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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 – Early Evidence for Brilliant Ritualized Display

In Current Anthropology 57:3, 287-310 (2016).

IAN WATTS, MICHAEL CHAZAN & JAYNE WILKINS – Early Evidence for Brilliant Ritualized Display: Specularite Use in the Northern Cape (South Africa) between ~500 and ~300 Ka

Earth pigments figure prominently in debates about signal evolution among later Homo. Most archaeologists consider such behavior to postdate ~300 Ka. To evaluate claims for Fauresmith and Acheulean pigments in South Africa’s Northern Cape

Province, extending back 1.1 Ma (Beaumont and Bednarik 2013), we re-examined collections from KathuPan 1, Wonderwerk Cave, and Canteen Kopje. We report and describe materials where we are confident as to a pigment status. We found (i) compelling evidence of absence in all but the youngest Acheulean contexts, (ii) definite but irregular use in Fauresmith contexts from at least 500 Ka, (iii) widespread and regular use within this limited area by ~300 Ka, coeval with circumstantial evidence for pigment transport over considerable distances and use in fire-lit environments. These findings are used to evaluate predictions derived from two competing hypotheses addressing the evolution of group ritual, the “female cosmetic coalitions” hypothesis (Power 2009) and the “cheap-but-honest signals” hypothesis (Kuhn 2014), finding that the former accounts for a greater range of the observations. The findings underscore the wider behavioral significance of the Fauresmith as an industry transitional between the Acheulean and the Middle Stone Age.

https://www.academia.edu/74789510/Early_Evidence_for_Brilliant_Ritualized_Display_Specularite_Use_in_the_Northern_Cape_South_Africa_between_500_and_300_Ka

RESEARCHGATE – On the use of evolutionary mismatch theories in debating human prosociality

In Medicine, Health Care and Philosophy 24, 305-314 (2021)

ANDRÉS SEGOVIA-CUÉLLAR & LORENZO DEL SAVIO – On the use of evolutionary mismatch theories in debating human prosociality

According to some evolutionary theorists human prosocial dispositions emerged in a context of inter-group competition and violence that made our psychology parochially prosocial, i.e. cooperative towards in-groups and competitive towards strangers. This evolutionary hypothesis is sometimes employed in bioethical debates to argue that human nature and contemporary environments, and especially large-scale societies, are mismatched. In this article we caution against the use of mismatch theories in moral philosophy in general and discuss empirical evidence that puts into question mismatch theories based on parochial prosociality. Evolutionary mismatch theories play at best a rhetorical role in these moral debates and may misrepresent the status of relevant evolutionary research. We finally recommend that moral philosophers interested in the evolutionary literature also engage with dispositions such as xenophilia and social tolerance to counterbalance the focus on psychological mismatches adopted so far.

https://www.researchgate.net/publication/351539809_On_the_use_of_evolutionary_mismatch_theories_in_debating_human_prosociality

COURSE ALERT – The Archaeogenomics of Domestic Animals

May 23-27, 2022, Vairo, Portugal

Diachronic genetic studies are required in order to infer the origins and evolutionary trajectories of domestic animals. Data spanning long time scales from zooarchaeological specimens allow the investigation of genomic variation within populations over time. Analysis of ancient DNA opens a direct window into the past for reconstruction of the genetic history of animal populations.

The objective of this course is to provide an overview of the most recent Archaeogenomics findings on the origin and evolution of domestic animals. It will also cover some of the recommended bioinformatics tools and methods for the study of ancient DNA genomics data. There will be hands-on sessions, including bioinformatics on how to filter, infer damage patterns and authenticate next-generation-sequencing data obtained from archaeological specimens, as well as on population genomics. One invited speaker in Archaeogenomics will also contribute to the course.

At the end of the course students should understand the importance of including genomic data concerning past populations to make evolutionary inferences, as well as get familiar with the challenges and peculiarities of ancient DNA analysis.

IMPORTANT DATES

Registration deadline: April 7, 2022

Notification of acceptance: April 18, 2022

Full details, including the course programme and instructors, application form, selection criteria and requirements, can be found here: <https://www.biodiv.pt/en/events/the-archaeogenomics-of-domestic-animals/>

This course is aimed at Ph.D. students, postdocs and other researchers in the fields of evolutionary biology, zooarchaeology and archaeology with a specific interest in Archaeogenomics.

NEWS

BREAKING SCIENCE – New Research Shows Stingrays and Cichlid Fish Can Add and Subtract

In a new study, researchers at the University of Bonn’s Institute of Zoology examined the numerical understanding of cichlids and stingrays regarding addition and subtraction abilities within the number space of one to five. “Whether vertebrates other than humans and primates can solve more complex numerical tasks or arithmetic problems such as addition and subtraction is — despite some promising studies — currently still unclear,” said University of Bonn researchers Vera Schluessel and her colleagues.

<http://www.sci-news.com/biology/stingray-cichlid-addition-subtraction-abilities-10674.html>

JOHN TEMPLETON FOUNDATION – The Psychology of Purpose

Reviewing six decades of research into the meaning, development, and benefits of purpose in life.

<https://www.templeton.org/discoveries/the-psychology-of-purpose>

NATURE BRIEFING – Scientists learn to speak manatee

Researchers listened to seven years of manatee (*Trichechus manatus latirostris*) chat to learn how the gentle, solitary grazers communicate. Almost all of the creatures' vocalizations fall into three categories: a high squeak used between mother and calf, a lower squeak that indicated stress and a squeal recorded during "cavorting" and "frisky behaviour".

