

EAORC BULLETIN 1,068 – 3 December 2023

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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.

EDITORIAL INTERJECTIONS

Comments in curly brackets are editorial interjections. The Editor reserves the right to be wrong.

OTHER PUBLICATIONS – The emergence of human warfare: Current perspectives

American Journal of Physical Anthropology 168:567, 141-163 (2019).

MARC KISSEL & NAM C. KIM – The emergence of human warfare: Current perspectives

The origins of warfare have long been of interest for researchers across disciplines. Did our earliest ancestors engage in forms of organized violence that are appropriately viewed as approximations, forms of, or analogs for more recent forms of warfare? Assessed in this article are contrasting views that see warfare as being either a product of more recent human societies or a phenomenon with a much deeper chronology. The article provides an overview of current debates, theories, and methodological approaches, citing literature and data from archaeological, ethnographic, genetic, primatological, and paleoanthropological studies. Synthetic anthropological treatments are needed, especially in efforts to inform debates among nonacademic audiences, because the discipline's approaches are ideally suited to study the origins of warfare. Emphasized is the need to consider possible forms of violence and intergroup aggression within Pleistocene contexts, despite the methodological challenges associated with fragmentary, equivocal, or scarce data. Finally, the review concludes with an argument about the implications of the currently available data. We propose that socially cooperative violence, or “emergent warfare,” became possible with the onset of symbolic thought and complex cognition. Viewing emergent warfare as a byproduct of the human capacity for symbolic thought explains how the same capacities for communication and sociality allowed for elaborate peacemaking, conflict resolution, and avoidance. Cultural institutions around war and peace are both made possible by these changes. Accordingly, we suggest that studies on warfare's origins should be tied to research on the advent of cooperation, sociality, and communication.

<https://onlinelibrary.wiley.com/doi/10.1002/ajpa.23751>

CALL FOR PAPERS – BOOK – Working Title: Evolution, Culture and Human Behaviour

Deadline: 10th January 2024

Fields: Psychology, Anthropology

Editors and lead writers: Bruce Rawlings (Psychology/University of Durham), Linda Lidborg (Psychology/University of Durham), Lynda Boothroyd (Psychology/University of Durham), Sheina Lew-Levy (Psychology/University of Durham), Yan Birch (Psychology/University of Durham)

EHBEA representative: Rebecca Sear (President)

We seek submissions for an online, open-access textbook on Evolution, Culture and Human Behaviour, produced in collaboration with the European Human Behaviour and Evolution Association (an academic society that encompasses diverse approaches to evolution and human psychology and behaviour). At present, there exists no broad-based textbook for students in Psychology or Anthropology, to study human evolutionary behavioural sciences in a holistic manner. This textbook will cover a broad range of human behaviour and psychology, drawing on the distinct and overlapping approaches within EHBEA. It will examine the evolutionary and cultural origins of our species - including some chapters which will inevitably demonstrate where evolutionary approaches currently fail to explain very much at all (despite trying). It will be targeted at students of A-level/advanced high school courses, and undergraduate psychology and anthropology courses. It

will provide the basis for evidence-based and accurate teaching in this domain for experts and non-specialist teachers, and include learning activities alongside research-led content. By being open access, we will maximise benefit to students and teachers and avoid barriers to learning for those on comparatively lower budgets and/or weaker currencies.

Themes to be covered in the textbook are:

- Evolution and our species
- Methods and approaches in human evolutionary behavioural sciences
- The human mind
- Human sexual selection
- Human groups
- Cultural evolution and innovation

We are particularly keen to solicit contributed chapters covering: cognitive evolution, social and spatial cognition, and logical reasoning; cooperation, (inter)group dynamics, leadership and hierarchy; intersexual conflict and female sexuality; kinship, pair-bonding, family structures, and human life histories; human and cultural phylogenetics. We also welcome short 'research focus' boxes. Contributors are welcome to suggest chapters they believe should be included and are not noted above.

Should you wish to submit a proposed contribution, please follow the guidelines below:

- 100-word abstracts stating which of the topics listed above your chapter will contribute to, with 5-10 key references, by 10th January 2024 at evolutionculturehumanbehaviour@gmail.com
- Chapters of up to 5,000 words (including notes and captions) with up to 5 illustrations, or research focus boxes of up to 600 words with 1 illustration, will be due June 2024 for publication in early 2025
- The book will be peer-reviewed and published online in full colour
- Images should be sourced as CC licensed OR redrawn to avoid fees

For enquiries, please contact Gemma Cornetti at evolutionculturehumanbehaviour@gmail.com or gemma.cornetti@durham.ac.uk

CONFERENCE ALERT – 30th annual conference 'The Science of Consciousness' ('TSC')

EHBEA 2024 Conference

The 18th European Human Behaviour and Evolution Association Conference will be hosted by the Institute of Evolutionary Science of Montpellier, in the beautiful Montpellier, France, from the 16th to the 19th of April 2024. Keep an eye on our website <https://www.ehbea2024.com/> for updates on the information you'll need...

Plenary Speakers

- Maxime Derex – Institute of Advanced Study in Toulouse
- Coralie Chevalier – École Nationale Supérieure & Education Paris Saclay University
- David W. Lawson – University of California, Santa Barbara
- Sarah Mathew – Arizona State University
- Yasuo Ihara – University of Tokyo
- Malin Ah-King – Stockholm University
- The 2024 New Investigator

Abstract submission and registration will open October 15th!

EHBEA2024 Buddy system

For the first time in 2024, EHBEA is organising a 'buddy system' for people who do not yet know many of their colleagues in EHBEA. If you are new to EHBEA, attending the conference by yourself, or just unsure how to meet new people – the buddy system is for you!

This means we will need some EHBEA 'old timers' who have been to the conference a couple of times to act as a buddy. This will mean chatting with your buddy before the conference via email to arrange a meet up at the start of the conference, introducing them to some research groups and just acting as a familiar face. Please sign up if you can to help to integrate new members to our lovely and growing community!

To nominate yourself as a buddy, please fill out this form:

https://docs.google.com/forms/d/e/1FAIpQLSdwm9_8B1fT2y-XshyggI0zAkEecrnkFe3R1fFGtdGo78LXQg/viewform

To request a buddy, please fill out this form:

<https://docs.google.com/forms/d/e/1FAIpQLScldWdpyFcb5w5GMCFpJcWJC2EMhh8mRUDnXZNikLxn6uLf2g/viewform>

If you would like more information, please email the EHBEA secretary Abigail Page (ehbea.secretary@gmail.com)

NEWS

NATURE BRIEFING – Babies start learning language before birth

Babies seem to be primed to learn their native language by listening to their mother's voice while still in the womb. In a study of 33 newborns, the infants' brain activity showed more signs of learning after listening to recordings of their native language than of other, similar languages. This doesn't mean that babies are necessarily disadvantaged if they don't have prenatal exposure to speech or if they learn a different language after birth, however. "Newborns can learn languages to which they were not exposed prenatally in the usual, normal way," explains neuroscientist and study co-author Judit Gervain.

