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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, do 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, do let me know.

And if you have any other ideas for extending the “EAORC experience”, please contact me.

ACADEMIA.EDU – From metonymy to syntax in the communication of events

Interaction Studies, 9 (1), 51-65.

JEAN-LOUIS DESSALLES – From metonymy to syntax in the communication of events

Language, from its early hominin origin to now, was not primarily being used for practical purposes. We suggest that an essential function of protolanguage was to signal ‘noteworthy’ events, as humans still systematically do. Words could not be so specific as to refer to whole, non-recurring, situations. They referred to elements such as objects or locations, and the communicated event was inferred metonymically. Compositionality was achieved, without syntax, through multi-metonymy, as words referring to elements of the same situation were concatenated into proto-utterances.

https://www.academia.edu/15006931/From_metonymy_to_syntax_in_the_communication_of_events

ACADEMIA.EDU – Deacon’s Challenge: From Calls to Words

Topoi 35, 271–282 (2016)

KIM STERELNY – Deacon’s Challenge: From Calls to Words

A Darwinian theory of the evolution of language must be incremental: to explain the transition from a hominin baseline with great ape grade communicative capacities to language-equipped hominins as a series of small steps. This paper takes up that project for the special case of words, giving an incremental model of the call to word transition. The model is embedded in a general conception of human social evolution with independent empirical support, but it also depends on some more specific assumptions about language and about the earlier forms of hominin communication. Given these assumptions, the paper can be no more than a working draft of a more complete theory.

https://www.academia.edu/15592534/Deacon_s_Challenge_From_Calls_to_Words

NEWS

BREAKING SCIENCE – Australia’s Oldest Known Rock Painting is a Kangaroo

A 2-m- (6.6-foot) long painting of a kangaroo in a rock shelter in the north-eastern Kimberley region of Western Australia is dated to between 17,500 and 17,100 years on the basis of the ages of three overlying and three underlying wasp nests.

http://feedproxy.google.com/~r/BreakingScienceNews/~3/G77tRrC3cA0/australias-oldest-known-rock-painting-09381.html?utm_source=feedburner&utm_medium=email

BREAKING SCIENCE – Scientists Show Two-Way Communication with Dreamers during Lucid Dream

New research from Northwestern University shows that individuals who are asleep and in the midst of a lucid dream — aware of the fact that they are currently dreaming — can perceive questions from an experimenter and provide answers using electrophysiological signals.

http://feedproxy.google.com/~r/BreakingScienceNews/~3/D_y0ef-YD4/two-way-communication-dreaming-persons-09388.html?utm_source=feedburner&utm_medium=email

BREAKING SCIENCE – 360,000-Year-Old DNA Sheds New Light on Evolutionary History of Cave Bears

An international team of researchers has extracted and sequenced DNA from a 360,000-year-old petrous bone of the extinct cave bear *Ursus kudarensis* found in a cave in the Caucasus Mountains — the oldest genome sequence from a non-permafrost environment. Using this and other cave bear genomes, they’ve determined nuclear and mitochondrial substitution rates and revised the evolutionary history of cave bears.

http://feedproxy.google.com/~r/BreakingScienceNews/~3/HFCumUI3w5M/ursus-kudarensis-genome-09392.html?utm_source=feedburner&utm_medium=email

BREAKING SCIENCE – 4.4-Million-Year-Old Ardipithecus Hand Reveals ‘Big Evolutionary Jump’

Paleoanthropologists from the United States, the United Kingdom, Norway, and South Africa have examined the fossilized hand of *Ardipithecus ramidus*, a species of hominid that lived in the east of the African continent around 4.4 million years ago. Their results, published in the journal *Science Advances*, provide clues about how early humans began to walk [...]

http://feedproxy.google.com/~r/BreakingScienceNews/~3/c1WJBrYW7Hc/ardipithecus-ramidus-hand-09397.html?utm_source=feedburner&utm_medium=email

NATURE BRIEFING – Life-size kangaroo is Australia’s oldest art

A kangaroo painted in red ochre in a rock shelter in remote northwestern Australia is at least 17,100 years old — the oldest rock art yet dated on the continent. It’s difficult to determine the age of Australian rock art because the region’s ancient artists didn’t tend to use organic materials that can be radiocarbon dated. In this case, researchers analysed fossilized mud-wasp nests laying over and under the art. Alongside the kangaroo, the richly decorated cave includes images interpreted as a boomerang, a reclining human figure and a 3-metre-long snake

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=c619a38eb6&e=1db4b9a19b>

SCIAM NEWS – People Answer Scientists' Queries in Real Time while Dreaming

Researchers demonstrate that during REM sleep, people can hear—and respond to—simple questions such as “What is eight minus six?”

<https://www.scientificamerican.com/article/people-answer-scientists-queries-in-real-time-while-dreaming/>

SCIAM NEWS – The Evolutionary Origins of Friendship

The emergence of this crucial kind of relationship relied on the ability to recognize the unique benefits others have to offer

<https://www.scientificamerican.com/article/the-evolutionary-origins-of-friendship/>

SCIENCE DAILY – New dating techniques reveal Australia's oldest known rock painting, and it's a kangaroo

Researchers successfully date Australia's oldest intact rock painting, using pioneering radiocarbon technique.

<https://www.sciencedaily.com/releases/2021/02/210222124703.htm>

SCIENCE DAILY – Genomic insights into the origin of pre-historic populations in East Asia

East Asia today harbors more than a fifth of the world's population and some of the most deeply branching modern human lineages outside of Africa. However, its genetic diversity and deep population history remain poorly understood relative to many other parts of the world. In a new study, researchers analyzes genome-wide data for 166 ancient individuals spanning 8,000 years and 46 present-day groups, and provides insights into the formation of East Asian populations.

<https://www.sciencedaily.com/releases/2021/02/210222124643.htm>

SCIENCE DAILY – From melody to language

In the process of developing language, the melody patterns that emerge in infants' vocalizations are a very important first step. A new study has shown that the complexity of these patterns rapidly increases in the first months.