Hear sounds: <https://nature.us17.list->

[manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=27b966d992&e=1db4b9a19b](https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=27b966d992&e=1db4b9a19b)

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=69923af263&e=1db4b9a19b>

SCIENCE DAILY – Unravelling the mystery of parrot longevity

Bigger brains have led some species of parrot to live surprisingly long lives, new research shows.

<https://www.sciencedaily.com/releases/2022/03/220329152826.htm>

SCIENCE DAILY – Zebra finch males sing in dialects and females pay attention

Male zebra finches learn their song by imitating conspecifics. To stand out in the crowd, each male develops its own unique song. Because of this individual-specific song, it was long assumed that dialects do not exist in zebra finches. However, with the help of an artificial intelligence technique, researchers have now been able to show that the songs of four different zebra finch populations differ systematically. They also discovered that these 'cryptic dialects' are decisive for the females' choice of mate. Thus, female zebra finches pay more attention to a cultural trait than to male appearance.

<https://www.sciencedaily.com/releases/2022/03/220329152821.htm>

SCIENCE DAILY – Tools reveal patterns of Neandertal extinction in the Iberian Peninsula

Neandertal populations in the Iberian Peninsula were experiencing local extinction and replacement even before Homo sapiens arrived, according to a new study.

<https://www.sciencedaily.com/releases/2022/03/220330141403.htm>

SCIENCE DAILY – New study explores relationship between psychedelics and consciousness

A new study addresses the question of whether psychedelics might change the attribution of consciousness to a range of living and nonliving things.

{I don't know what they're on, but I think I need some.}

<https://www.sciencedaily.com/releases/2022/03/220331134240.htm>

SCIENCE NEWS – Fish can learn basic arithmetic

Cichlids and stingrays can add and subtract small numbers.

<https://www.science.org/content/article/fish-can-learn-basic-arithmetic>

SOCIETY FOR SCIENCE – North America's oldest skull surgery dates to at least 3,000 years ago

Bone regrowth suggests the man, who lived in what's now Alabama, survived a procedure to treat brain swelling by scraping a hole out of his forehead.

<http://click.societyforscience->

[email.com/?qs=f2f65755421ff8ab6c5992e17ea71976b650f7afb7a48193c2671e80dace43c3ad5f206d872a3ab992eacc94b91](http://click.societyforscience-email.com/?qs=f2f65755421ff8ab6c5992e17ea71976b650f7afb7a48193c2671e80dace43c3ad5f206d872a3ab992eacc94b91067a4cfcf52131602a789dd7c2970749035dc)

[067a4cfcf52131602a789dd7c2970749035dc](http://click.societyforscience-email.com/?qs=f2f65755421ff8ab6c5992e17ea71976b650f7afb7a48193c2671e80dace43c3ad5f206d872a3ab992eacc94b91067a4cfcf52131602a789dd7c2970749035dc)

SOCIETY FOR SCIENCE – Social mingling shapes how orangutans issue warning calls

The new findings hint at how modern language may have taken root in sparse communities of ancient apes and humans.

<http://click.societyforscience->

[email.com/?qs=f2f65755421ff8ab31741357221bb8b6c2fc302e7fc67962d073fbf7e6f5f4eef13d340805bff30a56ec8390c7c3](http://click.societyforscience-email.com/?qs=f2f65755421ff8ab31741357221bb8b6c2fc302e7fc67962d073fbf7e6f5f4eef13d340805bff30a56ec8390c7c33d203f1c41e97c331717fa2b8b48246ba)

[33d203f1c41e97c331717fa2b8b48246ba](http://click.societyforscience-email.com/?qs=f2f65755421ff8ab31741357221bb8b6c2fc302e7fc67962d073fbf7e6f5f4eef13d340805bff30a56ec8390c7c33d203f1c41e97c331717fa2b8b48246ba)

SOCIETY FOR SCIENCE – Some past Science News coverage was racist and sexist. We're deeply sorry

During our early history, Science News shared and endorsed ideas that were unscientific and morally wrong.

<http://click.societyforscience->

[email.com/?qs=f2f65755421ff8ab2273c8fc53c0d88ee21ee3116697e46d67ac5652781b7c2141634cb24259414af14f2e63d99](http://click.societyforscience-email.com/?qs=f2f65755421ff8ab2273c8fc53c0d88ee21ee3116697e46d67ac5652781b7c2141634cb24259414af14f2e63d99929360b8fda985923693cdbc3b459e9ec54bd)

[929360b8fda985923693cdbc3b459e9ec54bd](http://click.societyforscience-email.com/?qs=f2f65755421ff8ab2273c8fc53c0d88ee21ee3116697e46d67ac5652781b7c2141634cb24259414af14f2e63d99929360b8fda985923693cdbc3b459e9ec54bd)

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

JULIA VAN BEESEL et al with JEAN-JACQUES HUBLIN – Comparison of the arm-lowering performance between Gorilla and Homo through musculoskeletal modeling

Contrary to earlier hypotheses, a previous biomechanical analysis indicated that long-documented morphological differences between the shoulders of humans and apes do not enhance the arm-raising mechanism. Here, we investigate a different interpretation: the oblique shoulder morphology that is shared by all hominoids but humans enhances the arm-lowering mechanism.

Our results highlight that arm-lowering capacity is greater in Gorilla than in Homo. The enhancement results from greater maximum isometric force capacities and moment arms of two important arm-lowering muscles, teres major, and pectoralis major. More distal muscle insertions along the humerus together with a more oblique shoulder configuration cause these greater moment arms.

The co-occurrence of improved arm-lowering capacity and high-muscle activity at elevation angles used during vertical climbing highlight the importance of a strong arm-lowering mechanism for arboreal locomotor behavior in nonhuman apes. Therefore, our findings reveal certain skeletal shoulder features that are advantageous in an arboreal context. These results advance our understanding of adaptation in living apes and can improve functional interpretations of the hominin fossil record.

