EAORC BULLETIN 929 – 4 April 2021

CONTENTS

NOTICES

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, 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 – The Animal Connection and Human Evolution

Current Anthropology 51:4 (2010)

PAT SHIPMAN – The Animal Connection and Human Evolution

A suite of unique physical and behavioral characteristics distinguishes Homo sapiens from other mammals. Three diagnostic human behaviors played key roles in human evolution: tool making, symbolic behavior and language, and the domestication of plants and animals. I focus here on a previously unrecognized fourth behavior, which I call the animal connection, that characterized the human lineage over the past 2.6 million years. I propose that the animal connection is the underlying link among the other key human behaviors and that it substantially influenced the evolution of humans.
https://www.academia.edu/355222/The_Animal_Connection_and_Human_Evolution?email_work_card=view-paper

PSYARXIV PREPRINTS – Non-syntactic differentiation in two-word stage of language evolution

PETAR GABRIĆ – Non-syntactic differentiation between agents and patients in the putative two-word stage of language evolution

Language evolution remains a hotly debated, yet somewhat controversial topic, due to our limited ability to experimentally investigate it and observe it in nature. While some researchers contend that modern-like language emerged in a single leap from a "languageless" state (Berwick 1998; Berwick et al. 2013; Berwick & Chomsky 2016), others believe language evolution followed a more gradual path (Bickerton 1990; Dediu & Levinson 2013, 2018; Michlich 2018). Several scholars from the latter school of thought have proposed that there was a two-word stage in the course of language evolution, in which utterances could not combine more than two words (Gil 2009; Progovac 2016; Jackendoff & Wittenberg 2014; cf. Hurford 2012: 585ff.).

These models agree that the putative two-word stage did not exhibit syntax. However, they disagree on whether or not there existed (semantic) rules for inferring the semantic relationship between the two words expressing a compositional proposition. Focusing on semantically transitive events, I combine in the present paper these language evolution models with previous empirical studies in linguistics to argue that the two-word stage was indeed governed by semantic rules for inferring the compositional meaning of the utterance, in that (1) words were either associated with fixed ("predetermined") semantic roles (i.e., agent, patient, predicate) or (2) there was a fixed order of semantic roles which could be relatively flexibly assigned to the words in a given utterance.
https://psyarxiv.com/8p3n2/

CONFERENCE ALERT – Animal Behaviour Society 2021 Virtual Conference – August 3rd-6th, 2021

Together with the ABS Meeting Planning Committee and the ABS Executive Committee, we are excited to invite you to our 2021 Annual Meeting. This will be the second ABS annual meeting to be held in virtual format. While we all miss the pleasures of meeting our colleagues in person during the annual meeting, the virtual format offers undeniable benefits in terms of accessibility, inclusivity, and engagement with our world-wide community of animal behaviorists.
https://www.animalbehaviorsociety.org/2021/

NEWS

BREAKING SCIENCE – Archaeologists Find New Evidence that Neanderthals Used Toothpicks

Neanderthals, our evolutionary cousins, used toothpicks nearly 46,000 years ago, a new study of their teeth has revealed. A research team, headed by University of Wrocław's Dr. Wioletta Nowaczewska, examined two hominin teeth dating back 46,000 years (Pleistocene epoch). The teeth — an upper premolar and a lower molar — were discovered in 2010 during [...]
http://feedproxy.google.com/~r/BreakingScienceNews/~3/OAyZiRUp7SY/neanderthal-toothpicks-09497.html?utm_source=feedburner&utm_medium=email

BREAKING SCIENCE – Innovative Humans Thrived in Water-Rich Kalahari 105,000 Years Ago

An international team of archaeologists has found evidence of complex symbolic and technological behaviors at Ga-Mohana Hill in the Northern Cape, South Africa dating back to 105,000 years ago — the same age when those behaviors occurred on the coast. The discovery challenges the idea that the origins of our species were linked to coastal environments.
http://feedproxy.google.com/~r/BreakingScienceNews/~3/eYgSIrclBpk/kalahari-humans-09512.html?utm_source=feedburner&utm_medium=email

