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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.

ACADEMIA.EDU – Group size and the late middle Pleistocene prehistoric archive

Journal of Human Evolution 127, 118- 132 (2019).

ARIEL MALINSKY-BULLER & ERELLA HOVERS – One size does not fit all: Group size and the late middle Pleistocene prehistoric archive

The role of demography is often suggested to be a key factor in both biological and cultural evolution. Recent research has shown that the linkage between population size and cultural evolution is not straightforward and emerges from the interplay of many demographic, economic, social and ecological variables. Formal modelling has yielded interesting insights into the complex relationship between population structure, intergroup connectedness, and magnitude and extent of population extinctions. Such studies have highlighted the importance of effective (as opposed to census) population size in transmission processes. At the same time, it remained unclear how such insights can be applied to material culture phenomena in the prehistoric record, especially for deeper prehistory. In this paper we approach the issue of population sizes during the time of the Lower to Middle Paleolithic transition through the proxy of regional trajectories of lithic technological change, identified in the archaeological records from Africa, the Levant, Southwestern and Northwestern Europe. Our discussion of the results takes into consideration the constraints inherent to the archaeological record of deep time – e.g. preservation bias, time-averaging and the incomplete nature of the archaeological record – and of extrapolation from discrete archaeological case studies to an evolutionary time scale. We suggest that technological trajectories of change over this transitional period reflect the robustness of transmission networks. Our results show differences in the pattern and rate of cultural transmission in these regions, from which we infer that information networks, and their underlying effective population sizes, also differed.

[https://www.academia.edu/38201246/Malinsky Buller A and Hovers E 2019 One size does not fit all Group size and the late Middle Pleistocene prehistoric archive Journal of Human Evolution 127 118 132 https doi org 10 1016 j_jhevol 2018 11 002](https://www.academia.edu/38201246/Malinsky_Buller_A_and_Hovers_E_2019_One_size_does_not_fit_all_Group_size_and_the_late_Middle_Pleistocene_prehistoric_archive_Journal_of_Human_Evolution_127_118_132_https_doi_org_10_1016_j_jhevol_2018_11_002)

ACADEMIA.EDU – There is more to Levallois production than predetermination

Quaternary International 464:A, 81-91 (2018).

RON SHIMELMITZ & STEVEN L. KUHN – The toolkit in the core: There is more to Levallois production than predetermination

Levallois technology has been used as both a chronological marker and a sign of cognitive evolution in hominins. The Levallois method is typically described as a specialized form of lithic manufacture, aimed at making products of predetermined shape. Analyses of Levallois technology tend to focus on the phenomenon of predetermination in the manufacture of specific products such as Levallois flakes, blades or points. Although it is widely recognized that some forms of recurrent Levallois technology actually produce diverse sorts of product, this feature is seldom emphasized or explored. We argue that despite similarities in how flaking is organized volumetrically, all varieties of Levallois are not simply equivalent means of creating blanks of predetermined form. In this paper we focus on Levallois production in the early Middle Paleolithic assemblages from Unit IX of Tabun Cave to provide an alternative perspective on some forms of Levallois production. The method used at Tabun is both flexible and efficient, yielding both large numbers of blanks and a range of products while reducing the waste of raw material. In these assemblages blades, flakes, Levallois points, and a variety of other products, were produced through systematic exploitation of different parts of the core's surface (or a series of surfaces). All types of products were transformed for use as tools, though perhaps to serve different ends. The choice to manufacture a range of products out of a single core highlights differences between the preferential and recurrent forms of Levallois technology. They represent fundamentally different approaches to lithic resource management.

[https://www.academia.edu/34267216/The toolkit in the core There is more to Levallois production than predetermination](https://www.academia.edu/34267216/The_toolkit_in_the_core_There_is_more_to_Levallois_production_than_predetermination)

CONFERENCE ALERT – Animal Behavior Society 2022 – Costa Rica – July 20th-23rd, 2022

We are pleased to announce the 2022 annual meeting of the Animal Behavior Society, to be held July 20-23, 2022 in San José, Costa Rica, with a vibrant virtual component to reach more widely to all in our community. We look forward to seeing many of our fellow animal behaviorists in-person in a COVID-safe environment while connecting and sharing our research with those from around the world as we enjoyed for the past two virtual ABS meetings. We have a terrific line-up of both plenary speakers and symposia on diverse topics spanning the range of animal behavior. We also have a full slate of pre-meeting workshops that we invite you to investigate.