<https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.24511>

RAQUEL HERNANDO et al – What about the buccal surfaces? Dental microwear texture analysis of buccal and occlusal surfaces refines paleodietary reconstructions

This study analyzes and compares dental microwear textures on occlusal and buccal surfaces from the same tooth to determine if using these surfaces in tandem can provide complementary data for dietary reconstructions.

The bootstrap resampling analysis shows significant differences in complexity and anisotropy between surfaces. There is no correlation between surfaces for complexity or anisotropy. The occlusal surfaces exhibit high complexities and low anisotropies, which are similar to values observed in Late Neolithic farming groups from Belgium.

The combination of occlusal and buccal microwear signatures provided important inferences regarding the studied sample. First, occlusal complexity and anisotropy values indicate an abrasive dietary regime. Second, we propose that the higher anisotropy values found on buccal surfaces, compared to those on the occlusal ones, are attributed to the specific mechanisms of microwear formation for each surface. Finally, combining both surfaces may increase the number of samples suitable for analysis. Further studies, with greater intergroup sampling, will help to understand how buccal microwear reflects or complements DMTA signatures on the occlusal surfaces.

<https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.24509>

Current Anthropology

PAPERS

JOSÉ LOBO et al – Scaling of Hunter-Gatherer Camp Size and Human Sociality

One of the most common tendencies of human settlements is for larger settlements to display higher population densities. Work in urban science and archaeology suggests that this densification pattern reflects an emergent spatial equilibrium where individuals balance movement costs with social interaction benefits, leading to increases in aggregate productivity and social interdependence. The temporary camps created by hunters and gatherers exhibit a tendency to become less dense with their population size. The different manner in which hunter-gatherer groups express their sociality in residential space suggests that they typically lack the social structures and material technologies necessary for humans to live at greater spatial densities in permanent settlements. Here we examine why this difference occurs and consider conditions under which hunter-gatherer groups may transition to sedentism and densification. We investigate the relationship between population and area in hunter-gatherer camps using a data set representing a large cross-cultural sample derived from the ethnographic literature. We present a model based on the interplay between social interactions and scalar stress that describes the observed patterns among mobile hunter-gatherers. We find that the transition to a densification scheme does not necessarily involve domestic food production, only surpluses and storable resources.

<https://www.journals.uchicago.edu/doi/abs/10.1086/719234>

IAN KEEN – The Evolution of Australian Kin Terminologies: Models, Conditions, and Consequences

This article proposes that the more complex and highly differentiated Australian Aboriginal kin terminologies such as those belonging to the Arrernte, Ngarinyin, and Yolngu languages evolved from simpler, less differentiated terminologies similar in form to those classified by Radcliffe-Brown as the Kariera type. The article offers models of that evolution and discusses when these developments may have occurred, as well as some of the implications for the diversity of Aboriginal societies. Along the way, it reconsiders the classification of Australian kin terminologies.

<https://www.journals.uchicago.edu/doi/abs/10.1086/719365>

MARISA HOESCHELE & W. TECUMSEH FITCH – Cultural evolution: Conserved patterns of melodic evolution across musical cultures

A new study finds that melodies evolve in similar ways, reminiscent of genetic evolution, across cultures. Patterns of change in music and other aesthetic domains may be the key to understanding how culture evolves when unfettered by physical or ecological constraints.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00207-X](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00207-X)

PAPERS

PATRICK E. SAVAGE et al with QUENTIN D. ATKINSON – Sequence alignment of folk song melodies reveals cross-cultural regularities of musical evolution

Culture evolves, but the existence of cross-culturally general regularities of cultural evolution is debated. As a diverse but universal cultural phenomenon, music provides a novel domain to test for the existence of such regularities. Folk song melodies can be thought of as culturally transmitted sequences of notes that change over time under the influence of cognitive and acoustic/physical constraints. Modeling melodies as evolving sequences constructed from an “alphabet” of 12 scale degrees allows us to quantitatively test for the presence of cross-cultural regularities using a sample of 10,062 melodies from musically divergent Japanese and English (British/American) folk song traditions. Our analysis identifies 328 pairs of highly related melodies, finding that note changes are more likely when they have smaller impacts on a song’s melody. Specifically, (1) notes with stronger rhythmic functions are less likely to change, and (2) note substitutions are most likely between neighboring notes. We also find that note insertions/deletions (“indels”) are more common than note substitutions, unlike genetic evolution where the reverse is true. Our results are consistent across English and Japanese samples despite major differences in their scales and tonal systems. These findings demonstrate that even a creative art form such as music is subject to evolutionary constraints analogous to those governing the evolution of genes, languages, and other domains of culture.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00092-6](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00092-6)

DAVIDE MARNETTO et al – Ancestral genomic contributions to complex traits in contemporary Europeans

The contemporary European genetic makeup formed in the last 8,000 years when local Western Hunter-Gatherers (WHGs) mixed with incoming Anatolian Neolithic farmers and Pontic Steppe pastoralists. This encounter combined genetic variants with distinct evolutionary histories and, together with new environmental challenges faced by the post-Neolithic Europeans, unlocked novel adaptations. Previous studies inferred phenotypes in these source populations, using either a few single loci or polygenic scores based on genome-wide association studies, and investigated the strength and timing of natural selection on lactase persistence or height, among others. However, how ancient populations contributed to present-day phenotypic variation is poorly understood. Here, we investigate how the unique tiling of genetic variants inherited from different ancestral components drives the complex traits landscape of contemporary Europeans and quantify selection patterns associated with these components. Using matching individual-level genotype and phenotype data for 27 traits in the Estonian biobank and genotype data directly from the ancient source populations, we quantify the contributions from each ancestry to present-day phenotypic variation in each complex trait. We find substantial differences in ancestry for eye and hair color, body mass index, waist/hip circumferences, and their ratio, height, cholesterol levels, caffeine intake, heart rate, and age at menarche. Furthermore, we find evidence for recent positive selection linked to four of these traits and, in addition, sleep patterns and blood pressure. Our results show that these ancient components were differentiated enough to contribute ancestry-specific signatures to the complex trait variability displayed by contemporary Europeans.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00108-7](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00108-7)

