EAORC BULLETIN 1,042 – 4 June 2023

CONTENTS

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.

RESEARCHGATE – Evidence of Grammatical Knowledge in Apes

Frontiers in Psychology 13:885605 (2022).

P. THOMAS SCHOENEMANN – Evidence of Grammatical Knowledge in Apes: An Analysis of Kanzi's Performance on Reversible Sentences

Ape language acquisition studies have demonstrated that apes can learn arbitrary mappings between different auditory or visual patterns and concepts, satisfying the definition of symbol use. The extent to which apes understand aspects of grammar is less well accepted. On the production side, several studies have shown that apes sometimes combine two or more symbols together, in non-random patterns. However, this is quite limited compared to human language production. On the comprehension side, much greater abilities have been reported in apes. One of the most famous examples is Kanzi, a bonobo who reportedly responded correctly to a large number of novel commands. However, based on his performance on a small subset of reversible sentences—where the understanding of English syntax was critical—the extent to which he demonstrated grammatical knowledge has been questioned. Using a randomization study it is shown here that his performance actually vastly exceeds random chance, supporting the contention that he does in fact understand word order grammatical rules in English. This of course represents only one aspect of English grammar, and does not suggest he has completely human grammatical abilities. However, it does show that he understands one of the arbitrary grammatical devices used in many languages: The use of word order to code argument relations. It also removes from serious consideration the view that apes lack any kind of grammatical ability. From an evolutionary perspective, Kanzi's ability is most likely to result from homologous brain circuitry, although this is ultimately an empirical question.
https://www.researchgate.net/publication/362209657_Evidence_of_Grammatical_Knowledge_in_Apes_An_Analysis_of_Kanzi's_Performance_on_Reversible_Sentences

CONFERENCE ALERT – 9th Polish Evolutionary Conference (PEC2023), 18-20 September 2023, Krakow

We are pleased to announce the 9th Polish Evolutionary Conference (PEC2023), which will take place from 18 to 20 September 2023 in Krakow, Poland. We cordially invite everyone interested in evolutionary biology and ecology, both young and experienced scientists, researchers and students, active and passive participants. The PEC has been bringing together researchers working in different areas of evolutionary biology and the interface between evolutionary biology and ecology for 10 years.

The invited speakers for this year's conference are:
--- Richard Eimer Lenski, Michigan State University, Michigan, USA
--- Carlos A. Botero, University of Texas at Austin, USA
--- Julia Pawłowska, University of Warsaw, Poland
--- Wilco C.E.P. Verberk, Radboud University, The Netherlands

We are pleased to announce that registration for the conference is now open. To ensure your participation, please visit the conference website at https://pec2023.confer.uj.edu.pl/start. The deadline for abstract submission is 16 June. Early bird registration is available until 17 July, so we encourage you to take advantage of this opportunity.

One day before the conference, on Sunday, September 17th, we suggest that we spend time together on a walk along the trails of the Kraków Valleys Landscape Park. For news about the conference, please follow PEC on Twitter https://twitter.com/PolishEvoConf or Facebook https://www.facebook.com/inos.uj.

If you have any questions or require any assistance, please do not hesitate to contact our organising committee at pec2023@uj.edu.pl.

NEWS

NATURE BRIEFING – Brain's wrinkles help to drive how it works

Our brains' walnut-like wrinkles have a large effect on brain activity, in much the same way that the shape of a bell determines how it sounds. The discovery challenges the paradigm that brain function emerges from the intricate web of connections between specialized brain-cell populations, called the connectome. Researchers used mathematical models that predict how waves travel across surfaces, and found that the shape of the brain's outer surface was a better predictor of brainwave data than was the model of the connectome.
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=da601ffa80&e=1db4b9a19b

NATURE BRIEFING – The mysterious origins of patriarchy

Gender made little difference for people living 9,000 years ago in Çatalhöyük, in modern-day Turkey: men and women had identical diets and did similar kinds of work. So what changed? History points to patriarchy beginning not with agriculture, work that requires physical strength, but with those in power. "Person power is the key to power in general," explains

anthropologist James Scott. The elites in the first states needed people to produce resources for them and to defend the state. Women were expected to focus on having more babies and were eventually pushed into the domestic shadows.
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=c058510150&e=1db4b9a19b

NATURE BRIEFING – Biggest ever study of primate genomes

There were surprises aplenty for researchers who undertook the largest ever primate-genome study. For example, the genomes of the 233 primate species examined were used to classify 4.3 million common gene variants present in the human genome. By assessing how common those variants were across species, the researchers were able to infer that around 98.7% of the variants they checked probably do not cause disease in humans. Before the international effort, just 10% of primate species' genomes had been sequenced. Now nearly half of them have been catalogued.
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=4ae02ee053&e=1db4b9a19b

