

CONTENTS

EAORC NOTICES.....	2
PUBLICATION ALERTS.....	2
ACADEMIA.EDU – Expression: Acts, Products, and Meaning.....	2
DORIT BAR-ON – Expression: Acts, Products, and Meaning.....	2
ACADEMIA.EDU – Doing with less: Hominin brain atrophy.....	3
ROBERT G. BEDNARIK – Doing with less: Hominin brain atrophy.....	3
ACADEMIA.EDU – Reading: How Readers Beget Imagining.....	3
SARAH BRO TRASMUNDI & STEPHEN J. COWLEY – Reading: How Readers Beget Imagining.....	3
RESEARCHGATE – The aboutness of language and the evolution of the construction-ready brain.....	3
MICHAEL A. ARBIB – The aboutness of language and the evolution of the construction-ready brain.....	3
OTHER EAORC – Why EAORC does not pay much attention to AI (but we will one day.....)	3
NEWS.....	4
BREAKING SCIENCE – First People to Settle in Americas were Accompanied by Their Dogs.....	4
BREAKING SCIENCE – Sleep Starts Later and is Shorter on Nights before Full Moon.....	4
BREAKING SCIENCE – Naked Mole-Rats Have Colony-Specific Dialects, New Study Shows.....	4
SAPIENS – Bioanthropology and teeth.....	4
SCIENCE DAILY – Stimulating brain pathways shows origins of human language and memory.....	4
SCIENCE DAILY – Women influenced coevolution of dogs and humans.....	4
SCIENCE DAILY – Pace of prehistoric human innovation could be revealed by 'linguistic thermometer'.....	4
SCIENCE DAILY – Brain activity during speaking varies between simple and complex grammar.....	4
SCIENCE NEWS – Ice age Siberian hunters may have domesticated dogs 23,000 years ago.....	5
SCIENCE NEWS – Humans were drinking milk before they could digest it.....	5
SCIENCE NEWS – Naked mole-rat colonies have their own dialects—selected by their monarch.....	5
SCIENCE NEWS – Your amazing thumb is about 2 million years old.....	5
PUBLICATIONS.....	5
Animal Behaviour.....	5
PAPERS.....	5
CLAUDIA MARTIN, GUY COWLISH & ALECIA J.CARTER – Individual differences in task participation in wild chacma baboons.....	5
Current Biology.....	6
PAPERS.....	6
FOTIOS ALEXANDROS KARAKOSTIS et al with KATERINA HARVATI – Biomechanics of the human thumb and the evolution of dexterity.....	6
Evolutionary Anthropology.....	6
PAPERS.....	6
RADU IOVITA et al – Operationalizing niche construction theory with stone tools.....	6
Interface: Journal of the Royal Society.....	6
PAPERS.....	6
MARCOS PIZARRO-MONZO et al – Do human butchery patterns exist? A study of the interaction of randomness and channelling in the distribution of cut marks on long bones.....	6
CHEN SHEN et al – Exit rights open complex pathways to cooperation.....	6
Mind & Language.....	7
PAPERS.....	7
PETER GODFREY-SMITH – Integration, lateralization, and animal experience.....	7
HENRY SHEVLIN – Non-human consciousness and the specificity problem: A modest theoretical proposal.....	7
Nature.....	7
PAPERS.....	7
MOHSEN JAMALI et al – Single-neuronal predictions of others' beliefs in humans.....	7
Nature Ecology & Evolution.....	7
PAPERS.....	7
STUART A. WEST et al – Ten recent insights for our understanding of cooperation.....	7
Nature Humanities & Social Sciences Communications.....	7
PAPERS.....	7

MICHAEL BOISSONNEAULT & PAUL VOGT – A systematic and interdisciplinary review of mathematical models of language competition	7
Nature Scientific Reports.....	8
PAPERS	8
AMELIA BURROUGHS, NINA KAZANINA & CONOR HOUGHTON – Grammatical category and the neural processing of phrases	8
CLAUDIA FUGAZZA et al – Rapid learning of object names in dogs	8
TIMOTHY M. KISTNER et al with DANIEL E. LIEBERMAN – Geometric morphometric investigation of craniofacial morphological change in domesticated silver foxes.....	8
New Scientist	9
NEWS	9
Was it just luck that our species survived and the Denisovans didn't?	9
ARTICLES	9
MICHAEL MARSHALL – The other humans: The emerging story of the mysterious Denisovans.....	9
CAROLINE WILLIAMS – Gaslighting warps our view of reality. How to spot it – and fight back.....	9
Philosophical Transactions of the Royal Society B	9
PAPERS	9
PAMELA LYON & FRANZ KUCHLING – Valuing what happens: a biogenic approach to valence and (potentially) affect	9
WILLIAM BECHTEL & LEONARDO BICH – Grounding cognition: heterarchical control mechanisms in biology	9
PLoS Biology.....	10
PAPERS	10
SEBASTIAN SAUPPE et al – Neural signatures of syntactic variation in speech planning	10
Proceedings of the Royal Society B.....	10
PAPERS	10
KAREN L. BAAB – Reconstructing cranial evolution in an extinct hominin	10
HANS RUTGER BOSKER & DAVID PEETERS – Beat gestures influence which speech sounds you hear.....	10
Royal Society Open Science.....	10
PAPERS	10
JULIA OSTNER, JANA WILKEN & OLIVER SCHÜLKE – Social contagion of affiliation in female macaques	10
NICO NEUREITER et al – Can Bayesian phylogeography reconstruct migrations and expansions in linguistic evolution?	11
SOPHIE VAN DER ZEE et al – A liar and a copycat: nonverbal coordination increases with lie difficulty	11
Science.....	11
ARTICLES	11
DAVID GRIMM – Siberia may be long-sought site of dog domestication	11
ROCHELLE BUFFENSTEIN – Colony-specific dialects of naked mole-rats	11
PAPERS	12
ALISON J. BARKER et al – Cultural transmission of vocal dialect in the naked mole-rat.....	12
Science Advances.....	12
PAPERS	12
LEANDRO CASIRAGHI et al – Moonstruck sleep: synchronization of human sleep with the moon cycle under field conditions.....	12
HELFRICH-FÖRSTER et al – Women temporarily synchronize their menstrual cycles with the luminance and gravimetric cycles of the Moon.....	12
SUBSCRIBE to the EAORC Bulletin	12
UNSUBSCRIBE from the EAORC Bulletin	12
PRODUCED BY AND FOR THE EAORC EMAIL GROUP	12

EAORC 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 – Expression: Acts, Products, and Meaning

In Steven Gross, Nicholas Tebben, and Michael Williams (eds.), Meaning Without Representation: Essays on Truth, Expression, Normativity, and Naturalism. Oxford University Press: Oxford, UK, 180-209 (2015).