ESTHER F. KUTTER et al – Neuronal codes for arithmetic rule processing in the human brain

Arithmetic is a cornerstone of scientifically and technologically advanced human culture, but its neuronal mechanisms are poorly understood. Calculating with numbers requires temporary maintenance and manipulation of numerical information according to arithmetic rules. We explored the brain mechanisms involved in simple arithmetic operations by recording single-neuron activity from the medial temporal lobe of human subjects performing additions and subtractions. We found abstract and notation-independent codes for addition and subtraction in neuronal populations. The neuronal codes of arithmetic in different brain areas differed drastically. Decoders applied to time-resolved recordings demonstrate a static code in hippocampus based on persistently rule-selective neurons, in contrast to a dynamic code in parahippocampal cortex originating from neurons carrying rapidly changing rule information. The implementation of abstract arithmetic codes suggests different cognitive functions for medial temporal lobe regions in arithmetic.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00116-6](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00116-6)

REVIEWS

STEPHANIE L. KING – The evolutionary roots of cooperation

Review of ‘God Knows What’ written or edited by Hugh Kantell.

{Do you remember those good old days, when editors knew what they were doing? How I miss them.}

As a species, we can celebrate the depth and breadth of ways in which we cooperate. Indeed, the success of our species is typically explained by our extraordinary ability to cooperate, with cooperation facilitating all major technological and social revolutions, ranging from agriculture to industrialisation to international alliances. Yet, cooperation can be found across all levels of biological organisation, from eukaryotic cells to whole organisms and bustling societies, and from bees to babblers and baboons. As such, the evolutionary roots of cooperation have long intrigued and challenged researchers across disciplines.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)00319-0](https://www.cell.com/current-biology/fulltext/S0960-9822(22)00319-0)

Evolutionary Anthropology

PAPERS

STACY ROSENBAUM & JOAN B. SILK – Pathways to paternal care in primates

Natural selection will favor male care when males have limited alternative mating opportunities, can invest in their own offspring, and when care enhances males' fitness. These conditions are easiest to fulfill in pair-bonded species, but neither male care nor stable “breeding bonds” that facilitate it are limited to pair-bonded species. We review evidence of paternal care and extended breeding bonds in owl monkeys, baboons, Assamese macaques, mountain gorillas, and chimpanzees. The data, which span social/mating systems and ecologies, suggest that there are multiple pathways by which conditions conducive to male care can arise. This diversity highlights the difficulty of making inferences about the emergence of male care in early hominins based on single traits visible in the fossil record. We discuss what types of data are most needed and the questions yet to be answered about the evolution of male care and extended breeding bonds in the primate order.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21942>

Frontiers for Young Minds

PAPERS

MARION COUMEL, SOPHIE M. HARDY & KATHERINE MESSENGER – The Art of Conversation: How Do We Communicate Successfully?

Every day we talk with people. But have you ever wondered how two people with completely separate minds manage to understand each other? To have a successful conversation, you must understand the language that the other person is using and produce language that your conversational partner can understand, otherwise communicating can become difficult. One thing that human speakers do to make sure that the other person understands them is to copy the language that their conversational partners use, such as their word choices. This is called alignment, and it increases the likelihood of two people having a successful conversation or doing well on a shared task. Scientific experiments have shown that alignment is an important feature of human communication that occurs in multiple situations. In this article, we explain three different types of alignment that speakers use and describe how language scientists study alignment.

<https://kids.frontiersin.org/articles/10.3389/frym.2022.639598>

Frontiers in Ecology and Evolution

PAPERS

PATRICE ADRET – Developmental Plasticity in Primate Coordinated Song: Parallels and Divergences With Duetting Songbirds

Homeothermic animals (birds and mammals) are prime model systems for investigating the developmental plasticity and neural mechanisms of vocal duetting, a cooperative acoustic signal that prevails in family-living and pair-bonded species including humans. This review focuses on the nature of this trait and its nurturing during ontogeny and extending into adulthood. I begin by outlining the underpinning concepts of duet codes and pair-specific answering rules as used by birds to develop their learned coordinated song, driven by a complex interaction between self-generated and socially mediated auditory feedback. The more tractable avian model of duetting helps identify research gaps in singing primates that also use duetting as a type of intraspecific vocal interaction. Nevertheless, it has become clear that primate coordinated song—whether overlapping or antiphonal—is subject to some degree of vocal flexibility. This is reflected in the ability of lesser apes, titi monkeys, tarsiers, and lemurs to adjust the structure and timing of their calls through (1) social influence, (2) coordinated duetting both before and after mating, (3) the repair of vocal mistakes, (4) the production of heterosexual song early in life, (5) vocal accommodation in call rhythm, (6) conditioning, and (7) innovation. Furthermore, experimental work on the neural underpinnings of avian and mammalian antiphonal duets point to a hierarchical (cortico-subcortical) control mechanism that regulates, via inhibition, the temporal segregation of rapid vocal exchanges. I discuss some weaknesses in this growing field of research and highlight prospective avenues for future investigation.

