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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 – Stone tool assemblages and models for the dispersal of Homo sapiens out of Africa

In Quaternary International 382, 8-30 (2015).

HUW S. GROUCUTT et al with MICHAEL D. PETRAGLIA – Stone tool assemblages and models for the dispersal of Homo sapiens out of Africa

The dispersal of Homo sapiens out of Africa has been extensively researched across several disciplines. Here we review the evidence for spatial and temporal variability in lithic (stone tool) technologies relative to the predictions of two major hypotheses: 1) that a single successful dispersal occurred 60-50 thousand years ago (ka), marked by a trail of geometric/microlithic technologies, and 2) that multiple dispersals occurred, beginning much earlier (probably in Marine Isotope Stage [MIS] 5), associated with Middle Palaeolithic technology in its early phase. Our results show that Late Pleistocene geometric/microlithic technologies exhibit significant temporal and regional differences between each other. These differences suggest independent, convergent origins for these technologies, which are likely to have been repeatedly re-invented. In contrast, we identify similarities between East African lithic technologies from MIS 8 onwards and Middle Palaeolithic assemblages as far east as India by MIS 5. That this constellation of technological features – particularly an emphasis on centripetal Levallois reduction reflecting inter-changeable preferential and recurrent methods, along with particular retouched forms such as points – transcends ecologies and raw material types suggests that it is unlikely to entirely reflect technological convergence (analogy). Our results indicate an early onset of multiple dispersals out of Africa. The hypothesis of an early onset to successful dispersal is entirely consistent with the possibility of further subsequent (post-MIS 5) dispersals out of Africa. Testing such hypotheses through quantified comparative lithic studies and interdisciplinary research is therefore likely to significantly advance understanding of the earliest H. sapiens dispersals.

https://www.academia.edu/10985350/Stone_tool_assemblages_and_models_for_the_dispersal_of_Homo_sapiens_out_of_Africa

ACADEMIA.EDU – On Variability and Complexity: Lessons from the Levantine Middle Paleolithic Record

In Current Anthropology 54:S8, S337-S357 (2013).

ERELLA HOVERS & ANNA BELFER-COHEN – On Variability and Complexity: Lessons from the Levantine Middle Paleolithic Record

A century of research has led to the recognition of multiple levels of technological variability in the Levantine Middle Paleolithic (MP) that cannot be resolved through single-cause explanatory models. Recent ecological models argue for continual occupation of the region and competitive coexistence of Neanderthal and modern human populations. Current paleogenetic studies underline the feasibility of the latter scenario. The Levantine MP offers a perspective on the interface of historical circumstances and long-term evolutionary mechanisms that structured in-tandem trajectories of technological and behavioral changes as well as insights into the dynamics of nondirectional behavioral complexities in the archaeological record.

https://www.academia.edu/5491129/Hovers_E_and_Belfer_Cohen_A_2013_On_variability_and_complexity_lessons_from_the_Levantine_Middle_Paleolithic_Current_Anthropology_54_supplement_8_S337_3S57

NEWS

BREAKING SCIENCE – New Study Reveals Function of Bronze Age Daggers

According to an organic residue analysis performed on 10 copper-alloy daggers from Pragatto, a Bronze Age domestic site (1550-1250 BCE) in northern Italy, these artifacts were used for processing animal carcasses and not as non-functional symbols of identity and status, as previously thought. Daggers are ubiquitous yet poorly understood artifacts from prehistoric Europe.

{So it's not the rich or great warriors who are being buried with honour, it's the people feeding the community, or the priests organising the feasts? Just a thought.}

http://www.sci-news.com/archaeology/pragatto-daggers-10760.html?utm_source=feedburner&utm_medium=email

SAPIENS – Rock art as historical archive

Non-Indigenous archaeologists are beginning to appreciate how rock art created by Indigenous people over the millennia constitute important historical archives.

<https://www.sapiens.org/archaeology/first-nations-rock-art-archive/>

SAPIENS – Five Human Species You May Not Know About

Homo sapiens is currently the only member of the genus Homo alive. There's only one species of human—but it wasn't always so.

<https://www.sapiens.org/column/field-trips/ancient-human-species/>

SAPIENS – Humans We Haven't Met Yet

One anthropologist contends that far too many species have been lumped into one category: Our story is more complicated, he argues.

<https://www.sapiens.org/biology/human-fossil-record/>

SAPIENS – Shaking the Hominin Tree

What does the discovery of Homo luzonensis mean for our understanding of humanity's history?

<https://www.sapiens.org/biology/homo-luzonensis-discovery/>

SCIAM NEWS – The Idea That Trees Talk to Cooperate Is Misleading

It's a romantic notion, but pretending they're like humans could actually harm the cause of conservation.

<https://www.scientificamerican.com/article/the-idea-that-trees-talk-to-cooperate-is-misleading/>

SCIENCE DAILY – An ocean in your brain: Interacting brain waves key to how we process information

For years, the brain has been thought of as a biological computer that processes information through traditional circuits, whereby data zips straight from one cell to another. While that model is still accurate, a new study shows that there's also a second, very different way that the brain parses information: through the interactions of waves of neural activity. The findings help researchers better understand how the brain processes information.