<https://english.elpais.com/science-tech/2023-11-24/exposure-to-speech-before-birth-can-facilitate-learning-in-newborns.html>

NATURE BRIEFING – The complex mathematics of sand drawing

Sand drawing, a tradition practised in Vanuatu in the South Pacific Ocean, produces complex figures drawn with a single finger stroke across a grid. The drawings have strict rules that can be described by graph theory, writes ethnomathematician Alban Da Silva. Expert artists have a repertoire of up to 400 designs and breaks are usually taken after what mathematicians call a cycle, a sequence of edges that start and end at the same node. "These results raise questions about the universality of mathematics and the form that math takes in other cultures," says Da Silva.

<https://www.scientificamerican.com/article/an-ancient-art-form-topples-assumptions-about-mathematics/>

NATURE BRIEFING – Furore over 'oldest pyramid' claim

A paper claiming that a structure in Indonesia is the oldest pyramid in the world has raised the eyebrows of archaeologists and prompted an investigation by publisher Wiley's ethics team. The study concludes that a structure lying beneath the prehistoric site of Gunung Padang in West Java might have been constructed as far back as 27,000 years ago — long before Egypt's great pyramids. However, critics say that the buried layers are more likely to have occurred naturally, and that there's no evidence people had the skills to build a pyramid at the time. The site has been linked to a fringe idea of an advanced global civilization that was wiped out 12,000 years ago, at the end of the last ice age.

{If something appears unbelievable, I have found that it is best to treat it as such until sufficient evidence accumulates to make it believable.}

<https://www.nature.com/articles/d41586-023-03546-w>

NATURE BRIEFING – Sparrow expands its brain before mating

When it's time to find a mate, the parts of songbird brains that are responsible for singing get bigger — and then shrink down again at the end of the season. But none do it quite like the Gambel's white-crowned sparrow (*Zonotrichia leucophrys gambelii*). In males of the species, a brain area called the HVC nearly doubles in size, expanding from 100,000 neurons to 170,000. How the bird pulls off this feat is still a mystery — but it might one day point to ways of treating anomalies in the human brain.

<https://www.nature.com/articles/d41586-023-03746-4>

SAPIENS – How the Folsom Point Became an Archaeological Icon

Scientific discoveries usually involve many people working over long periods of time. But they are generally worth the wait.

<https://www.sapiens.org/archaeology/folsom-point-archaeology-icon/>

SCIENCEADVISER – Babies' brains start to learn language before they're born

Young humans learn words remarkably quickly. And research with newborns suggests that's in part because they start to pick up language in utero.

Fetuses gain the ability to hear sometime between five and seven months gestation. Previous studies had indicated that during this time, they learn to recognize the sounds of music and speaking voices they hear. But whether they really pick up on the language in either has remained unclear. So, researchers fitted one- to five-day-old newborns with electroencephalography (EEG) caps to measure their brain activity. Then they played kids' stories in English, Spanish, and French—the last of which was their parents' language. When the French story came at the end, the newborns' brains reacted differently, exhibiting brain wave patterns that suggested they were already primed to learn their parent's tongue, according to the authors.

"These results provide the most compelling evidence to date that language experience already shapes the functional organization of the infant brain, even before birth," the team writes.

The team plans to follow up with infants at other ages. "This technique could certainly help us in the future to quantify how the learning abilities change with the baby's age," says co-author Benedetta Mariani.

<https://www.science.org/doi/10.1126/sciadv.adj3524>

SCIENCEADVISER – In the right head space for breeding

When it's approaching time to find a partner, the Gambel's white-crowned sparrow nearly doubles the number of neurons in a particular part of its brain—though scientists aren't yet sure how.

<https://www.nature.com/articles/d41586-023-03746-4>

SCIENCEADVISER – No farms required

Ancient forts in Siberia indicate that people built large defensive structures long before the advent of agriculture, calling into question the idea that farming alone led to big societies with permanent settlements.

<https://www.science.org/content/article/world-s-oldest-forts-upend-idea-farming-alone-led-complex-societies>

SCIENCE.ORG NEWS – Spain wants to end the 'dictatorship of papers'

Officials aim to use wider range of research outputs to assess researchers at public universities.

<https://www.science.org/content/article/spain-wants-change-how-it-evaluates-scientists-and-end-dictatorship-papers>

SCIENCE.ORG NEWS – World's oldest forts upend idea that farming alone led to complex societies

In remote Siberia, hunter-gatherers built complex defenses 8000 years ago.

<https://www.science.org/content/article/world-s-oldest-forts-upend-idea-farming-alone-led-complex-societies>

OTHER NEWS – CNN OPINION – Why we should embrace uncertainty

Uncertainty — that “uneasy sense of not-knowing” — offers an unsung opportunity to develop cognitive skills such as curiosity, adaptability and resilience, says science writer Maggie Jackson. Rather than seeking comfort in unwarranted confidence, we would do better to embrace the reality of unpredictable situations, say psychologists. In her new book *Uncertain*, Jackson explains how, “as we confront something new, powerful neurotransmitters such as norepinephrine boost the mind's receptivity to new data, fire up cognitive circuits that flexibly control focus and prime brain regions to engage in information-sharing”.

<https://edition.cnn.com/2023/11/03/opinions/uncertainty-is-good-for-you-jackson/index.html>

PUBLICATIONS**American Journal of Biological Anthropology****PAPERS****HYUNWOO JUNG et al – Evaluating modularity in the hominine skull related to feeding biomechanics**

Modular architecture of traits in complex organisms can be important for morphological evolution at micro- and sometimes macroevolutionary scales as it may influence the tempo and direction of changes to groups of traits that are essential for particular functions, including food acquisition and processing. We tested several distinct hypotheses about craniofacial modularity in the hominine skull in relation to feeding biomechanics.

First, we formulated hypothesized functional modules for craniofacial traits reflecting specific demands of feeding biomechanics (e.g., masseter leverage/gape or tooth crown mechanics) in *Homo sapiens*, *Pan troglodytes*, and *Gorilla gorilla*. Then, the pattern and strength of modular signal was quantified by the covariance ratio coefficient and compared across groups using covariance ratio effect size. Hierarchical clustering analysis was then conducted to examine whether a priori-defined functional modules correspond to empirically recovered clusters.