DORIT BAR-ON – Expression: Acts, Products, and Meaning

The notion of expression is used in a number of seemingly unrelated contexts and ways. Poems, paintings, and pieces of music are often said to be expressive of various emotions, there is expressionism in art, and varieties of expressivism in philosophy. People, as well as nonhuman animals, are often said to be expressing affective states such as fear, anger, wants; people are said, in addition, to express feelings, emotions and sentiments, attitudes, intentions, opinions, even selves. Groups of individuals (a corporation, an administration), too, are said to express sentiments, attitudes, and intentions. In a

different vein, we also speak of sentences as expressing propositions, words as expressing concepts, and essays as expressing ideas. Expression is a notion in prevalent use, but one that has received surprisingly little direct theoretical attention.

https://www.academia.edu/3146461/Origins_of_Meaning_Must_We_Go_Gricean?email_work_card=view-paper

ACADEMIA.EDU – Doing with less: Hominin brain atrophy

HOMO – Journal of Comparative Human Biology 65 (2014) 433-449.

ROBERT G. BEDNARIK – Doing with less: Hominin brain atrophy

In contrast to hominin encephalization, the final Pleistocene and Holocene reduction in cranial volume has attracted very little attention and remains unexplained. Here it is examined in the light of current neuroscientific and archaeological understanding, and it is shown that the most parsimonious explanation is via the domestication hypothesis of recent humans. Accordingly, rapid atrophy of the brain is partly explained by the culturally based process of sexual selection, first detectable in late robust *Homo sapiens* perhaps 40,000 years ago. Furthermore it is suggested that this deleterious process of neotenzation and brain atrophy was compensated for by the concurrent development of exograms, i.e. means of storing memory outside the brain. Consequently most of human memory and cultural information is now stored external to the brain, which has altered that organ significantly and facilitated a cultural complexity that would be impossible to maintain by biological memory alone. The escalating use of exograms, neotenzation and reduction in cranial volume all appear to co-occur with numerous other changes to the human genome.

https://www.academia.edu/14094530/Doing_with_less_hominin_brain_atrophy?email_work_card=view-paper

ACADEMIA.EDU – Reading: How Readers Beget Imagining

Frontiers in Psychology, 11:531682, 2020.

SARAH BRO TRASMUNDI & STEPHEN J. COWLEY – Reading: How Readers Beget Imagining

We trace reading to an embodied synthetic process that drives the rapid scales of imagining. As sensorimotor engagement with written artifacts permeates experience, it sharpens the sensibility that brings forth understanding. We thus trace material engagement with written artifacts to fine control over saccadic eye movements and voicing that draws on humans or what the Greeks knew as aisthesis. In reading, we identify aisthesis in how prereflective judgments punctuate the flow of engagement with written documents. While the study of reading often begins with “texts,” we start with how written artifacts are put to use. We use cognitive ethnography to trace reading to how fine multiscale coordination enables readers to engage with written artifacts such as books. Our ethnography of reading provides descriptions of how readers use sensorimotor activity to integrate understanding with saccading and actual or imagined vocalization in ways that show how reading connects sensorimotor schemata with highly skilled use of written artifacts. By pursuing the power of rapid multiscale dynamics, we complement views of reading as slow-scale subjective experience. Rather than focus on interaction between a reader and an imagined author, we turn to coordinating with an affordance-rich environment. Human prereflective judgments demonstrably use collective experience with written signs. In fine-grained analysis of authentic data, we therefore track kinesthetic experience to how a child’s vocalizations beget understanding and, at once, imagining. These observations show how engagement brings life to written signs by connecting other peoples’ pasts with the use of gaze, gesture, voice, and touch. While describing saccades and bursts of vocalizing, we reach beyond analogies with interaction and, in so doing, the multiscale approach takes enactive-ecological work beyond the slow interactional and social scales or reported experience. Imagining arises as readers use multiscale happenings to bind the anticipated, the seen, and collective aspects of experience.

https://www.academia.edu/45005164/Reading_How_Readers_Beget_Imagining?email_work_card=view-paper

RESEARCHGATE – The aboutness of language and the evolution of the construction-ready brain

In The Oxford Handbook of Symbolic Evolution. A. Lock, C. Sinha & N. Gonthier, Eds. Oxford: Oxford University Press.

MICHAEL A. ARBIB – The aboutness of language and the evolution of the construction-ready brain

The chapter presents the hypothesis that early *Homo sapiens* were language-ready in the sense that they had brains that could have supported language had it already been developed, but were not yet language-using. Informed by data from comparative neuroprimateology, the approach sees protolanguage emerging from complex recognition and imitation of manual skills via biocultural evolution, while cultural evolution alone supported the emergence of language from protolanguage. This approach supports the view that the *Homo sapiens* language-ready brain had the more general property of being construction-ready, and that this made possible the emergence of drawing and painting through later cultural evolution.

https://www.researchgate.net/publication/348789739_2021_Chapter_-_Oxford_Handbook_of_Human_Symbolic_Evolution_Revised_01-21

OTHER EAORC – Why EAORC does not pay much attention to AI (but we will one day...)

Two emails. The first received yesterday:

You wrote the paper “The Smoke and Mirrors of Linguistics: Challenging the hidden metaphors”. A related paper is available on Academia: “The cognitive ability of birds”.

