8

CLAUDIA A.F. WASCHER – Cognition: Crows are natural statisticians

A new study shows that carrion crows use memorized reward associations in a combinatorial way to apply relative probabilistic information to optimize reward outcome. This for the first time shows that a corvid species can flexibly apply statistical inference during decision making.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00859-X

MICHAEL GROSS – Music on our minds

Music is widely believed to be beneficial for children's development, but the systematic study of cross-domain effects, for instance between music and language learning, is still an emerging field with many questions left to investigate.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00965-X

eLife

PAPERS

BINGJIANG LYU et al – Finding structure during incremental speech comprehension

A core aspect of human speech comprehension is the incremental combination of consecutive words into a structured and coherent interpretation of the speaker's intended meaning. This rapid process is subject to multi-dimensional probabilistic constraints, including both linguistic and non-linguistic knowledge in the specific context, and it is their interpretative coherence that drives successful comprehension. To unveil the neural substrates of this process, we extracted word-by-word measures of sentential structure from artificial neural networks, approximating a coherent outcome of the dynamic interplay between various types of constraints that is difficult to model with traditional methods. Using representational similarity analysis, we tested these structural measures and relevant lexical properties against the spatiotemporally resolved brain activity recorded by electro/magnetoencephalography when participants were listening to the same sentences. Our results reveal a detailed picture of the neurobiological processes involved in building structured interpretations through the integration across multifaceted constraints, including an extensive set of bilateral brain regions beyond the classical fronto-temporal language system, which sheds light on the distributed nature of language processing in the brain. This study also highlights the power of combining multiple methodologies to uncover the neural dynamics of complex cognitive processes.
https://elifesciences.org/reviewed-preprints/89311

JÖRN K POMPER et al – Non-shared coding of observed and executed actions prevails in macaque ventral premotor mirror neurons

According to the mirror mechanism the discharge of F5 mirror neurons of a monkey observing another individual performing an action is a motor representation of the observed action that may serve to understand or learn from the action. This hypothesis, if strictly interpreted, requires mirror neurons to exhibit an action tuning that is shared between action observation and execution. Due to insufficient data it remains contentious if this requirement is met. To fill in the gaps, we conducted an experiment in which identical objects had to be manipulated in three different ways in order to serve distinct action goals. Using three methods, including cross-task classification, we found that at most time points F5 mirror neurons did not encode observed actions with the same code underlying action execution. However, in about 20% of neurons there were time periods with a shared code. These time periods formed a distinct cluster and cannot be considered a product of chance. Population classification yielded non-shared coding for observed actions in the whole population, which was at times optimal and consistently better than shared coding in differentially selected subpopulations. These results support the hypothesis of a representation of observed actions based on a strictly defined mirror mechanism only for small subsets of neurons and only under the assumption of time-resolved readout. Considering alternative concepts and recent findings, we propose that during observation mirror neurons represent the process of a goal pursuit from the observer's viewpoint. Whether the observer's goal pursuit, in which the other's action goal becomes the observer's action goal, or the other's goal pursuit is represented remains to be clarified. In any case, it may allow the observer to use expectations associated with a goal pursuit to directly intervene in or learn from another's action.
https://elifesciences.org/articles/77513

Evolutionary Anthropology

NEWS

Addressing the growing fossil record of subadult hominins by reaching across disciplines
The field of paleoanthropology lacks a coherent methodology to study ontogeny in extinct hominins.
https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21995

PAPERS

ANNA WARRENER – The multifactor pelvis: An alternative to the adaptationist approach of the obstetrical dilemma
The obstetrical dilemma describes the competing demands that a bipedally adapted pelvis and a large-brained neonate place on human childbirth and is the predominant model within which hypotheses about the evolution of the pelvis are framed. I argue the obstetrical dilemma follows the adaptationist program outlined by Gould and Lewontin in 1979 and should be replaced with a new model, the multifactor pelvis. This change will allow thorough consideration of nonadaptive explanations for the evolution of the human pelvis and avoid negative social impacts from considering human childbirth inherently dangerous. First, the atomization of the pelvis into discrete traits is discussed, after which current evidence for both adaptive and nonadaptive hypotheses is evaluated, including childbirth, locomotion, shared genetics with other traits under selection, evolutionary history, genetic drift, and environmental and epigenetic influences on the pelvis.
https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21997