<https://www.animalbehaviorsociety.org/2022/>

PRE/POST CONFERENCE TRIP OPPORTUNITIES

We have partnered with the Organization for Tropical Studies (OTS), which in addition to be an academic non-profit tropical hub for over 50 universities and research institutions also functions in a way as a “tour operator” in Costa Rica since 1963. The OTS is offering an exciting pre-conference trip (see details here: <https://www.animalbehaviorsociety.org/2022/travel-pre.php>) and we will soon be announcing post-conference trips.

STAY CONNECTED

Use #ABS2022 to share your experience.

NEWS

BREAKING SCIENCE – Scientists Have New Theory on Origin of State

The conventional theory about the origin of the state is that the adoption of farming increased land productivity, which led to the production of food surplus; this surplus was a prerequisite for the emergence of tax-levying elites and, eventually, states. Hebrew University of Jerusalem’s Professor Joram Mayshar and colleagues challenge this theory and propose that hierarchy arose as a result of the shift to dependence on appropriable cereal grains.

<http://www.sci-news.com/othersciences/anthropology/state-origin-theory-10699.html>

BREAKING SCIENCE – Fungi Use Electrical ‘Language’ to Communicate with Each Other: Study

In new research, Dr. Andrew Adamatzky, a computer scientist at the Unconventional Computing Laboratory of the University of the West of England, analyzed electrical activity of ghost fungi (*Omphalotus nidiformis*), Enoki fungi (*Flammulina velutipes*), split gill fungi (*Schizophyllum commune*), and caterpillar fungi (*Cordyceps militaris*). The results, published in the journal *Royal Society Open Science*, suggest the fungi kingdom has an electrical ‘language’ which is far more complicated than anyone previously thought.

<http://www.sci-news.com/biology/fungi-language-10718.html>

NATURE BRIEFING – How climate shaped human ancestry

A record-breaking simulation of the past two million years of Earth’s climate provides evidence that temperature and other planetary conditions influenced early human migration — and possibly contributed to the emergence of the modern-day human species around 300,000 years ago. “This is another brick in the wall to support the role of climate in shaping human ancestry,” says marine geologist Peter de Menocal.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=e9ab8631ca&e=1db4b9a19b>

SAPIENS – Ancient beginnings

Newly sequenced African aDNA shows dynamic ancient migratory patterns and interactions around the Later Stone Age that shaped human history.

<https://sapiens.us11.list-manage.com/track/click?u=80f6cf678900daf984bf763b7&id=19edf37628&e=dc0eff6180>

SAPIENS – Athletics, IQ, Health: Three Myths of Race

In this essay, which draws upon their new book *Racism, Not Race*, Goodman and Graves tackle each of these smaller myths. They show how differences in athleticism, educational levels, and overall health among different racialized communities are tied to a complex mix of biological and social factors. Importantly, they argue that systemic racism, not biological race, is to blame for the disparities among different groups.

<https://sapiens.us11.list-manage.com/track/click?u=80f6cf678900daf984bf763b7&id=fb2d06dd60&e=dc0eff6180>

SCIAM NEWS – Aha! Moments Pop Up from below the Level of Conscious Awareness

People in a study handily solved puzzles while juggling an unrelated mental task by relying on spontaneous insight, not analytic thinking.

<https://www.scientificamerican.com/article/aha-moments-pop-up-from-below-the-level-of-conscious-awareness/>

SCIENCE DAILY – First European farmers' heights did not meet expectations

A combined study of genetics and skeletal remains show that the switch from primarily hunting, gathering and foraging to farming about 12,000 years ago in Europe may have had negative health effects as indicated by shorter than expected heights in the earliest farmers, according to an international team of researchers.

<https://www.sciencedaily.com/releases/2022/04/220407170927.htm>

SCIENCE DAILY – Early human habitats linked to past climate shifts

A study provides clear evidence for a link between astronomically-driven climate change and human evolution.