The second email received this morning:

Stephen Llano just published "The Relationship between Facts, Debate, and Education" in Academia Letters. You previously read a related paper, "The cognitive ability of birds".

NEWS

BREAKING SCIENCE – First People to Settle in Americas were Accompanied by Their Dogs

A new study, published in the Proceedings of the National Academy of Sciences, suggests that dogs were domesticated in Siberia by 23,000 years ago, possibly while both people and wolves were isolated during the harsh climate of the most recent Ice Age; dogs then accompanied the first people into the Americas and traveled with them.

http://feedproxy.google.com/~r/BreakingScienceNews/~3/6Hp8_9ltyj0/first-people-americas-dogs-09293.html?utm_source=feedburner&utm_medium=email

BREAKING SCIENCE – Sleep Starts Later and is Shorter on Nights before Full Moon

Before the availability of artificial light, moonlight was the only source of light sufficient to stimulate nighttime activity; still, evidence for the modulation of sleep timing by lunar phases is controversial. A new study, led by the University of Washington, shows a clear synchronization of nocturnal sleep timing with the lunar cycle in participants living in environments that range from a rural setting with and without access to electricity in indigenous communities in northern Argentina to Seattle, a highly urbanized postindustrial setting in the United States.

http://feedproxy.google.com/~r/BreakingScienceNews/~3/5hbveiLHDrU/human-sleep-lunar-cycle-synchronization-09297.html?utm_source=feedburner&utm_medium=email

BREAKING SCIENCE – Naked Mole-Rats Have Colony-Specific Dialects, New Study Shows

Naked mole-rats (*Heterocephalus glaber*) form some of the most cooperative groups in the animal kingdom, living in multigenerational colonies under the control of a single breeding queen. Little is known about how individuals within these colonies navigate the many interactions that must occur in such a complex cooperative group.

http://feedproxy.google.com/~r/BreakingScienceNews/~3/9bmZB5QCvCk/naked-mole-rats-colony-specific-dialects-09302.html?utm_source=feedburner&utm_medium=email

SAPIENS – Bioanthropology and teeth

New research is overturning long-held assumptions about tooth enamel and human diversity.

<https://sapiens.us11.list-manage.com/track/click?u=80f6cf678900daf984bf763b7&id=26f5594c0d&e=dc0eff6180>

SCIENCE DAILY – Stimulating brain pathways shows origins of human language and memory

Scientists have identified that the evolutionary development of human and primate brains may have been similar for communication and memory.

<https://www.sciencedaily.com/releases/2021/01/210125113202.htm>

SCIENCE DAILY – Women influenced coevolution of dogs and humans

A cross-cultural analysis found several factors may have played a role in building the relationship between humans and dogs, including temperature, hunting and surprisingly - gender. The analysis used ethnographic information from 144 traditional, subsistence-level societies from all over the globe. People were more likely to regard dogs as a type of person if the dogs had a special relationship with women -- such as having names and being treated as family.

<https://www.sciencedaily.com/releases/2021/01/210125094057.htm>

SCIENCE DAILY – Pace of prehistoric human innovation could be revealed by 'linguistic thermometer'

A physics professor has joined forces with language experts to build a 'linguistic thermometer' that can record the temperature of 'hot' or 'cold' (ie fast or slow) developments in modern linguistic features to create a computer-based model that can provide a better understanding of the development in human language and innovation stretching back to pre-history.

<https://www.sciencedaily.com/releases/2021/01/210127085222.htm>

SCIENCE DAILY – Brain activity during speaking varies between simple and complex grammar

Some languages require less neural activity than others. But these are not necessarily the ones we would imagine.

Researchers have shown that languages that are often considered 'easy' actually require an enormous amount of work from our brains.

<https://www.sciencedaily.com/releases/2021/01/210127122402.htm>

SCIENCE NEWS – Ice age Siberian hunters may have domesticated dogs 23,000 years ago

Sometime toward the end of the last ice age, a group of humans armed with stone-tipped spears stalked their prey in the bitter cold of northeastern Siberia, tracking bison and woolly mammoths across a vast, grassy landscape. Beside them ran wolflike creatures, more docile than their ancestors and remarkably willing to help their primate companions hunt down prey and drag it back to camp. These were the world's first dogs. Their descendants flowed both west and east, populating Eurasia as well as accompanying the ancestors of Native Americans as they spread into the Americas.

https://www.sciencemag.org/news/2021/01/ice-age-siberian-hunters-may-have-domesticated-dogs-23000-years-ago?utm_campaign=news_daily_2021-01-25&et rid=17774313&et cid=3642808

SCIENCE NEWS – Humans were drinking milk before they could digest it

Our history with milk presents a chicken-or-egg conundrum: Humans couldn't digest the beverage before they evolved mutations that helped them do so, yet they had to already be consuming milk to change their DNA. "There's always been the question of which came first," says University of Pennsylvania geneticist Sarah Tishkoff. "The cultural practice or the mutation."

https://www.sciencemag.org/news/2021/01/humans-were-drinking-milk-they-could-digest-it?utm_campaign=news_daily_2021-01-27&et rid=17774313&et cid=3645689

SCIENCE NEWS – Naked mole-rat colonies have their own dialects—selected by their monarch

The naked mole-rat may not be the most attractive rodent on the block, but it's still a social butterfly. These hairless, mostly blind and deaf animals live in colonies of up to 300 individuals, which communicate with high-pitched squeaks. Now, researchers have discovered that, like humans and many birds, mole-rat communities have their own dialect, which is kept alive by their queen.

https://www.sciencemag.org/news/2021/01/all-hail-queen-naked-mole-rat-colonies-have-their-own-dialects-selected-their-monarch?utm_campaign=news_daily_2021-01-28&et rid=17774313&et cid=3647089

SCIENCE NEWS – Your amazing thumb is about 2 million years old

The human thumb is a nimble wonder, allowing us to make tools, sew clothing, and open pickle jars. But just how and when this unique digit evolved has long been a mystery. Now, a new study modeling muscle in fossilized thumbs suggests about 2 million years ago, our ancient ancestors evolved a uniquely dexterous appendage while our other close relatives remained ... all thumbs.