SCIENCE.ORG NEWS – Why human societies still use arms, feet, and other body parts to measure things

Body-based measurements may have persisted because they are convenient and offer ergonomic advantages over standardized units.
https://www.science.org/content/article/why-human-societies-still-use-arms-feet-and-other-body-parts-measure-things

SCIENCE.ORG NEWS – Desert ants build mounds of sand to help find a way home

The lack of landmarks to identify their nests makes Tunisian ants fashion their own.
https://www.science.org/content/article/desert-ants-build-mounds-sand-help-find-way-home

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

ADELA CEBEIRO & ALASTAIR KEY – Captive bonobos (Pan paniscus) apply precision grips when using flaked stone tools

Current evidence suggests that flaked stone tool technologies did not emerge until ~3.3–2.6 million-years-ago (Ma). It is often hypothesized that early hominin (principally Ardipithecus and early Australopithecus) manual anatomy may have prevented an earlier emergence, as the forceful precision grips essential to flake tool-use may have been ineffectively performed by these species. Marzke, Marchant, McGrew, and Reece (2015) observed potentially forceful pad-to-side precision grips being recruited by wild chimpanzees (Pan troglodytes) during feeding behaviors, indicating that Pan-like manual anatomy, and therefore potentially early hominin anatomy, may be capable of effectively securing flake stone tools during their use.

Here, we report on the grips recruited by four captive, human-trained, bonobos (Pan paniscus) during the use of stone and organic tools, including flake stone tools during cutting behaviors.

It is revealed that pad-to-side precision grips are frequently recruited by these bonobos when securing stone flakes during cutting actions. In some instances, high forces could have been resisted and applied by the thumb and fingers.

While our analyzes are preliminary and limited to captive individuals, and Pan is not suggested to secure flakes with the same efficacy as Homo or Australopithecus, it points to early hominins potentially being able to perform the precision grips required to use flake stone tools. In turn, the ability to gain tangible benefits from the effective use of flake tools (i.e., gain energetic returns from processing food resources) may have been – at least anatomically – possible in early Australopithecus and other pre-Early Stone Age hominin species. In turn, hominin manual anatomy may not be a leading restriction on the emergence of the earliest stone tool technologies.
https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.24759

Biology Letters

PAPERS

ANTTI O. TANSKANEN, SAMULI HELLE & MIRKKA DANIELSBACKA – Differential grandparental investment when maternal grandmothers are living versus deceased

Grandparents can increase their inclusive fitness by investing time and resources in their grandchildren. However, not all grandparents make such investments equally, and between-grandparent differences in this regard can be predicted based on paternity uncertainty, lineage and grandparents' sex. Using population-based data for English and Welsh adolescents (n = 1430), we examined whether the death of the most important grandparent (in terms of investment), the maternal grandmother (MGM), changes relative support for existing hypotheses predicting differential grandparental-investment patterns. To contrast the predictions of the grandparental investment hypotheses, we used generalized order-restricted information criterion approximation. We consequently found that, when MGMs are alive, the most-supported hypothesis is 'discriminative grandparental solicitude', which ranks grandparental investment as MGMs > maternal grandfathers (MGFs) > paternal grandmothers (PGMs) > paternal grandfathers (PGFs). However, when MGMs are deceased, the paternity

uncertainty hypothesis (MGFs = PGMs > PGFs) receives the most support; this is due to increased investment by PGMs. Thus, when the heaviest investors (i.e. MGMs) are deceased, PGM investments are closer to—but do not exceed—MGF investments.
https://royalsocietypublishing.org/doi/full/10.1098/rsbl.2023.0061

Current Anthropology

PAPERS

GABRIEL SCHEIDECKER – Parents, Caregivers, and Peers: Patterns of Complementarity in the Social World of Children in Rural Madagascar

Research on childhood in anthropology and neighboring disciplines has continuously broadened the range of the social partners that are considered relevant for young children's development—from parents to other caregivers, siblings, and peers. Yet most studies as well as interventions in early childhood still focus exclusively on parents, who are presumed to be the most significant socializing agents. Objecting to such a hierarchical understanding of the social world of children, I propose a complementarity view. Rather than being linearly ranked in a hierarchy of significance, children's social partners may complement each other by providing different but equally significant experiences. My suggestions are based on an ethnographic study in a rural community in Madagascar. Focusing on children in the first 3 years of life, I explore the full range of their social partners and the respective experiences they provide. Caregivers focus on children's physical needs and aim to keep them in a calm emotional state, while other young related children are the most crucial partners when it comes to play, face-to-face interaction, and the exchange of intense emotions. These complementary roles, I argue, lead to the parallel formation of two distinct socioemotional modes: a hierarchical one and an egalitarian one.
https://www.journals.uchicago.edu/doi/abs/10.1086/725037