SCIENCE DAILY – Friends and enemies 'make sense' for long-lived animals

It makes evolutionary sense for long-lived animals to have complex social relationships - such as friends and enemies - researchers say.
https://www.sciencedaily.com/releases/2021/03/210330121251.htm

SCIENCE DAILY – Infants' language skills more advanced than first words suggest

Babies can recognise combinations of words even before they have uttered their first word, a study suggests, challenging ideas of how children learn language. Assessments in 11-12 month-olds show that infants at the cusp of talking are already processing multiword phrases such as 'clap your hands'.
https://www.sciencedaily.com/releases/2021/03/210330121242.htm

SCIENCE DAILY – Tiny device changes songbird pitch & improves understanding of human speech

Scientific understanding of the brain regions responsible for speech and communication is limited. Consequently, knowledge of how to improve challenges such as speech impediments or language acquisition is limited as well. Using an ultra-lightweight, wireless implant, a team is researching songbirds - one of the few species that share humans' ability to learn new vocalizations - to improve scientific understanding of human speech.
https://www.sciencedaily.com/releases/2021/03/210331085847.htm

SCIENCE NEWS – Earliest South American migrants had Indigenous Australian, Melanesian ancestry

In 2015, scientists discovered something surprising: that some Indigenous peoples in the Brazilian Amazon were distantly—but distinctly—related to native Australians and Melanesians. The genetic signal of Australasian ancestry in so far-flung a population sent researchers scrambling for answers. A new study reveals this genetic signal is more prevalent throughout South America than thought and suggests the people who first carried these genes into the New World got it from an ancestral Siberian population.
https://www.sciencemag.org/news/2021/03/earliest-south-american-migrants-had-australian-melanesian-ancestry

SOCIETY FOR SCIENCE – Stone Age culture bloomed inland, not just along Africa's coasts

Homo sapiens living more than 600 kilometers from the coast around 105,000 years ago collected crystals that may have had ritual meaning.
http://click.societyforscience-email.com/?qs=499a6db5c5e3a8ab6ff59c84d23e1d63da9d81abbbebc7b64564cbded523d44d01bf9b03b651f6eab4df977876d4e7e05a1ad9ca07f7f5f5b22fda87c8aa97d0

PUBLICATIONS

Animal Behaviour

PAPERS

VERONIKA STÄDELE et al with JOAN B. SILK – Extended male–female bonds and potential for prolonged paternal investment in a polygynandrous primate (Papio anubis)

Extended breeding bonds and direct paternal care are rare in group-living species with high levels of male–male competition. In polygynandrously mating savannah baboons, many males form close ties (primary associations) to certain females outside the mating context. These relationships have likely evolved as a form of male parenting effort because roughly 50–75% of primary associates are the sires of the females' current infants. Mismatches between the formation of primary associations and paternity have been interpreted as kin recognition errors, which arise because males rely on imperfect proxies of paternity. Alternatively, mismatches may reflect prior paternity history if males form enduring relationships with the mothers of their offspring. We tested these hypotheses in a wild population of olive baboons, Papio anubis. The behaviour of sires near the time of conception was considerably different from the behaviour of nonsire primary associates, suggesting that most males were not misled by ambiguous behavioural cues of paternity. Instead, previous paternity history was an important predictor of the strength of ties between males and lactating females. Both paternity of the current infant and paternity of the previous infant influenced the probability that males would establish close ties to females, and these effects were largely additive. These findings indicate that male–female bonds in olive baboons extend long past lactation and suggest that selection may have favoured prolonged paternal investment in offspring.
https://www.sciencedirect.com/science/article/abs/pii/S0003347221000294?dgcid=raven_sd_via_email

A.MUNSON, M. MICHELANGELI & A. SIH – Stable social groups foster conformity and among-group differences