https://www.sciencemag.org/news/2021/01/your-amazing-thumb-about-2-million-years-old?utm_campaign=news_daily_2021-01-28&et rid=17774313&et cid=3647089

PUBLICATIONS

Animal Behaviour

PAPERS

CLAUDIA MARTIN, GUY COWLISH & ALECIA J. CARTER – Individual differences in task participation in wild chacma baboons

Despite the controlled testing conditions that are typical of captive environments, many evaluations of animal cognition fail to ensure that all tested individuals participate. This is even more evident under wild conditions, as animals are not restricted in their movement or social interactions and have other activities available. In this study, we aimed to understand variation in cognitive task participation in wild chacma baboons, *Papio ursinus*. We quantified individual differences in the latency and likelihood to approach and explore two types of stimuli for two cognitive tests: a set of coloured paper bags (in an associative learning test) and a blue cardboard square (in a second-order conditioning test). We evaluated whether participation in each task was predicted by individuals' phenotypic traits/states, as well as by two additional aspects of their behaviour: (1) the availability of competing activities at the time of testing and (2) their propensity to exploit social information. We found consistent results for both types of stimuli regarding the effect of age: juveniles were more likely to contact the stimuli and explore them for longer. Similarly, for both tasks, individuals involved in an activity at the time of testing were less likely to contact the stimuli and had a lower exploration time. Finally, juveniles and females with a high propensity to use social information (i.e. scrounge) were more likely, and had shorter latencies, to contact the paper bags. Our findings not only highlight the potential bias cognitive studies conducted in the wild can have, but also some of the individual attributes and external factors that determine task participation.

https://www.sciencedirect.com/science/article/abs/pii/S000334722030350X?dgcid=raven_sd_via_email

Current Biology

PAPERS

FOTIOS ALEXANDROS KARAKOSTIS et al with KATERINA HARVATI – Biomechanics of the human thumb and the evolution of dexterity

Systematic tool production and use is one of humanity's defining characteristics, possibly originating as early as >3 million years ago. Although heightened manual dexterity is considered to be intrinsically intertwined with tool use and manufacture, and critical for human evolution, its role in the emergence of early culture remains unclear. Most previous research on this question exclusively relied on direct morphological comparisons between early hominin and modern human skeletal elements, assuming that the degree of a species' dexterity depends on its similarity with the modern human form. Here, we develop a new approach to investigate the efficiency of thumb opposition, a fundamental component of manual dexterity, in several species of fossil hominins. Our work for the first time takes into account soft tissue as well as bone anatomy, integrating virtual modeling of *musculus opponens pollicis* and its interaction with three-dimensional bone shape form. Results indicate that a fundamental aspect of efficient thumb opposition appeared approximately 2 million years ago, possibly associated with our own genus *Homo*, and did not characterize *Australopithecus*, the earliest proposed stone tool maker. This was true also of the late *Australopithecus* species, *Australopithecus sediba*, previously found to exhibit human-like thumb proportions. In contrast, later *Homo* species, including the small-brained *Homo naledi*, show high levels of thumb opposition dexterity, highlighting the increasing importance of cultural processes and manual dexterity in later human evolution.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(20\)31893-5?dgcid=raven_jbs_aip_email](https://www.cell.com/current-biology/fulltext/S0960-9822(20)31893-5?dgcid=raven_jbs_aip_email)

Evolutionary Anthropology

PAPERS

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=wolearlyview>

Interface: Journal of the Royal Society

PAPERS

MARCOS PIZARRO-MONZO et al – Do human butchery patterns exist? A study of the interaction of randomness and channelling in the distribution of cut marks on long bones

Bone surface modifications (BSMs) in faunal assemblages are frequently used to infer past agency and actions of hominins and carnivores, with implications for the emergence of key human behaviours. Patterning of BSMs has mostly been defined as a combination of the intensity of marks per bone portion and sometimes per element. Numerous variables involved in butchery can condition cut mark anatomical distribution, so much so that these variables are widely assumed to be stochastic. Here, we present a new methodological approach using a novel geospatial tool (Ikhnos) which combines the three-dimensional spatial documentation of cut mark patterns with spatial statistics based on wavelets, applied to three experimental and ethnoarchaeological faunal assemblages. We use wavelets to identify patterning of multiple longitudinal series of cut mark distributions on bones, and to establish similarities or differences in patterning within and across different assemblages. This method demonstrates the existence of general and behaviour-specific butchery patterns. It can also be used to effectively assess the proportion of mark clustering that is due to randomness, versus that which is conditioned by the butchery process.

<https://royalsocietypublishing.org/doi/full/10.1098/rsif.2020.0958>

CHEN SHEN et al – Exit rights open complex pathways to cooperation

We study the evolutionary dynamics of the Prisoner's Dilemma game in which cooperators and defectors interact with another actor type called exiters. Rather than being exploited by defectors, exiters exit the game in favour of a small pay-off. We find that this simple extension of the game allows cooperation to flourish in well-mixed populations when iterations or reputation are added. In networked populations, however, the exit option is less conducive to cooperation. Instead, it enables the coexistence of cooperators, defectors, and exiters through cyclic dominance. Other outcomes are also possible as the exit pay-off increases or the network structure changes, including network-wide oscillations in actor abundances that may cause the extinction of exiters and the domination of defectors, although game parameters should favour exiting. The

complex dynamics that emerges in the wake of a simple option to exit the game implies that nuances matter even if our analyses are restricted to incentives for rational behaviour.