There was statistical support for most a priori-defined functional modules in the cranium and half of the functional modules in the mandible. Modularity signal was similar in the cranium and mandible, and across the three taxa. Despite a similar strength of modularity, the empirically recovered clusters do not map perfectly onto our priori functional modules, indicating that further work is needed to refine our hypothesized functional modules.

The results suggest that modular structure of traits in association with feeding biomechanics were mostly shared with humans and the two African apes. Thus, conserved patterns of functional modularity may have facilitated evolutionary changes to the skull during human evolution.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24875>

eLife**PAPERS****LISA M. BASIAN et al – A neurocomputational account of the link between social perception and social action**

People selectively help others based on perceptions of their merit or need. Here, we develop a neurocomputational account of how these social perceptions translate into social choice. Using a novel fMRI social perception task, we show that both merit and need perceptions recruited the brain's social inference network. A behavioral computational model identified two non-exclusive mechanisms underlying variance in social perceptions: a consistent tendency to perceive others as meritorious/needy (bias) and a propensity to sample and integrate normative evidence distinguishing high from low

merit/need in other people (sensitivity). Variance in people's merit (but not need) bias and sensitivity independently predicted distinct aspects of altruism in a social choice task completed months later. An individual's merit bias predicted context-independent variance in people's overall other-regard during altruistic choice, biasing people towards prosocial actions. An individual's merit sensitivity predicted context-sensitive discrimination in generosity towards high and low merit recipients by influencing other-regard and self-regard during altruistic decision-making. This context-sensitive perception-action link was associated with activation in the right temporoparietal junction. Together, these findings point towards stable, biologically based individual differences in perceptual processes related to abstract social concepts like merit, and suggest that these differences may have important behavioral implications for an individual's tendency toward favoritism or discrimination in social settings.

<https://elifesciences.org/reviewed-preprints/92539>

Frontiers in Complex Systems

PAPERS

CHRISTOS CHARALAMBOUS, DAVID SANCHEZ & RAUL TORAL – Language dynamics within adaptive networks: an agent-based approach of nodes and links coevolution

Institute for Cross-Disciplinary Physics and Complex Systems IFISC (UIB-CSIC), Campus Universitat Illes Balears, Palma, Spain
Motivated by the dramatic disappearance of endangered languages observed in recent years, a great deal of attention has been given to the modeling of language competition in order to understand the factors that promote the disappearance of a language and its unfolding dynamics. With this in mind, we build on existing network models of language competition in bilingual societies. These models deal with the interplay between the usage of a language (link state) and the preference or attitude of the speakers towards the language (node state). In this work, we allow for the case where agents have the freedom to adapt their local interactions in accordance with their language preference. This is modeled by introducing a local rewiring mechanism triggered by the dissatisfaction of an agent with its usage of a given language. Our numerical simulations show that permitting this freedom to agents likely results in linguistically segregated communities for small network sizes. However, for networks of sufficiently large size, the extinction of one of the languages is the most probable scenario. Furthermore, we analyze how the fraction of minority speakers changes with the system size and we find that this fraction grows as the total population increases, which is consistent with existing data. Overall, the results of this work help us understand the impact of speakers' preferences and choices in the complex language landscape of bilingual societies.

<https://www.frontiersin.org/articles/10.3389/fcpxs.2023.1304448/full>

Frontiers in Earth Science

PAPERS

DEVARA ANIL et al – Diversity of MIS 3 Levallois technology from Motravulapadu, Andhra Pradesh, India-implications of MIS 3 cultural diversity in South Asia

The chronology and hominin association of the South Asian Middle Palaeolithic have attracted much attention in the last few decades. The emergence of Middle Palaeolithic culture in the region has been debated between the local origins (behavioural change) model based on an early date around 380 ka and the diffusion (biological change) model based on Homo sapiens dispersals from Africa around 120–80 ka. The latter has more consensus, whereas the former requires a more robust chronological framework to attribute the emergence of the Middle Palaeolithic to behavioural changes. In the absence of hominin remains, the presence of Middle Palaeolithic technological trajectories are frequently used as behavioural markers of Homo sapiens. Homo sapiens fossil remains from the regions between Africa and South Asia dated to ~ 200 ka presents more convincing support for the latter model. Here we present contextual, chronological and technological analysis of Middle Palaeolithic assemblages dated to 52 ka from Motravulapadu, Andhra Pradesh, India. Morphometrical analysis of the lithic assemblage indicates diverse Levallois core reductions were practised at the site at the onset of MIS 3. Further this evidence highlights the significance of MIS 3 cultural diversity in South Asia, likely related to changing population dynamics, cultural drift, and the highly variable climatic context of MIS 3.

<https://www.frontiersin.org/articles/10.3389/feart.2023.1302419/full>

Heliyon

PAPERS

HONGWEI KANG et al – Bonus-based mercenary punishment promotes cooperation in public goods games

Various regions often adopt punish strategies to solve traffic congestion problems. Punishing defectors is an effective strategy to solve the first-order free-rider problem in a public goods game. But this behavior is costly because the punisher is often also involved in the original joint venture and therefore vulnerable, which jeopardizes the effectiveness of this incentive. As an option, we could hire special players whose sole duty would be to monitor the population and punish defectors. The fines collected by various regions will also be used to subsidize the construction of public transportation. Thereby, we derive inspiration, and propose an improved public goods game model based on bonus and mercenary punishment. Research has shown that after cooperator gives the punisher an appropriate bonus, cooperators can strengthen the punisher, thereby weakening the defector's advantage and indirectly promoting cooperation by stabilizing the punisher's

position in the system. In addition, the mechanism of reusing the fines collected from defectors and then subsidize to other players in the system can directly promote the emergence of cooperation.

[https://www.cell.com/heliyon/fulltext/S2405-8440\(23\)09956-5](https://www.cell.com/heliyon/fulltext/S2405-8440(23)09956-5)

DAVID IHEKE OKORIE & JOEL MIWORSE GNATCHIGLO – Game of strokes: Optimal & conversion strategy algorithms with simulations & application

Strategic decision-making for sequential move games requires rationality and continuity of Rationality to guarantee maximum payoffs at all nodes/stages/levels. Rationality and continuity of rationality in a player's behaviour are not often observed and/or maintained thus, leading to less optimal outcomes. More so, the belief in an opponent's rationality, on the other hand, co-determines the level of effort a player employs while making strategic decisions. Given the irrationality and discontinuity of rationality in a sequential move game with mover advantages, there are strategic steps (algorithms) to convert and/or maintain the mover advantages of an irrational player. In this paper, the conversion strategy algorithms, as well as the optimal strategy algorithms, are developed using the Beta Limit Sum strategy model and the game of strokes. The simulation exercises confirm that the BLS strategy model is an optimal solution for the finite sequential game of strokes. One of the key applications of these strategies is that of resource economics like environmental resources (clean water, air & land). These are public goods, as such, the optimal strategy entails that the community cooperates as one entity and takes the same actions or strategy to maintain a healthy and clean state of the communal environmental resources.