<https://www.sciencedaily.com/releases/2021/02/210224100904.htm>

SCIENCE DAILY – Ancient skeletal hand could reveal evolutionary secrets

Evolutionary expert Charles Darwin and others recognized a close evolutionary relationship between humans, chimps and gorillas based on their shared anatomies, raising some big questions: how are humans related to other primates, and exactly how did early humans move around?

<https://www.sciencedaily.com/releases/2021/02/210225082500.htm>

SCIENCE DAILY – Atheists and believers both have moral compasses, but with key differences

A new study suggests that, while atheists and theists share moral values related to protecting vulnerable individuals, atheists are less likely to endorse values that promote group cohesion and more inclined to judge the morality of actions based on their consequences.

<https://www.sciencedaily.com/releases/2021/02/210224143306.htm>

SOCIETY FOR SCIENCE – A magnetic field reversal 42ky ago may have contributed to mass extinctions

The weakening of Earth's magnetic field beginning around 42,000 years ago correlates with a cascade of environmental crises, scientists say.

<http://click.societyforscience-email.com/?qs=667217bd9f3b679f3e29dbccd7c7a541a337a96c9b9f5048ad74686196788dc8d8dcf42d8ad1d688076d4bc2fa6a78163e4d9c62ffb4d373>

SOCIETY FOR SCIENCE – A body burned inside a hut 20,000 years ago signaled shifting views of death

Ancient hunter-gatherers burned a hut in which they had placed a dead woman, suggesting a change in how death was viewed.

<http://click.societyforscience-email.com/?qs=667217bd9f3b679f9dd04402a61bb2880c7a3e7219cfa5276b51cda3785b740547a1ca5cc9f65f0acb78a0126f0e9634216085efde4dc5a77>

SOCIETY FOR SCIENCE – Ardi may have been more chimplike than initially thought - or not

A contested study of hand and foot fossils suggests this 4.4-million-year-old hominid was a tree climber and branch swinger.

<http://click.societyforscience-email.com/?qs=ac0de128c8f8f7088282090ff70ac6a561228d23abfae3840d798c13556bfadfb9dcc10e51cfec3884ccb0f104cc1e0a3e3b28842c0880614c219c9223d182fa>

OTHER NEWS – HARVARD – Homo Erectus and the Invention of Human Language

DANIEL EVERETT – Homo Erectus and the Invention of Human Language

In this video, Everett examines the culture of the first known human species, Homo erectus, focusing especially on their physical and cultural evolution such as tools, travel, and settlements. He then makes the case that these accomplishments are best explained by the invention of language. Language in turn is shown to be the transfer of information by symbols, where other components of language, such as grammar, play roles in support of symbolic communication. Concrete evidence for symbols among erectus populations is found in their tool construction and “dialectal” tool distinctions. The talk is based on Everett's book, ‘How Language Began: The Story of Humanity's Greatest Invention’.

https://www.youtube.com/watch?v=4uUilIN-8gk&fbclid=IwAR0diBfvh_hisKYT8gHfrmiJkpM7diOQNUSM_wa0ALKP9u9ufxXE6OrMdCE

PUBLICATIONS

Animal Behaviour

PAPERS

A. SÁNCHEZ-AMARO, J.M. BURKART & F. ROSSANO – Marmoset monkeys overcome dyadic social dilemmas while avoiding mutual defection

Social primates constantly face situations in which their preferences collide and they need to engineer strategies to overcome conflicts of interest. Studies with chimpanzees, *Pan troglodytes*, have found that they use competitive strategies to overcome social dilemmas, maximizing their own benefits while minimizing the loss of rewards. However, little is known about how other primates that rely more on cooperation would overcome similar dilemmas. We therefore presented male–female pairs of common marmosets, *Callithrix jacchus* (cooperative breeders) with two experiments of an action-based paradigm that creates a conflict of interest over access to an unequal reward distribution. Rather than engaging in mutual defection, marmosets were able to overcome this social dilemma over time, by developing a mix of strategic behaviours (predominantly by females) and tolerance to disadvantageous reward distributions (predominantly by males). This mix of behavioural strategies yielded more and better rewards for the females. Importantly, such a net outcome is consistent with the natural history of this species where females, who carry a high energetic burden of reproduction, tend to be less prosocial and are receivers, rather than donors, in food-sharing events among adults.

https://www.sciencedirect.com/science/article/abs/pii/S0003347221000026?dgcid=raven_sd_via_email

ALEXANDER MIELKE et al – Grooming interventions in female rhesus macaques as social niche construction

Social animals invest time and resources into adapting their social environment, which emerges not only from their own but also from the decisions of other group members. Thus, individuals have to monitor interactions between others and potentially decide when and how to interfere to prevent damage to their own investment. These interventions can be subtle, as in the case of affiliative interactions such as grooming, but they can inform us about how animals structure their world and influence other group members. Here, we used interventions into grooming bouts in female rhesus macaques, *Macaca mulatta*, to determine who intervened in which grooming bouts, and what determined intervention outcomes, based on kinship, dominance rank and affiliative relationships between groomers and (potential) interveners. We show that high dominance rank of groomers reduced the risk of intervention. Bystanders, particularly when high ranking, intervened in grooming of their kin, close affiliates and close-ranked competitors. Interveners gained access to their close affiliates for subsequent grooming. Reduced aggression risk facilitated grooming involving three individuals, which was more common when a strong affiliative relationship existed and when interveners were lower in rank than the groomers. Thus, interventions in this species involved the monitoring of grooming interactions, decision making based on several individual and dyadic characteristics, and potentially allowed individuals to broaden their access to grooming partners, protect their own relationships and influence their social niche.

https://www.sciencedirect.com/science/article/abs/pii/S0003347221000038?dgcid=raven_sd_via_email

J.S. MARTIN et al – Prosociality, social tolerance and partner choice facilitate mutually beneficial cooperation in common marmosets, *Callithrix jacchus*