<https://www.sciencedaily.com/releases/2022/04/220422161527.htm>

SCIENCE DAILY – Discovery sheds light on why the Pacific islands were colonized

Evidence of the early colonization of the Pacific has been described as like finding a needle in a haystack by researchers who have unearthed items from more than 3000 years ago in Papua New Guinea.

<https://www.sciencedaily.com/releases/2022/04/220422114740.htm>

SCIENCE DAILY – Friendship ornaments from the Stone Age

Roughly 6,000 years ago, hunter-gatherer communities in northeast Europe produced skillfully manufactured slate ring ornaments in great numbers. While these ornaments are commonly referred to as 'slate rings', they were rarely used as intact rings. Instead, the ornaments were fragmented on purpose, using pieces of rings as tokens. These fragments were further processed into pendants. The fragments have most likely served as symbols of the social relations of Stone Age hunter-gatherers.

<https://www.sciencedaily.com/releases/2022/04/220425104936.htm>

SCIENCE DAILY – Neanderthals of the north

A multidisciplinary research team has investigated whether Neanderthals were well adapted to life in the cold or preferred more temperate environmental conditions. Based on investigations in Lichtenberg in the Wendland region (Lower Saxony, Germany), the researchers showed that during the last Ice Age, Neanderthals visited their northernmost settlement areas even during cold phases -- albeit more frequently in the summer months.

<https://www.sciencedaily.com/releases/2022/04/220426101653.htm>

SCIENCE DAILY – Before Stonehenge monuments, hunter-gatherers made use of open habitats

Hunter-gatherers made use of open woodland conditions in the millennia before Stonehenge monuments were built, according to a new study.

<https://www.sciencedaily.com/releases/2022/04/220427140650.htm>

SCIENCE DAILY – Humans run at the most energy-efficient speed, regardless of distance

As race season approaches, many runners have the same goal: go faster. But researchers now show that speeding up might require defying our natural biology. By combining data from runners monitored in a lab along with 37,000 runs recorded on wearable fitness trackers, scientists have found that humans' natural tendency is to run at a speed that conserves caloric loss -- something that racers seeking to shave time off their miles will have to overcome.

<https://www.sciencedaily.com/releases/2022/04/220428125438.htm>

PUBLICATIONS

Current Biology

PAPERS

MATTHEW V. CHAFEE & SARAH R. HEILBRONNER – Prefrontal cortex

The prefrontal cortex is a well-studied but, in terms of understanding what it is for, deeply divisive part of the brain located at the front of the head. Perhaps the least controversial feature of the prefrontal cortex is its complexity. The prefrontal cortex is anatomically, functionally, and computationally complex. It is anatomically complex, containing a number of subregions each sending and receiving projections to a unique set of other cortical and subcortical areas. This interconnectivity presents a serious challenge to efforts to localize function to prefrontal cortex, because it can seem as though information flows

everywhere all at once in prefrontal networks. Perhaps as a result, prefrontal cortex is also computationally complex: working memory, abstraction, sensory attention, value-based decision making, planning, and motor control are all functions that have been attributed to the prefrontal cortex. This diversity of functions is likely to reflect the diversity of brain regions that prefrontal cortex communicates with while carrying out the computations it performs to influence behavior.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00341-4](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00341-4)

SHYAMALIKA GOPALAN et al – Hunter-gatherer genomes reveal diverse demographic trajectories during the rise of farming in Eastern Africa

The fate of hunting and gathering populations following the rise of agriculture and pastoralism remains a topic of debate in the study of human prehistory. Studies of ancient and modern genomes have found that autochthonous groups were largely replaced by expanding farmer populations with varying levels of gene flow, a characterization that is influenced by the almost universal focus on the European Neolithic. We sought to understand the demographic impact of an ongoing cultural transition to farming in Southwest Ethiopia, one of the last regions in Africa to experience such shifts. Importantly, Southwest Ethiopia is home to several of the world's remaining hunter-gatherer groups, including the Chabu people, who are currently transitioning away from their traditional mode of subsistence. We generated genome-wide data from the Chabu and four neighboring populations, the Majang, Shekkacho, Bench, and Sheko, to characterize their genetic ancestry and estimate their effective population sizes over the last 60 generations. We show that the Chabu are a distinct population closely related to ancient people who occupied Southwest Ethiopia >4,500 years ago. Furthermore, the Chabu are undergoing a severe population bottleneck, which began approximately 1,400 years ago. By analyzing eleven Eastern African populations, we find evidence for divergent demographic trajectories among hunter-gatherer-descendant groups. Our results illustrate that although foragers respond to encroaching agriculture and pastoralism with multiple strategies, including cultural adoption of agropastoralism, gene flow, and economic specialization, they often face population decline.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00314-1](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00314-1)

Evolutionary Anthropology

PAPERS

RENÉ BOBE & BERNARD WOOD – Estimating origination times from the early hominin fossil record

The age of the earliest recovered fossil evidence of a hominin taxon is all too often equated with that taxon's origination. However, the earliest known fossil record nearly always postdates, sometimes by a substantial period of time, the true origination of a taxon. Here we evaluate the first appearance records of the earliest potential hominins (*Sahelanthropus*, *Ardipithecus*, *Orrorin*), as well as of the genera *Australopithecus*, *Homo*, and *Paranthropus*, to illustrate the considerable uncertainty regarding the actual timing of origin of these taxa. By placing confidence intervals on the first appearance records of early hominin taxa, we can better evaluate patterns of hominin diversity, turnover, and potential correlations with climatic and environmental changes.