<https://www.sciencedaily.com/releases/2022/04/220413131147.htm>

SCIENCE DAILY – Newborns' brains already organized into functional networks

Right from birth, human brains are organized into networks that support mental functions such as vision and attention, a new study shows.

<https://www.sciencedaily.com/releases/2022/04/220413091006.htm>

SCIENCE NEWS – Ancient human playground found inside sloth footprints

Fossilized tracks of a giant ground sloth are stamped with tiny human feet.

<https://www.science.org/content/article/ancient-human-playground-found-inside-sloth-footprints>

SOCIETY FOR SCIENCE – This hieroglyph is the oldest known record of the Maya calendar

Plaster fragments with the markings date to at least 200 B.C. and indicate that the calendar system, still used today, might be centuries older.

<http://click.societyforscience-email.com/?qs=c7d2bc5bdb36ee8c011231b93c917bb6e055c0c056ba83ca467629577693296cbe9a3f1f06afb78c4f44f11fce887ddb5b04aa126d3e3557451d3b2bc52dba24>

SOCIETY FOR SCIENCE – How ancient, recurring climate changes may have shaped human evolution

Climate changes drove where Homo species lived over the last 2 million years, with a disputed ancestor giving rise to H. sapiens, a new study claims.

<http://click.societyforscience-email.com/?qs=c7d2bc5bdb36ee8c0ddb89025bc8ca14e88a0b62bc7d7d3e0d9346ed7f66606481f66b0c7183e6e1bb51098d33d0315a5b9718efcf06470ebff648dc10381494>

PUBLICATIONS

Current Biology

ARTICLES

LIBERTY S. HAMILTON – Human song: Separate neural pathways for melody and speech

Does the brain perceive song as speech with melody? A new study using intracranial recordings and functional brain imaging in humans suggests that it does not. Instead, singing, instrumental music, and speech are represented by different neural populations.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00259-7](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00259-7)

ALEKSANDRA A.W. DOPIERALA & LAUREN L. EMBERSON – Cognitive development: Looking for perceptual awareness in human infants

The extent to which young human infants are conscious, in the sense of being perceptually aware of their environment, has been long debated. A new study has revealed that infants do exhibit a key signature of consciousness — the attentional blink — but this early consciousness changes with age.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00278-0](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00278-0)

PAPERS

SAM V. NORMAN-HAIGNERE et al with NANCY KANWISHER – A neural population selective for song in human auditory cortex

How is music represented in the brain? While neuroimaging has revealed some spatial segregation between responses to music versus other sounds, little is known about the neural code for music itself. To address this question, we developed a method to infer canonical response components of human auditory cortex using intracranial responses to natural sounds, and further used the superior coverage of fMRI to map their spatial distribution. The inferred components replicated many prior findings, including distinct neural selectivity for speech and music, but also revealed a novel component that responded nearly exclusively to music with singing. Song selectivity was not explainable by standard acoustic features, was located near speech- and music-selective responses, and was also evident in individual electrodes. These results suggest that representations of music are fractionated into subpopulations selective for different types of music, one of which is specialized for the analysis of song.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00131-2](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00131-2)

EMMA CHERESKIN et al with STEPHANIE L. KING – Allied male dolphins use vocal exchanges to “bond at a distance”

Vocal interactions are intrinsic features of social groups and can play a pivotal role in social bonding. Dunbar’s social bonding hypothesis posits that vocal exchanges evolved to “groom at a distance” when social groups became too large or complex for individuals to devote time to physical bonding activities. Tests of this hypothesis in non-human primates, however, suggest that vocal exchanges occur between more strongly bonded individuals that engage in higher grooming rates and thus do not provide evidence for replacement of physical bonding. Here, we combine data on social bond strength, whistle exchange frequency, and affiliative contact behavior rates to test this hypothesis in wild male Indo-Pacific bottlenose dolphins, who form multi-level alliances that cooperate over access to females. We show that, although whistle exchanges are more likely to occur within the core alliance, they occur more frequently between those males that share weaker social bonds, i.e., between core allies that spend less time together, while the opposite occurs for affiliative physical contact behavior. This suggests that vocal exchanges function as a low-cost mechanism for male dolphins that spend less time in close proximity and engage in fewer affiliative contact behaviors to reinforce and maintain their valuable alliance relationships. Our findings provide new evidence outside of the primate lineage that vocal exchanges serve a bonding function and reveal that, as the social bonding hypothesis originally suggested, vocal exchanges can function as a replacement of physical bonding activities for individuals to maintain their important social relationships.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00241-X](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00241-X)