Prosocial motivation has been suggested to facilitate the initiation and maintenance of cooperative interactions, as well as the evolution of social systems reliant on helping behaviour and social coordination. Previous comparative research on the link between prosociality and cooperation has been limited, however, by the absence of directly comparable measures of these traits among the same individuals. In the present study, we therefore examined intraspecific variation in prosociality

and cooperative behaviour within a captive colony of group-living, cooperatively breeding common marmosets to provide a direct experimental test of these hypothesized benefits. We measured prosociality using a group service food-provisioning paradigm, and we assessed mutually beneficial dyadic cooperation with the loose string coordinated pulling paradigm. In addition, we also investigated the effects of individual social tolerance and partner choice, which have previously been identified as key factors promoting prosociality and cooperation among primates. As predicted, successful cooperation in the loose string paradigm was positively associated with prosociality, as well as with social tolerance and partner choice. These effects were independent of age, sex, personality, food motivation and learning across experimental sessions. Our results therefore suggest that prosocial motivation, social tolerance and partner choice can each facilitate mutually beneficial cooperation and social coordination in marmosets, supporting the hypothesized role of these mechanisms in the evolution of cooperative behaviour among primates.

https://www.sciencedirect.com/science/article/pii/S0003347220303778?dgcid=raven_sd_via_email

LOU M. HAUX et al – How chimpanzees decide in the face of social and nonsocial uncertainty

Uncertainty can arise in interactions with both social partners and nonliving objects. Previous research has shown that humans display higher aversion to uncertainty arising from social interactions than to uncertainty caused by interactions with objects such as gambling machines, and that this difference may be mediated by betrayal aversion. We investigated whether chimpanzees, *Pan troglodytes*, differentiate between social and nonsocial forms of uncertainty. Subjects participated in two experiments, each involving a social and a nonsocial condition. In both experiments, choosing the safe option resulted in immediate access to low-value food. Choosing the uncertain option could result in access to high-value food, but only if the partner (social condition) or a machine (nonsocial condition) proved trustworthy. In experiment 1, where chimpanzees had no prior information on reciprocation rates (i.e. decided under uncertainty), chimpanzees were less likely to choose the uncertain option when they interacted with a partner than with a machine. When they did choose the uncertain option, chimpanzees also hesitated longer in the social condition. In experiment 2, where chimpanzees had learned the statistical probabilities on reciprocation rates (i.e. decided under risk), they did not distinguish between social and nonsocial situations and were generally risk averse. These results suggest that chimpanzees are more averse to engaging in uncertain choices when the source of uncertainty is a conspecific than when it is a machine; when confronted with risky choices, chimpanzees show no such tendency.

https://www.sciencedirect.com/science/article/abs/pii/S0003347221000282?dgcid=raven_sd_via_email

Biology Letters

COMMENTARIES

DAVID A. AGAR – Spear study misses the point: a critique of the Ennos and Chan fire-hardening study, concerning wood material representation in archaeological finds and generalized conclusions

Ennos and Chan (E&C) investigated the effects of fire hardening on wooden spears [Ennos AR, Chan TL. 2016 'Fire hardening' spear

wood does slightly harden it, but makes it much weaker and more brittle. *Biol. Lett.* 12, 20160174]. Their fire treatment of representative wood reduced its strength and work of fracture, and the authors concluded that it had no tangible benefits for spear functionality. Several aspects of the study, which casts doubt on the ingenuity of early hominins, invite a response.

<https://royalsocietypublishing.org/doi/full/10.1098/rsbl.2020.0832>

ANTHONY ROLAND ENNOS – Reply: A critique of the Ennos and Chan fire-hardening study, concerning wood material representation in archaeological finds and generalized conclusions

The comment criticizes our work in three ways. First, that the heat treatment we applied to our wooden rods was crude. Second, that we investigated the effect of fire on a hardwood, not a softwood such as was used to manufacture the Clacton and Schöningen spears. Third, that our rods were composed of sapwood, not the heartwood used for the Clacton and Schöningen spears.

<https://royalsocietypublishing.org/doi/full/10.1098/rsbl.2020.0899>

Current Biology

PAPERS

JACOB A. HARRIS, ROBERT BOYD & BRIAN M. WOOD – The role of causal knowledge in the evolution of traditional technology

Humans occupy a wider range of environments, process more energy, and have greater biomass than any other species because we are able to culturally evolve complex, locally adaptive technologies. Competing models make different predictions about the role of causal knowledge in this process. Some argue that innovation and transmission cannot occur without causal understanding, while others posit that complex technologies can evolve without causal understanding. Prior research on this topic has been restricted to theoretical work and experimental studies with student participants. The Hadza are foragers who rely on bows for subsistence. We interviewed skilled Hadza bowyers (bow-makers) and compared their beliefs regarding the tradeoffs in bow construction to those revealed by experimental and engineering research. If bowyers understand the tradeoffs, it is plausible that cultural evolution is rooted in causal understanding, while if they do not, the

cultural accumulation of knowledge is likely more important in the process. We show that Hadza bowyers understand some mechanical trade-offs but not others, and therefore the evolution of a complex, highly adaptive technology is possible with incomplete causal knowledge regarding key mechanical trade-offs. Instead, some important design choices made by subjects seem to reflect cultural norms. Although previously published reports have suggested that some individuals are recognized by the Hadza as being especially skilled or knowledgeable, our results do not indicate that some individuals are significantly more knowledgeable about bow-making than others, nor is there statistical evidence that causal knowledge increases with age.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00161-5?dgcid=raven_jbs_aip_email](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00161-5?dgcid=raven_jbs_aip_email)

GABRIELA MOCHOL, ROOZBEH KIANI & RUBÉN MORENO-BOTE – Prefrontal cortex represents heuristics that shape choice bias and its integration into future behavior