<https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21928>

Frontiers in Ecology and Evolution

PAPERS

PETER M. KAPPELER, CLAUDIA FICHEL & UTE RADESPIEL – The Island of Female Power? Intersexual Dominance Relationships in the Lemurs of Madagascar

The extant primates of Madagascar (*Lemuriformes*) represent the endpoints of an adaptive radiation following a single colonization event more than 50 million years ago. They have since evolved a diversity of life history traits, ecological adaptations and social systems that rivals that of all other living primates combined. Their social systems are characterized by a unique combination of traits, including the ability of adult females to dominate adult males. In fact, there is no other group of mammals in which female dominance is so widespread. Yet, recent research has indicated that there is more interspecific variation in lemur intersexual relationships than previously acknowledged. Here, we therefore review and summarize the relevant literature, quantifying the extent of sex-bias in intersexual dominance relations documented in observational and experimental studies in captivity and the wild. Female dominance is often, but not always, implemented by spontaneous male submission in the absence of female aggression and linked to female sexual maturation. We connect the available evidence to the hypotheses that have been proposed to explain the evolution of female dominance among lemurs. The occurrence of female dominance in all lemur families and the interspecific variation in its extent indicate that it has evolved soon after lemurs colonized Madagascar – presumably in response to particular ecological challenges – and that it has since been reduced in magnitude independently in some taxa. Our study contributes important comparative information on sex roles from an independent primate radiation and provides general insights into the conditions, opportunities and obstacles in the evolution of female-biased power.

<https://www.frontiersin.org/articles/10.3389/fevo.2022.858859/full>

T. JEAN M. ARSENEAU-ROBAR et al – Think Fast!: Vervet Monkeys Assess the Risk of Being Displaced by a Dominant Competitor When Making Foraging Decisions

Foraging animals need to quickly assess the costs and benefits of different foraging decisions, including resource quantity, quality, preference, ease of access, dispersion, distance, and predation risk. Social animals also need to take social context into account and adapt foraging strategies that maximize net resource intake and minimize contest competition with conspecifics. We used an experimental approach to investigate how social context impacts wild vervet monkey (*Chlorocebus pygerythrus*) foraging decisions in a multi-destination pentagon array. We baited four platforms with less-preferred corn and one platform with a larger, preferred resource (half banana) that required handling time. We ran over 1,000 trials and found that when monkeys foraged alone, they usually took the path that minimized travel distance but prioritized the preferred-food platform when in competition. However, the foraging strategy chosen by low-ranking individuals depended on the handling skill of the decision maker (i.e., time it would take them to retrieve the banana), the relative rank of their audience members (i.e., who has priority-of-access to resources), and the distance audience members were from the experiment site (i.e., their travel time). When the risk of being displaced by a dominant competitor was low (because they were far away and/or because the decision-maker was skilled in retrieving the banana), low-ranking individuals chose a route that minimized travel costs. Conversely, when the risk of losing food to a dominant competitor was high, decision-makers rushed for the preferred-food platform at the onset of the trial. When the risk of displacement was moderate because a dominant audience member was at least 50 m away, low-ranking individuals partly prioritized the preferred-food platform but took the time to stop for one platform of corn on the way. This strategy increased the total amount of food obtained during the trial. These findings suggest that lower-ranking individuals, who experienced high contest competition at the foraging experiment, calculated the risk of being displaced by a dominant competitor when making foraging decisions. This experiment demonstrates that vervets go through a complex decision-making process that simultaneously considers the profitability of different foraging decisions and their social context.

<https://www.frontiersin.org/articles/10.3389/fevo.2022.775288/full>

PAUL PALMQVIST et al with JOSÉ MARÍA BERMÚDEZ DE CASTRO – Insights on the Early Pleistocene Hominin Population of the Guadix-Baza Depression (SE Spain) and a Review on the Ecology of the First Peopling of Europe

The chronology and environmental context of the first hominin dispersal in Europe have been subject to debate and controversy. The oldest settlements in Eurasia (e.g., Dmanisi, ~1.8 Ma) suggest a scenario in which the Caucasus and southern Asia were occupied ~0.4 Ma before the first peopling of Europe. Barranco León (BL) and Fuente Nueva 3 (FN3), two Early Pleistocene archeological localities dated to ~1.4 Ma in Orce (Guadix-Baza Depression, SE Spain), provide the oldest evidence of hominin presence in Western Europe. At these sites, huge assemblages of large mammals with evidence of butchery and marrow processing have been unearthed associated to abundant Oldowan tools and a deciduous tooth of *Homo* sp. in the case of BL. Here, we: (i) review the Early Pleistocene archeological sites of Europe; (ii) discuss on the subsistence strategies of these hominins, including new estimates of resource abundance for the populations of Atapuerca and Orce; (iii) use cartographic data of the sedimentary deposits for reconstructing the landscape habitable in Guadix-Baza; and (iv) calculate the size of the hominin population using an estimate of population density based on resource abundance. Our results indicate that Guadix-Baza could be home for a small hominin population of 350–280 individuals. This basin is surrounded by the highest mountainous reliefs of the Alpine-Betic orogen and shows a limited number of connecting corridors with the surrounding areas, which could have limited gene flow with other hominin populations. Isolation would eventually lead to bottlenecks, genetic drift and inbreeding depression, conditions documented in the wild dog population of the basin, which probably compromised the viability of the hominin population in the medium to long term. This explains the discontinuous nature of the archeological record in Guadix-Baza, a situation that can also be extrapolated to the scarcity of hominin settlements for these ancient chronologies in Europe.