Current Biology

PAPERS

MARILIA FREIRE, ANTONIO BOLLIG & MARKUS KNADEN – Absence of visual cues motivates desert ants to build their own landmarks

The desert ants Cataglyphis fortis inhabit the harsh salt pans of Tunisia. The individually foraging ants rely on path integration to navigate back to their nest. However, as path integration accumulates errors at a rate that increases with distance traveled, it is supplemented by visual and olfactory cues. We show that despite their impressive homing accuracy, ants returning from long foraging journeys face a mortality rate of up to 20%. To facilitate homing, colonies inhabiting the featureless center of the salt pan build tall nest hills as visual cues. Removing these hills triggers rebuilding, but visual artificial landmarks placed near the nest entrance are sufficient to suppress the ants' rebuilding activity. Our data suggest that the desert ant builds its own landmark on purpose in a featureless environment to increase its chances of successful homing and survival.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00614-0

eLife

PAPERS

OLIVIER CORNEILLE et al – Point of View: Beware 'persuasive communication devices' when writing and reading scientific articles

Authors rely on a range of devices and techniques to attract and maintain the interest of readers, and to convince them of the merits of the author's point of view. However, when writing a scientific article, authors must use these 'persuasive communication devices' carefully. In particular, they must be explicit about the limitations of their work, avoid obfuscation, and resist the temptation to oversell their results. Here we discuss a list of persuasive communication devices and we encourage authors, as well as reviewers and editors, to think carefully about their use.
https://elifesciences.org/articles/88654

KONRAD WAGSTYL et al – Transcriptional Cartography Integrates Multiscale Biology of the Human Cortex

The cerebral cortex underlies many of our unique strengths and vulnerabilities - but efforts to understand human cortical organization are challenged by reliance on incompatible measurement methods at different spatial scales. Macroscale features such as cortical folding and functional activation are accessed through spatially dense neuroimaging maps, whereas microscale cellular and molecular features are typically measured with sparse postmortem sampling. Here, we integrate these distinct windows on brain organization by building upon existing postmortem data to impute, validate and analyze a library of spatially dense neuroimaging-like maps of human cortical gene expression. These maps allow spatially unbiased discovery of cortical zones with extreme transcriptional profiles or unusually rapid transcriptional change which index distinct microstructure and predict neuroimaging measures of cortical folding and functional activation. Modules of spatially coexpressed genes define a family of canonical expression maps that integrate diverse spatial scales and temporal epochs of human brain organization - ranging from protein-protein interactions to large-scale systems for cognitive processing. These module maps also parse neuropsychiatric risk genes into subsets which tag distinct cyto-laminar features and differentially

predict the location of altered cortical anatomy and gene expression in patients. Taken together, the methods, resources and findings described here advance our understanding of human cortical organization and offer flexible bridges to connect scientific fields operating at different spatial scales of human brain research.
https://elifesciences.org/reviewed-preprints/86933

Frontiers in Bioengineering and Biotechnology

PAPERS

LAUREN WELTE et al – Mobility of the human foot's medial arch helps enable upright bipedal locomotion

Developing the ability to habitually walk and run upright on two feet is one of the most significant transformations to have occurred in human evolution. Many musculoskeletal adaptations enabled bipedal locomotion, including dramatic structural changes to the foot and, in particular, the evolution of an elevated medial arch. The foot's arched structure has previously been assumed to play a central role in directly propelling the center of mass forward and upward through leverage about the toes and a spring-like energy recoil. However, it is unclear whether or how the plantarflexion mobility and height of the medial arch support its propulsive lever function. We use high-speed biplanar x-ray measurements of foot bone motion on seven participants while walking and running and compare their motion to a subject-specific model without arch recoil. We show that regardless of intraspecific differences in medial arch height, arch recoil enables a longer contact time and favorable propulsive conditions at the ankle for walking upright on an extended leg. The generally overlooked navicular-medial cuneiform joint is primarily responsible for arch recoil in human arches. The mechanism through which arch recoil enables an upright ankle posture may have helped drive the evolution of the longitudinal arch after our last common ancestor with chimpanzees, who lack arch plantarflexion mobility during push-off. Future morphological investigations of the navicular-medial cuneiform joint will likely provide new interpretations of the fossil record. Our work further suggests that enabling medial arch recoil in footwear and surgical interventions may be critical for maintaining the ankle's natural propulsive ability.
https://www.frontiersin.org/articles/10.3389/fbioe.2023.1155439/full