<https://royalsocietypublishing.org/doi/full/10.1098/rsif.2020.0777>

Mind & Language

PAPERS

PETER GODFREY-SMITH – Integration, lateralization, and animal experience

Many vertebrate animals approximate, to various degrees, the “split-brain” condition that results from surgery done in humans to treat severe epilepsy, with very limited connection between the left and right sides of the upper parts of the brain. The split-brain condition has been the topic of extensive philosophical discussion, because it appears, in some circumstances, to give rise to two minds within one body. Is the same true of these animals? This article attempts to make progress on two difficult topics—animal experience, and the consequences of the human split-brain condition—by considering both at once.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12323?campaign=wolearlyview>

HENRY SHEVLIN – Non-human consciousness and the specificity problem: A modest theoretical proposal

Most scientific theories of consciousness are challenging to apply outside the human case insofar as non-human systems (both biological and artificial) are unlikely to implement human architecture precisely, an issue I call the specificity problem. After providing some background on the theories of consciousness debate, I survey the prospects of four approaches to this problem. I then consider a fifth solution, namely the theory-light approach proposed by Jonathan Birch. I defend a modified version of this that I term the modest theoretical approach, arguing that it may provide insights into challenging cases that would otherwise be intractable.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12338?campaign=wolearlyview>

Nature

PAPERS

MOHSEN JAMALI et al – Single-neuronal predictions of others’ beliefs in humans

Human social behaviour crucially depends on our ability to reason about others. This capacity for theory of mind has a vital role in social cognition because it enables us not only to form a detailed understanding of the hidden thoughts and beliefs of other individuals but also to understand that they may differ from our own^{1,2,3}. Although a number of areas in the human brain have been linked to social reasoning^{4,5} and its disruption across a variety of psychosocial disorders^{6,7,8}, the basic cellular mechanisms that underlie human theory of mind remain undefined. Here, using recordings from single cells in the human dorsomedial prefrontal cortex, we identify neurons that reliably encode information about others’ beliefs across richly varying scenarios and that distinguish self- from other-belief-related representations. By further following their encoding dynamics, we show how these cells represent the contents of the others’ beliefs and accurately predict whether they are true or false. We also show how they track inferred beliefs from another’s specific perspective and how their activities relate to behavioural performance. Together, these findings reveal a detailed cellular process in the human dorsomedial prefrontal cortex for representing another’s beliefs and identify candidate neurons that could support theory of mind.

<https://www.nature.com/articles/s41586-021-03184-0>

Nature Ecology & Evolution

PAPERS

STUART A. WEST et al – Ten recent insights for our understanding of cooperation

Since Hamilton published his seminal papers in 1964, our understanding of the importance of cooperation for life on Earth has evolved beyond recognition. Early research was focused on altruism in the social insects, where the problem of cooperation was easy to see. In more recent years, research into cooperation has expanded across the entire tree of life, and has been revolutionized by advances in genetic, microbiological and analytical techniques. We highlight ten insights that have arisen from these advances, which have illuminated generalizations across different taxa, making the world simpler to explain. Furthermore, progress in these areas has opened up numerous new problems to solve, suggesting exciting directions for future research.

<https://www.nature.com/articles/s41559-020-01384-x>

Nature Humanities & Social Sciences Communications

PAPERS

MICHAEL BOISSONNEAULT & PAUL VOGT – A systematic and interdisciplinary review of mathematical models of language competition

During the last three decades, scientists in formal and natural sciences have been proposing models of language competition. Such models could prove instrumental in informing efforts made towards preserving the world’s linguistic diversity but have

yet to gain significant interest among linguists. This situation could be due to a lack of overlap between the concepts and methods used in those models and those used by linguists. In an effort towards promoting interdisciplinary dialogue on the topic of language competition, this study describes the concepts and methods used in mathematical models of language competition and assesses whether these concepts and methods are becoming more similar over time to those used by linguists. To this end, studies that proposed mathematical models of language competition were systematically retrieved and analysed. Change over time in those models was first assessed concerning the way they are specified, including the parameters they contain. Next, it was checked whether models were increasingly fitted to empirical data. Finally, change in the disciplines covered by the journals where those models were published was evaluated. Results show that overall, models have been including few sociolinguistic parameters, have been relying little on empirical data, and have been mostly published in journals covering the fields of mathematics and physics. However, the last years have seen an important turnaround along each of these three axes. A common language seems to be emerging between fields regarding mathematical models of language competition, which should prove instrumental in informing efforts made towards preserving the world's linguistic diversity.

<https://www.nature.com/articles/s41599-020-00683-9>

Nature Scientific Reports

PAPERS

AMELIA BURROUGHS, NINA KAZANINA & CONOR HOUGHTON – Grammatical category and the neural processing of phrases

The interlocking roles of lexical, syntactic and semantic processing in language comprehension has been the subject of longstanding debate. Recently, the cortical response to a frequency-tagged linguistic stimulus has been shown to track the rate of phrase and sentence, as well as syllable, presentation. This could be interpreted as evidence for the hierarchical processing of speech, or as a response to the repetition of grammatical category. To examine the extent to which hierarchical structure plays a role in language processing we recorded EEG from human participants as they listen to isochronous streams of monosyllabic words. Comparing responses to sequences in which grammatical category is strictly alternating and chosen such that two-word phrases can be grammatically constructed—cold food loud room—or is absent—rough give ill tell—showed cortical entrainment at the two-word phrase rate was only present in the grammatical condition. Thus, grammatical category repetition alone does not yield entrainment at higher level than a word. On the other hand, cortical entrainment was reduced for the mixed-phrase condition that contained two-word phrases but no grammatical category repetition—that word send less—which is not what would be expected if the measured entrainment reflected purely abstract hierarchical syntactic units. Our results support a model in which word-level grammatical category information is required to build larger units.

<https://www.nature.com/articles/s41598-021-81901-5>

CLAUDIA FUGAZZA et al – Rapid learning of object names in dogs

Learning object names after few exposures, is thought to be a typically human capacity. Previous accounts of similar skills in dogs did not include control testing procedures, leaving unanswered the question whether this ability is uniquely human. To investigate the presence of the capacity to rapidly learn words in dogs, we tested object-name learning after four exposures in two dogs with knowledge of multiple toy-names. The dogs were exposed to new object-names either while playing with the objects with the owner who named those in a social context or during an exclusion-based task similar to those used in previous studies. The dogs were then tested on the learning outcome of the new object-names. Both dogs succeeded after exposure in the social context but not after exposure to the exclusion-based task. Their memory of the object-names lasted for at least two minutes and tended to decay after retention intervals of 10 min and 1 h. This reveals that rapid object-name learning is possible for a non-human species (dogs), although memory consolidation may require more exposures. We suggest that rapid learning presupposes learning in a social context. To investigate whether rapid learning of object names in a social context is restricted to dogs that have already shown the ability to learn multiple object-names, we used the same procedure with 20 typical family dogs. These dogs did not demonstrate any evidence of learning the object names. This suggests that only a few subjects show this ability. Future studies should investigate whether this outstanding capacity stems from the exceptional talent of some individuals or whether it emerges from previous experience with object name learning.