<https://www.frontiersin.org/articles/10.3389/fevo.2022.862196/full>

LUDOVICA PANNITTO & AURELIE HERBELOT – Can Recurrent Neural Networks Validate Usage-Based Theories of Grammar Acquisition?

It has been shown that Recurrent Artificial Neural Networks automatically acquire some grammatical knowledge in the course of performing linguistic prediction tasks. The extent to which such networks can actually learn grammar is still an object of investigation. However, being mostly data-driven, they provide a natural testbed for usage-based theories of language acquisition. This mini-review gives an overview of the state of the field, focusing on the influence of the theoretical framework in the interpretation of results.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2022.741321/full>

PAPERS

JOHN CORBIT et al – The Development of Intergroup Cooperation: Children Show Impartial Fairness and Biased Care

One of the most remarkable features of human societies is our ability to cooperate with each other. However, the benefits of cooperation are not extended to everyone. Indeed, another hallmark of human societies is a division between us and them. Favoritism toward members of our group can result in a loss of empathy and greater tolerance of harm toward those outside our group. The current study sought to investigate how in-group bias impacts the developmental emergence of concerns for fairness and care. We investigated the impact of in-group bias on decisions related to care and fairness in children (N = 95; ages 4–9). Participants made decisions about how to allocate resources between themselves and a peer who was either an in-group or out-group member. In decisions related to care, participants were given two trial types on which they could decide whether to give or throw away a positive or negative resource. In decisions related to fairness participants and peer partners each received one candy and participants decided whether to allocate or throw away an extra candy. If the extra candy was distributed it would place either the participant or their recipient at a relative advantage, whereas if the extra candy was thrown away the distribution would be equal. We found that on fairness trials children's tendency to allocate resources was similar toward in-group and out-group recipients. Furthermore, children's tendency to allocate resources changed with age such that younger participants were more likely to allocate extra candies to themselves, whereas older participants were more likely to allocate extra candies to their recipient. On trials related to care we did observe evidence of in-group bias. While distribution of positive resources was greater than negative resources for both in-group and out-group recipients, participants distributed negative resources to out-group recipients more often compared to in-group recipients, a tendency that was heightened for young boys. This pattern of results suggests that fairness and care develop along distinct pathways with independent motivational supports.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2022.825987/full>

Human Nature

PAPERS

FRANCESCA GIARDINI et al with SZABOLCS SZÁMADÓ – Four Puzzles of Reputation-Based Cooperation: Content, Process, Honesty, and Structure

Research in various disciplines has highlighted that humans are uniquely able to solve the problem of cooperation through the informal mechanisms of reputation and gossip. Reputation coordinates the evaluative judgments of individuals about one another. Direct observation of actions and communication are the essential routes that are used to establish and update reputations. In large groups, where opportunities for direct observation are limited, gossip becomes an important channel to share individual perceptions and evaluations of others that can be used to condition cooperative action. Although reputation and gossip might consequently support large-scale human cooperation, four puzzles need to be resolved to understand the operation of reputation-based mechanisms. First, we need empirical evidence of the processes and content that form reputations and how this may vary cross-culturally. Second, we lack an understanding of how reputation is determined from the muddle of imperfect, biased inputs people receive. Third, coordination between individuals is only possible if reputation sharing and signaling is to a large extent reliable and valid. Communication, however, is not necessarily honest and reliable, so theoretical and empirical work is needed to understand how gossip and reputation can effectively promote cooperation despite the circulation of dishonest gossip. Fourth, reputation is not constructed in a social vacuum; hence we need a better understanding of the way in which the structure of interactions affects the efficiency of gossip for establishing reputations and fostering cooperation.

<https://email.bt.com/mail/index-rui.jsp?v=2.22.1-2#app/mail>

Interface: Journal of the Royal Society

PAPERS

GUOCHENG WANG, QI SU & LONG WANG – Evolution of cooperation with joint liability

'Personal responsibility', one of the basic principles of social governance, requires one to be accountable for what one does. However, personal responsibility is far from the only norm ruling human interactions, especially in social and economic activities. In many collective communities such as among enterprise colleagues and family members, one's personal interests are often bound to others'—once one member breaks the rule, a group of people have to bear the punishment or sanction.

Such a mechanism is termed 'joint liability'. Although many real-world cases have evidenced that joint liability can help to maintain collective collaboration, a deep and systematic theoretical analysis on how and when it promotes cooperation remains lacking. Here, we use evolutionary game theory to model an interacting system with joint liability, where one's losing credit could deteriorate the reputation of the whole group. We provide the analytical condition to predict when cooperation evolves and analytically prove that in the presence of punishment, being jointly liable greatly promotes cooperation. Our work stresses that joint liability is of great significance in promoting current economic prosperity.

<https://royalsocietypublishing.org/doi/abs/10.1098/rsif.2022.0082>

LINJIE LIU et al – Early exclusion leads to cyclical cooperation in repeated group interactions

Explaining the emergence and maintenance of cooperation among selfish individuals from an evolutionary perspective remains a grand challenge in biology, economy and social sciences. Social exclusion is believed to be an answer to this conundrum. However, previously related studies often assume one-shot interactions and ignore how free-riding is identified, which seem to be too idealistic. In this work, we consider repeated interactions where excluders need to pay a monitoring cost to identify free-riders for exclusion and free-riders cannot participate in the following possible game interactions once they are identified and excluded by excluders in the repeated interaction process. We reveal that the introduction of such exclusion can prevent the breakdown of cooperation in repeated group interactions. In particular, we demonstrate that an evolutionary oscillation among cooperators, defectors and excluders can appear in infinitely large populations when early exclusion is implemented. In addition, we find that the population spends most of the time in states where cooperators dominate for early exclusion when stochastic mutation–selection is considered in finite populations. Our results highlight that early exclusion is successful in solving the mentioned enigma of cooperation in repeated group interactions.