Frontiers in Psychology

PAPERS

AXEL G. EKSTRÖM & JENS EDLUND – Evolution of the human tongue and emergence of speech biomechanics

The tongue is one of the organs most central to human speech. Here, the evolution and species-unique properties of the human tongue is traced, via reference to the apparent articulatory behavior of extant non-human great apes, and fossil findings from early hominids – from a point of view of articulatory phonetics, the science of human speech production. Increased lingual flexibility provided the possibility of mapping of articulatory targets, possibly via exaptation of manual-gestural mapping capacities evident in extant great apes. The emergence of the human-specific tongue, its properties, and morphology were crucial to the evolution of human articulate speech.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1150778/full

CORAL J. DANDO, PAUL J. TAYLOR & ALEXANDRA L. SANDHAM – Cross cultural verbal cues to deception: truth and lies in first and second language forensic interview contexts

The verbal deception literature is largely based upon North American and Western European monolingual English speaker interactions. This paper extends this literature by comparing the verbal behaviors of 88 south Asian bilinguals, conversing in either first (Hindi) or second (English) languages, and 48 British monolinguals conversing in English.
All participated in a live event following which they were interviewed having been incentivized to be either deceptive or truthful. Event details, complications, verifiable sources, and plausibility ratings were analyzed as a function of veracity, language and culture.
Main effects revealed cross cultural similarities in both first and second language interviews whereby all liar's verbal responses were impoverished and rated as less plausible than truthtellers. However, a series of cross-cultural interactions emerged whereby bi-lingual South Asian truthtellers and liars interviewed in first and second languages exhibited varying patterns of verbal behaviors, differences that have the potential to trigger erroneous assessments in practice.
Despite limitations, including concerns centered on the reductionary nature of deception research, our results highlight that while cultural context is important, impoverished, simple verbal accounts should trigger a 'red flag' for further attention irrespective of culture or interview language, since the cognitive load typically associated with formulating a deceptive account apparently emerges in a broadly similar manner.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1152904/full

FRANCESCO FERRETTI – On the influence of thought on language: a naturalistic framework for the pantomimic origins of human communication

This paper focuses on the idea that pantomime is a privileged lens for investigating the origin of language in a naturalistic framework. Two reasons support this claim. The first one concerns the motivated and iconic character of pantomime compared to the arbitrary and abstract features of linguistic signs emphasized by the conventionalist thesis. The second

reason is that a pantomimic account of language origin paves the way for a rethinking of the traditional hypothesis on the relationship between thought and language. Specifically, it leads to a revision of the thesis of the unidirectional influence of language on thought in favor of a bidirectional influence. Indeed, looking at the relationship between thought and language in its nascent stage means investigating the role of thought in shaping language rather than the role of language in shaping thought. A bidirectional perspective of this type hinges on the twofold idea that thought has primarily a narrative foundation and that pantomime represents an ideal expressive means for bootstrapping the evolutionary foundations of language origins in a naturalistic framework.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1197968/full

Heliyon

PAPERS

K.M. ARIFUL KABIR et al – Exploring the performance of volatile mutations on evolutionary game dynamics in complex networks

The typical framework of replicator dynamics in evolutionary game theory assumes that all mutations are equally likely, meaning that the mutation of an evolving inhabitant only contributes constantly. However, in natural systems in biological and social sciences, mutations can arise due to their repetitive regeneration. The phenomenon of changing strategies (updating), typically prolonged sequences repeated many times, is defined as a volatile mutation that has been overlooked in evolutionary game theory. Implementing a repeated time framework introduces a dynamic mutation aspect incorporated with the pairwise Fermi rule. Network structure, ubiquitous in many natural and artificial systems, has significantly affected the dynamics and outcomes of evolutionary games. We examine the evolution of the pairwise game in terms of dilemma strength. It is revealed that mutation intensity can influence evolutionary dynamics. We also demonstrated that the obtained outcomes run by the deterministic and multi-agent simulation (MAS) process present similar stability regions for both linear and non-linear dynamics, even in various game classes. In particular, the most stimulating effect is detected for the relationship between the fraction of cooperation and the fraction of the mutated individuals, as inclination tends to provide an increasing tendency and supporting defection in the opposite case. In conclusion, we identified a form of volatile mutation as a form of noise that, under certain situations, could be used to enhance cooperation in social systems and design strategies for promoting cooperation in networked environments.
https://www.cell.com/heliyon/fulltext/S2405-8440(23)03997-X