<https://www.frontiersin.org/articles/10.3389/fevo.2022.881651/full>

Frontiers in Neuroscience

PAPERS

GIOVANNA PONTE et al with DAVID B. EDELMAN – Cephalopod Behavior: From Neural Plasticity to Consciousness

It is only in recent decades that subjective experience - or consciousness - has become a legitimate object of scientific inquiry. As such, it represents perhaps the greatest challenge facing neuroscience today. Subsumed within this challenge is the study of subjective experience in non-human animals: a particularly difficult endeavor that becomes even more so, as one crosses the great evolutionary divide between vertebrate and invertebrate phyla. Here, we explore the possibility of consciousness in one group of invertebrates: cephalopod molluscs. We believe such a review is timely, particularly considering cephalopods' impressive learning and memory abilities, rich behavioral repertoire, and the relative complexity of their nervous systems and sensory capabilities. Indeed, in some cephalopods, these abilities are so sophisticated that they are comparable to those of some higher vertebrates. Following the criteria and framework outlined for the identification of hallmarks of consciousness in non-mammalian species, here we propose that cephalopods - particularly the octopus - provide a unique test case among invertebrates for examining the properties and conditions that, at the very least, afford a basal faculty of consciousness. These include, among others: (i) discriminatory and anticipatory behaviors indicating a strong link between perception and memory recall; (ii) the presence of neural substrates representing functional analogs of thalamus and cortex; (iii) the neurophysiological dynamics resembling the functional signatures of conscious states in mammals. We highlight the

current lack of evidence as well as potentially informative areas that warrant further investigation to support the view expressed here. Finally, we identify future research directions for the study of consciousness in these tantalizing animals. <https://www.frontiersin.org/articles/10.3389/fnsys.2021.787139/full>

Frontiers in Psychology

PAPERS

ALEXANDRA RETT & KATHERINE S. WHITE – Children Treat Grammatical Errors Differently for Native and Non-Native Speakers

Both children and adults demonstrate biases against non-native speakers. However, in some situations, adults act more generously towards non-native speakers than towards native speakers. In particular, adults judge errors from non-native speakers less harshly, presumably because they expect such errors. In the present study, we asked whether 5-6-year-old children place less weight on errors from speakers with a foreign accent. In Experiment 1, 5- and 6-year-old children (N = 80) listened to pairs of either native or foreign-accented speakers (between-subjects) label objects. For native speaker pairings, children preferred information provided by grammatical speakers over information from speakers who made subject-verb agreement errors. In contrast, children chose between foreign-accented speakers at chance. In Experiment 2 (N = 40), children preferred information from grammatical foreign-accented speakers over information from foreign-accented speakers who produced word-order violations. These findings constitute the first demonstration that children treat speech errors differently based on a speaker's language background.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2022.855130/full>

HERBERT S. TERRACE, ANN E. BIGELOW & BEATRICE BEEBE – Intersubjectivity and the Emergence of Words

Intersubjectivity refers to two non-verbal intersubjective relations infants experience during their first year that are precursors to the emergence of words. Trevarthen, a pioneer in the study of intersubjectivity, referred to those relations as primary and secondary intersubjectivity. The former, a dyadic coordination between the infant and her caregiver, begins at birth. The latter, a triadic coordination that develops around 9 months, allows the infant and a caregiver to share attention to particular features of the environment. Secondary intersubjectivity is crucial for an infant's ability to begin to produce words, at around 12 months. Much research on the social and cognitive origins of language has focused on secondary intersubjectivity. That is unfortunate because it neglects the fact that secondary intersubjectivity and the emergence of words are built on a foundation of primary intersubjectivity. It also ignores the evolutionary origins of intersubjectivity and its uniquely human status. That unique status explains why only humans learn words. This article seeks to address these issues by relating the literature on primary intersubjectivity, particularly research on bi-directional and contingent communication between infants and mothers, to joint attention and ultimately to words. In that context, we also discuss Hrdy's hypothesis about the influence of alloparents on the evolution of intersubjectivity.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2022.693139/full>

JENNIFER LAVOIE & VICTORIA TALWAR – Theory of Mind and Concealing vs. Forthcoming Communication in Adolescence

Concealing information requires that adolescents manage the information that they share, which requires cognitive skills, for example, theory of mind (ToM). This study explored motivations for concealment that early adolescents (N = 90, M = 12.81 years, SD = 5.10 months, range 12–14 years, and 58% female) endorsed concealing or disclosing to friends and parents, in relation to their theory of mind. We found that adolescents broadly endorsed disclosure to both parents and friends, even when it might mean they would face consequences, be impolite (by not protecting another's feelings), or face negative identity-related emotions. We found that ToM ability was associated with a tendency to endorse being forthcoming and sharing information with both friends and parents. These findings provide new insight into how the relation between ToM and concealment may change with age, specifically how in early adolescence it may foster open communication rather than concealment as is the case in early and middle childhood.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2022.866964/full>