<https://royalsocietypublishing.org/doi/abs/10.1098/rsif.2021.0755>

THE ANH HAN – Institutional incentives for the evolution of committed cooperation: ensuring participation is as important as enhancing compliance

Both conventional wisdom and empirical evidence suggest that arranging a prior commitment or agreement before an interaction takes place enhances the chance of reaching mutual cooperation. Yet it is not clear what mechanisms might underlie the participation in and compliance with such a commitment, especially when participation is costly and non-compliance can be profitable. Here, we develop a theory of participation and compliance with respect to an explicit commitment formation process and to institutional incentives where individuals, at first, decide whether or not to join a cooperative agreement to play a one-shot social dilemma game. Using a mathematical model, we determine whether and when participating in a costly commitment, and complying with it, is an evolutionarily stable strategy, resulting in high levels of cooperation. We show that, given a sufficient budget for providing incentives, rewarding of commitment compliant behaviours better promotes cooperation than punishment of non-compliant ones. Moreover, by sparing part of this budget for rewarding those willing to participate in a commitment, the overall level of cooperation can be significantly enhanced for both reward and punishment. Finally, the presence of mistakes in deciding to participate favours evolutionary stability of commitment compliance and cooperation.

<https://royalsocietypublishing.org/doi/abs/10.1098/rsif.2022.0036>

CHRISTIAN HOULE et al with SERGEY GAVRILETS – Inequality between identity groups and social unrest

Economic, social and political inequality between different identity groups is an important contributor to violent conflicts within societies. To deepen our understanding of the underlying social dynamics, we develop a mathematical model describing cooperation and conflict in a society composed of multiple factions engaged in economic and political interactions. Our model predicts that growing economic and political inequality tends to lead to the collapse of cooperation between factions that were initially seeking to cooperate. Certain mechanisms can delay this process, including the decoupling of political and economic power through rule of law and allegiance to the state or dominant faction. Counterintuitively, anti-conformity (a social norm for independent action) can also stabilize society, by preventing initial defections from cooperation from cascading through society. However, the availability of certain material resources that can be acquired by the state without cooperation with other factions has the opposite effect. We test several of these predictions using a multivariate statistical analysis of data covering 75 countries worldwide. Using social unrest as a proxy for the breakdown of cooperation in society, we find support for many of the predictions from our theory.

<https://royalsocietypublishing.org/doi/full/10.1098/rsif.2021.0725>

DOMINIC COE et al – A biomechanical investigation of the efficiency hypothesis of hafted tool technology

The transition from hand-held to hafted tool technology marked a significant shift in conceptualizing the construction and function of tools. Among other benefits, hafting is thought to have given users a significant biomechanical and physiological advantage in undertaking basic subsistence tasks compared with hand-held tools. It is assumed that addition of a handle improved the (bio)mechanical properties of a tool and upper limb by offering greater amounts of leverage, force and precision. This controlled laboratory study compares upper limb kinematics, electromyography and physiological performance during two subsistence tasks (chopping, scraping) using hafted and hand-held tools. Results show that hafted tool use elicits greater ranges of motion, greater muscle activity and greater net energy expenditure (EE) compared with hand-held equivalents. Importantly, however, these strategies resulted in reduced relative EE compared with the hand-held

condition in both tasks. More specifically, the hafted axe prompted use of two well-known biomechanical strategies that help produce larger velocities at the distal end of the limb without requiring heavy muscular effort, thus improving the tool's functional efficiency and relative energy use. The energetic and biomechanical benefits of hafting arguably contributed to both the invention and spread of this technology.

<https://royalsocietypublishing.org/doi/full/10.1098/rsif.2021.0660>

Mind & Language

PAPERS

GABE DUPRE – Public language, private language, and subsymbolic theories of mind

Language has long been a problem-case for subsymbolic theories of mind. The reason for this is obvious: Language seems essentially symbolic. However, recent work has developed a potential solution to this problem, arguing that linguistic symbols are public objects which augment a fundamentally subsymbolic mind, rather than components of cognitive symbol-processing. I shall argue that this strategy cannot work, on the grounds that human language acquisition consists in projecting linguistic structure onto environmental entities, rather than extracting this structure from them.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12400>

MATTHIAS MICHEL – How (not) to underestimate unconscious perception

Recent work questions whether previously reported unconscious perceptual effects are genuinely unconscious, or due to weak conscious perception. Some philosophers and psychologists react by rejecting unconscious perception or by holding that it has been overestimated. I argue that the most significant attack on unconscious perception commits the criterion content fallacy: the fallacy of interpreting evidence that observers were conscious of something as evidence that they were conscious of task-relevant features. This fallacy is prevalent in consciousness research: if unconscious perception exists, scientists could routinely underestimate it. I conclude with methodological recommendations for moving the debate forward.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12406>

New Scientist

NEWS

Ancient Britons rapidly evolved to cope with lack of sunlight

The DNA of people who lived in Great Britain thousands of years ago has markers of natural selection at work – and the driving force seems to have been a shortage of vitamin D.

<https://www.newscientist.com/article/2314017-ancient-britons-rapidly-evolved-to-cope-with-lack-of-sunlight/#ixzz7PCgG6xdh>

ARTICLES

THOMAS LEWTON – A new place for consciousness in our understanding of the universe

To make sense of mysteries like quantum mechanics and the passage of time, theorists are trying to reformulate physics to include subjective experience as a physical constituent of the world.