iScience

PAPERS

D. KIMBROUGH OLLER et al – Sex differences in infant vocalization and the origin of language

Seeking to discern the earliest sex differences in language-related activities, our focus is vocal activity in the first two years of life, following up on recent research that unexpectedly showed boys produced significantly more speech-like vocalizations (protophones) than girls during the first year of life.We now bring a much larger body of data to bear on the comparison of early sex differences in vocalization, data based on automated analysis of all-day recordings of infants in their homes. The new evidence, like that of the prior study, also suggests boys produce more protophones than girls in the first year and offers additional basis for informed speculation about biological reasons for these differences. More broadly, the work offers a basis for informed speculations about foundations of language that we propose to have evolved in our distant hominin ancestors, foundations also required in early vocal development of modern human infants.
https://www.cell.com/iscience/fulltext/S2589-0042(23)00961-6

Nature

NEWS

Oldest known 'blueprints' aided human hunters 9,000 years ago

Prehistoric engravings depict vast hunting traps with extraordinary precision.
https://www.nature.com/articles/d41586-023-01593-x

Biggest ever study of primate genomes has surprises for humanity

Genomes of humans' closest relatives provide insight for conservation, human disease and the origins of social structures.
https://www.nature.com/articles/d41586-023-01776-6

REVIEWS

ERIC-JAN WAGENMAKERS – Is the biggest challenge to scientific thinking science itself?

Data torturing, cherry-picking, P-hacking and the invention of tools such as ChatGPT — when it comes to assisting the spread of disinformation science is its own worst enemy, argues a new book.
Review of 'Distrust: Big Data, Data-Torturing, and the Assault on Science' by Gary Smith, Oxford University Press (2023).
https://www.nature.com/articles/d41586-023-01709-3

Nature Africa

NEWS

New fossil evidence adds branch to early hominin family tree
Infant skull fragments show intriguing growth patterns.
https://www.nature.com/articles/d44148-023-00133-z

Nature Communications

PAPERS

KINGA MAKOVI et al – Trust within human-machine collectives depends on the perceived consensus about cooperative norms
With the progress of artificial intelligence and the emergence of global online communities, humans and machines are increasingly participating in mixed collectives in which they can help or hinder each other. Human societies have had thousands of years to consolidate the social norms that promote cooperation; but mixed collectives often struggle to articulate the norms which hold when humans coexist with machines. In five studies involving 7917 individuals, we document the way people treat machines differently than humans in a stylized society of beneficiaries, helpers, punishers, and trustors. We show that a different amount of trust is gained by helpers and punishers when they follow norms over not doing so. We also demonstrate that the trust-gain of norm-followers is associated with trustors' assessment about the consensual nature of cooperative norms over helping and punishing. Lastly, we establish that, under certain conditions, informing trustors about the norm-consensus over helping tends to decrease the differential treatment of both machines and people interacting with them. These results allow us to anticipate how humans may develop cooperative norms for human-machine collectives, specifically, by relying on already extant norms in human-only groups. We also demonstrate that this evolution may be accelerated by making people aware of their emerging consensus.
https://www.nature.com/articles/s41467-023-38592-5

Nature Communications Biology

PAPERS

ETHAN H. WILLBRAND et al – Sulcal morphology of posteromedial cortex substantially differs between humans and chimpanzees
Recent studies identify a surprising coupling between evolutionarily new sulci and the functional organization of human posteromedial cortex (PMC). Yet, no study has compared this modern PMC sulcal patterning between humans and non-human hominoids. To fill this gap in knowledge, we first manually defined over 2500 PMC sulci in 120 chimpanzee (Pan Troglodytes) hemispheres and 144 human hemispheres. We uncovered four new sulci, and quantitatively identified species differences in sulcal incidence, depth, and surface area. Interestingly, some sulci are more common in humans and others, in chimpanzees. Further, we found that the prominent marginal ramus of the cingulate sulcus differs significantly between species. Contrary to classic observations, the present results reveal that the surface anatomy of PMC substantially differs between humans and chimpanzees—findings which lay a foundation for better understanding the evolution of neuroanatomical-functional and neuroanatomical-behavioral relationships in this highly expanded region of the human cerebral cortex.
https://www.nature.com/articles/s42003-023-04953-5

Nature Ecology & Evolution

ARTICLES

DIEGO CORTEZ – Structural shifts in primate Y
An analysis of Y chromosomes from 29 primate species shows lineage-specific evolutionary strata as well as changes in the 3D structure, rearrangements and positive selection that have shaped the primate Y chromosome over the past 80 million years.
https://www.nature.com/articles/s41559-023-01984-3