LIVIA GERBER et al with STEPHANIE L. KING – Social integration influences fitness in allied male dolphins

Understanding determinants of differential reproductive success is at the core of evolutionary biology because of its connection to fitness. Early work has linked variation in reproductive success to differences in age, rank, or size, as well as habitat characteristics. More recently, studies in group-living taxa have revealed that social relationships also have measurable effects on fitness. The influence of social bonds on fitness is particularly interesting in males who compete over reproductive opportunities. In Shark Bay, Western Australia, groups of 4-14 unrelated male bottlenose dolphins cooperate in second-order alliances to compete with rival alliances over access to females. Nested within second-order alliances, pairs or trios of males, which can vary in composition, form first-order alliances to herd estrus females. Using 30 years of behavioral data, we examined how individual social factors, such as first-order alliance stability, social connectivity, and variation in social bond strength within second-order alliances, affect male fitness. Analyzing the reproductive careers of 85 males belonging to 10 second-order alliances, we found that the number of paternities a male achieved was positively correlated with his cumulative social bond strength but negatively correlated with his variation in bond strength. Thus, well-integrated males with more homogeneous social bonds to second-order allies obtained most paternities. Our findings provide novel

insights into the fitness benefits of polyadic cooperation among unrelated males and highlight the adaptive value of social bonds in this context.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00422-5](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00422-5)

Nature

NEWS

Your brain expands and shrinks over time — these charts show how

Based on more than 120,000 brain scans, the charts are still preliminary. But researchers hope they could one day be used as a routine clinical tool by physicians.

<https://www.nature.com/articles/d41586-022-00971-1>

Record-breaking simulation hints at how climate shaped human migration

Model suggests that a shift in weather patterns in southern Africa might have contributed to the rise of Homo sapiens.

<https://www.nature.com/articles/d41586-022-01050-1>

ARTICLES

MICHAEL D. PETRAGLIA – A lengthy look at climate and its role in hominin evolution

Climate effects on ecosystems shaped the evolution of our hominin relatives in the human family tree. A modelling study examines these habitat changes and the various ways in which they influenced hominin species.

<https://www.nature.com/articles/d41586-022-00975-x>

MICHAEL HASLAM – Insights from orangutans into the evolution of tool use

Gaining the ability to make stone tools was a useful development for early human ancestors in the hominin branch of the evolutionary tree. Could studying orangutans provide clues to how this behaviour arose?

<https://www.nature.com/articles/d41586-022-00872-3>

PAPERS

AXEL TIMMERMANN et al – Climate effects on archaic human habitats and species successions

It has long been believed that climate shifts during the last 2 million years had a pivotal role in the evolution of our genus Homo. However, given the limited number of representative palaeo-climate datasets from regions of anthropological interest, it has remained challenging to quantify this linkage. Here, we use an unprecedented transient Pleistocene coupled general circulation model simulation in combination with an extensive compilation of fossil and archaeological records to study the spatiotemporal habitat suitability for five hominin species over the past 2 million years. We show that astronomically forced changes in temperature, rainfall and terrestrial net primary production had a major impact on the observed distributions of these species. During the Early Pleistocene, hominins settled primarily in environments with weak orbital-scale climate variability. This behaviour changed substantially after the mid-Pleistocene transition, when archaic humans became global wanderers who adapted to a wide range of spatial climatic gradients. Analysis of the simulated hominin habitat overlap from approximately 300–400 thousand years ago further suggests that antiphased climate disruptions in southern Africa and Eurasia contributed to the evolutionary transformation of Homo heidelbergensis populations into Homo sapiens and Neanderthals, respectively. Our robust numerical simulations of climate-induced habitat changes provide a framework to test hypotheses on our human origin.