DIEDERIK AERTS & LESTER BELTRAN – A Planck Radiation and Quantization Scheme for Human Cognition and Language

As a result of the identification of "identity" and "indistinguishability" and strong experimental evidence for the presence of the associated Bose-Einstein statistics in human cognition and language, we argued in previous work for an extension of the research domain of quantum cognition. In addition to quantum complex vector spaces and quantum probability models, we showed that quantization itself, with words as quanta, is relevant and potentially important to human cognition. In the present work, we build on this result, and introduce a powerful radiation quantization scheme for human cognition. We show that the lack of independence of the Bose-Einstein statistics compared to the Maxwell-Boltzmann statistics can be explained by the presence of a 'meaning dynamics,' which causes words to be attracted to the same words. And so words clump together in the same states, a phenomenon well known for photons in the early years of quantum mechanics, leading to fierce disagreements between Planck and Einstein. Using a simple example, we introduce all the elements to get a better and detailed view of this "meaning dynamics," such as micro and macro states, and Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac numbers and weights, and compare this example and its graphs, with the radiation quantization scheme of a Winnie

the Pooh story, also with its graphs. By connecting a concept directly to human experience, we show that entanglement is a necessity for preserving the “meaning dynamics” we identified, and it becomes clear in what way Fermi-Dirac addresses human memory. Within the human mind, as a crucial aspect of memory, in spaces with internal parameters, identical words can nevertheless be assigned different states and hence realize locally and contextually the necessary distinctiveness, structured by a Pauli exclusion principle, for human thought to thrive.

{This is either fundamental theory or arrant boldilocks; or, as it is about that quantum thing, both at the same time. I have no way of knowing.}

<https://www.frontiersin.org/articles/10.3389/fpsyg.2022.850725/full>

Nature

ARTICLES

EMŐKE-ÁGNES HORVÁT & BRIAN UZZI – Virtual collaboration hinders a key component of creativity

Experiments and fieldwork show that teams working together online produce fewer ideas than those collaborating in person — a first step towards answering the question of which modes of communication are generally best for creativity.

<https://www.nature.com/articles/d41586-022-00126-2>

Nature Communications

PAPERS

PETTER HOLME – Universality out of order

Orders, rankings, and hierarchies on one side, universal statistical laws on the other—it is rare that these core concepts of complex systems science meet. This Comment sets the scene for some recent discoveries in this too seldomly visited border zone.

<https://www.nature.com/articles/s41467-022-29955-5>

Nature Ecology & Evolution

ARTICLES

JESSICA E. M. VAN DER WAL, CLAIRE N. SPOTTISWOODE & SHOKO SUGASAWA – Opportunities and risks of publishing academic talks online

The COVID-19 pandemic caused an overnight transition to virtual interactions in academia. One non-systematic list noted that 40 out of 59 ecology and evolution conferences in 2021 were online. In particular, publishing recorded talks online has gained popularity, with the positive intent of increasing accessibility and visibility of scientific events. Although this has revolutionized how we share findings in ecology and evolution, it also poses novel privacy and ethical issues that can inadvertently risk further impairing inclusion in science. Here, we briefly discuss the opportunities and risks of routinely publishing talks, and highlight considerations for presenters, their hosts and journals.

<https://www.nature.com/articles/s41559-022-01755-6>

Nature Human Behaviour

PAPERS

KATHELIJNE KOOPS et al – Field experiments find no evidence that chimpanzee nut cracking can be independently innovated

Cumulative culture has been claimed a hallmark of human evolution. Yet, the uniqueness of human culture is heavily debated. The zone of latent solutions hypothesis states that only humans have cultural forms that require form-copying social learning and are culture-dependent. Non-human ape cultural behaviours are considered ‘latent solutions’, which can be independently (re-)innovated. Others claim that chimpanzees, like humans, have cumulative culture. Here, we use field experiments at Seringbara (Nimba Mountains, Guinea) to test whether chimpanzee nut cracking can be individually (re-)innovated. We provided: (1) palm nuts and stones, (2) palm fruit bunch, (3) cracked palm nuts and (4) Coula nuts and stones. Chimpanzee parties visited ($n = 35$) and explored ($n = 11$) the experiments but no nut cracking occurred. In these experiments, chimpanzees did not individually (re-)innovate nut cracking under ecologically valid conditions. Our null results are consistent with the hypothesis that chimpanzee nut cracking is a product of social learning.

<https://www.nature.com/articles/s41562-021-01272-9>

SIMON CIRANKA et al – Asymmetric reinforcement learning facilitates human inference of transitive relations

Humans and other animals are capable of inferring never-experienced relations (for example, $A > C$) from other relational observations (for example, $A > B$ and $B > C$). The processes behind such transitive inference are subject to intense research. Here we demonstrate a new aspect of relational learning, building on previous evidence that transitive inference can be accomplished through simple reinforcement learning mechanisms. We show in simulations that inference of novel relations benefits from an asymmetric learning policy, where observers update only their belief about the winner (or loser) in a pair. Across four experiments ($n = 145$), we find substantial empirical support for such asymmetries in inferential learning. The learning policy favoured by our simulations and experiments gives rise to a compression of values that is routinely observed

in psychophysics and behavioural economics. In other words, a seemingly biased learning strategy that yields well-known cognitive distortions can be beneficial for transitive inferential judgements.