[https://www.cell.com/heliyon/fulltext/S2405-8440\(23\)10281-7](https://www.cell.com/heliyon/fulltext/S2405-8440(23)10281-7)

Interface: Journal of the Royal Society

PAPERS

PHILIP LAPORTE & MARTIN A. NOWAK – A geometric process of evolutionary game dynamics

Many evolutionary processes occur in phenotype spaces which are continuous. It is therefore of interest to explore how selection operates in continuous spaces. One approach is adaptive dynamics, which assumes that mutants are local. Here we study a different process which also allows non-local mutants. We assume that a resident population is challenged by an invader who uses a strategy chosen from a random distribution on the space of all strategies. We study the repeated donation game of direct reciprocity. We consider reactive strategies given by two probabilities, denoting respectively the probability to cooperate after the co-player has cooperated or defected. The strategy space is the unit square. We derive analytic formulae for the stationary distribution of evolutionary dynamics and for the average cooperation rate as function of the cost-to-benefit ratio. For positive reactive strategies, we prove that cooperation is more abundant than defection if the area of the cooperative region is greater than $1/2$ which is equivalent to benefit, b , divided by cost, c , exceeding $2+\sqrt{2}$. We introduce the concept of strategies that are stable with probability one. We also study an extended process and discuss other games.

<https://royalsocietypublishing.org/doi/full/10.1098/rsif.2023.0460>

Nature

ARTICLES

CARINA M. SCHLEBUSCH – The genetic diversity of Bantu-speaking populations helped to shape African history

Analysis of a massive genomic data set reveals the profound effects that the movement of Bantu-speaking peoples had on Africa's biological, linguistic and cultural landscape. These findings provide valuable insights for a wide range of disciplines and serve as a comprehensive data set of ancient and modern African individuals for comparative studies.

<https://www.nature.com/articles/d41586-023-03379-7>

PAPERS

CESAR A. FORTES-LIMA et mul – The genetic legacy of the expansion of Bantu-speaking peoples in Africa

The expansion of people speaking Bantu languages is the most dramatic demographic event in Late Holocene Africa and fundamentally reshaped the linguistic, cultural and biological landscape of the continent. With a comprehensive genomic dataset, including newly generated data of modern-day and ancient DNA from previously unsampled regions in Africa, we contribute insights into this expansion that started 6,000–4,000 years ago in western Africa. We genotyped 1,763 participants, including 1,526 Bantu speakers from 147 populations across 14 African countries, and generated whole-genome sequences from 12 Late Iron Age individuals. We show that genetic diversity amongst Bantu-speaking populations declines with distance from western Africa, with current-day Zambia and the Democratic Republic of Congo as possible crossroads of interaction. Using spatially explicit methods and correlating genetic, linguistic and geographical data, we provide cross-disciplinary support for a serial-founder migration model. We further show that Bantu speakers received significant gene flow from local groups in regions they expanded into. Our genetic dataset provides an exhaustive modern-day African comparative dataset for ancient DNA studies and will be important to a wide range of disciplines from science and humanities, as well as to the medical sector studying human genetic variation and health in African and African-descendant populations.

<https://www.nature.com/articles/s41586-023-06770-6>

LUKAS F.K. KUDERNA et al – Identification of constrained sequence elements across 239 primate genomes

Noncoding DNA is central to our understanding of human gene regulation and complex diseases, and measuring the evolutionary sequence constraint can establish the functional relevance of putative regulatory elements in the human genome. Identifying the genomic elements that have become constrained specifically in primates has been hampered by the faster evolution of noncoding DNA compared to protein-coding DNA, the relatively short timescales separating primate species, and the previously limited availability of whole-genome sequences. Here we construct a whole-genome alignment of 239 species, representing nearly half of all extant species in the primate order. Using this resource, we identified human regulatory elements that are under selective constraint across primates and other mammals at a 5% false discovery rate. We detected 111,318 DNase I hypersensitivity sites and 267,410 transcription factor binding sites that are constrained specifically in primates but not across other placental mammals and validate their cis-regulatory effects on gene expression. These regulatory elements are enriched for human genetic variants that affect gene expression and complex traits and diseases. Our results highlight the important role of recent evolution in regulatory sequence elements differentiating primates, including humans, from other placental mammals.

<https://www.nature.com/articles/s41586-023-06798-8>

Nature Africa**ARTICLES****FRANCIS KOKUTSE – Chimps take the high ground to get a read on their rivals**

A new study concludes that chimpanzees use similar tactics to humans for gathering information.

<https://www.nature.com/articles/d44148-023-00339-1>

Nature Communications**PAPERS****GIOVANNI M. DI LIBERTO et al – Emergence of the cortical encoding of phonetic features in the first year of life**

Even prior to producing their first words, infants are developing a sophisticated speech processing system, with robust word recognition present by 4–6 months of age. These emergent linguistic skills, observed with behavioural investigations, are likely to rely on increasingly sophisticated neural underpinnings. The infant brain is known to robustly track the speech envelope, however previous cortical tracking studies were unable to demonstrate the presence of phonetic feature encoding. Here we utilise temporal response functions computed from electrophysiological responses to nursery rhymes to investigate the cortical encoding of phonetic features in a longitudinal cohort of infants when aged 4, 7 and 11 months, as well as adults. The analyses reveal an increasingly detailed and acoustically invariant phonetic encoding emerging over the first year of life, providing neurophysiological evidence that the pre-verbal human cortex learns phonetic categories. By contrast, we found no credible evidence for age-related increases in cortical tracking of the acoustic spectrogram.

<https://www.nature.com/articles/s41467-023-43490-x>

WAN-YU SHIH et al – Electrophysiological population dynamics reveal context dependencies during decision making in human frontal cortex

Evidence from monkeys and humans suggests that the orbitofrontal cortex (OFC) encodes the subjective value of options under consideration during choice. Data from non-human primates suggests that these value signals are context-dependent, representing subjective value in a way influenced by the decision makers' recent experience. Using electrodes distributed throughout cortical and subcortical structures, human epilepsy patients performed an auction task where they repeatedly reported the subjective values they placed on snack food items. High-gamma activity in many cortical and subcortical sites including the OFC positively correlated with subjective value. Other OFC sites showed signals contextually modulated by the subjective value of previously offered goods—a context dependency predicted by theory but not previously observed in humans. These results suggest that value and value-context signals are simultaneously present but separately represented in human frontal cortical activity.