OBITUARIES

LAURIE R. GODFREY & DAVID A. BURNEY – William L. Jungers, a gentle giant in Madagascar
William L. Jungers is perhaps best known for his work on human evolution and especially Australopithecus afarensis ("Lucy") and Homo floresiensis ("the hobbit"). But Madagascar was his first love, and the place to which he retired.
https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21992

Frontiers in Psychology

PAPERS

TUOXIONG WANG & HAOMIN ZHANG – Examining the dimensionality of morphological knowledge and morphological awareness and their effects on second language vocabulary knowledge
Morphological knowledge and morphological awareness are multidimensional and both have been confirmed to make important contributions to vocabulary knowledge. However, the extant literature has not made a clear demarcation between morphological knowledge and morphological awareness. The current study examined the underlying components of morphological knowledge and morphological awareness as well as their effects on vocabulary knowledge. The performance of 226 tenth- and eleventh-graders on five tasks was investigated using confirmatory factor analysis and structural equation modeling. Results demonstrated that morphological knowledge and morphological awareness were two distinct constructs. In regard to the direct and indirect effects between morphological knowledge and vocabulary, it was indicated that morphological knowledge made a significant indirect effect on vocabulary knowledge through morphological awareness. However, the direct effect of morphological knowledge on vocabulary knowledge was not significant. Findings from the current study have important implications to adolescent EFL students' vocabulary instruction and research.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1207854/full

MICHELE I. FEIST & SARAH E. DUFFY – To each their own: a review of individual differences and metaphorical perspectives on time
How do people talk—and potentially think—about abstract concepts? Supported by abundant linguistic evidence, Conceptual Metaphor Theory posits that people draw upon concrete concepts to structure abstract ones via metaphorical connections. Often, the source domain for a metaphor draws upon embodied physical experience, as in the time is space system, whereby representations in the domain of time are thought to arise from experiences of navigating through, orienting within, and observing motion in space. In recent years, psychological evidence has suggested that the connections between space and time are indeed conceptual; however, many gaps in our understanding of the workings of metaphor remain. Notably, until recently, the unique variations in the ways in which people experience metaphor have been largely overlooked, with much research falling prey to what Dąbrowska has identified as one of the 'deadly sins' of cognitive linguistics: to ignore individual differences. By focusing on two widely studied metaphors for time, Moving Time and Moving Ego, this review article shines a spotlight on the varied ways in which people draw on their embodied and enculturated experiences, along with 'human experience' on an individual level and the contexts within which they use metaphor. In doing so, it highlights the importance for metaphoric conceptualization of variation across languages, across contexts, and across individuals, suggesting that while the use and interpretation of metaphor may begin with cross-domain connections, they are but part of the story.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1213719/full

Frontiers in Systems Neuroscience

PAPERS

GABRIEL D. NOEL, LIONEL E. MUGNO & DANIELA S. ANDRES – From signals to music: a bottom-up approach to the structure of neuronal activity

The search for the "neural code" has been a fundamental quest in neuroscience, concerned with the way neurons and neuronal systems process and transmit information. However, the term "code" has been mostly used as a metaphor, seldom acknowledging the formal definitions introduced by information theory, and the contributions of linguistics and semiotics not at all. The heuristic potential of the latter was suggested by structuralism, which turned the methods and findings of linguistics to other fields of knowledge. For the study of complex communication systems, such as human language and music, the necessity of an approach that considers multilayered, nested, structured organization of symbols becomes evident. We work under the hypothesis that the neural code might be as complex as these human-made codes. To test this, we propose a bottom-up approach, constructing a symbolic logic in order to translate neuronal signals into music scores. We recorded single cells' activity from the rat's globus pallidus pars interna under conditions of full alertness, blindfoldedness and environmental silence. We analyzed the signals with statistical, spectral, and complex methods, including Fast Fourier Transform, Hurst exponent and recurrence plot analysis.