The social niche hypothesis theorizes that repeated social interactions between group members is an important mechanism for generating consistent individual differences in behaviour. However, such frequent interactions also have the potential to mask or suppress behavioural differences if individuals conform towards a group behavioural norm (i.e. the social conformity hypothesis) by either synchronizing their behaviour or shifting their behaviour towards that of influential group members. Both of these predictions hinge on the notion that social feedback among group members plays a key role in modulating consistent behavioural variation; thus, in the absence of such feedback, it could be expected that such consistent variation will be reduced. Here, we investigated how a 1-month housing with a stable social group, as opposed to being socially isolated, affected consistent individual differences in the shoaling tendencies of threespine stickleback, Gasterosteus aceluteus. Specifically, we repeatedly tested the tendency of individual sticklebacks to shoal with conspecifics before and after their social experience. In support of the social conformity hypothesis, we observed a four-fold increase in among-group differences, but no change in among-individual differences, in the shoaling tendencies of sticklebacks housed in groups. A post hoc analysis revealed that the increase in among-group differences may have been driven by the most 'social' pretreatment group member. Conversely, fish that were housed in isolation, expressed a notable, albeit nonsignificant, decrease in individual shoaling variation and repeatability. This decrease in shoaling variation corresponded with an increase in the average shoaling tendencies of solitary fish post-treatment, suggesting that solitary fish converged towards a similarly high level of shoaling tendencies post-treatment. For both treatment groups, however, we found among-individual positive correlations in pre- and post-treatment shoaling tendencies, suggesting that individuals may inherently differ in their shoaling tendencies, but that the social environment plays an important role in mediating the expression of these differences.
https://www.sciencedirect.com/science/article/abs/pii/S0003347221000580?dgcid=raven_sd_via_email

PAWEL FEDUREK et al with KLAUS ZUBERBÜHLER & CATHERINE CROCKFORD – The function of chimpanzee greeting calls is modulated by their acoustic variation

Signalling plays an important role in mediating social interactions in many animal species. For example, during approaches certain species produce 'greetings', which can take the form of vocal or visual signals, which reduce the probability of aggressive interactions and/or facilitate affiliation when approaching each other. However, in species where greetings comprise both vocal and visual signals, little is known about how the vocal component relates to the visual component or, in species with fission–fusion dynamics, to the time spent together by the dyad in the same subgroup prior to the approach. Similarly, in species with several acoustic variants of greeting calls, it is unclear whether different variants have different functions. We looked at the production of two acoustically distinct greeting call variants, low-fundamental frequency pant grunts and high-fundamental frequency pant barks, during approaches between two individuals in five communities of wild chimpanzees, Pan troglodytes, in Uganda and Ivory Coast. More specifically, we explored the relationship between greeting

call production and (1) aggressive and submissive interactions during the approach and (2) preceding and subsequent proximity levels between the involved individuals. Calls were more likely to be produced during aggressive interactions and were associated with postures and gestures linked to submission; these patterns were stronger when the utterance contained a pant bark rather than a pant grunt alone. The production of greeting calls was more likely soon after party fusion and was negatively related to subsequent proximity levels between the caller and receiver. These results expand our knowledge of greeting calls and imply that these calls might be used to re-establish dominance relationships after a period of separation, and that the function of these calls can be modulated by their specific acoustic variants and by visual signals that often accompany them.
https://www.sciencedirect.com/science/article/abs/pii/S0003347221000415?dgcid=raven_sd_via_email