{I could comment, but I will let the subjective experience of the world make its argument first.}

<https://www.newscientist.com/article/mg25433802-500-a-new-place-for-consciousness-in-our-understanding-of-the-universe/#ixzz7PCgZvraQ>

PLoS Biology

PAPERS

XINRAN WU et al – Dynamic changes in brain lateralization correlate with human cognitive performance

Hemispheric lateralization constitutes a core architectural principle of human brain organization underlying cognition, often argued to represent a stable, trait-like feature. However, emerging evidence underlines the inherently dynamic nature of brain networks, in which time-resolved alterations in functional lateralization remain uncharted. Integrating dynamic network approaches with the concept of hemispheric laterality, we map the spatiotemporal architecture of whole-brain lateralization in a large sample of high-quality resting-state fMRI data (N = 991, Human Connectome Project). We reveal distinct laterality dynamics across lower-order sensorimotor systems and higher-order associative networks. Specifically, we expose 2 aspects of the laterality dynamics: laterality fluctuations (LF), defined as the standard deviation of laterality time series, and laterality reversal (LR), referring to the number of zero crossings in laterality time series. These 2 measures are associated with moderate and extreme changes in laterality over time, respectively. While LF depict positive association with language function and cognitive flexibility, LR shows a negative association with the same cognitive abilities. These opposing interactions indicate a dynamic balance between intra and interhemispheric communication, i.e., segregation and integration of information across hemispheres. Furthermore, in their time-resolved laterality index, the default mode and language networks correlate negatively with visual/sensorimotor and attention networks, which are linked to better cognitive abilities. Finally, the laterality dynamics are associated with functional connectivity changes of higher-order brain networks and correlate with regional metabolism and structural connectivity. Our results provide insights into the adaptive nature of the lateralized brain and new perspectives for future studies of human cognition, genetics, and brain disorders.

PLoS One

PAPERS

JOSEBA RIOS-GARAIZAR et al – The intrusive nature of the Châtelperronian in the Iberian Peninsula

Multiple factors have been proposed to explain the disappearance of Neandertals between ca. 50 and 40 kyr BP. Central to these discussions has been the identification of new techno-cultural complexes that overlap with the period of Neandertal demise in Europe. One such complex is the Châtelperronian, which extends from the Paris Basin to the Northern Iberian Peninsula between 43,760–39,220 BP. In this study we present the first open-air Châtelperronian site in the Northern Iberian Peninsula, Aranbaltza II. The technological features of its stone tool assemblage show no links with previous Middle Paleolithic technology in the region, and chronological modeling reveals a gap between the latest Middle Paleolithic and the Châtelperronian in this area. We interpret this as evidence of local Neandertal extinction and replacement by other Neandertal groups coming from southern France, illustrating how local extinction episodes could have played a role in the process of disappearance of Neandertals.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0265219>

Proceedings of the Royal Society B

PAPERS

DAVID A. GRAY – Sexual selection and ‘species recognition’ revisited: serial processing and order-of-operations in mate choice

Following the modern synthesis, mating signals were thought of principally as species recognition traits, a view later challenged by a burgeoning interest in sexual selection—specifically mate choice. In the 1990s, these different signal functions were proposed to represent a single process driven by the shape of female preference functions across both intra- and interspecific signal space. However, the properties of reliable ‘recognition’ signals (stereotyped; low intraspecific variation) and informative ‘quality’ signals (condition dependent; high intraspecific variation) seem at odds, perhaps favouring different signal components for different functions. Surprisingly, the idea that different components of mating signals are evaluated in series, first to recognize generally compatible mates and then to select for quality, has never been explicitly tested. Here I evaluate patterns of (i) intraspecific signal variation, (ii) female preference function shape and (iii) phylogenetic signal for male cricket call components known to be processed in series. The results show that signal components processed first tend to have low variation, closed preference functions and low phylogenetic signal, whereas signal components processed later show the opposite, suggesting that mating signal evaluation follows an ‘order-of-operations’. Applicability of this finding to diverse groups of organisms and sensory modalities is discussed.

<https://royalsocietypublishing.org/doi/abs/10.1098/rspb.2021.2687>

LÉNA DE FRAMOND et al – The broken-wing display across birds and the conditions for its evolution

The broken-wing display is a well-known and conspicuous deceptive signal used to protect birds' broods against diurnal terrestrial predators. Although commonly associated with shorebirds, it remains unknown how common the behaviour is across birds and what forces are associated with the evolution of the display. Here, we use the broken-wing display as a paradigmatic example to study the evolution of a behaviour across Aves. We show that the display is widespread: it has been described in 52 families spread throughout the phylogeny, suggesting that it independently evolved multiple times. Further, we evaluated the association with 16 ecological and life-history variables hypothesized to be related to the evolution of the broken-wing display. Eight variables were associated with the display. We found that species breeding farther from the equator, in more dense environments, with shorter incubation periods, and relatively little nest cover were more likely to perform the display, as were those in which only one parent incubates eggs, species that mob nest predators and species that are altricial or multi-brooded. Collectively, our comprehensive approach identified forces associated with the repeated evolution of this conspicuous display, thereby providing new insights into how deceptive behaviours evolve in the context of predator–prey interactions.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2022.0058>

ANDREW E. SNYDER-BEATTIE & MICHAEL B. BONSALL – Catastrophe risk can accelerate unlikely evolutionary transitions