PAPERS

YANG ZHOU et al – Eighty million years of rapid evolution of the primate Y chromosome
The Y chromosome usually plays a critical role in determining male sex and comprises sequence classes that have experienced unique evolutionary trajectories. Here we generated 19 new primate sex chromosome assemblies, analysed them with 10 existing assemblies and report rapid evolution of the Y chromosome across primates. The pseudoautosomal boundary has shifted at least six times during primate evolution, leading to the formation of a Simiiformes-specific evolutionary stratum and to the independent start of young strata in Catarrhini and Platyrrhini. Different primate lineages experienced different rates of gene loss and structural and chromatin change on their Y chromosomes. Selection on several Y-linked genes has contributed to the evolution of male developmental traits across the primates. Additionally, lineage-specific expansions of ampliconic regions have further increased the diversification of the structure and gene composition of

the Y chromosome. Overall, our comprehensive analysis has broadened our knowledge of the evolution of the primate Y chromosome.
https://www.nature.com/articles/s41559-022-01974-x

Nature Humanities & Social Sciences Communications

PAPERS

DAVID N. MATZIG, CLEMENS SCHMID & FELIX RIEDE – Mapping the field of cultural evolutionary theory and methods in archaeology using bibliometric methods

Bibliometrics offers powerful means of visualising and understanding trends within research domains. We here present a first exploratory bibliometric analysis of cultural evolutionary theory and attendant methods as applied specifically within archaeology across the last four decades (1981–2021). Bibliographic coupling network analysis shows that there exists a broadly successive series of author clusters making up the core of this research domain. A broader vernacular version of cultural evolution is also commonly used in thematic or regional research traditions that fall outside of cultural evolutionary studies in the strict sense. Our bibliometric networks trace the development of evolutionary archaeology over the last four decades and while they demonstrate the centrality of computational models, they also suggest a stagnation in the application of precisely that suite of methods—phylogenetics—that is central to evolutionary archaeology's biological counterpart palaeontology. Recent methodological innovations in palaeobiology are, however, offering new ways of integrating artefact shape data directly with phylogenetic applications. This development may usher in a renaissance in artefact phylogenetics and appropriately marco-scale applications of cultural evolutionary theory in archaeology.
https://www.nature.com/articles/s41599-023-01767-y

Nature Scientific Reports

PAPERS

EDGAR DUBOURG et al – Exploratory preferences explain the human fascination for imaginary worlds in fictional stories

Imaginary worlds are present and often central in many of the most culturally successful modern narrative fictions, be it in novels (e.g., Harry Potter), movies (e.g., Star Wars), video games (e.g., The Legend of Zelda), graphic novels (e.g., One Piece) and TV series (e.g., Game of Thrones). We propose that imaginary worlds are popular because they activate exploratory preferences that evolved to help us navigate the real world and find new fitness-relevant information. Therefore, we hypothesize that the attraction to imaginary worlds is intrinsically linked to the desire to explore novel environments and that both are influenced by the same underlying factors. Notably, the inter-individual and cross-cultural variability of the preference for imaginary worlds should follow the inter-individual and cross-cultural variability of exploratory preferences (with the personality trait Openness-to-experience, age, sex, and ecological conditions). We test these predictions with both experimental and computational methods. For experimental tests, we run a pre-registered online experiment about movie preferences (N = 230). For computational tests, we leverage two large cultural datasets, namely the Internet Movie Database (N = 9424 movies) and the Movie Personality Dataset (N = 3.5 million participants), and use machine-learning algorithms (i.e., random forest and topic modeling). In all, consistent with how the human preference for spatial exploration adaptively varies, we provide empirical evidence that imaginary worlds appeal more to more explorative people, people higher in Openness-to-experience, younger individuals, males, and individuals living in more affluent environments. We discuss the implications of these findings for our understanding of the cultural evolution of narrative fiction and, more broadly, the evolution of human exploratory preferences.
https://www.nature.com/articles/s41598-023-35151-2