<https://www.nature.com/articles/s41598-021-81699-2>

TIMOTHY M. KISTNER et al with DANIEL E. LIEBERMAN – Geometric morphometric investigation of craniofacial morphological change in domesticated silver foxes

To test the effects of domestication on craniofacial skeletal morphology, we used three-dimensional geometric morphometrics (GM) along with linear and endocranial measurements to compare selected (domesticated) and unselected foxes from the Russian Farm-Fox Experiment to wild foxes from the progenitor population from which the farmed foxes are derived. Contrary to previous findings, we find that domesticated and unselected foxes show minimal differences in craniofacial shape and size compared to the more substantial differences between the wild foxes and both populations of farmed foxes. GM analyses and linear measurements demonstrate that wild foxes differ from farmed foxes largely in terms of less cranial base flexion, relatively expanded cranial vaults, and increased endocranial volumes. These results challenge the assumption that the unselected population of foxes kept as part of the Russian Farm-Fox experiment are an appropriate

proxy for 'wild' foxes in terms of craniofacial morphology and highlight the need to include wild populations in further studies of domestication syndrome to disentangle the phenotypic effects of multiple selection pressures. These findings also suggest that marked increases in docility cannot be reliably diagnosed from shape differences in craniofacial skeletal morphology.

<https://www.nature.com/articles/s41598-021-82111-9>

New Scientist

NEWS

Was it just luck that our species survived and the Denisovans didn't?

THE human story only becomes more intricate and fascinating. For hundreds of thousands of years, a mysterious group known as the Denisovans lived in the east of Asia – even as our species was emerging in Africa and beginning to spread around the world. Their homeland spanned thousands of kilometres and they existed as a group longer than we have as a species. Yet they were utterly unknown until 2010, when they were identified from DNA preserved in a bone fragment.

<https://www.newscientist.com/article/mg24933192-700-was-it-just-luck-that-our-species-survived-and-the-denisovans-didnt/#ixzz6kvv72T1q>

ARTICLES

MICHAEL MARSHALL – The other humans: The emerging story of the mysterious Denisovans

The existence of the Denisovans was discovered just a decade ago through DNA alone. Now we're starting to uncover fossils and artefacts revealing what these early humans were like.

<https://www.newscientist.com/article/mg24933192-500-the-other-humans-the-emerging-story-of-the-mysterious-denisovans/#ixzz6kvuBTwVw>

CAROLINE WILLIAMS – Gaslighting warps our view of reality. How to spot it – and fight back

All of us are vulnerable to psychological manipulation, due to quirks in the way our brains create our perception of the world. Understanding how that happens can help strengthen our defences against gaslighting.

<https://www.newscientist.com/article/mg24933190-700-gaslighting-warps-our-view-of-reality-how-to-spot-it-and-fight-back/#ixzz6kvufvx2n>

Philosophical Transactions of the Royal Society B

PAPERS

PAMELA LYON & FRANZ KUHLING – Valuing what happens: a biogenic approach to valence and (potentially) affect

Valence is half of the pair of properties that constitute core affect, the foundation of emotion. But what is valence, and where is it found in the natural world? Currently, this question cannot be answered. The idea that emotion is the body's way of driving the organism to secure its survival, thriving and reproduction runs like a leitmotif from the pathfinding work of Antonio Damasio through four book-length neuroscientific accounts of emotion recently published by the field's leading practitioners. Yet while Damasio concluded 20 years ago that the homeostasis–affect linkage is rooted in unicellular life, no agreement exists about whether even non-human animals with brains experience emotions. Simple neural animals—those less brainy than bees, fruit flies and other charismatic invertebrates—are not even on the radar of contemporary affective research, to say nothing of aneural organisms. This near-sightedness has effectively denied the most productive method available for getting a grip on highly complex biological processes to a scientific domain whose importance for understanding biological decision-making cannot be underestimated. Valence arguably is the fulcrum around which the dance of life revolves. Without the ability to discriminate advantage from harm, life very quickly comes to an end. In this paper, we review the concept of valence, where it came from, the work it does in current leading theories of emotion, and some of the odd features revealed via experiment. We present a biologically grounded framework for investigating valence in any organism and sketch a preliminary pathway to a computational model.

<https://royalsocietypublishing.org/doi/full/10.1098/rstb.2019.0752>

WILLIAM BECHTEL & LEONARDO BICH – Grounding cognition: heterarchical control mechanisms in biology

We advance an account that grounds cognition, specifically decision-making, in an activity all organisms as autonomous systems must perform to keep themselves viable—controlling their production mechanisms. Production mechanisms, as we characterize them, perform activities such as procuring resources from their environment, putting these resources to use to construct and repair the organism's body and moving through the environment. Given the variable nature of the environment and the continual degradation of the organism, these production mechanisms must be regulated by control mechanisms that select when a production is required and how it should be carried out. To operate on production mechanisms, control mechanisms need to procure information through measurement processes and evaluate possible actions. They are making decisions. In all organisms, these decisions are made by multiple different control mechanisms that are organized not hierarchically but heterarchically. In many cases, they employ internal models of features of the environment with which the organism must deal. Cognition, in the form of decision-making, is thus fundamental to living systems which must control their production mechanisms.