<https://www.nature.com/articles/s41467-023-42092-x>

Nature Communications Biology**PAPERS****BASILIO FUREST CATALDO et al – Novel sound exposure drives dynamic changes in auditory lateralization that are associated with perceptual learning in zebra finches**

Songbirds provide a model for adult plasticity in the auditory cortex as a function of recent experience due to parallels with human auditory processing. As for speech processing in humans, activity in songbirds' higher auditory cortex (caudomedial nidopallium, NCM) is lateralized for complex vocalization sounds. However, in Zebra finches exposed to a novel heterospecific (canary) acoustic environment for 4–9 days, the typical pattern of right-lateralization is reversed. We now report that, in birds passively exposed to a novel heterospecific environment for extended periods (up to 21 days), the right-lateralized pattern of epidural auditory potentials first reverses transiently then returns to the typical pattern. Using acute,

bilateral multi-unit electrophysiology, we confirm that this dynamic pattern occurs in NCM. Furthermore, extended exposure enhances discrimination for heterospecific stimuli. We conclude that lateralization is functionally labile and, when engaged by novel sensory experience, contributes to discrimination of novel stimuli that may be ethologically relevant. Future studies seek to determine whether, (1) the dynamicity of lateralized processes engaged by novel sensory experiences recurs with every novel challenge in the same organism; (2) the dynamic pattern extends to other cortical, thalamic or midbrain structures; and (3) the phenomenon generalizes across sensory modalities.

<https://www.nature.com/articles/s42003-023-05567-7>

JACQUELINE VON SETH et al – Recurrent connectivity supports higher-level visual and semantic object representations in the brain

Visual object recognition has been traditionally conceptualised as a predominantly feedforward process through the ventral visual pathway. While feedforward artificial neural networks (ANNs) can achieve human-level classification on some image-labelling tasks, it's unclear whether computational models of vision alone can accurately capture the evolving spatiotemporal neural dynamics. Here, we probe these dynamics using a combination of representational similarity and connectivity analyses of fMRI and MEG data recorded during the recognition of familiar, unambiguous objects. Modelling the visual and semantic properties of our stimuli using an artificial neural network as well as a semantic feature model, we find that unique aspects of the neural architecture and connectivity dynamics relate to visual and semantic object properties. Critically, we show that recurrent processing between the anterior and posterior ventral temporal cortex relates to higher-level visual properties prior to semantic object properties, in addition to semantic-related feedback from the frontal lobe to the ventral temporal lobe between 250 and 500 ms after stimulus onset. These results demonstrate the distinct contributions made by semantic object properties in explaining neural activity and connectivity, highlighting it as a core part of object recognition not fully accounted for by current biologically inspired neural networks.

<https://www.nature.com/articles/s42003-023-05565-9>

Nature Ecology & Evolution

PAPERS

MIKE W. MORLEY et al – Why the geosciences are becoming increasingly vital to the interpretation of the human evolutionary record

Advanced geoscience techniques are essential to contextualize fossils, artefacts and other archaeologically important material accurately and effectively. Their appropriate use will increase confidence in new interpretations of the fossil and archaeological record, providing important information about the life and depositional history of these materials and so should form an integral component of all human evolutionary studies. Many of the most remarkable recent finds that have transformed the field of human evolution are small and scarce, ranging in size from teeth to strands of DNA, recovered from complex sedimentary environments. Nevertheless, if properly analysed, they hold immense potential to rewrite what we know about the evolution of our species and our closest hominin ancestors.

<https://www.nature.com/articles/s41559-023-02215-5>

Nature Human Behaviour

PAPERS

ANA MARIA PORTUGAL et al – Infants' looking preferences for social versus non-social objects reflect genetic variation

To what extent do individual differences in infants' early preference for faces versus non-facial objects reflect genetic and environmental factors? Here in a sample of 536 5-month-old same-sex twins, we assessed attention to faces using eye tracking in two ways: initial orienting to faces at the start of the trial (thought to reflect subcortical processing) and sustained face preference throughout the trial (thought to reflect emerging attention control). Twin model fitting suggested an influence of genetic and unique environmental effects, but there was no evidence for an effect of shared environment. The heritability of face orienting and preference were 0.19 (95% confidence interval (CI) 0.04 to 0.33) and 0.46 (95% CI 0.33 to 0.57), respectively. Face preference was associated positively with later parent-reported verbal competence ($\beta = 0.14$, 95% CI 0.03 to 0.25, $P = 0.014$, $R^2 = 0.018$, $N = 420$). This study suggests that individual differences in young infants' selection of perceptual input—social versus non-social—are heritable, providing a developmental perspective on gene–environment interplay occurring at the level of eye movements.

<https://www.nature.com/articles/s41562-023-01764-w>

Nature Humanities & Social Sciences Communications

PAPERS

MARIA MICHELA DEL VIVA, SERENA CASTELLOTTI & GALINA V. PARAMEI – The Italian colour lexicon in Tuscany: elicited lists, cognitive salience, and semantic maps of colour terms

We investigated the Tuscan Italian colour inventory, with the aim of establishing the cognitive salience of the basic colour terms (BCTs) and most frequent non-BCTs. Native speakers from Tuscany ($N = 89$) completed a colour-term elicitation task lasting for 5 min. In total, 337 unique terms were elicited, with an average list length of 30.06. The frequency of each term, its

mean list position and cognitive salience index (S) were calculated. The CTs with the highest S (ranked 1–13) included 10 counterparts of the Berlin and Kay BCTs listed in their 1969 seminal work and three basic ‘blue’ terms, blu, azzurro, celeste, estimated for Tuscan respondents by Del Viva et al. in 2022. S-index and Zipf-function (the terms’ “popularity”) indicated that fucsia (rank 14) is conceivably an emerging BCT in (Tuscan) Italian. Other cognitively salient non-BCTs are lilla, magenta, ocre and beige. The terms’ 3D semantic map (conceptual closeness), assessed using multidimensional scaling and cluster analysis, revealed that in the lists, closely associated CTs were arranged along three competing criteria: the term’s salience gradient; word length; and clustering of fully chromatic concepts with those defined primarily by lightness or desaturation. We also consider salient Italian non-BCTs as indicators of the ongoing process of lexical refinement in certain areas of the colour space. In conclusion, measures of elicitation productivity, as well as the augmented BCT inventory, including the Tuscan ‘triple blues’, and abundant hyponyms and derived forms all indicate (Tuscan) Italian speakers’ “cultural competence” in the colour domain and the need to communicate nuanced information about colour shades.