PLoS One

PAPERS

NA HU et al – The role of prosody in interpreting causality in English discourse

Previous studies have well established that certain causal connectives encode information about the semantic-pragmatic distinction between different types of causal relations such as CAUSE-CONSEQUENCE versus CLAIM-ARGUMENT relations. These "specialized" causal connectives assist listeners in discerning different types of causality. Additionally, research has demonstrated that utterances expressing CLAIM-ARGUMENT relations exhibit distinct prosodic characteristics compared to utterances expressing CAUSE-CONSEQUENCE relations. However, it remains unknown whether the prosodic characteristics of utterances expressing causality can aid listeners in determining the specific type of causality being conveyed. To address this knowledge gap, this study investigates the impact of the prosody, specifically the prosody of the causal connective so in English, on listeners' interpretation of the type of causality expressed. We conducted a perception experiment employing a forced-choice discourse completion task, where the participants were required to select a continuation for each sound clip they heard. The sound clip consisted of factual events followed by the causal connective so. We found that the odds of listeners choosing subjective continuations over objective continuations increased when the connective so at the end of the sound clip was pronounced with subjective causality prosodic features, such as prolonged duration and a concave f0 contour. This finding suggests that the prosody of the connective so plays a role in conveying subjectivity in causality, guiding listeners

in interpreting causal relations. In addition, it is important to note that our data revealed individual variation among listeners in their interpretations of prosodic information related to subjective-objective causality contrast.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0286003

ALEJANDRO SÁNCHEZ-AMARO & FEDERICO ROSSANO – Comparative curiosity: How do great apes and children deal with uncertainty?

Humans are perhaps the most curious animals on earth, but to what extent our innate motivations for discovering new information are shared with our closest relatives remain poorly understood. To shed light on this question, we presented great apes with two experimental paradigms in which they had to initially choose between an empty opaque cup and a baited opaque cup with rewards invisible to the ape in study 1, or to choose between a transparent cup with rewards or a baited opaque cup with rewards invisible to the ape in studies 2 and 3. We also presented young children with scenarios comparable to the second paradigm (studies 4 and 5). Notably, after the initial choice phase, we presented participants with potential alternatives providing better rewards than the previously secured options. Importantly, those alternatives shared some features with the uncertain options, giving subjects the possibility to relate both options through analogical reasoning. We found that most great apes were not curious about the uncertain options. They only explored those options after they were presented with the alternatives. Children, instead, explored the uncertain options before the alternatives were presented, showing a higher degree of curiosity than the great apes. We argue that differences between children and apes mostly lay in motivational dispositions to explore the unknown.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0285946

DANIELLE SULIKOWSKI et al – The composite effect reveals that human (but not other primate) faces are special to humans

Recognising faces is widely believed to be achieved using "special" neural and cognitive mechanisms that depend on "holistic" processing, which are not used when recognising other kinds of objects. An important, but largely unaddressed, question is how much like a Human face a stimulus needs to be to engage this "special" mechanism(s). In the current study, we attempted to answer this question in 3 ways. In Experiments 1 and 2 we examined the extent to which the disproportionate inversion effect for human faces extends to the faces of other species (including a range of other primates). Results suggested that the faces of other primates engage the mechanism responsible for the inversion effect approximately as well as that mechanism is engaged by Human faces, but that non-primate faces engage the mechanism less well. And so primate faces, in general, seem to produce a disproportionate inversion effect. In Experiment 3 we examined the extent to which the Composite effect extends to the faces of a range of other primates, and found no compelling evidence of a composite effect for the faces of any other primate. The composite effect was exclusive to Human faces. Because these data differ so dramatically from a previously reported study asking similar questions Taubert (2009), we also (in Experiment 4) ran an exact replication of Taubert's Experiment 2, which reported on both Inversion and Composite effects in a range of species. We were unable to reproduce the pattern of data reported by Taubert. Overall, the results suggest that the disproportionate inversion effect extends to all of the faces of the non-human primates tested, but that the composite effect is exclusive to Human faces.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0286451

Science

ARTICLES

STEPHEN CHRISOMALIS – Embodying measurement: Measuring with body parts is a handy and persistent cross-cultural phenomenon

Humans use multiple culturally-specific cognitive strategies for managing social and technical challenges. Measurement, the correlation of some target to some comparator or unit, is cross-culturally universal and has a deep history. Ethnographic and historical analyses have documented these strategies for individual societies, but generalizing across languages and cultures is still an incomplete task. On page 948 of this issue, Kaaronen et al. show that body-based measuring is both common worldwide and builds on embodied cognitive properties that make such practices highly suitable for many measuring problems. Rather than considering standardized measures such as the metric system as superior, the authors argue that body-based measurement is often advantageous when solving human problems at human scales. Assessing 186 societies, past and present, they show that body-based measuring is globally prevalent because it is readily available to users, ergonomically adaptive, and linked to local knowledge, language, and tasks.
https://www.science.org/doi/10.1126/science.adi2352

PAPERS

XIAO-GUANG QI et al with CHRISTOPHER OPIE – Adaptations to a cold climate promoted social evolution in Asian colobine primates