PLoS Biology

PAPERS

SEBASTIAN SAUPPE et al – Neural signatures of syntactic variation in speech planning

Planning to speak is a challenge for the brain, and the challenge varies between and within languages. Yet, little is known about how neural processes react to these variable challenges beyond the planning of individual words. Here, we examine how fundamental differences in syntax shape the time course of sentence planning. Most languages treat alike (i.e., align with each other) the 2 uses of a word like “gardener” in “the gardener crouched” and in “the gardener planted trees.” A minority keeps these formally distinct by adding special marking in 1 case, and some languages display both aligned and nonaligned expressions. Exploiting such a contrast in Hindi, we used electroencephalography (EEG) and eye tracking to suggest that this difference is associated with distinct patterns of neural processing and gaze behavior during early planning stages, preceding phonological word form preparation. Planning sentences with aligned expressions induces larger synchronization in the theta frequency band, suggesting higher working memory engagement, and more visual attention to agents than planning nonaligned sentences, suggesting delayed commitment to the relational details of the event. Furthermore, plain, unmarked expressions are associated with larger desynchronization in the alpha band than expressions with special markers, suggesting more engagement in information processing to keep overlapping structures distinct during planning. Our findings contrast with the observation that the form of aligned expressions is simpler, and they suggest that the global preference for alignment is driven not by its neurophysiological effect on sentence planning but by other sources, possibly by aspects of production flexibility and fluency or by sentence comprehension. This challenges current theories on how production and comprehension may affect the evolution and distribution of syntactic variants in the world’s languages.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001038>

Proceedings of the Royal Society B

PAPERS

KAREN L. BAAB – Reconstructing cranial evolution in an extinct hominin

Homo erectus is the first hominin species with a truly cosmopolitan distribution and resembles recent humans in its broad spatial distribution. The microevolutionary events associated with dispersal and local adaptation may have produced similar population structure in both species. Understanding the evolutionary population dynamics of *H. erectus* has larger implications for the emergence of later *Homo* lineages in the Middle Pleistocene. Quantitative genetics models provide a means of interrogating aspects of long-standing *H. erectus* population history narratives. For the current study, cranial fossils were sorted into six major palaeodemes from sites across Africa and Asia spanning 1.8–0.1 Ma. Three-dimensional shape data from the occipital and frontal bones were used to compare intraspecific variation and test evolutionary hypotheses. Results indicate that *H. erectus* had higher individual and group variation than *Homo sapiens*, probably reflecting different levels of genetic diversity and population history in these spatially disperse species. This study also revealed distinct evolutionary histories for frontal and occipital bone shape in *H. erectus*, with a larger role for natural selection in the former. One scenario consistent with these findings is climate-driven facial adaptation in *H. erectus*, which is reflected in the frontal bone through integration with the orbits.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2020.2604>

HANS RUTGER BOSKER & DAVID PEETERS – Beat gestures influence which speech sounds you hear

Beat gestures—spontaneously produced biphasic movements of the hand—are among the most frequently encountered co-speech gestures in human communication. They are closely temporally aligned to the prosodic characteristics of the speech signal, typically occurring on lexically stressed syllables. Despite their prevalence across speakers of the world’s languages, how beat gestures impact spoken word recognition is unclear. Can these simple ‘flicks of the hand’ influence speech perception? Across a range of experiments, we demonstrate that beat gestures influence the explicit and implicit perception of lexical stress (e.g. distinguishing *Object* from *obJECT*), and in turn can influence what vowels listeners hear. Thus, we provide converging evidence for a manual McGurk effect: relatively simple and widely occurring hand movements influence which speech sounds we hear.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2020.2419>

Royal Society Open Science

PAPERS

JULIA OSTNER, JANA WILKEN & OLIVER SCHÜLKE – Social contagion of affiliation in female macaques

Social contagion of non-interactive behaviour is widespread among animals including humans. It is thought to facilitate behavioural synchronization and consequently group cohesion, coordination and opportunities for social learning. Contagion of interactive behaviour—particularly affiliation—has received much less attention. Here, we investigated in female rhesus macaques (*Macaca mulatta*) the effect of observing group members groom on a subject’s subsequent grooming behaviour and the potential modulation of contagion by relationship quality and social status. We recorded behaviour after subjects witnessed a grooming event and compared it to behaviour in a control condition with the same individuals in proximity but in

the absence of a stimulus grooming event. Compared to the control condition, after observing others groom, females engaged in a grooming interaction sooner, and were more likely to be the initiator and to take on the active groomer role. Dominance rank of the focal individual and more weakly also of the stimulus individuals affected the latency to the next grooming interaction of the focal subject. Latency to the next grooming interaction decreased with increasing rank of the subject potentially reflecting lower social constraints faced by high ranking individuals in this highly despotic species. Relationship quality between the subject and the stimulus individuals had no effect on latency to grooming. Collectively, our findings provide evidence for visual contagion of affiliation in rhesus macaques. Future studies should explore the systematic variation in contagion of interactive behaviour in relation to a gradient of social tolerance.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.201538>

NICO NEUREITER et al – Can Bayesian phylogeography reconstruct migrations and expansions in linguistic evolution?

Bayesian phylogeography has been used in historical linguistics to reconstruct homelands and expansions of language families, but the reliability of these reconstructions has remained unclear. We contribute to this discussion with a simulation study where we distinguish two types of spatial processes: migration, where populations or languages leave one place for another, and expansion, where populations or languages gradually expand their territory. We simulate migration and expansion in two scenarios with varying degrees of spatial directional trends and evaluate the performance of state-of-the-art phylogeographic methods. Our results show that these methods fail to reconstruct migrations, but work surprisingly well on expansions, even under severe directional trends. We demonstrate that migrations and expansions have typical phylogenetic and spatial patterns, which in the one case inhibit and in the other facilitate phylogeographic reconstruction. Furthermore, we propose descriptive statistics to identify whether a real sample of languages, their relationship and spatial distribution, better fits a migration or an expansion scenario. Bringing together the results of the simulation study and theoretical arguments, we make recommendations for assessing the adequacy of phylogeographic models to reconstruct the spatial evolution of languages.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.201079>

SOPHIE VAN DER ZEE et al – A liar and a copycat: nonverbal coordination increases with lie difficulty