Goal-directed behavior requires integrating sensory information with prior knowledge about the environment. Behavioral biases that arise from these priors could increase positive outcomes when the priors match the true structure of the environment, but mismatches also happen frequently and could cause unfavorable outcomes. Biases that reduce gains and fail to vanish with training indicate fundamental suboptimalities arising from ingrained heuristics of the brain. Here, we report systematic, gain-reducing choice biases in highly trained monkeys performing a motion direction discrimination task where only the current stimulus is behaviorally relevant. The monkey's bias fluctuated at two distinct time scales: slow, spanning tens to hundreds of trials, and fast, arising from choices and outcomes of the most recent trials. Our findings enabled single trial prediction of biases, which influenced the choice especially on trials with weak stimuli. The pre-stimulus activity of neuronal ensembles in the monkey prearcuate gyrus represented these biases as an offset along the decision axis in the state space. This offset persisted throughout the stimulus viewing period, when sensory information was integrated, leading to a biased choice. The pre-stimulus representation of history-dependent bias was functionally indistinguishable from the neural representation of upcoming choice before stimulus onset, validating our model of single-trial biases and suggesting that pre-stimulus representation of choice could be fully defined by biases inferred from behavioral history. Our results indicate that the prearcuate gyrus reflects intrinsic heuristics that compute bias signals, as well as the mechanisms that integrate them into the oculomotor decision-making process.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00133-0?dgcid=raven_jbs_aip_email](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00133-0?dgcid=raven_jbs_aip_email)

Evolutionary Anthropology

PAPERS

DAVID R. BRAUN et al with NICHOLAS J. CONARD – Ecosystem engineering in the Quaternary of the West Coast of South Africa

Despite advances in our understanding of the geographic and temporal scope of the Paleolithic record, we know remarkably little about the evolutionary and ecological consequences of changes in human behavior. Recent inquiries suggest that human evolution reflects a long history of interconnections between the behavior of humans and their surrounding ecosystems (e.g., niche construction). Developing expectations to identify such phenomena is remarkably difficult because it requires understanding the multi-generational impacts of changes in behavior. These long-term dynamics require insights into the emergent phenomena that alter selective pressures over longer time periods which are not possible to observe, and are also not intuitive based on observations derived from ethnographic time scales. Generative models show promise for probing these potentially unexpected consequences of human-environment interaction. Changes in the uses of landscapes may have long term implications for the environments that hominins occupied. We explore other potential proxies of behavior and examine how modeling may provide expectations for a variety of phenomena.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21886?campaign=wolearlyview>

ELIZABETH G. VEATCH et al – Using niche construction theory to generate testable foraging hypotheses at Llang Bua

Niche construction theory (NCT) has emerged as a promising theoretical tool for interpreting zooarchaeological material. However, its juxtaposition against more established frameworks like optimal foraging theory (OFT) has raised important criticism around the testability of NCT for interpreting hominin foraging behavior. Here, we present an optimization foraging model with NCT features designed to consider the destructive realities of the archaeological record after providing a brief review of OFT and NCT. Our model was designed to consider a forager's decision to exploit an environment given predation risk, mortality, and payoff ratios between different ecologies, like more-open or more-forested environments. We then discuss how the model can be used with zooarchaeological data for inferring environmental exploitation by a primitive hominin, *Homo floresiensis*, from the island of Flores in Southeast Asia. Our example demonstrates that NCT can be used in combination with OFT principles to generate testable foraging hypotheses suitable for zooarchaeological research.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21884?campaign=woletoc>

JESSICA C. THOMPSON, DAVID K. WRIGHT & SARAH J. IVORY – The emergence and intensification of early hunter-gatherer niche construction

Hunter-gatherers, especially Pleistocene examples, are not well-represented in archeological studies of niche construction. However, as the role of humans in shaping environments over long time scales becomes increasingly apparent, it is critical to develop archeological proxies and testable hypotheses about early hunter-gatherer impacts. Modern foragers engage in

niche constructive behaviors aimed at maintaining or increasing the productivity of their environments, and these may have had significant ecological consequences over later human evolution. In some cases, they may also represent behaviors unique to modern *Homo sapiens*. Archeological and paleoenvironmental data show that African hunter-gatherers were niche constructors in diverse environments, which have legacies in how ecosystems function today. These can be conceptualized as behaviorally mediated trophic cascades, and tested using archeological and paleoenvironmental proxies. Thus, large-scale niche construction behavior is possible to identify at deeper time scales, and may be key to understanding the emergence of modern humans.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21877?campaign=woletoc>

RADU IOVITA et al – Operationalizing niche construction theory with stone tools

One of the greatest difficulties with evolutionary approaches in the study of stone tools (lithics) has been finding a mechanism for tying culture and biology in a way that preserves human agency and operates at scales that are visible in the archaeological record. The concept of niche construction, whereby organisms actively construct their environments and change the conditions for selection, could provide a solution to this problem. In this review, we evaluate the utility of niche construction theory (NCT) for stone tool archaeology. We apply NCT to lithics both as part of the “extended phenotype” and as residuals or precipitates of other niche-constructing activities, suggesting ways in which archaeologists can employ niche construction feedbacks to generate testable hypotheses about stone tool use. Finally, we conclude that, as far as its applicability to lithic archaeology, NCT compares favorably to other prominent evolutionary approaches, such as human behavioral ecology and dual-inheritance theory.

<https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21881?campaign=woletoc>

MICHAEL J. O'BRIEN & R. ALEXANDER BENTLEY – Genes, culture, and the human niche: An overview

The sharp distinction between biological traits and culturally based traits, which had long been standard in evolutionary approaches to behavior, was blurred in the early 1980s by mathematical models that allowed a co-dependent evolution of genetic transmission and cultural information. Niche-construction theory has since added another contrast to standard evolutionary theory, in that it views niche construction as a cause of evolutionary change rather than simply a product of selection. While offering a new understanding of the coevolution of genes, culture, and human behavior, niche-construction models also invoke multivariate causality, which require multiple time series to resolve. The empirical challenge lies in obtaining time-series data on causal pathways involved in the coevolution of genes, culture, and behavior. This is a significant issue in archeology, where time series are often sparse and causal behaviors are represented only by proxies in the material record.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21865?campaign=woletoc>

ELSPETH READY & MICHAEL HOLTON PRICE – Human behavioral ecology and niche construction

We examine the relationship between niche construction theory (NCT) and human behavioral ecology (HBE), two branches of evolutionary science that are important sources of theory in archeology. We distinguish between formal models of niche construction as an evolutionary process, and uses of niche construction to refer to a kind of human behavior. Formal models from NCT examine how environmental modification can change the selection pressures that organisms face. In contrast, formal models from HBE predict behavior assuming people behave adaptively in their local setting, and can be used to predict when and why people engage in niche construction. We emphasize that HBE as a field is much broader than foraging theory and can incorporate social and cultural influences on decision-making. We demonstrate how these approaches can be formally incorporated in a multi-inheritance framework for evolutionary research, and argue that archeologists can best contribute to evolutionary theory by building and testing models that flexibly incorporate HBE and NCT elements.