<https://www.nature.com/articles/s41599-023-02393-4>

Nature Reviews Neuroscience

PAPERS

GEORGE DRAGOI – The generative grammar of the brain: a critique of internally generated representations

The past decade of progress in neurobiology has uncovered important organizational principles for network preconfiguration and neuronal selection that suggest a generative grammar exists in the brain. In this Perspective, I discuss the competence of the hippocampal neural network to generically express temporally compressed sequences of neuronal firing that represent novel experiences, which is envisioned as a form of generative neural syntax supporting a neurobiological perspective on brain function. I compare this neural competence with the hippocampal network performance that represents specific experiences with higher fidelity after new learning during replay, which is envisioned as a form of neural semantic that supports a complementary neuropsychological perspective. I also demonstrate how the syntax of network competence emerges a priori during early postnatal life and is followed by the later development of network performance that enables rapid encoding and memory consolidation. Thus, I propose that this generative grammar of the brain is essential for internally generated representations, which are crucial for the cognitive processes underlying learning and memory, prospection, and inference, which ultimately underlie our reason and representation of the world.

<https://www.nature.com/articles/s41583-023-00763-0>

Nature Scientific Data

PAPERS

FREDERIC BLUM et al – Grammars Across Time Analyzed (GATA): a dataset of 52 languages

Grammars Across Time Analyzed (GATA) is a resource capturing two snapshots of the grammatical structure of a diverse range of languages separated in time, aimed at furthering research on historical linguistics, language evolution, and cultural change. GATA comprises grammatical information on 52 diverse languages across all continents, featuring morphological, syntactic, and phonological information based on published grammars of the same language at two different time points. Here we introduce the coding scheme and design features of GATA, and we describe some salient patterns related to language change and the coverage of grammatical descriptions over time.

<https://www.nature.com/articles/s41597-023-02659-1>

Nature Scientific Reports

PAPERS

SEIYA NAKATA & MASANORI TAKEZAWA – Conditions under which faithful cultural transmission through teaching promotes cumulative cultural evolution

It has been argued that teaching promotes the accurate transmission of cultural traits and eventually leads to cumulative cultural evolution (CCE). However, previous studies have questioned this argument. In this study, we modified the action sequences model into a network exploring model with reinforcement learning to examine the conditions under which teaching promotes CCE. Our model incorporates a time trade-off between innovation and teaching. Simulations revealed that the positive influence of teaching on CCE depends on task difficulty. When the task was too difficult and advanced, such that it could not be accomplished through individual learning within a limited time, spending more time on teaching—even at the expense of time for innovation—contributed to CCE. On the contrary, the easier the task, the more time was spent on innovation than on teaching, which contributed to the improvement of performance. These findings suggest that teaching becomes more valuable as cultures become more complex. Therefore, humanity must have co-evolved a complex cumulative culture and teaching that supports cultural fidelity.

<https://www.nature.com/articles/s41598-023-47018-7>

KEREN LESINGER et al – Functional connectivity of the human face network exhibits right hemispheric lateralization from infancy to adulthood

Adults typically exhibit right hemispheric dominance in the processing of faces. In this cross-sectional study, we investigated age-dependent changes in face processing lateralization from infancy to adulthood (1–48 years old; N = 194). We co-registered anatomical and resting state functional Magnetic Resonance Imaging (fMRI) scans of toddlers, children, adolescents, and adults into a common space and examined functional connectivity across the face, as well as place, and object-selective regions identified in adults. As expected, functional connectivity between core face-selective regions was stronger in the right compared to the left hemisphere in adults. Most importantly, the same lateralization was evident in all other age groups (infants, children, adolescents) and appeared only in face-selective regions, and not in place or object-selective regions. These findings suggest that the physiological development of face-selective brain areas may differ from that of object and place-selective areas. Specifically, the functional connectivity of the core-face selective regions exhibits rightward lateralization from infancy, years before these areas develop mature face-selective responses.

<https://www.nature.com/articles/s41598-023-47581-z>

ALEXANDER GAVASHELISHVILI et al – The time and place of origin of South Caucasian languages: Insights into past human societies, ecosystems and human population genetics

This study re-examines the linguistic phylogeny of the South Caucasian linguistic family (aka the Kartvelian linguistic family) and attempts to identify its Urheimat. We apply Bayesian phylogenetics to infer a dated phylogeny of the South Caucasian languages. We infer the Urheimat and the reasons for the split of the Kartvelian languages by taking into consideration (1) the past distribution ranges of wildlife elements whose names can be traced back to proto-Kartvelian roots, (2) the distribution ranges of past cultures and (3) the genetic variations of past and extant human populations. Our best-fit Bayesian phylogenetic model is in agreement with the widely accepted topology suggested by previous studies. However, in contrast to these studies, our model suggests earlier mean split dates, according to which the divergence between Svan and Karto-Zan occurred in the early Copper Age, while Georgian and Zan diverged in the early Iron Age. The split of Zan into Megrelian and Laz is widely attributed to the spread of Georgian and/or Georgian speakers in the seventh-eighth centuries CE. Our analyses place the Kartvelian Urheimat in an area that largely intersects the Colchis glacial refugium in the South Caucasus. The divergence of Kartvelian languages is strongly associated with differences in the rate of technological expansions in relation to landscape heterogeneity, as well as the emergence of state-run communities. Neolithic societies could not colonize dense forests, whereas Copper Age societies made limited progress in this regard, but not to the same degree of success achieved by Bronze and Iron Age societies. The paper also discusses the importance of glacial refugia in laying the foundation for linguistic families and where Indo-European languages might have originated.

<https://www.nature.com/articles/s41598-023-45500-w>

Neuron**PAPERS****JON M. MCCLELLAN et al – An evolutionary perspective on complex neuropsychiatric disease**

The forces of evolution—mutation, selection, migration, and genetic drift—shape the genetic architecture of human traits, including the genetic architecture of complex neuropsychiatric illnesses. Studying these illnesses in populations that are diverse in genetic ancestry, historical demography, and cultural history can reveal how evolutionary forces have guided adaptation over time and place. A fundamental truth of shared human biology is that an allele responsible for a disease in anyone, anywhere, reveals a gene critical to the normal biology underlying that condition in everyone, everywhere. Understanding the genetic causes of neuropsychiatric disease in the widest possible range of human populations thus yields the greatest possible range of insight into genes critical to human brain development. In this perspective, we explore some of the relationships between genes, adaptation, and history that can be illuminated by an evolutionary perspective on studies of complex neuropsychiatric disease in diverse populations.