Studies of the nonverbal correlates of deception tend to examine liars' behaviours as independent from the behaviour of the interviewer, ignoring joint action. To address this gap, experiment 1 examined the effect of telling a truth and easy, difficult and very difficult lies on nonverbal coordination. Nonverbal coordination was measured automatically by applying a dynamic time warping algorithm to motion-capture data. In experiment 2, interviewees also received instructions that influenced the attention they paid to either the nonverbal or verbal behaviour of the interviewer. Results from both experiments found that interviewer–interviewee nonverbal coordination increased with lie difficulty. This increase was not influenced by the degree to which interviewees paid attention to their nonverbal behaviour, nor by the degree of interviewer's suspicion. Our findings are consistent with the broader proposition that people rely on automated processes such as mimicry when under cognitive load.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.200839>

Science

ARTICLES

DAVID GRIMM – Siberia may be long-sought site of dog domestication

Dogs were the first animals ever domesticated, yet researchers have argued for decades over when, where, and how they arose. Now, the most comprehensive comparison of ancient human and canine DNA suggests dogs were domesticated about 23,000 years ago in ice age Siberia. The people who domesticated them—known as the ancient north Siberians—were trapped in northeastern Siberia for millennia because the harsh climate of the time prevented them from traveling too far east or west. They were stuck here with the gray wolf, the direct ancestor of today's dogs. Scientists speculate that the two forged a relationship over time, leading to the domestication of the dog. Thousands of years later, these Siberians would give some of their pups to the distant ancestors of Native Americans, who would eventually bring them to the Americas. Other ancient humans, traveling west, would bring them deeper into Asia and Europe, where they would proliferate around the world.

<https://science.sciencemag.org/content/371/6528/451>

ROCHELLE BUFFENSTEIN – Colony-specific dialects of naked mole-rats

Oral communication is an essential component of vertebrate social living. Even so, few animals are vocal learners. Rather, in most species vocalizations are instinctive, immutable, and genetically determined. Humans, whales, and songbirds are well-known exceptions, with elaborate language learned in early life using vocal mimicry, thereby creating distinctive geographic dialects or accents. These vocalizations nevertheless retain acoustic flexibility. On page 503 of this issue, Barker et al. (1) show that unlike other rodents, the almost blind, highly social, yet xenophobic, naked mole-rat has a colony-specific greeting—the soft chirp—that is learned in early life and facilitates recognition of colony members and thereby helps maintain colony cohesiveness. This soft-chirp signature appears to be modulated by the matriarch, or “queen.” Should she die, or new colonies form by fission or outbreeding, after a period of acoustic variability the dialect once again becomes fixed and specific to the colony when a new queen is established.

<https://science.sciencemag.org/content/371/6528/461>

PAPERS

ALISON J. BARKER et al – Cultural transmission of vocal dialect in the naked mole-rat

Naked mole-rats (*Heterocephalus glaber*) form some of the most cooperative groups in the animal kingdom, living in multigenerational colonies under the control of a single breeding queen. Yet how they maintain this highly organized social structure is unknown. Here we show that the most common naked mole-rat vocalization, the soft chirp, is used to transmit information about group membership, creating distinctive colony dialects. Audio playback experiments demonstrate that individuals make preferential vocal responses to home colony dialects. Pups fostered in foreign colonies in early postnatal life learn the vocal dialect of their adoptive colonies, which suggests vertical transmission and flexibility of vocal signatures. Dialect integrity is partly controlled by the queen: Dialect cohesiveness decreases with queen loss and remerges only with the ascendance of a new queen.

<https://science.sciencemag.org/content/371/6528/503>

Science Advances

PAPERS

LEANDRO CASIRAGHI et al – Moonstruck sleep: synchronization of human sleep with the moon cycle under field conditions

Before the availability of artificial light, moonlight was the only source of light sufficient to stimulate nighttime activity; still, evidence for the modulation of sleep timing by lunar phases is controversial. Here, we use wrist actimetry to show a clear synchronization of nocturnal sleep timing with the lunar cycle in participants living in environments that range from a rural setting with and without access to electricity in indigenous Toba/Qom communities in Argentina to a highly urbanized postindustrial setting in the United States. Our results show that sleep starts later and is shorter on the nights before the full moon when moonlight is available during the hours following dusk. Our data suggest that moonlight likely stimulated nocturnal activity and inhibited sleep in preindustrial communities and that access to artificial light may emulate the ancestral effect of early-night moonlight.

https://advances.sciencemag.org/content/7/5/eabe0465?utm_campaign=toc_advances_2021-01-29&et rid=17774313&et cid=3648325

HELFRICH-FÖRSTER et al – Women temporarily synchronize their menstrual cycles with the luminance and gravimetric cycles of the Moon

Many species synchronize reproductive behavior with a particular phase of the lunar cycle to increase reproductive success. In humans, a lunar influence on reproductive behavior remains controversial, although the human menstrual cycle has a period close to that of the lunar cycle. Here, we analyzed long-term menstrual recordings of individual women with distinct methods for biological rhythm analysis. We show that women's menstrual cycles with a period longer than 27 days were intermittently synchronous with the Moon's luminance and/or gravimetric cycles. With age and upon exposure to artificial nocturnal light, menstrual cycles shortened and lost this synchrony. We hypothesize that in ancient times, human reproductive behavior was synchronous with the Moon but that our modern lifestyles have changed reproductive physiology and behavior.

https://advances.sciencemag.org/content/7/5/eabe1358?utm_campaign=toc_advances_2021-01-29&et rid=17774313&et cid=3648325

SUBSCRIBE to the EAORC Bulletin

If you would like to subscribe to this free weekly newsletter, please contact martin.edwardes@btopenworld.com.

UNSUBSCRIBE from the EAORC Bulletin

Send an email to martin.edwardes@btopenworld.com with the subject "EAORC unsubscribe".

PRODUCED BY AND FOR THE EAORC EMAIL GROUP

EAORC is a fee-free academic internet news service and has no commercial sponsorship or other commercial interests.

EAORC website information is at <http://martinedwardes.me.uk/eaorc/>

If you have received this bulletin, and are unhappy about receiving it, please contact martin.edwardes@btopenworld.com.