<https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21885?campaign=woletoc>

Frontiers in Psychology

PAPERS

JUDEE K. BURGOON et al – Nonverbal Behaviors “Speak” Relational Messages of Dominance, Trust, and Composure

Nonverbal signals color the meanings of interpersonal relationships. Humans rely on facial, head, postural, and vocal signals to express relational messages along continua. Three of relevance are dominance-submission, composure-nervousness and trust-distrust. Machine learning and new automated analysis tools are making possible a deeper understanding of the dynamics of relational communication. These are explored in the context of group interactions during a game entailing deception. The “messiness” of studying communication under naturalistic conditions creates many measurement and design obstacles that are discussed here. Possibilities for their mitigation are considered.

https://www.frontiersin.org/articles/10.3389/fpsyg.2021.624177/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1561928_69_Psycho_20210225_arts_A

MARTIN WEIß et al – We, Them, and It: Dictator Game Offers Depend on Hierarchical Social Status, Artificial Intelligence, and Social Dominance

We investigated the influence of social status on behavior in a modified dictator game (DG). Since the DG contains an inherent dominance gradient, we examined the relationship between dictator decisions and recipient status, which was

operationalized by three social identities and an artificial intelligence (AI). Additionally, we examined the predictive value of social dominance orientation (SDO) on the behavior of dictators toward the different social and non-social hierarchical recipients. A multilevel model analysis showed that recipients with the same status as the dictator benefited the most and the artificial intelligence the least. Furthermore, SDO, regardless of social status, predicted behavior toward recipients in such a way that higher dominance was associated with lower dictator offers. In summary, participants treated other persons of higher and lower status equally, those of equal status better and, above all, an algorithm worst. The large proportion of female participants and the limited variance of SDO should be taken into account with regard to the results of individual differences in SDO.

https://www.frontiersin.org/articles/10.3389/fpsyg.2020.541756/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1561928_69_Psycho_20210225_arts_A

TERRA EDWARDS & DIANE BRENTARI – The Grammatical Incorporation of Demonstratives in an Emerging Tactile Language

In this article, we analyze the grammatical incorporation of demonstratives in a tactile language, emerging in communities of DeafBlind signers in the US who communicate via reciprocal, tactile channels—a practice known as “protactile.” In the first part of the paper, we report on a synchronic analysis of recent data, identifying four types of “taps,” which have taken on different functions in protactile language and communication. In the second part of the paper, we report on a diachronic analysis of data collected over the past 8 years. This analysis reveals the emergence of a new kind of “propriotactic” tap, which has been co-opted by the emerging phonological system of protactile language. We link the emergence of this unit to both demonstrative taps, and backchanneling taps, both of which emerged earlier. We show how these forms are all undergirded by an attention-modulation function, more or less backgrounded, and operating across different semiotic systems. In doing so, we contribute not only to what is known about demonstratives in tactile languages, but also to what is known about the role of demonstratives in the emergence of new languages.

https://www.frontiersin.org/articles/10.3389/fpsyg.2020.579992/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1561928_69_Psycho_20210225_arts_A

Interface: Journal of the Royal Society

PAPERS

VALERIO CAPRARO & MATJAŽ PERC – Mathematical foundations of moral preferences

One-shot anonymous unselfishness in economic games is commonly explained by social preferences, which assume that people care about the monetary pay-offs of others. However, during the last 10 years, research has shown that different types of unselfish behaviour, including cooperation, altruism, truth-telling, altruistic punishment and trustworthiness are in fact better explained by preferences for following one's own personal norms—internal standards about what is right or wrong in a given situation. Beyond better organizing various forms of unselfish behaviour, this moral preference hypothesis has recently also been used to increase charitable donations, simply by means of interventions that make the morality of an action salient. Here we review experimental and theoretical work dedicated to this rapidly growing field of research, and in doing so we outline mathematical foundations for moral preferences that can be used in future models to better understand selfless human actions and to adjust policies accordingly. These foundations can also be used by artificial intelligence to better navigate the complex landscape of human morality.

<https://royalsocietypublishing.org/doi/full/10.1098/rsif.2020.0880>

WILLIAM CASEY, STEVEN E MASSEY & BUD MISHRA – How signalling games explain mimicry at many levels: from viral epidemiology to human sociology

Mimicry is exhibited in multiple scales, ranging from molecular, to organismal, and then to human society. ‘Batesian’-type mimicry entails a conflict of interest between sender and receiver, reflected in a deceptive mimic signal. ‘Müllerian’-type mimicry occurs when there is perfect common interest between sender and receiver in a particular type of encounter, manifested by an honest co-mimic signal. Using a signalling games approach, simulations show that invasion by Batesian mimics will make Müllerian mimicry unstable, in a coevolutionary chase. We use these results to better understand the deceptive strategies of SARS-CoV-2 and their key role in the COVID-19 pandemic. At the biomolecular level, we explain how cellularization promotes Müllerian molecular mimicry, and discourages Batesian molecular mimicry. A wide range of processes analogous to cellularization are presented; these might represent a manner of reducing oscillatory instabilities. Lastly, we identify examples of mimicry in human society that might be addressed using a signalling game approach.