<https://www.nature.com/articles/s41562-021-01263-w>

Nature Humanities & Social Sciences Communications

PAPERS

SALLY E. STREET, TUOMAS EEROLA & JEREMY R. KENDAL – The role of population size in folk tune complexity

Demography, particularly population size, plays a key role in cultural complexity. However, the relationship between population size and complexity appears to vary across domains: while studies of technology typically find a positive correlation, the opposite is true for language, and the role of population size in complexity in the arts remains to be established. Here, we investigate the relationship between population size and complexity in music using Irish folk session tunes as a case study. Using analyses of a large online folk tune dataset, we show that popular tunes played by larger communities of musicians have diversified into a greater number of different versions which encompass more variation in melodic complexity compared with less popular tunes. However, popular tunes also tend to be intermediate in melodic complexity and variation in complexity for popular tunes is lower than expected given the increased number of tune versions. We also find that user preferences for individual tune versions are more skewed in popular tunes. Taken together, these results suggest that while larger populations create more frequent opportunities for musical innovation, they encourage convergence upon intermediate levels of melodic complexity due to a widespread inverse U-shaped relationship between complexity and aesthetic preference. We explore the assumptions underlying our empirical analyses further using simple simulations of tune diffusion through populations of different sizes, finding that a combination of biased copying and structured populations appears most consistent with our results. Our study demonstrates a unique relationship between population size and cultural complexity in the arts, confirming that the relationship between population size and cultural complexity is domain-dependent, rather than universal.

<https://www.nature.com/articles/s41599-022-01139-y>

Nature Italy

ARTICLES

NICOLÒ ROMANO – Ancestors of modern Asians got to Europe first

Study suggests that early humans migrating out of Africa did not immediately diverge towards an Eastern and a Western route.

<https://www.nature.com/articles/d43978-022-00053-w>

Nature Reviews Neuroscience

PAPERS

ERIC B. KNUDSEN & JONI D. WALLIS – Taking stock of value in the orbitofrontal cortex

People with damage to the orbitofrontal cortex (OFC) have specific problems making decisions, whereas their other cognitive functions are spared. Neurophysiological studies have shown that OFC neurons fire in proportion to the value of anticipated outcomes. Thus, a central role of the OFC is to guide optimal decision-making by signalling values associated with different choices. Until recently, this view of OFC function dominated the field. New data, however, suggest that the OFC may have a much broader role in cognition by representing cognitive maps that can be used to guide behaviour and that value is just one of many variables that are important for behavioural control. In this Review, we critically evaluate these two alternative accounts of OFC function and examine how they might be reconciled.

<https://www.nature.com/articles/s41583-022-00589-2>

Nature Reviews Psychology

PAPERS

TATSUYA KAMEDA, WATARU TOYOKAWA & R. SCOTT TINDALE – Information aggregation and collective intelligence beyond the wisdom of crowds

In humans and other gregarious animals, collective decision-making is a robust behavioural feature of groups. Pooling individual information is also fundamental for modern societies, in which digital technologies have exponentially increased the interdependence of individual group members. In this Review, we selectively discuss the recent human and animal literature, focusing on cognitive and behavioural mechanisms that can yield collective intelligence beyond the wisdom of crowds. We distinguish between two group decision-making situations: consensus decision-making, in which a group consensus is required, and combined decision-making, in which a group consensus is not required. We show that in both group decision-making situations, cognitive and behavioural algorithms that capitalize on individual heterogeneity are the key for collective intelligence to emerge. These algorithms include accuracy or expertise-weighted aggregation of individual inputs and implicit or explicit coordination of cognition and behaviour towards division of labour. These mechanisms can be implemented either as 'cognitive algebra', executed mainly within the mind of an individual or by some arbitrating system, or as a dynamic behavioural aggregation through social interaction of individual group members. Finally, we discuss implications

for collective decision-making in modern societies characterized by a fluid but auto-correlated flow of information and outline some future directions.

<https://www.nature.com/articles/s44159-022-00054-y>

Nature Scientific Reports

PAPERS

JESÚS RODRÍGUEZ et al – Sustainable human population density in Western Europe between 560.000 and 360.000 years ago

The time period between 560 and 360 ka (MIS14 to MIS11) was critical for the evolution of the Neanderthal lineage and the appearance of Levallois technology in Europe. The shifts in the distribution of the human populations, driven by cyclical climate changes, are generally accepted to have played major roles in both processes. We used a dataset of palaeoclimate maps and a species distribution model to reconstruct the changes in the area of Western Europe with suitable environmental conditions for humans during 11 time intervals of the MIS14 to MIS 11 period. Eventually, the maximum sustainable human population within the suitable area during each time interval was estimated by extrapolating the relationship observed between recent hunter-gatherer population density and net primary productivity and applying it to the past. Contrary to common assumptions, our results showed the three Mediterranean Peninsulas were not the only region suitable for humans during the glacial periods. The estimated total sustainable population of Western Europe from MIS14 to MIS11 oscillated between 13,000 and 25,000 individuals. These results offer a new theoretical scenario to develop models and hypotheses to explain cultural and biological evolution during the Middle Pleistocene in Western Europe.