The results indicated complex behavior and recurrence graphs consistent with fractality, and a Hurst exponent >0.5, evidencing temporal persistence. On the whole, these features point toward a complex behavior of the time series analyzed, also present in classical music, which upholds the hypothesis of structural similarities between music and neuronal activity. Furthermore, through our experiment we performed a comparison between music and raw neuronal activity. Our results point to the same conclusion, showing the structures of music and neuronal activity to be homologous. The scores were not only spontaneously tonal, but they exhibited structure and features normally present in human-made musical creations. The hypothesis of a structural homology between the neural code and the code of music holds, suggesting that some of the insights introduced by linguistic and semiotic theory might be a useful methodological resource to go beyond the limits set by metaphoric notions of "code."

https://www.frontiersin.org/articles/10.3389/fnsys.2023.1171984/full

Nature Communications Biology

PAPERS

TIINA M. MATTILA, et al – Genetic continuity, isolation, and gene flow in Stone Age Central and Eastern Europe

The genomic landscape of Stone Age Europe was shaped by multiple migratory waves and population replacements, but different regions do not all show similar patterns. To refine our understanding of the population dynamics before and after the dawn of the Neolithic, we generated and analyzed genomic sequence data from human remains of 56 individuals from the Mesolithic, Neolithic, and Eneolithic across Central and Eastern Europe. We found that Mesolithic European populations formed a geographically widespread isolation-by-distance zone ranging from Central Europe to Siberia, which was already established 10,000 years ago. We found contrasting patterns of population continuity during the Neolithic transition: people around the lower Dnipro Valley region, Ukraine, showed continuity over 4000 years, from the Mesolithic to the end of the Neolithic, in contrast to almost all other parts of Europe where population turnover drove this cultural change, including vast areas of Central Europe and around the Danube River.

https://www.nature.com/articles/s42003-023-05131-3

Nature Scientific Reports

PAPERS

FRANCESCO D'ERRICO et al – A 36,200-year-old carving from Grotte des Gorges, Amange, Jura, France

The earliest European carvings, made of mammoth ivory, depict animals, humans, and anthropomorphs. They are found at Early Aurignacian sites of the Swabian Jura in Germany. Despite the wide geographical spread of the Aurignacian across Europe, these carvings have no contemporaneous counterparts. Here, we document a small, intriguing object, that sheds light on this uniqueness. Found at the Grotte des Gorges (Jura, France), in a layer sandwiched between Aurignacian contexts and dated to c. 36.2 ka, the object bears traces of anthropogenic modifications indicating intentional carving. Microtomographic, microscopic, three-dimensional roughness and residues analyses reveal the carving is a fragment of a large ammonite, which was modified to represent a caniformia head decorated with notches and probably transported for long time in a container stained with ochre. While achieving Swabian Jura-like miniaturization, the Grotte des Gorges specimen displays original features, indicating the craftsman emulated ivory carvings while introducing significant technical, thematic, and stylistic innovations. This finding suggests a low degree of cultural connectivity between Early Aurignacian hunter-gatherer groups in the production of their symbolic material culture. The pattern conforms to the existence of cultural boundaries limiting the transmission of symbolic practices while leaving space for the emergence of original regional expressions.

https://www.nature.com/articles/s41598-023-39897-7

New Scientist

ARTICLES

MICHAEL MARSHALL – How prehistoric people settled one of Earth's most extreme places
Archaeologists previously believed the Tibetan plateau was one of the last places to be settled by humans or hominins – over the past couple of decades that notion has been slowly but comprehensively blown apart.
https://www.newscientist.com/article/2386570-how-prehistoric-people-settled-one-of-earths-most-extreme-places/