<https://royalsocietypublishing.org/doi/full/10.1098/rsif.2020.0689>

Nature Scientific Reports

PAPERS

LEANDRO ZILIO et al – Examining Neanderthal and carnivore occupations of Teixoneres Cave (Moià, Barcelona, Spain) using archaeostratigraphic and Intra-site spatial analysis

Teixoneres Cave (Moià, Barcelona, Spain) is a reference site for Middle Palaeolithic studies of the Iberian Peninsula. The cave preserves an extensive stratigraphic sequence made up of eight units, which is presented in depth in this work. The main goal

of this study is to undertake an initial spatial examination of Unit III, formed during Marine Isotope Stage 3, with the aim of understanding spatial organization and past activities developed by Neanderthals and carnivores (bears, hyenas and smaller carnivores). The total sample analysed includes 38,244 archaeological items and 5888 limestone blocks. The application of GIS tools allows us to clearly distinguish three geologically-defined stratigraphic subunits. Unit III has been previously interpreted as a palimpsest resulting from alternating occupation of the cave by human groups and carnivores. The distribution study shows that faunal specimens, lithic artefacts, hearths and charcoal fragments are significantly concentrated at the entrance of the cave where, it is inferred, hominins carried out different activities, while carnivores preferred the sheltered zones in the inner areas of the cave. The results obtained reveal a spatial pattern characterized by fire use related zones, and show that the site was occupied by Neanderthals in a similar and consistent way throughout the > 7000 years range covered by the analysed subunits. This spatial pattern is interpreted as resulting from repeated short-term human occupations.

<https://www.nature.com/articles/s41598-021-83741-9>

New Scientist

NEWS

People can answer questions about their dreams without waking up

Talking to people while they are asleep can influence their dreams – and in some cases, the dreamer can respond without waking up.

<https://www.newscientist.com/article/2268496-people-can-answer-questions-about-their-dreams-without-waking-up/#ixzz6nWlgiHge>

Australia's oldest known rock art is a 17,000-year-old kangaroo

A life size kangaroo painted in red ochre around 17,300 years ago is Australia's oldest known rock art. This indicates that the earliest style of rock art in Australia focused on animals, similar to the early cave art found in Indonesia and Europe.

<https://www.newscientist.com/article/2268608-australias-oldest-known-rock-art-is-a-17000-year-old-kangaroo/#ixzz6nWly3Vvk>

ARTICLES

LAURA SPINNEY – The rise and fall of the mysterious culture that invented civilisation

AROUND 6200 years ago, farmers living on the eastern fringes of Europe, in what is now Ukraine, did something inexplicable. They left their Neolithic villages and moved into a sparsely inhabited area of forest and steppe. There, in an area roughly the size of Belgium between the modern cities of Kiev and Odessa, they congregated at new settlements up to 20 times the size of their old ones.

<https://www.newscientist.com/article/mg24933230-900-the-rise-and-fall-of-the-mysterious-culture-that-invented-civilisation/#ixzz6nWJl3FrQ>

Open Biology

PAPERS

NÚRIA ROS-ROCHER et al – The origin of animals: an ancestral reconstruction of the unicellular-to-multicellular transition

How animals evolved from a single-celled ancestor, transitioning from a unicellular lifestyle to a coordinated multicellular entity, remains a fascinating question. Key events in this transition involved the emergence of processes related to cell adhesion, cell–cell communication and gene regulation. To understand how these capacities evolved, we need to reconstruct the features of both the last common multicellular ancestor of animals and the last unicellular ancestor of animals. In this review, we summarize recent advances in the characterization of these ancestors, inferred by comparative genomic analyses between the earliest branching animals and those radiating later, and between animals and their closest unicellular relatives. We also provide an updated hypothesis regarding the transition to animal multicellularity, which was likely gradual and involved the use of gene regulatory mechanisms in the emergence of early developmental and morphogenetic plans. Finally, we discuss some new avenues of research that will complement these studies in the coming years.

<https://royalsocietypublishing.org/doi/full/10.1098/rsob.200359>

Philosophical Transactions of the Royal Society B

PAPERS

YOSHIHISA KASHIMA et al – Ideology, communication and polarization

Ideologically committed minds form the basis of political polarization, but ideologically guided communication can further entrench and exacerbate polarization depending on the structures of ideologies and social network dynamics on which cognition and communication operate. Combining a well-established connectionist model of cognition and a well-validated computational model of social influence dynamics on social networks, we develop a new model of ideological cognition and communication on dynamic social networks and explore its implications for ideological political discourse. In particular, we explicitly model ideologically filtered interpretation of social information, ideological commitment to initial opinion, and

communication on dynamically evolving social networks, and examine how these factors combine to generate ideologically divergent and polarized political discourse. The results show that ideological interpretation and commitment tend towards polarized discourse. Nonetheless, communication and social network dynamics accelerate and amplify polarization. Furthermore, when agents sever social ties with those that disagree with them (i.e. structure their social networks by homophily), even non-ideological agents may form an echo chamber and form a cluster of opinions that resemble an ideological group.

<https://royalsocietypublishing.org/doi/full/10.1098/rstb.2020.0133>

PLoS One

PAPERS

RAZIEL J. DAVISON & MICHAEL D. GURVEN – Human uniqueness? Life history diversity among small-scale societies and chimpanzees

Humans life histories have been described as “slow”, patterned by slow growth, delayed maturity, and long life span. While it is known that human life history diverged from that of a recent common chimpanzee-human ancestor some ~4–8 mya, it is unclear how selection pressures led to these distinct traits. To provide insight, we compare wild chimpanzees and human subsistence societies in order to identify the age-specific vital rates that best explain fitness variation, selection pressures and species divergence.