<https://www.nature.com/articles/s41598-022-10642-w>

ENIKŐ KATALIN MAGYARI et al – Mammal extinction facilitated biome shift and human population change during the last glacial termination in East-Central Europe

The study of local extinction times, together with the associated environmental and human population changes in the last glacial termination, provides insights into the causes of mega- and microfauna extinctions. In East-Central (EC) Europe, groups of Palaeolithic humans were present throughout the last glacial maximum, but disappeared suddenly around 15,200 cal BP. In this study cave sediment profiles dated using radiocarbon techniques and a large set of mammal bones dated directly by AMS 14C were used to determine local extinction times. These were, in turn, compared to changes in the total megafauna population of EC Europe derived from coprophilous fungi, the Epigravettian population decline, quantitative climate models, pollen and plant macrofossil inferred climate, as well as to biome reconstructions. The results suggest that the population size of large herbivores decreased in the area after 17,700 cal BP, when temperate tree abundance and warm continental steppe cover both increased in the lowlands. Boreal forest expansion started around 16,200 cal BP. Cave sediments show the decline of narrow-headed vole and arctic lemming populations specifically associated with a tundra environment at the same time and the expansion of the common vole, an inhabitant of steppes. The last dated appearance of arctic lemming was at ~ 16,640 cal BP, while that of the narrow-headed vole at ~ 13,340, and the estimated extinction time of woolly mammoth was either at 13,830 (GRIWM) or 15,210 (PHASE), and reindeer at 11,860 (GRIWM) or 12,550 cal BP (PHASE). The population decline of the large herbivore fauna slightly preceded changes in terrestrial vegetation, and likely facilitated it via a reduction in the intensity of grazing and the concomitant accumulation of plant biomass. Furthermore, it is possible to conclude that the Late Epigravettian population had high degree of quarry-fidelity; they left the basin when these mammals vanished.

<https://www.nature.com/articles/s41598-022-10714-x>

New Scientist

NEWS

Stone Age Europeans may have gathered to watch animations by the fire

The campfire was a social hub for ancient humans, and a virtual reality investigation suggests that the flickering light may have made art etched on flat rocks look animated.

<https://www.newscientist.com/article/2316642-stone-age-europeans-may-have-gathered-to-watch-animations-by-the-fire/#ixzz7RqEuZ7ZJ>

Proceedings of the Royal Society B

PAPERS

JULIEN LIE-PANIS & JEAN-BAPTISTE ANDRÉ – Cooperation as a signal of time preferences

Many evolutionary models explain why we cooperate with non-kin, but few explain why cooperative behaviour and trust vary. Here, we introduce a model of cooperation as a signal of time preferences, which addresses this variability. At equilibrium in our model (i) future-oriented individuals are more motivated to cooperate, (ii) future-oriented populations have access to a wider range of cooperative opportunities, and (iii) spontaneous and inconspicuous cooperation reveal stronger preference for the future, and therefore inspire more trust. Our theory sheds light on the variability of cooperative behaviour and trust. Since affluence tends to align with time preferences, results (i) and (ii) explain why cooperation is often associated with affluence, in surveys and field studies. Time preferences also explain why we trust others based on proxies

for impulsivity, and, following result (iii), why uncalculating, subtle and one-shot cooperators are deemed particularly trustworthy. Time preferences provide a powerful and parsimonious explanatory lens, through which we can better understand the variability of trust and cooperation.

<https://royalsocietypublishing.org/doi/abs/10.1098/rspb.2021.2266>

THOMAS G. AUBIER & HANNA KOKKO – Volatile social environments can favour investments in quality over quantity of social relationships

Cooperation does not occur in a vacuum: interactions develop over time in social groups that undergo demographic changes. Intuition suggests that stable social environments favour developing few but strong reciprocal relationships (a 'focused' strategy), while volatile social environments favour the opposite: more but weaker social relationships (a 'diversifying' strategy). We model reciprocal investments under a quality–quantity trade-off for social relationships. We find that volatility, counterintuitively, can favour a focused strategy. This result becomes explicable through applying the theory of antagonistic pleiotropy, originally developed for senescence, to social life. Diversifying strategies show superior performance later in life, but with costs paid at young ages, while the social network is slowly being built. Under volatile environments, many individuals die before reaching sufficiently old ages to reap the benefits. Social strategies that do well early in life are then favoured: a focused strategy leads individuals to form their first few social bonds quickly and to make strong use of existing bonds. Our model highlights the importance of pleiotropy and population age structure for the evolution of cooperative strategies and other social traits, and shows that it is not sufficient to reflect on the fate of survivors only, when evaluating the benefits of social strategies.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2022.0281>

ARIANNA CURIONI et al with JOSEP CALL – Human adults prefer to cooperate even when it is costly

Joint actions are cooperative activities where humans coordinate their actions to achieve individual and shared goals. While the motivation to engage in joint action is clear when a goal cannot be achieved by individuals alone, we asked whether humans are motivated to act together even when acting together is not necessary and implies incurring additional costs compared to individual goal achievement. Using a utility-based empirical approach, we investigated the extent of humans' preference for joint action over individual action, when the instrumental costs of performing joint actions outweigh the benefits. The results of five experiments showed that human adults have a stable preference for joint action, even if individual action is more effective to achieve a certain goal. We propose that such preferences can be understood as ascribing additional reward value to performing actions together.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2022.0128>