REVIEWS

ALISON GEORGE – Cave of Bones review: Lee Berger on the discovery of Homo naledi
Following his discovery of the ancient hominin Homo naledi, Lee Berger was determined to enter the cave where the fossils were discovered, but a dreadful journey lay ahead.
Review of 'Cave of Bones' by Lee Berger and John Hawks, Penguin Random House (2023).
https://www.newscientist.com/article/mg25934510-700-cave-of-bones-review-lee-berger-on-the-discovery-of-homo-naledi/

Philosophical Transactions of the Royal Society B

PAPERS

ADAM ZAIDEL & ROY SALOMON – Multisensory decisions from self to world
Classic Bayesian models of perceptual inference describe how an ideal observer would integrate 'unisensory' measurements (multisensory integration) and attribute sensory signals to their origin(s) (causal inference). However, in the brain, sensory signals are always received in the context of a multisensory bodily state—namely, in combination with other senses. Moreover, sensory signals from both interoceptive sensing of one's own body and exteroceptive sensing of the world are highly interdependent and never occur in isolation. Thus, the observer must fundamentally determine whether each sensory observation is from an external (versus internal, self-generated) source to even be considered for integration. Critically, solving this primary causal inference problem requires knowledge of multisensory and sensorimotor dependencies. Thus, multisensory processing is needed to separate sensory signals. These multisensory processes enable us to simultaneously form a sense of self and form distinct perceptual decisions about the external world. In this opinion paper, we review and discuss the similarities and distinctions between multisensory decisions underlying the sense of self and those directed at acquiring information about the world. We call attention to the fact that heterogeneous multisensory processes take place all along the neural hierarchy (even in forming 'unisensory' observations) and argue that more integration of these aspects, in theory and experiment, is required to obtain a more comprehensive understanding of multisensory brain function.
https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2022.0335

STEVEN J. JERJIAN, DEVIN R. HARSCH & CHRISTOPHER R. FETSCH – Self-motion perception and sequential decision-making: where are we heading?
To navigate and guide adaptive behaviour in a dynamic environment, animals must accurately estimate their own motion relative to the external world. This is a fundamentally multisensory process involving integration of visual, vestibular and kinesthetic inputs. Ideal observer models, paired with careful neurophysiological investigation, helped to reveal how visual and vestibular signals are combined to support perception of linear self-motion direction, or heading. Recent work has extended these findings by emphasizing the dimension of time, both with regard to stimulus dynamics and the trade-off between speed and accuracy. Both time and certainty—i.e. the degree of confidence in a multisensory decision—are essential to the ecological goals of the system: terminating a decision process is necessary for timely action, and predicting one's accuracy is critical for making multiple decisions in a sequence, as in navigation. Here, we summarize a leading model for multisensory decision-making, then show how the model can be extended to study confidence in heading discrimination. Lastly, we preview ongoing efforts to bridge self-motion perception and navigation per se, including closed-loop virtual reality and active self-motion. The design of unconstrained, ethologically inspired tasks, accompanied by large-scale neural recordings, raise promise for a deeper understanding of spatial perception and decision-making in the behaving animal.
https://royalsocietypublishing.org/doi/10.1098/rstb.2022.0333

Philosophy Now

ARTICLES

NURANA RAJABOVA – John Locke & Personal Identity
Why, according to John Locke, you continue to be you.
https://philosophynow.org/issues/157/John_Locke_and_Personal_Identity

PLoS One

PAPERS

ANNA SEYDELL-GREENWALD et al – Spoken language processing activates the primary visual cortex