<https://www.nature.com/articles/s41586-022-04600-9>

Nature Communications

PAPERS

DANIEL A. J. MURPHY et al – Dynamic modulation of inequality aversion in human interpersonal negotiations

Negotiating with others about how finite resources should be distributed is an important aspect of human social life. However, little is known about mechanisms underlying human social-interactive decision-making in gradually evolving environments. Here, we report results from an iterative Ultimatum Game (UG), in which the proposer's facial emotions and offer amounts were sampled probabilistically based on the participant's decisions. Our model-free results confirm the prediction that both the proposer's facial emotions and the offer amount should influence acceptance rates. Model-based analyses extend these findings, indicating that participants' decisions in the UG are guided by aversion to inequality. We highlight that the proposer's facial affective reactions to participant decisions dynamically modulate how human decision-makers perceive self–other inequality, relaxing its otherwise negative influence on decision values. This cognitive model underlies how offers initially rejected can gradually become more acceptable under increasing affective load (predictive accuracy ~86%). Furthermore, modelling human choice behaviour isolated the role of the central arousal systems, assessed by measuring pupil size. We demonstrate that pupil-linked central arousal systems selectively encode a key component of subjective decision values: the magnitude of self–other inequality. Taken together, our results demonstrate that, under affective influence, aversion to inequality is a malleable cognitive process.

<https://www.nature.com/articles/s42003-022-03318-8>

Nature Human Behaviour

PAPERS

GABRIEL GRAND et al – Semantic projection recovers rich human knowledge of multiple object features from word embeddings

How is knowledge about word meaning represented in the mental lexicon? Current computational models infer word meanings from lexical co-occurrence patterns. They learn to represent words as vectors in a multidimensional space, wherein words that are used in more similar linguistic contexts—that is, are more semantically related—are located closer together. However, whereas inter-word proximity captures only overall relatedness, human judgements are highly context dependent. For example, dolphins and alligators are similar in size but differ in dangerousness. Here, we use a domain-general method to extract context-dependent relationships from word embeddings: ‘semantic projection’ of word-vectors onto lines that represent features such as size (the line connecting the words ‘small’ and ‘big’) or danger (‘safe’ to ‘dangerous’), analogous to ‘mental scales’. This method recovers human judgements across various object categories and properties. Thus, the geometry of word embeddings explicitly represents a wealth of context-dependent world knowledge.

<https://www.nature.com/articles/s41562-022-01316-8>

Nature Scientific Reports

PAPERS

JACQUELINE PHELPS, ADAM ATTAHERI & MIRJANA BOZIC – How bilingualism modulates selective attention in children

There is substantial evidence that learning and using multiple languages modulates selective attention in children. The current study investigated the mechanisms that drive this modification. Specifically, we asked whether the need for constant management of competing languages in bilinguals increases attentional capacity, or draws on the available resources such that they need to be economised to support optimal task performance. Monolingual and bilingual children aged 7–12 attended to a narrative presented in one ear, while ignoring different types of interference in the other ear. We used EEG to capture the neural encoding of attended and unattended speech envelopes, and assess how well they can be reconstructed from the responses of the neuronal populations that encode them. Despite equivalent behavioral performance, monolingual and bilingual children encoded attended speech differently, with the pattern of encoding across conditions in bilinguals suggesting a redistribution of the available attentional capacity, rather than its enhancement.

<https://www.nature.com/articles/s41598-022-09989-x>

AURÉLIEN MIRALLES, MARINE GRANDGEORGE & MICHEL RAYMOND – Self-perceived empathic abilities of people with autism towards living beings mostly differs for humans

Being phylogenetically close involves greater empathic perceptions towards other species. To explore this phenomenon, this study investigates the influence of neurocognitive predispositions to empathy on our perceptions of other organisms. Autistic spectrum disorders (ASD) are characterized, among others, by weakened empathic skills. Our online survey involved a group of 202 raters with ASD and a control group of 1100 raters, who had to make choices to assess their empathic perceptions toward an extended photographic sampling of organisms. Results highlight that both groups present overall similar trends in their empathic preferences, with empathy scores significantly decreasing with the phylogenetic distance relatively to humans. However, the empathy score attributed to *Homo sapiens* in the ASD group represents a striking outlier in the yet very sharp overall correlation between empathy scores and divergence time, scoring our species as low as cold-blooded vertebrates. These results are consistent with previous studies, which emphasized that (1) understanding human beings would be more difficult for people with ASD than decoding “animals” and (2) that Theory of Mind impairment would not represent a global deficit in people with ASD but may relate to the mindreading of specifically human agents.