Primates have evolved a diverse set of social systems, from solitary living to large multilevel societies. The traditional socioecological model explains this diversity as a response to changing environments, which shaped patterns of cooperation and competition for resources and predator defense. However, the socioecological model does not explain why sympatric

species living in the same environment exhibit different social systems. There is a growing consensus that primate social organization shows a strong phylogenetic signal as a result of shared inheritance from a common ancestor and evolved stepwise along with species differentiation. This implies a genetic basis for the evolution of animal social systems. However, the genomic mechanisms that underlie the expression of primate social systems remain poorly understood.
https://www.science.org/doi/10.1126/science.abl8621

ERIK F. SØRENSEN et mul – Genome-wide coancestry reveals details of ancient and recent male-driven reticulation in baboons
As a widespread but comparatively young clade of six parapatric species, the baboons (Papio sp.) exemplify a frequently observed pattern of mammalian diversity. In particular, they provide analogs for the population structure of the multibranched prehuman lineage that occupied a similar geographic range before the hegemony of "modern" humans, Homo sapiens. Despite phenotypic and genetic differences, interspecies hybridization has been described between baboons at several locations, and population relationships based on mitochondrial DNA (mtDNA) do not correspond with relationships based on phenotype. These previous studies captured the broad outlines of baboon population genetic structure and evolutionary history but necessarily used data that were limited in genomic and geographical coverage and therefore could not adequately document inter- and intrapopulation variation. In this study, we analyzed whole-genome sequences of 225 baboons representing all six species and 19 geographic sites, with 18 local populations represented by multiple individuals.
https://www.science.org/doi/10.1126/science.abn8153

ROOPE O. KAARONEN, MIKAEL A. MANNINEN & JUSSI T. ERONEN – Body-based units of measure in cultural evolution
Measurement systems are important drivers of cultural and technological evolution. However, the evolution of measurement is still insufficiently understood. Many early standardized measurement systems evolved from body-based units of measure, such as the cubit and fathom, but researchers have rarely studied how or why body-based measurement has been used. We documented body-based units of measure in 186 cultures, illustrating how body-based measurement is an activity common to cultures around the world. Here, we describe the cultural and technological domains these units are used in. We argue that body-based units have had, and may still have, advantages over standardized systems, such as in the design of ergonomic technologies. This helps explain the persistence of body-based measurement centuries after the first standardized measurement systems emerged.
https://www.science.org/doi/10.1126/science.adf1936

Science Advances

PAPERS

BAO-LIN ZHANG et mul – Comparative genomics reveals the hybrid origin of a macaque group
Although species can arise through hybridization, compelling evidence for hybrid speciation has been reported only rarely in animals. Here, we present phylogenomic analyses on genomes from 12 macaque species and show that the fascicularis group originated from an ancient hybridization between the sinica and silenus groups ~3.45 to 3.56 million years ago. The X chromosomes and low-recombination regions exhibited equal contributions from each parental lineage, suggesting that they were less affected by subsequent backcrossing and hence could have played an important role in maintaining hybrid integrity. We identified many reproduction-associated genes that could have contributed to the development of the mixed sexual phenotypes characteristic of the fascicularis group. The phylogeny within the silenus group was also resolved, and functional experimentation confirmed that all extant Western silenus species are susceptible to HIV-1 infection. Our study provides novel insights into macaque evolution and reveals a hybrid speciation event that has occurred only very rarely in primates.
https://www.science.org/doi/full/10.1126/sciadv.add3580

Trends in Cognitive Sciences

PAPERS

JARED PIAZZA, VICTORIA SIMPSON & LUKE MCGUIRE – Why children moralise harm to animals but not meat
Many children care about animals yet are accepting of meat consumption. This may reflect a disconnect between children's meat eating, food-systems knowledge, and their moral evaluations. A theoretical framework is proposed for understanding the developmental trajectory of this disconnection. We discuss its components and the implications for dietary interventions.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00121-3

ALEXANDER P. DEMOS & CAROLINE PALMER – Social and nonlinear dynamics unite: musical group synchrony
Synchronization, the human tendency to align behaviors in time with others, is necessary for many survival skills. The ability to synchronize actions with rhythmic (predictable) sound patterns is especially well developed in music making. Recent models of synchrony in musical ensembles rely on pairwise comparisons between group members. This pairwise approach to synchrony has hampered theory development, given current findings from social dynamics indicating shifts in members' influence within larger groups. We draw on social theory and nonlinear dynamics to argue that emergent properties and

novel roles arise in musical group synchrony that differ from individual or pairwise behaviors. This transformational shift in defining synchrony sheds light on successful outcomes as well as on disruptions that cause negative behavioral outcomes.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00122-5

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