Primary visual cortex (V1) is generally thought of as a low-level sensory area that primarily processes basic visual features. Although there is evidence for multisensory effects on its activity, these are typically found for the processing of simple sounds and their properties, for example spatially or temporally-congruent simple sounds. However, in congenitally blind individuals, V1 is involved in language processing, with no evidence of major changes in anatomical connectivity that could explain this seemingly drastic functional change. This is at odds with current accounts of neural plasticity, which emphasize the role of connectivity and conserved function in determining a neural tissue's role even after atypical early experiences. To reconcile what appears to be unprecedented functional reorganization with known accounts of plasticity limitations, we tested whether V1's multisensory roles include responses to spoken language in sighted individuals. Using fMRI, we found that V1 in normally sighted individuals was indeed activated by comprehensible spoken sentences as compared to an incomprehensible reversed speech control condition, and more strongly so in the left compared to the right hemisphere. Activation in V1 for language was also significant and comparable for abstract and concrete words, suggesting it was not driven by visual imagery. Last, this activation did not stem from increased attention to the auditory onset of words, nor was it correlated with attentional arousal ratings, making general attention accounts an unlikely explanation. Together these findings suggest that V1 responds to spoken language even in sighted individuals, reflecting the binding of multisensory high-level signals, potentially to predict visual input. This capability might be the basis for the strong V1 language activation observed in people born blind, re-affirming the notion that plasticity is guided by pre-existing connectivity and abilities in the typically developed brain.

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0289671

XIAOPING FANG et al – Time separating spatial memories does not influence their integration in humans

Humans can navigate through similar environments—like grocery stores—by integrating across their memories to extract commonalities or by differentiating between each to find idiosyncratic locations. Here, we investigate one factor that might impact whether two related spatial memories are integrated or differentiated: Namely, the temporal delay between experiences. Rodents have been shown to integrate memories more often when they are formed within 6 hours of each other. To test if this effect influences how humans spontaneously integrate spatial memories, we had 131 participants search for rewards in two similar virtual environments. We separated these learning experiences by either 30 minutes, 3 hours, or 27 hours. Memory integration was assessed three days later. Participants were able to integrate and simultaneously differentiate related memories across experiences. However, neither memory integration nor differentiation was modulated by temporal delay, in contrast to previous work. We further showed that both the levels of initial memory reactivation during the second experience and memory generalization to novel environments were comparable across conditions. Moreover, perseveration toward the initial reward locations during the second experience was related positively to integration and negatively to differentiation—but again, these associations did not vary by delay. Our findings identify important boundary conditions on the translation of rodent memory mechanisms to humans, motivating more research to characterize how even fundamental memory mechanisms are conserved and diverge across species.

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0289649

SHEILA J. CUNNINGHAM et al – The cost of social influence: Own-gender and gender-stereotype social learning biases in adolescents and adults

Pervasive gender gaps in academic subject and career choices are likely to be underpinned by social influences, including gender stereotypes of competence in academic and career domains (e.g., men excel at engineering, women excel at care), and model-based social learning biases (i.e., selective copying of particular individuals). Here, we explore the influence of gender stereotypes on social learning decisions in adolescent and adult males and females. Participants (Exp 1: N = 69 adolescents; Exp 2: N = 265 adults) were presented with 16 difficult multiple-choice questions from stereotypically feminine (e.g., care) and masculine (e.g., engineering) domains. The answer choices included the correct response and three incorrect responses paired with a male model, a female model, or no model. Participants' gender stereotype knowledge and endorsement were measured, and adolescents (Exp. 1) listed their academic subject choices. As predicted, there was a bias towards copying answers paired with a model (Exp.1: 74%, Exp. 2: 65% ps < .001). This resulted in less success than would be expected by chance (Exp. 1: 12%, Exp. 2: 16% ps < .001), demonstrating a negative consequence of social information. Adults (Exp 2) showed gender stereotyped social learning biases; they were more likely to copy a male model in masculine questions and a female model in feminine questions (p = .012). However, adolescents (Exp 1) showed no evidence of this stereotype bias; rather, there was a tendency for male adolescents to copy male models regardless of domain (p = .004). This own-gender bias was not apparent in female adolescents. In Exp 1, endorsement of masculine stereotypes was positively associated with selecting more own-gender typical academic subjects at school and copying significantly more male models in the male questions. The current study provides evidence for the first time that decision-making in both adolescence and adulthood is impacted by gender biases.