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Current Biology

PAPERS

JIAYU ZHAN et al – Modeling individual preferences reveals that face beauty is not universally perceived across cultures
Facial attractiveness confers considerable advantages in social interactions, with preferences likely reflecting psychobiological mechanisms shaped by natural selection. Theories of universal beauty propose that attractive faces comprise features that are closer to the population average while optimizing sexual dimorphism. However, emerging evidence questions this model as an accurate representation of facial attractiveness, including representing the diversity of beauty preferences within and across cultures. Here, we demonstrate that Western Europeans (WEs) and East Asians (EAs) evaluate facial beauty using culture-specific features, contradicting theories of universality. With a data-driven method, we modeled, at both the individual and group levels, the attractive face features of young females (25 years old) in two matched groups each of 40 young male WE and EA participants. Specifically, we generated a broad range of same- and other-ethnicity female faces with naturally varying shapes and complexions. Participants rated each on attractiveness. We then reverse correlated the face features that drive perception of attractiveness in each participant. From these individual face models, we reconstructed a facial attractiveness representation space that explains preference variations. We show that facial attractiveness is distinct both from averageness and from sexual dimorphism in both cultures. Finally, we disentangled attractive face features into those shared across cultures, culture specific, and specific to individual participants, thereby revealing their diversity. Our results have direct theoretical and methodological impact for representing diversity in social perception and for the design of culturally and ethnically sensitive socially interactive digital agents.
https://www.cell.com/current-biology/fulltext/S0960-9822(21)00352-3?dgcid=raven_jbs_aip_email

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Frontiers in Psychology

PAPERS

NICOLAI D. AYASSE, ALANA J. HODSON & ARTHUR WINGFIELD – The Principle of Least Effort and Comprehension of Spoken Sentences by Younger and Older Adults
There is considerable evidence that listeners' understanding of a spoken sentence need not always follow from a full analysis of the words and syntax of the utterance. Rather, listeners may instead conduct a superficial analysis, sampling some words and using presumed plausibility to arrive at an understanding of the sentence meaning. Because this latter strategy occurs more often for sentences with complex syntax that place a heavier processing burden on the listener than sentences with simpler syntax, shallow processing may represent a resource conserving strategy reflected in reduced processing effort. This factor may be even more important for older adults who as a group are known to have more limited working memory resources. In the present experiment, 40 older adults (Mage = 75.5 years) and 20 younger adults (Mage = 20.7) were tested for comprehension of plausible and implausible sentences with a simpler subject-relative embedded clause structure or a more complex object-relative embedded clause structure. Dilation of the pupil of the eye was recorded as an index of processing effort. Results confirmed greater comprehension accuracy for plausible than implausible sentences, and for sentences with simpler than more complex syntax, with both effects amplified for the older adults. Analysis of peak pupil dilations for implausible sentences revealed a complex three-way interaction between age, syntactic complexity, and plausibility. Results are discussed in terms of models of sentence comprehension, and pupillometry as an index of intentional task engagement.
https://www.frontiersin.org/articles/10.3389/fpsyg.2021.629464/full

PRANY WANTZEN et al – Autobiographical Memory and Social Identity in Autism: Preliminary Results of Social Positioning and Cognitive Intervention
Autobiographical memory (AM) is closely linked to the self-concept, and fulfills directive, identity, social, and adaptive functions. Individuals with autism spectrum disorder (ASD) are now known to have atypical AM, which may be closely associated with social communication difficulties. This may result in qualitatively different autobiographical narratives, notably regarding social identity. In the present study, we sought to investigate this concept and develop a cognitive intervention targeting individuals with ASD. First, 13 adolescents with ASD and 13 typically developing adolescents underwent an AM interview featuring an original coding system designed to analyze the social self. We observed that the narratives produced by the ASD group focused more on the family than on extended social spheres, compared with those of the comparison group. Moreover, participants with ASD did not include themselves in the social groups they mentioned, and produced more references to others, compared with typically developing participants. Second, we designed a cognitive

intervention program consisting of individual and group sessions that targeted AM. We conducted a pilot study among three adolescents with ASD aged 12, 16, and 17 years. Preliminary results showed that the program increased extra-family narrative references by the two youngest adolescents, who produced more social integration markers. Our study of autobiographical narratives yielded interesting findings about social positioning in ASD and showed how AM can be targeted in rehabilitation programs as a vector of social interaction.
https://www.frontiersin.org/articles/10.3389/fpsyg.2021.641765/full

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Interface: Journal of the Royal Society