<https://www.nature.com/articles/s41598-022-10353-2>

PeerJ

PAPERS

WENFENG ZHENG & LIRONG YIN – Characterization inference based on joint-optimization of multi-layer semantics and deep fusion matching network

The whole sentence representation reasoning process simultaneously comprises a sentence representation module and a semantic reasoning module. This paper combines the multi-layer semantic representation network with the deep fusion matching network to solve the limitations of only considering a sentence representation module or a reasoning model. It proposes a joint optimization method based on multi-layer semantics called the Semantic Fusion Deep Matching Network (SCF-DMN) to explore the influence of sentence representation and reasoning models on reasoning performance. Experiments on text entailment recognition tasks show that the joint optimization representation reasoning method performs better than the existing methods. The sentence representation optimization module and the improved optimization reasoning model can promote reasoning performance when used individually. However, the optimization of the reasoning model has a more significant impact on the final reasoning results. Furthermore, after comparing each module’s performance, there is a mutual constraint between the sentence representation module and the reasoning model. This condition restricts overall performance, resulting in no linear superposition of reasoning performance. Overall, by comparing

the proposed methods with other existed methods that are tested using the same database, the proposed method solves the lack of in-depth interactive information and interpretability in the model design which would be inspirational for future improving and studying of natural language reasoning.

<https://peerj.com/articles/cs-908/>

PLoS Biology

ARTICLES

CLAUS C. HILGETAG & BASILIS ZIKOPOULOS – The highways and byways of the brain

Brain functions rely on the communication network formed by axonal fibers. However, the number of axons connecting different brain regions is unknown. A study in PLoS Biology addresses this question and finds that most areas of the human cerebral cortex are linked by an astoundingly small number of fibers.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001612>

PAPERS

MARK A. ECKERT et al with DYSLEXIA DATA CONSORTIUM – Cortical asymmetries at different spatial hierarchies relate to phonological processing ability

The ability to map speech sounds to corresponding letters is critical for establishing proficient reading. People vary in this phonological processing ability, which has been hypothesized to result from variation in hemispheric asymmetries within brain regions that support language. A cerebral lateralization hypothesis predicts that more asymmetric brain structures facilitate the development of foundational reading skills like phonological processing. That is, structural asymmetries are predicted to linearly increase with ability. In contrast, a canalization hypothesis predicts that asymmetries constrain behavioral performance within a normal range. That is, structural asymmetries are predicted to quadratically relate to phonological processing, with average phonological processing occurring in people with the most asymmetric structures. These predictions were examined in relatively large samples of children (N = 424) and adults (N = 300), using a topological asymmetry analysis of T1-weighted brain images and a decoding measure of phonological processing. There was limited evidence of structural asymmetry and phonological decoding associations in classic language-related brain regions. However, and in modest support of the cerebral lateralization hypothesis, small to medium effect sizes were observed where phonological decoding accuracy increased with the magnitude of the largest structural asymmetry across left hemisphere cortical regions, but not right hemisphere cortical regions, for both the adult and pediatric samples. In support of the canalization hypothesis, small to medium effect sizes were observed where phonological decoding in the normal range was associated with increased asymmetries in specific cortical regions for both the adult and pediatric samples, which included performance monitoring and motor planning brain regions that contribute to oral and written language functions. Thus, the relevance of each hypothesis to phonological decoding may depend on the scale of brain organization.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001591>

Proceedings of the Royal Society B

PAPERS

ANNA GONCERZEWICZ et al – Brain size, gut size and cognitive abilities: the energy trade-offs tested in artificial selection experiment