[https://www.cell.com/neuron/fulltext/S0896-6273\(23\)00842-5](https://www.cell.com/neuron/fulltext/S0896-6273(23)00842-5)

New Scientist**NEWS****Babies may start to learn language before they are born**

Newborn babies respond differently to their mother tongue, suggesting that exposure to language in the uterus may provide the foundations for learning.

<https://www.newscientist.com/article/2404345-babies-may-start-to-learn-language-before-they-are-born/>

Did Homo naledi bury its dead? Debate rages over human relative

Studies earlier this year claimed that the extinct hominin *Homo naledi* buried its dead and produced rock art, but other researchers say the evidence is “non-existent”.

<https://www.newscientist.com/article/2404369-did-homo-naledi-bury-its-dead-debate-rages-over-human-relative/>

PeerJ

PAPERS

BRENDA MCCOWAN et al – Interactive bioacoustic playback as a tool for detecting and exploring nonhuman intelligence: “conversing” with an Alaskan humpback whale

Here we report on a rare and opportunistic acoustic turn-taking with an adult female humpback whale, known as Twain, in Southeast Alaska. Post hoc acoustic and statistical analyses of a 20-min acoustic exchange between the broadcast of a recorded contact call, known as a ‘whup/throp’, with call responses by Twain revealed an intentional human-whale acoustic (and behavioral) interaction. Our results show that Twain participated both physically and acoustically in three phases of interaction (Phase 1: Engagement, Phase 2: Agitation, Phase 3: Disengagement), independently determined by blind observers reporting on surface behavior and respiratory activity of the interacting whale. A close examination of both changes to the latency between Twain’s calls and the temporal matching to the latency of the exemplar across phases indicated that Twain was actively engaged in the exchange during Phase 1 (Engagement), less so during Phase 2 (Agitation), and disengaged during Phase 3 (Disengagement). These results, while preliminary, point to several key considerations for effective playback design, namely the importance of salient, dynamic and adaptive playbacks, that should be utilized in experimentation with whales and other interactive nonhuman species.

<https://peerj.com/articles/16349/>

PLoS One

PAPERS

HEELI C. SCHECHTER et al – Making ties and social identities: Drawing connections between PPNB communities as based on shell bead typology

People tend to belong to multiple social circles, which construct and reflect a person’s social identity. Group affiliation is embodied and may be expressed by personal adornment. Personal adornment in general has multiple functions in human societies, among them the assimilation and transmission of different aspects of personal and collective, social and cultural identity. Beads in general, including shell beads, often constitute parcels of composite adornment, and as such are used in different configurations to portray these messages. The shared use of similar bead types by different individuals and communities indicates the mutual affiliation of the sharing parties to the same cultural circles and reflects social ties and relationships. The Pre-Pottery Neolithic B (PPNB) period in the Levant is a time of pivotal changes to human lifeways necessitating profound adjustments in all aspects of life, including social relations and networks. Here we use the shell bead assemblage from the cultic-mortuary aggregation site of Kfar HaHoresh, in comparison to shell bead assemblages from multiple other sites in the Levant, as a proxy for the exploration of local and regional networks and connections between PPNB communities. Multivariate analyses of shell bead type distribution patterns across the Levant demonstrate that some types were widely shared among different communities, characterising different geographic regions, while others were rare or unique, highlighting relationships between sites and regions, which are occasionally independent of geographic proximity. Specific occurrences of shared shell bead types between Kfar HaHoresh and compared sites further illuminate the web of connections between PPNB communities in the Levant and the varying breadths of sharing-patterns reflect the hierarchical nature of the underlying social circles. Outlining these widening social affiliations sheds light on the complex structure of Neolithic social identity.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0289091>

LISA SCHUNK et al – Enhancing lithic analysis: Introducing 3D-EdgeAngle as a semi-automated 3D digital method to systematically quantify stone tool edge angle and design

In stone tool studies, the analysis of different technological and typological features is known to provide distinct but interrelated information on the design and use of artefacts. The selection of these features can potentially influence the understanding and reconstruction of past human technological behaviour across time. One feature frequently part of a standard lithic analysis is the measurement of edge angles. The angle of an edge, unmodified or shaped by retouch and an integral part of the overall tool design, is certainly a parameter that influences the interpretation of an artefact. The acuteness of an edge angle is often linked to aspects such as cutting, carving, or scraping efficiency and durability and thus, tool performance. Knowing the actual edge angle of a stone tool can therefore have important implications for its interpretation. In the case of edge angle analyses, manual measuring techniques have been established for many years in lithic studies. Here, we introduce a new method for accurate and precise edge angle measurements based on 3D data (hereafter 3D-EdgeAngle). 3D-EdgeAngle consists of a script-based, semi-automated edge angle measuring method applicable to 3D models. Unlike other methods, 3D-EdgeAngle illustrates an objective way of measuring the edge angle at cross sections along the entire tool edge in defined steps and, moreover, allows measurements at different distances perpendicular to the edge by controlling three involved parameters. Thus, with this method, the edge angle can be measured at any point in a high resolution and scale of analysis. Compared to measurements taken manually, with this method random and systematic errors can be reduced significantly. Additionally, all data are reproducible and statistically evaluable. We introduce 3D-EdgeAngle as a standard method to calculate edge angles with a highly accurate and systematic approach. With this method, we aim to improve the process of studying lithics and thus to increase the understanding of past human tool design.

PNAS

PAPERS

ERICA A. CARTMILL – Overcoming bias in the comparison of human language and animal communication

Human language is a powerful communicative and cognitive tool. Scholars have long sought to characterize its uniqueness, but each time a property is proposed to set human language apart (e.g., reference, syntax), some (attenuated) version of that property is found in animals. Recently, the uniqueness argument has shifted from linguistic rules to cognitive capacities underlying them. Scholars argue that human language is unique because it relies on ostension and inference, while animal communication depends on simple associations and largely hardwired signals. Such characterizations are often borne out in published data, but these empirical findings are driven by radical differences in the ways animal and human communication are studied. The field of animal communication has been dramatically shaped by the “code model,” which imagines communication as involving information packets that are encoded, transmitted, decoded, and interpreted. This framework standardized methods for studying meaning in animal signals, but it does not allow for the nuance, ambiguity, or contextual variation seen in humans. The code model is insidious. It is rarely referenced directly, but it significantly shapes how we study animals. To compare animal communication and human language, we must acknowledge biases resulting from the different theoretical models used. By incorporating new approaches that break away from searching for codes, we may find that animal communication and human language are characterized by differences of degree rather than kind.