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0290122

DANIEL KRÄHMER, LAURA SCHÄCHTELE & ANDREAS SCHNECK – Care to share? Experimental evidence on code sharing behavior in the social sciences

Transparency and peer control are cornerstones of good scientific practice and entail the replication and reproduction of findings. The feasibility of replications, however, hinges on the premise that original researchers make their data and research code publicly available. This applies in particular to large-N observational studies, where analysis code is complex and may involve several ambiguous analytical decisions. To investigate which specific factors influence researchers' code sharing behavior upon request, we emailed code requests to 1,206 authors who published research articles based on data from the European Social Survey between 2015 and 2020. In this preregistered multifactorial field experiment, we randomly varied three aspects of our code request's wording in a 2x4x2 factorial design: the overall framing of our request (enhancement of social science research, response to replication crisis), the appeal why researchers should share their code (FAIR principles, academic altruism, prospect of citation, no information), and the perceived effort associated with code sharing (no code cleaning required, no information). Overall, 37.5% of successfully contacted authors supplied their analysis code. Of our experimental treatments, only framing affected researchers' code sharing behavior, though in the opposite direction we expected: Scientists who received the negative wording alluding to the replication crisis were more likely to share their research code. Taken together, our results highlight that the availability of research code will hardly be enhanced by small-scale individual interventions but instead requires large-scale institutional norms.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0289380

Proceedings of the Royal Society B

PAPERS

JOSH J. ARBON et al – Competition and generalization impede cultural formation in wild jackdaws

Animal cultures have now been demonstrated experimentally in diverse taxa from flies to great apes. However, experiments commonly use tasks with unrestricted access to equal pay-offs and innovations seeded by demonstrators who are trained to exhibit strong preferences. Such conditions may not reflect those typically found in nature. For example, the learned preferences of natural innovators may be weaker, while competition for depleting resources can favour switching between strategies and generalizing from past experience. Here we show that in experiments where wild jackdaws (Corvus monedula) can freely discover depleting supplies of novel foods, generalization has a powerful effect on learning, allowing individuals to exploit multiple new opportunities through both social and individual learning. Further, in contrast to studies with trained demonstrators, individuals that were first to innovate showed weak preferences. As a consequence, many individuals ate all available novel foods, displaying no strong preference and no group-level culture emerged. Individuals followed a 'learn from adults' strategy, but other demographic factors played a minimal role in shaping social transmission. These results demonstrate the importance of generalization in allowing animals to exploit new opportunities and highlight how natural competitive dynamics may impede the formation of culture.
https://royalsocietypublishing.org/doi/full/10.1098/rspb.2023.0705

JULIE THÉVENET et al – Crocodile perception of distress in hominid baby cries

It is generally argued that distress vocalizations, a common modality for alerting conspecifics across a wide range of terrestrial vertebrates, share acoustic features that allow heterospecific communication. Yet studies suggest that the acoustic traits used to decode distress may vary between species, leading to decoding errors. Here we found through playback experiments that Nile crocodiles are attracted to infant hominid cries (bonobo, chimpanzee and human), and that the intensity of crocodile response depends critically on a set of specific acoustic features (mainly deterministic chaos, harmonicity and spectral prominences). Our results suggest that crocodiles are sensitive to the degree of distress encoded in the vocalizations of phylogenetically very distant vertebrates. A comparison of these results with those obtained with human subjects confronted with the same stimuli further indicates that crocodiles and humans use different acoustic criteria to assess the distress encoded in infant cries. Interestingly, the acoustic features driving crocodile reaction are likely to be more reliable markers of distress than those used by humans. These results highlight that the acoustic features encoding information in vertebrate sound signals are not necessarily identical across species.
https://royalsocietypublishing.org/doi/10.1098/rspb.2023.0201