JESSE G. LEINWAND et al – Familiarity mediates apes' attentional biases toward human faces

In zoos, primates experience markedly different interactions with familiar humans, such as the zookeepers who care for them, compared with those with unfamiliar humans, such as the large volume of zoo visitors to whom they are regularly exposed. While the behaviour of zoo-housed primates in the presence of unfamiliar, and to a lesser extent familiar, humans has received considerable attention, if and how they spontaneously distinguish familiar from unfamiliar people, and the cognitive mechanisms underlying the relationships they form with familiar and unfamiliar humans, remain poorly understood. Using a dot-probe paradigm, we assessed whether primates (chimpanzees and gorillas) show an attentional bias toward the faces of familiar humans, with whom the apes presumably had a positive relationship. Contrary to our predictions, all subjects showed a significant attentional bias toward unfamiliar people's faces compared with familiar people's faces when the faces showed a neutral expression, both with and without a surgical face mask on, but no significant attentional bias when the faces showed a surprised expression. These results demonstrate that apes can spontaneously categorize humans based on familiarity and we argue that the attentional biases the apes showed for unfamiliar human faces reflect a novelty effect.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2021.2599>

Royal Society Open Science

PAPERS

JAMES P. TRUJILLO, STEPHEN C. LEVINSON & JUDITH HOLLER – A multi-scale investigation of the human communication system's response to visual disruption

In human communication, when the speech is disrupted, the visual channel (e.g. manual gestures) can compensate to ensure successful communication. Whether speech also compensates when the visual channel is disrupted is an open question, and one that significantly bears on the status of the gestural modality. We test whether gesture and speech are dynamically co-adapted to meet communicative needs. To this end, we parametrically reduce visibility during casual conversational interaction and measure the effects on speakers' communicative behaviour using motion tracking and manual annotation for kinematic and acoustic analyses. We found that visual signalling effort was flexibly adapted in response to a decrease in visual quality (especially motion energy, gesture rate, size, velocity and hold-time). Interestingly, speech was also affected: speech intensity increased in response to reduced visual quality (particularly in speech-gesture utterances, but independently of kinematics). Our findings highlight that multi-modal communicative behaviours are flexibly adapted at multiple scales of measurement and question the notion that gesture plays an inferior role to speech.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.211489>

LIAM KEEBLE, JOEL C. WALLENBERG & ELIZABETH E. PRICE – The evolution of coordination: a phylogenetic meta-analysis and systematic review

To solve many cooperative problems, humans must have evolved the ability to solve physical problems in their environment by coordinating their actions. There have been many studies conducted across multiple different species regarding coordinating abilities. These studies aim to provide data which will help illuminate the evolutionary origins of cooperative problem solving and coordination. However, it is impossible to make firm conclusions about the evolutionary origins of coordinating abilities without a thorough comparative analysis of the existing data. Furthermore, there may be certain aspects of the literature that make it very difficult to confidently address evolutionary and meta-analytic questions. This study aimed to rectify this by using meta-analysis, phylogenetic analysis and systematic review to analyse the data already obtained across multiple studies, and to assess the reliability of this data. We found that many studies did not provide the information necessary for meta-analysis, or were not comparable enough to other studies to be included in analyses, meaning meta-analyses were underpowered or could not be conducted due to low samples of both studies and different species. Overall, we found that many studies reported small positive effects across studies, but the standard errors of these effects frequently traversed zero.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.201728>

Science Advances

COMMENTARIES

T. J. CLARK, JASON NEWTON & EWAN D. WAKEFIELD – Comment on “Evidence of prehistoric human activity in the Falkland Islands”

Stable isotopes from archaic Falkland Islands wolves (*Dusicyon australis*) indicate a high trophic, marine diet. Hamley et al. Argue that this is consistent with mutualism with Yaghan people. However, most *D. australis* had similar isotopic signatures in the European era, despite human persecution. These data therefore neither support nor refute human-mediated introduction of *D. australis* to the Falklands.

<https://www.science.org/doi/full/10.1126/sciadv.abo0928>

KIT M. HAMLEY et al – Response to comment on “Evidence of prehistoric human activity in the Falkland Islands”

Hamley et al. previously presented multiple lines of evidence that people were present in the Falkland Islands before Europeans and may have brought the now-extinct canid, *Dusicyon australis*. Stable isotope data reported by Clark et al. Indicate that *D. australis* had a high-trophic, marine diet that terrestrialized following European arrival. This is consistent with our hypothesis of a human mutualism.

<https://www.science.org/doi/full/10.1126/sciadv.abo6765>

Trends in Ecology and Evolution

PAPERS

PETER BUSTON & TIM CLUTTON-BROCK – Strategic growth in social vertebrates

Individual differences in growth and size of vertebrates often represent adaptive, plastic responses to contrasts in ecological conditions. Recent studies show that vertebrates can also modify their growth and size in an adaptive fashion in response to fine-grain changes in social conditions (which we refer to as strategic growth). Here, we review experimental evidence for strategic growth in social vertebrates. We describe a set of conditions under which strategic growth commonly occurs, and highlight potential examples of convergent evolution of strategic growth across the tree of life. This synthesis has implications for the way we think about organismal growth and size, because it underscores that the size of individuals can often be fine-tuned to their social environment.

[https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(22\)00063-5](https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(22)00063-5)

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