PAPERS

MIRTA GALESIC et al – Integrating social and cognitive aspects of belief dynamics: towards a unifying framework
Belief change and spread have been studied in many disciplines—from psychology, sociology, economics and philosophy, to biology, computer science and statistical physics—but we still do not have a firm grasp on why some beliefs change more easily and spread faster than others. To fully capture the complex social-cognitive system that gives rise to belief dynamics, we first review insights about structural components and processes of belief dynamics studied within different disciplines. We then outline a unifying quantitative framework that enables theoretical and empirical comparisons of different belief dynamic models. This framework uses a statistical physics formalism, grounded in cognitive and social theory, as well as empirical observations. We show how this framework can be used to integrate extant knowledge and develop a more comprehensive understanding of belief dynamics.
https://royalsocietypublishing.org/doi/full/10.1098/rsif.2020.0857

Nature

ARTICLES

PAMELA R. WILLOUGHBY – Early humans far from the South African coast collected unusual objects
Ostrich eggshells and crystals gathered more than 100,000 years ago shed light on the cultural evolution of early humans. Found in South Africa's interior, they reveal that technological innovations occurred beyond its coast.
https://www.nature.com/articles/d41586-021-00795-5

PAPERS

JAYNE WILKINS et al – Innovative Homo sapiens behaviours 105,000 years ago in a wetter Kalahari
The archaeological record of Africa provides the earliest evidence for the emergence of the complex symbolic and technological behaviours that characterize Homo sapiens. The coastal setting of many archaeological sites of the Late Pleistocene epoch, and the abundant shellfish remains recovered from them, has led to a dominant narrative in which modern human origins in southern Africa are intrinsically tied to the coast and marine resources, and behavioural innovations in the interior lag behind. However, stratified Late Pleistocene sites with good preservation and robust chronologies are rare in the interior of southern Africa, and the coastal hypothesis therefore remains untested. Here we show that early human innovations that are similar to those dated to around 105 thousand years ago (ka) in coastal southern Africa existed at around the same time among humans who lived over 600 km inland. We report evidence for the intentional collection of non-utilitarian objects (calcite crystals) and ostrich eggshell from excavations of a stratified rockshelter deposit in the southern Kalahari Basin, which we date by optically stimulated luminescence to around 105 ka. Uranium–thorium dating of relict tufa deposits indicates sporadic periods of substantial volumes of fresh, flowing water; the oldest of these episodes is dated to between 110 and 100 ka and is coeval with the archaeological deposit. Our results suggest that behavioural innovations among humans in the interior of southern Africa did not lag behind those of populations near the coast, and that these innovations may have developed within a wet savannah environment. Models that tie the emergence of behavioural innovations to the exploitation of coastal resources by our species may therefore require revision.
https://www.nature.com/articles/s41586-021-03419-0

MATTHEW F. PANICHELLO & TIMOTHY J. BUSCHMAN – Shared mechanisms underlie the control of working memory and attention
Cognitive control guides behaviour by controlling what, when, and how information is represented in the brain. For example, attention controls sensory processing; top-down signals from prefrontal and parietal cortex strengthen the representation of task-relevant stimuli. A similar 'selection' mechanism is thought to control the representations held 'in mind'—in working memory. Here we show that shared neural mechanisms underlie the selection of items from working memory and attention to sensory stimuli. We trained rhesus monkeys to switch between two tasks, either selecting one item from a set of items held in working memory or attending to one stimulus from a set of visual stimuli. Neural recordings showed that similar representations in prefrontal cortex encoded the control of both selection and attention, suggesting that prefrontal cortex acts as a domain-general controller. By contrast, both attention and selection were represented independently in parietal and visual cortex. Both selection and attention facilitated behaviour by enhancing and transforming the representation of the selected memory or attended stimulus. Specifically, during the selection task, memory items were initially represented in independent subspaces of neural activity in prefrontal cortex. Selecting an item caused its representation to transform from its own subspace to a new subspace used to guide behaviour. A similar transformation occurred for attention. Our results

suggest that prefrontal cortex controls cognition by dynamically transforming representations to control what and when cognitive computations are engaged.
https://www.nature.com/articles/s41586-021-03390-w