<https://www.pnas.org/doi/full/10.1073/pnas.2218799120>

Proceedings of the Royal Society B

PAPERS

ANTÓNIO M. M. RODRIGUES & ANDY GARDNER – Transmission of social status drives cooperation and offspring philopatry

The evolution of cooperation depends on two crucial overarching factors: relatedness, which describes the extent to which the recipient shares genes in common with the actor; and quality, which describes the recipient's basic capacity to transmit genes into the future. While most research has focused on relatedness, there is a growing interest in understanding how quality modulates the evolution of cooperation. However, the impact of inheritance of quality on the evolution of cooperation remains largely unexplored, especially in spatially structured populations. Here, we develop a mathematical model to understand how inheritance of quality, in the form of social status, influences the evolution of helping and harming within social groups in a viscous-population setting. We find that: (1) status-reversal transmission, whereby parental and offspring status are negatively correlated, strongly inhibits the evolution of cooperation, with low-status individuals investing less in cooperation and high-status individuals being more prone to harm; (2) transmission of high status promotes offspring philopatry, with more cooperation being directed towards the higher-dispersal social class; and (3) fertility inequality and inter-generational status inheritance reduce within-group conflict. Overall, our study highlights the importance of considering different mechanisms of phenotypic inheritance, including social support, and their potential interactions in shaping animal societies.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2023.1314>

LOTTE SCHLICHT et al – A dawn and dusk chorus will emerge if males sing in the absence of their mate

The spring dawn and dusk chorus of birds is a widespread phenomenon, yet its origin remains puzzling. We propose that a dawn and dusk chorus will inevitably arise if two criteria are met: (1) females leave their roost later in the morning and go to roost earlier in the evening than their mate, and (2) males sing more when separated from their mate. Previous studies on blue tits (*Cyanistes caeruleus*) support the first criterion. We here report that males sing at a higher rate whenever they are separated from their mate and that song rate increases with the duration of female absence. These findings can explain the existence of the dawn and dusk chorus in blue tits, and they can explain why the dawn chorus is more pronounced than the dusk chorus, as is typically observed. An exhaustive literature search provides support for both criteria of the ‘absent mate’ hypothesis in several passerine birds. We found no evidence contradicting the hypothesis. The new hypothesis is not inconsistent with many of the existing hypotheses about dawn singing, but may be a more general explanation for the occurrence of a dawn and dusk chorus. We describe how the ‘absent mate’ hypothesis leads to testable predictions about daily and seasonal variation in song output.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2023.2266>

ELIZABETH C. LANGE et al – Environmental, sex-specific and genetic determinants of infant social behaviour in a wild primate

Affiliative social bonds are linked to fitness components in many social mammals. However, despite their importance, little is known about how the tendency to form social bonds develops in young animals, or if the timing of development is heritable and thus can evolve. Using four decades of longitudinal observational data from a wild baboon population, we assessed the environmental determinants of an important social developmental milestone in baboons—the age at which a young animal

first grooms a conspecific—and we assessed how the rates at which offspring groom their mothers develops during the juvenile period. We found that grooming development differs between the sexes: female infants groom at an earlier age and reach equal rates of grooming with their mother earlier than males. We also found that age at first grooming for both sexes is weakly heritable ($h^2 = 0.043$, 95% CI: 0.002–0.110). These results show that sex differences in grooming emerge at a young age; that strong, equitable social relationships between mothers and daughters begin very early in life; and that age at first grooming is heritable and therefore can be shaped by natural selection.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2023.1597>

Royal Society Open Science

PAPERS

NIKI TEUNISSEN et al – Best of both worlds? Helpers in a cooperative fairy-wren assist most to breeding pairs that comprise a potential mate and a relative

In cooperative breeders, individuals forego independent reproduction and help others raise offspring. Helping is proposed to be driven by indirect benefits from raising relatives, and/or direct benefits from raising additional recruits or helping itself. We propose that consideration of social context is also important, in particular the characteristics of the breeding pair: helping may also serve to lighten the workload of—or maintain social bonds with—breeders (e.g. kin, potential mates) who in turn can offer benefits to helpers (e.g. prolonged nepotism, future mating, future production of relatives). Here, we test this hypothesis, while controlling for potential direct and indirect benefits from raising offspring, in purple-crowned fairy-wrens (*Malurus coronatus*) exhibiting variation in social group composition, and thus, breeder value. We show that helper provisioning rates to the nest were explained by characteristics of breeders that helpers assisted, rather than benefits from raising offspring. The presence of at least one related breeder was a prerequisite to help, but helpers provisioned most if assisting a relative and potential mate. Neglecting to take group composition into account would have led to misinterpretation of our results. A comprehensive understanding of the evolution of cooperative breeding hence requires nuanced consideration of social context.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.231342>

MATHILDE GRAMPP et al with KLAUS ZUBERBÜHLER, ROMAN M. WITTIG & CATHERINE CROCKFORD – Social uncertainty promotes signal complexity during approaches in wild chimpanzees (*Pan troglodytes verus*) and mangabeys (*Cercocebus atys atys*)

The social complexity hypothesis for the evolution of communication posits that complex social environments require greater communication complexity for individuals to effectively manage their relationships. We examined how different socially uncertain contexts, reflecting an increased level of social complexity, relate to variation in signalling within and between two species, which display varying levels of fission–fusion dynamics (sympatric-living chimpanzees and sooty mangabeys, Taï National Park, Ivory Coast). Combined signalling may improve message efficacy, notably when involving different perception channels, thus may increase in moments of high social uncertainty. We examined the probability of individuals to emit no signal, single or multisensory or combined (complex) signals, during social approaches which resulted in non-agonistic outcomes. In both species, individuals were more likely to use more combined and multisensory signals in post-conflict approaches with an opponent than in other contexts. The clearest impact of social uncertainty on signalling complexity was observed during chimpanzee fusions, where the likelihood of using complex signals tripled relative to other contexts. Overall, chimpanzees used more multisensory signals than mangabeys. Social uncertainty may shape detected species differences in variation in signalling complexity, thereby supporting the hypothesis that social complexity, particularly associated with high fission–fusion dynamics, promotes signalling complexity.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.231073>

Science

NEWS

World's oldest forts upend idea that farming alone led to complex societies

In remote Siberia, hunter-gatherers built complex defenses 8000 years ago.

<https://www.science.org/content/article/world-s-oldest-forts-upend-idea-farming-alone-led-complex-societies>

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