Intelligent life has emerged late in Earth's habitable lifetime, and required a preceding series of key evolutionary transitions. A simple model (the Carter model) explains the late arrival of intelligent life by positing these evolutionary transitions were exceptionally unlikely ‘critical steps’. An alternative model (the neocatastrophism hypothesis) proposes that intelligent life was delayed by frequent catastrophes that served to set back evolutionary innovation. Here, we generalize the Carter model and explore this hypothesis by including catastrophes that can ‘undo’ an evolutionary transition. Introducing catastrophes or evolutionary dead ends can create situations in which critical steps occur rapidly or in clusters, suggesting that past estimates of the number of critical steps could be underestimated. If catastrophes affect complex life more than simple life, the critical steps will also exhibit a pattern of acceleration towards the present, suggesting that the increase in biological complexity over the past 500 Myr could reflect previously overlooked evolutionary transitions. Furthermore, our results have

implications for understanding the different explanations (critical steps versus neo-catastrophes) for the evolution of intelligent life and the so-called Fermi paradox—the observation that intelligent life appears rare in the observable Universe. <https://royalsocietypublishing.org/doi/full/10.1098/rspb.2021.2711>

SIMEON Q. SMEELE et al – Coevolution of relative brain size and life expectancy in parrots

Previous studies have demonstrated a correlation between longevity and brain size in a variety of taxa. Little research has been devoted to understanding this link in parrots; yet parrots are well-known for both their exceptionally long lives and cognitive complexity. We employed a large-scale comparative analysis that investigated the influence of brain size and life-history variables on longevity in parrots. Specifically, we addressed two hypotheses for evolutionary drivers of longevity: the cognitive buffer hypothesis, which proposes that increased cognitive abilities enable longer lifespans, and the expensive brain hypothesis, which holds that increases in lifespan are caused by prolonged developmental time of, and increased parental investment in, large-brained offspring. We estimated life expectancy from detailed zoo records for 133 818 individuals across 244 parrot species. Using a principled Bayesian approach that addresses data uncertainty and imputation of missing values, we found a consistent correlation between relative brain size and life expectancy in parrots. This correlation was best explained by a direct effect of relative brain size. Notably, we found no effects of developmental time, clutch size or age at first reproduction. Our results suggest that selection for enhanced cognitive abilities in parrots has in turn promoted longer lifespans.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2021.2397>

CATHAL O'MADAGAIN et al with JOSEP CALL & MICHAEL TOMASELLO – Great apes and human children rationally monitor their decisions

Several species can detect when they are uncertain about what decision to make—revealed by opting out of the choice, or by seeking more information before deciding. However, we do not know whether any nonhuman animals recognize when they need more information to make a decision because new evidence contradicts an already-formed belief. Here, we explore this ability in great apes and human children. First, we show that after great apes saw new evidence contradicting their belief about which of two rewards was greater, they stopped to recheck the evidence for their belief before deciding. This indicates the ability to keep track of the reasons for their decisions, or 'rational monitoring' of the decision-making process. Children did the same at 5 years of age, but not at 3 years. In a second study, participants formed a belief about a reward's location, but then a social partner contradicted them, by picking the opposite location. This time even 3-year-old children rechecked the evidence, while apes ignored the disagreement. While apes were sensitive only to the conflict in physical evidence, the youngest children were more sensitive to peer disagreement than conflicting physical evidence.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2021.2686>

DIANA WEITING TAN et al – An investigation of a novel broad autism phenotype: increased facial masculinity among parents of children on the autism spectrum

{I have misgivings about including this paper. The relationship between “masculine features” and testosterone may involve circular logic, or it may be correlation without causation; and the link between autism and testosterone remains problematic. But for what it is, here it is.}

The broad autism phenotype commonly refers to sub-clinical levels of autistic-like behaviour and cognition presented in biological relatives of autistic people. In a recent study, we reported findings suggesting that the broad autism phenotype may also be expressed in facial morphology, specifically increased facial masculinity. Increased facial masculinity has been reported among autistic children, as well as their non-autistic siblings. The present study builds on our previous findings by investigating the presence of increased facial masculinity among non-autistic parents of autistic children. Using a previously established method, a 'facial masculinity score' and several facial distances were calculated for each three-dimensional facial image of 192 parents of autistic children (58 males, 134 females) and 163 age-matched parents of non-autistic children (50 males, 113 females). While controlling for facial area and age, significantly higher masculinity scores and larger (more masculine) facial distances were observed in parents of autistic children relative to the comparison group, with effect sizes ranging from small to medium ($0.16 \leq d \leq .41$), regardless of sex. These findings add to an accumulating evidence base that the broad autism phenotype is expressed in physical characteristics and suggest that both maternal and paternal pathways are implicated in masculinized facial morphology.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2022.0143>

Royal Society Open Science

PAPERS

NATALIIA HÜBLER – Phylogenetic signal and rate of evolutionary change in language structures

Within linguistics, there is an ongoing debate about whether some language structures remain stable over time, which structures these are and whether they can be used to uncover the relationships between languages. However, there is no consensus on the definition of the term 'stability'. I define 'stability' as a high phylogenetic signal and a low rate of change. I use metric D to measure the phylogenetic signal and Hidden Markov Model to calculate the evolutionary rate for 171 structural features coded for 12 Japonic, 2 Koreanic, 14 Mongolic, 11 Tungusic and 21 Turkic languages. To more deeply investigate the differences in evolutionary dynamics of structural features across areas of grammar, I divide the features into

4 language domains, 13 functional categories and 9 parts of speech. My results suggest that there is a correlation between the phylogenetic signal and evolutionary rate and that, overall, two-thirds of the features have a high phylogenetic signal and over a half of the features evolve at a slow rate. Specifically, argument marking (flagging and indexing), derivation and valency appear to be the most stable functional categories, pronouns and nouns the most stable parts of speech, and phonological and morphological levels the most stable language domains.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.211252>

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