JINGYI CHEN et al – Flexible scaling and persistence of social vocal communication
Innate vocal sounds such as laughing, screaming or crying convey one's feelings to others. In many species, including humans, scaling the amplitude and duration of vocalizations is essential for effective social communication. In mice, female scent triggers male mice to emit innate courtship ultrasonic vocalizations (USVs). However, whether mice flexibly scale their vocalizations and how neural circuits are structured to generate flexibility remain largely unknown. Here we identify mouse neurons from the lateral preoptic area (LPOA) that express oestrogen receptor 1 (LPOAESR1 neurons) and, when activated, elicit the complete repertoire of USV syllables emitted during natural courtship. Neural anatomy and functional data reveal a two-step, di-synaptic circuit motif in which primary long-range inhibitory LPOAESR1 neurons relieve a clamp of local periaqueductal grey (PAG) inhibition, enabling excitatory PAG USV-gating neurons to trigger vocalizations. We find that social context shapes a wide range of USV amplitudes and bout durations. This variability is absent when PAG neurons are stimulated directly; PAG-evoked vocalizations are time-locked to neural activity and stereotypically loud. By contrast, increasing the activity of LPOAESR1 neurons scales the amplitude of vocalizations, and delaying the recovery of the inhibition clamp prolongs USV bouts. Thus, the LPOA disinhibition motif contributes to flexible loudness and the duration and persistence of bouts, which are key aspects of effective vocal social communication.
https://www.nature.com/articles/s41586-021-03403-8

Nature Communications

PAPERS

HYEONSOO JEONG et al – Evolution of DNA methylation in the human brain
DNA methylation is a critical regulatory mechanism implicated in development, learning, memory, and disease in the human brain. Here we have elucidated DNA methylation changes during recent human brain evolution. We demonstrate dynamic evolutionary trajectories of DNA methylation in cell-type and cytosine-context specific manner. Specifically, DNA methylation in non-CG context, namely CH methylation, has increased (hypermethylation) in neuronal gene bodies during human brain evolution, contributing to human-specific down-regulation of genes and co-expression modules. The effects of CH hypermethylation is particularly pronounced in early development and neuronal subtypes. In contrast, DNA methylation in CG context shows pronounced reduction (hypomethylation) in human brains, notably in cis-regulatory regions, leading to upregulation of downstream genes. We show that the majority of differential CG methylation between neurons and oligodendrocytes originated before the divergence of hominoids and catarrhine monkeys, and harbors strong signal for genetic risk for schizophrenia. Remarkably, a substantial portion of differential CG methylation between neurons and oligodendrocytes emerged in the human lineage since the divergence from the chimpanzee lineage and carries significant genetic risk for schizophrenia. Therefore, recent epigenetic evolution of human cortex has shaped the cellular regulatory landscape and contributed to the increased vulnerability to neuropsychiatric diseases.
https://www.nature.com/articles/s41467-021-21917-7

Nature Ecology & Evolution

PAPERS

HANS P. PÜSCHEL et al – Divergence-time estimates for hominins provide insight into encephalization and body mass trends in human evolution
Quantifying speciation times during human evolution is fundamental as it provides a timescale to test for the correlation between key evolutionary transitions and extrinsic factors such as climatic or environmental change. Here, we applied a total evidence dating approach to a hominin phylogeny to estimate divergence times under different topological hypotheses. The time-scaled phylogenies were subsequently used to perform ancestral state reconstructions of body mass and phylogenetic encephalization quotient (PEQ). Our divergence-time estimates are consistent with other recent studies that analysed extant species. We show that the origin of the genus Homo probably occurred between 4.30 and 2.56 million years ago. The ancestral state reconstructions show a general trend towards a smaller body mass before the emergence of Homo, followed by a trend towards a greater body mass. PEQ estimations display a general trend of gradual but accelerating encephalization evolution. The obtained results provide a rigorous temporal framework for human evolution.
https://www.nature.com/articles/s41559-021-01431-1