The enlarged brains of homeotherms bring behavioural advantages, but also incur high energy expenditures. The 'expensive brain' (EB) hypothesis posits that the energetic costs of the enlarged brain and the resulting increased cognitive abilities (CA) were met by either increased energy turnover or reduced allocation to other expensive organs, such as the gut. We tested the EB hypothesis by analysing correlated responses to selection in an experimental evolution model system, which comprises line types of laboratory mice selected for high or low basal metabolic rate (BMR), maximum (VO₂max) metabolic rates and random-bred (unselected) lines. The traits are implicated in the evolution of homeothermy, having been pre-requisites for the encephalization and exceptional CA of mammals, including humans. High-BMR mice had bigger guts, but not brains, than mice of other line types. Yet, they were superior in the cognitive tasks carried out in both reward and avoidance learning contexts and had higher neuronal plasticity (indexed as the long-term potentiation) than their counterparts. Our data indicate that the evolutionary increase of CA in mammals was initially associated with increased BMR and brain plasticity. It was also fuelled by an enlarged gut, which was not traded off for brain size.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2021.2747>

Science

ARTICLES

DALMEET SINGH CHAWLA – Russian site peddles paper authorship in reputable journals for up to \$5000 a pop

Advertisements promised adding names to articles that appeared in dozens of journals.

<https://www.science.org/content/article/russian-website-peddles-authorships-linked-reputable-journals>

Science Advances

PAPERS

CAMILLE TESTARD et al with the CAYO BIOBANK RESEARCH UNIT – Social connections predict brain structure in a multidimensional free-ranging primate society

Reproduction and survival in most primate species reflects management of both competitive and cooperative relationships. Here, we investigated the links between neuroanatomy and sociality in free-ranging rhesus macaques. In adults, the number of social partners predicted the volume of the mid–superior temporal sulcus and ventral-dysgranular insula, implicated in social decision-making and empathy, respectively. We found no link between brain structure and other key social variables such as social status or indirect connectedness in adults, nor between maternal social networks or status and dependent infant brain structure. Our findings demonstrate that the size of specific brain structures varies with the number of direct affiliative social connections and suggest that this relationship may arise during development. These results reinforce proposed links between social network size, biological success, and the expansion of specific brain circuits.

<https://www.science.org/doi/full/10.1126/sciadv.abl5794>

Trends in Cognitive Sciences

PAPERS

LIAD MUDRIK et al – Free will without consciousness?

Findings demonstrating decision-related neural activity preceding volitional actions have dominated the discussion about how science can inform the free will debate. These discussions have largely ignored studies suggesting that decisions might be influenced or biased by various unconscious processes. If these effects are indeed real, do they render subjects' decisions less free or even unfree? Here, we argue that, while unconscious influences on decision-making do not threaten the existence of free will in general, they provide important information about limitations on freedom in specific circumstances. We demonstrate that aspects of this long-lasting controversy are empirically testable and provide insight into their bearing on degrees of freedom, laying the groundwork for future scientific-philosophical approaches.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00063-8](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00063-8)

NICHOLAS EPLEY et al – Undersociality: miscalibrated social cognition can inhibit social connection

A person's well-being depends heavily on forming and maintaining positive relationships, but people can be reluctant to connect in ways that would create or strengthen relationships. Emerging research suggests that miscalibrated social cognition may create psychological barriers to connecting with others more often. Specifically, people may underestimate how positively others will respond to their own sociality across a variety of social actions, including engaging in conversation, expressing appreciation, and performing acts of kindness. We suggest that these miscalibrated expectations are created and maintained by at least three mechanisms: differential construal, uncertain responsiveness, and asymmetric learning. Underestimating the positive consequences of social engagement could make people less social than would be optimal for both their own and others' well-being.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00043-2](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00043-2)

ALEX R. DECASIEN, ROBERT A. BARTON & JAMES P. HIGHAM – Understanding the human brain: insights from comparative biology

Human brains are exceptionally large, support distinctive cognitive processes, and evolved by natural selection to mediate adaptive behavior. Comparative biology situates the human brain within an evolutionary context to illuminate how it has been shaped by selection and how its structure relates to evolutionary function, while identifying the developmental and molecular changes that were involved. Recent applications of powerful phylogenetic methods have uncovered new findings, some of which overturn conventional wisdom about how and why brains evolve. Here, we focus on four long-standing claims about brain evolution and discuss how new work has either contradicted these claims or shown the relevant phenomena to be more complicated than previously appreciated. Throughout, we emphasize studies of non-human primates and hominins, our close relatives and recent ancestors.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00039-0](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00039-0)

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