Chimpanzees’ earlier maturity and higher adult mortality drive species differences in population growth, whereas infant mortality and fertility variation explain differences between human populations. Human fitness is decoupled from longevity by postreproductive survival, while chimpanzees forfeit higher potential lifetime fertility due to adult mortality attrition. Infant survival is often lower among humans, but lost fitness is recouped via short birth spacing and high peak fertility, thereby reducing selection on infant survival. Lastly, longevity and delayed maturity reduce selection on child survival, but among humans, recruitment selection is unexpectedly highest in longer-lived populations, which are also faster-growing due to high fertility.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0239170>

JAMES BROOKS et al – Uniting against a common enemy: Perceived outgroup threat elicits ingroup cohesion in chimpanzees

Outgroup threat has been identified as an important driver of ingroup cohesion in humans, but the evolutionary origin of such a relationship is unclear. Chimpanzees (*Pan troglodytes*) in the wild are notably aggressive towards outgroup members but coordinate complex behaviors with many individuals in group hunting and border patrols. One hypothesis claims that these behaviors evolve alongside one another, where outgroup threat selects for ingroup cohesion and group coordination. To test this hypothesis, 5 groups of chimpanzees (N = 29 individuals) were observed after hearing either pant-hoots of unfamiliar wild chimpanzees or control crow vocalizations both in their typical daily environment and in a context of induced feeding competition. We observed a behavioral pattern that was consistent both with increased stress and vigilance (self-directed behaviors increased, play decreased, rest decreased) and increased ingroup cohesion (interindividual proximity decreased, aggression over food decreased, and play during feeding competition increased). These results support the hypothesis that outgroup threat elicits ingroup tolerance in chimpanzees. This suggests that in chimpanzees, like humans, competition between groups fosters group cohesion.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0246869>

PNAS

PAPERS

XUE-FENG SUN et al – Ancient DNA and multimethod dating confirm the late arrival of anatomically modern humans in southern China

The expansion of anatomically modern humans (AMHs) from Africa around 65,000 to 45,000 y ago (ca. 65 to 45 ka) led to the establishment of present-day non-African populations. Some paleoanthropologists have argued that fossil discoveries from Huanglong, Zhiren, Luna, and Fuyan caves in southern China indicate one or more prior dispersals, perhaps as early as ca. 120 ka. We investigated the age of the human remains from three of these localities and two additional early AMH sites (Yangjiapo and Sanyou caves, Hubei) by combining ancient DNA (aDNA) analysis with a multimethod geological dating strategy. Although U–Th dating of capping flowstones suggested they lie within the range ca. 168 to 70 ka, analyses of aDNA and direct AMS 14C dating on human teeth from Fuyan and Yangjiapo caves showed they derive from the Holocene. OSL dating of sediments and AMS 14C analysis of mammal teeth and charcoal also demonstrated major discrepancies from the flowstone ages; the difference between them being an order of magnitude or more at most of these localities. Our work highlights the surprisingly complex depositional history recorded at these subtropical caves which involved one or more episodes of erosion and redeposition or intrusion as recently as the late Holocene. In light of our findings, the first appearance datum for AMHs in southern China should probably lie within the timeframe set by molecular data of ca. 50 to 45 ka.

<https://www.pnas.org/content/118/8/e2019158118.abstract?etoc>

HADI MABOUDI et al – Non-numerical strategies used by bees to solve numerical cognition tasks

We examined how bees solve a visual discrimination task with stimuli commonly used in numerical cognition studies. Bees performed well on the task, but additional tests showed that they had learned continuous (non-numerical) cues. A network model using biologically plausible visual feature filtering and a simple associative rule was capable of learning the task using only continuous cues inherent in the training stimuli, with no numerical processing. This model was also able to reproduce behaviours that have been considered in other studies indicative of numerical cognition. Our results support the idea that a sense of magnitude may be more primitive and basic than a sense of number. Our findings highlight how problematic inadvertent continuous cues can be for studies of numerical cognition. This remains a deep issue within the field that requires increased vigilance and cleverness from the experimenter. We suggest ways of better assessing numerical cognition in non-speaking animals, including assessing the use of all alternative cues in one test, using cross-modal cues, analysing behavioural responses to detect underlying strategies, and finding the neural substrate.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2020.2711>

SHAY ROTICS & TIM CLUTTON-BROCK – Group size increases inequality in cooperative behaviour

In cooperatively breeding species where rearing effort is shared among multiple group members, increases in group size typically reduce average per capita contributions to offspring care by all group members (load-lightening) but it is not known how changes in group size affect the distribution of workload among group members. The socioeconomic collective action theory suggests that, in larger groups, the incentives for free riding are stronger, leading to greater inequalities in work division among group members. Here, we use the Gini index to measure inequality at the group level in the contributions of helpers to three different cooperative behaviours (babysitting, pup-provisioning and raised guarding) in groups of varying size in wild Kalahari meerkats (*Suricata suricatta*). In larger groups, inequality in helpers' contributions to cooperative activities and the frequency of free riding both increased. Elevated levels of inequality were generated partly as a result of increased differences in contributions to cooperative activities between helpers in different sex and age categories in larger groups. After controlling for the positive effect of group size on total provisioning, increasing levels of inequality in contributions were associated with reductions in total pup-provisioning conducted by the group. Reductions in total pup-provisioning were, in turn, associated with reductions in the growth and survival of pups (but pup growth and survival were not directly affected by inequality in provisioning). Our results support the prediction of collective action theory described above and show how the Gini index can be used to investigate the distribution of cooperative behaviour within the group.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2020.2104>

FLÁVIO L. PINHEIRO, JORGE M. PACHECO & FRANCISCO C. SANTOS – Stable leaders pave the way for cooperation under time-dependent exploration rates

The exploration of different behaviours is part of the adaptation repertoire of individuals to new environments. Here, we explore how the evolution of cooperative behaviour is affected by the interplay between exploration dynamics and social learning, in particular when individuals engage on prisoner's dilemma along the edges of a social network. We show that when the population undergoes a transition from strong to weak exploration rates a decline in the overall levels of cooperation is observed. However, if the rate of decay is lower in highly connected individuals (Leaders) than for the less connected individuals (Followers) then the population is able to achieve higher levels of cooperation. Finally, we show that minor differences in selection intensities (the degree of determinism in social learning) and individual exploration rates, can translate into major differences in the observed collective dynamics.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.200910>

ALBA MOTES-RODRIGO et al with JOSEP CALL – Evaluating the influence of action- and subject-specific factors on chimpanzee action copying