Science

NEWS

Wandering Seeds

Millennia before Europeans arrived in Australia, humans helped shape the distribution of the continent's plants.
https://www.science.org/content/article/indigenous-people-shaped-australias-curious-geography-plants

ARTICLES

EMILY J. BEVERLY – Using climate to model ancient human migration

Modeling fills gaps in the fossil record of early hominin movement from Africa.
https://www.science.org/doi/full/10.1126/science.adj4631

PAPERS

JIAOYANG RUAN et al – Climate shifts orchestrated hominin interbreeding events across Eurasia
When, where, and how often hominin interbreeding happened is largely unknown. We study the potential for Neanderthal-Denisovan admixture using species distribution models that integrate extensive fossil, archaeological, and genetic data with transient coupled general circulation model simulations of global climate and biomes. Our Pleistocene hindcast of past hominins' habitat suitability reveals pronounced climate-driven zonal shifts in the main overlap region of Denisovans and Neanderthals in central Eurasia. These shifts, which influenced the timing and intensity of potential interbreeding events, can be attributed to the response of climate and vegetation to past variations in atmospheric carbon dioxide and Northern Hemisphere ice-sheet volume. Therefore, glacial-interglacial climate swings likely played an important role in favoring gene flow between archaic humans.
https://www.science.org/doi/10.1126/science.add4459

VASILIKI MARGARI et al with SIMON A. PARFITT – Extreme glacial cooling likely led to hominin depopulation of Europe in the Early Pleistocene
The oldest known hominin remains in Europe [~1.5 to ~1.1 million years ago (Ma)] have been recovered from Iberia, where paleoenvironmental reconstructions have indicated warm and wet interglacials and mild glacials, supporting the view that once established, hominin populations persisted continuously. We report analyses of marine and terrestrial proxies from a deep-sea core on the Portugese margin that show the presence of pronounced millennial-scale climate variability during a glacial period ~1.154 to ~1.123 Ma, culminating in a terminal stadial cooling comparable to the most extreme events of the last 400,000 years. Climate envelope–model simulations reveal a drastic decrease in early hominin habitat suitability around the Mediterranean during the terminal stadial. We suggest that these extreme conditions led to the depopulation of Europe, perhaps lasting for several successive glacial-interglacial cycles.
https://www.science.org/doi/10.1126/science.adf4445

Trends in Cognitive Sciences

ARTICLES

MASAKI ISODA – Decoding social rewards via inter-areal coordination frequency in the brain
Vicarious reward plays a pivotal role in shaping altruism and prosociality. However, neural circuit mechanisms underlying the distinction between vicarious reward and experienced reward are poorly understood. Putnam et al. recently demonstrated that the two types of reward are represented by distinct coordination frequencies within the same cingulate–amygdala pathway.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00178-X

PAPERS

KEVIN BERRYMAN, SARA W. LAZAR & JAKOB HOHWY – Do contemplative practices make us more moral?
Contemplative practices are a staple of modern life and have historically been intertwined with morality. However, do these practices in fact improve our morality? The answer remains unclear because the science of contemplative practices has focused on unidimensional aspects of morality, which do not align with the type of interdependent moral functioning these practices aspire to cultivate. Here, we appeal to a multifactor construct, which allows the assessment of outcomes from a contemplative intervention across multiple dimensions of moral cognition and behavior. This offers an open-minded and empirically rigorous investigation into the impact of contemplative practices on moral actions. Using this framework, we gain insight into the effect of mindfulness meditation on morality, which we show does indeed have positive influences, but also some negative influences, distributed across our moral functioning.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00173-0

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