The ability to imitate has been deemed crucial for the emergence of human culture. Although non-human animals also possess culture, the acquisition mechanisms underlying behavioural variation between populations in other species is still under debate. It is especially controversial whether great apes can spontaneously imitate. Action- and subject-specific factors have been suggested to influence the likelihood of an action to be imitated. However, few studies have jointly tested these hypotheses. Just one study to date has reported spontaneous imitation in chimpanzees (Persson et al. 2017 *Primates* 59, 19–29), although important methodological limitations were not accounted for. Here, we present a study in which we (i) replicate the above-mentioned study addressing their limitations in an observational study of human–chimpanzee imitation; and (ii) aim to test the influence of action- and subject-specific factors on action copying in chimpanzees by providing human demonstrations of multiple actions to chimpanzees of varying rearing background. To properly address our second aim, we conducted a preparatory power analysis using simulated data. Contrary to Persson et al.'s study, we found extremely low rates of spontaneous chimpanzee imitation and we did not find enough cases of action matching to be able to apply our

planned model with sufficient statistical power. We discuss possible factors explaining the lack of observed action matching in our experiments compared with previous studies.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.200228>

Z. V. J. WOODHEAD et al with D. V. M. BISHOP – An updated investigation of the multidimensional structure of language lateralization in left- and right-handed adults: a test–retest functional transcranial Doppler sonography study with six language tasks

A previous study we reported in this journal suggested that left and right-handers may differ in their patterns of lateralization for different language tasks (Woodhead et al. 2019 R. Soc. Open Sci.6, 181801. (doi:10.1098/rsos.181801)). However, it had too few left-handers (N = 7) to reach firm conclusions. For this update paper, further participants were added to the sample to create separate groups of left- (N = 31) and right-handers (N = 43). Two hypotheses were tested: (1) that lateralization would be weaker at the group level in left-than right-handers; and (2) that left-handers would show weaker covariance in lateralization between tasks, supporting a two-factor model. All participants performed the same protocol as in our previous paper: lateralization was measured using functional transcranial Doppler sonography during six different language tasks, on two separate testing sessions. The results supported hypothesis 1, with significant differences in laterality between groups for four out of six tasks. For hypothesis 2, structural equation modelling showed that there was stronger evidence for a two-factor model in left than right-handers; furthermore, examination of the factor loadings suggested that the pattern of laterality across tasks may also differ between handedness groups. These results expand on what is known about the differences in laterality between left- and right-handers.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.200696>

Science Advances

PAPERS

THOMAS C. PRANG et al – Ardipithecus hand provides evidence that humans and chimpanzees evolved from an ancestor with suspensory adaptations

The morphology and positional behavior of the last common ancestor of humans and chimpanzees are critical for understanding the evolution of bipedalism. Early 20th century anatomical research supported the view that humans evolved from a suspensory ancestor bearing some resemblance to apes. However, the hand of the 4.4-million-year-old hominin *Ardipithecus ramidus* purportedly provides evidence that the hominin hand was derived from a more generalized form. Here, we use morphometric and phylogenetic comparative methods to show that *Ardipithecus* retains suspensory adapted hand morphologies shared with chimpanzees and bonobos. We identify an evolutionary shift in hand morphology between *Ardipithecus* and *Australopithecus* that renews questions about the coevolution of hominin manipulative capabilities and obligate bipedalism initially proposed by Darwin. Overall, our results suggest that early hominins evolved from an ancestor with a varied positional repertoire including suspension and vertical climbing, directly affecting the viable range of hypotheses for the origin of our lineage.

https://advances.sciencemag.org/content/7/9/eabf2474?utm_campaign=toc_advances_2021-02-26&et rid=17774313&et cid=3680819

EDWIN J. C. VAN LEEUWEN ET AL WITH JOSEP CALL – Chimpanzees behave prosocially in a group-specific manner

Chimpanzees act cooperatively in the wild, but whether they afford benefits to others, and whether their tendency to act prosocially varies across communities, is unclear. Here, we show that chimpanzees from neighboring communities provide valuable resources to group members at personal cost, and that the magnitude of their prosocial behavior is group specific. Provided with a resource-donation experiment allowing free (partner) choice, we observed an increase in prosocial acts across the study period in most of the chimpanzees. When group members could profit (test condition), chimpanzees provided resources more frequently and for longer durations than when their acts produced inaccessible resources (control condition). Strikingly, chimpanzees' prosocial behavior was group specific, with more socially tolerant groups acting more prosocially. We conclude that chimpanzees may purposely behave prosocially toward group members, and that the notion of group-specific sociality in nonhuman animals should crucially inform discussions on the evolution of prosocial behavior.

https://advances.sciencemag.org/content/7/9/eabc7982?utm_campaign=toc_advances_2021-02-26&et rid=17774313&et cid=3680819

Trends in Cognitive Sciences

ARTICLES

ALICE PAILHÈS & GUSTAV KUHN – Mind Control Tricks: Magicians' Forcing and Free Will

A new research program has recently emerged that investigates magicians' mind control tricks, also called forces. This research highlights the psychological processes that underpin decision-making, illustrates the ease by which our decisions can be covertly influenced, and helps answer questions about our sense of free will and agency over choices.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(21\)00032-2?dgcid=raven_jbs_aip_email](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00032-2?dgcid=raven_jbs_aip_email)

Trends in Neurosciences

PAPERS

RICHARD RAMSEY, DAVID M. KAPLAN & EMILY S. CROSS – Watch and Learn: The Cognitive Neuroscience of Learning from Others' Actions

The mirror neuron system has dominated understanding of observational learning from a cognitive neuroscience perspective. Our review highlights the value of observational learning frameworks that integrate a more diverse and distributed set of cognitive and brain systems, including those implicated in sensorimotor transformations, as well as in more general processes such as executive control, reward, and social cognition. We argue that understanding how observational learning occurs in the real world will require neuroscientific frameworks that consider how visuomotor processes interface with more general aspects of cognition, as well as how learning context and action complexity shape mechanisms supporting learning from watching others.

[https://www.cell.com/trends/neurosciences/fulltext/S0166-2236\(21\)00020-5?dgcid=raven_jbs_aip_email](https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(21)00020-5?dgcid=raven_jbs_aip_email)

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