Nature Scientific Reports

PAPERS

RHONDA L. QUINN & CHRISTOPHER J. LEPRE – Contracting eastern African C4 grasslands during the extinction of Paranthropus boisei
The extinction of the Paranthropus boisei estimated to just before 1 Ma occurred when C4 grasslands dominated landscapes of the Eastern African Rift System (EARS). P. boisei has been characterized as an herbivorous C4 specialist, and paradoxically, its demise coincided with habitats favorable to its dietary ecology. Here we report new pedogenic carbonate stable carbon

(δ13CPC) and oxygen (δ18OPC) values (nodules = 53, analyses = 95) from an under-sampled interval (1.4–0.7 Ma) in the Turkana Basin (Kenya), one of the most fossiliferous locales of P. boisei. We combined our new results with published δ13CPC values from the EARS dated to 3–0 Ma, conducted time-series analysis of woody cover (ƒWC), and compared the EARS ƒWC trends to regional and global paleo-environmental and -climatic datasets. Our results demonstrate that the long-term rise of C4 grasslands was punctuated by a transient but significant increase in C3 vegetation and warmer temperatures, coincident with the Mid-Pleistocene Transition (1.3–0.7 Ma) and implicating a short-term rise in pCO2. The contraction of C4 grasslands escalated dietary competition amongst the abundant C4-feeders, likely influencing P. boisei's demise.
https://www.nature.com/articles/s41598-021-86642-z

FABIO FLORINDO et al – Environmental evolution, faunal and human occupation since 2 Ma in the Anagni basin, central Italy
We present the study of a composite, yet continuous sedimentary succession covering the time interval spanning 2.6–0.36 Ma in the intramontane basin of Anagni (central Italy) through a dedicated borecore, field surveys, and the review of previous data at the three palaeontological and archaeological sites of Colle Marino, Coste San Giacomo and Fontana Ranuccio. By combining the magneto- and chronostratigraphic data with sedimentologic and biostratigraphic analysis, we describe the palaeogeographic and tectonic evolution of this region during this entire interval. In this time frame, starting from 0.8 Ma, the progressive shallowing and temporary emersion of the large lacustrine basins and alluvial plains created favorable conditions for early hominin occupation of the area, as attested by abundant tool industry occurrences and fossils. This study provides new constraints to better interpret the hominin migratory dynamics and the factors that influenced the location and spatial distribution during the early occupation of this region.
https://www.nature.com/articles/s41598-021-85446-5

RYO KITADA et al – Brain networks underlying the processing of sound symbolism related to softness perception
Unlike the assumption of modern linguistics, there is non-arbitrary association between sound and meaning in sound symbolic words. Neuroimaging studies have suggested the unique contribution of the superior temporal sulcus to the processing of sound symbolism. However, because these findings are limited to the mapping between sound symbolism and visually presented objects, the processing of sound symbolic information may also involve the sensory-modality dependent mechanisms. Here, we conducted a functional magnetic resonance imaging experiment to test whether the brain regions engaged in the tactile processing of object properties are also involved in mapping sound symbolic information with tactually perceived object properties. Thirty-two healthy subjects conducted a matching task in which they judged the congruency between softness perceived by touch and softness associated with sound symbolic words. Congruency effect was observed in the orbitofrontal cortex, inferior frontal gyrus, insula, medial superior frontal gyrus, cingulate gyrus, and cerebellum. This effect in the insula and medial superior frontal gyri was overlapped with softness-related activity that was separately measured in the same subjects in the tactile experiment. These results indicate that the insula and medial superior frontal gyrus play a role in processing sound symbolic information and relating it to the tactile softness information.
https://www.nature.com/articles/s41598-021-86328-6

New Scientist

NEWS

Mini-brains show why human brains grow larger than those of other apes
Miniature brains of humans, gorillas and chimpanzees developed in the lab have shown how our brains grow much larger than those of other apes.
https://www.newscientist.com/article/2272206-mini-brains-show-why-human-brains-grow-larger-than-those-of-other-apes/#ixzz6qpEoW8Rl

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PLoS One

PAPERS

MIROSŁAW MASOJĆ et al – The oldest Homo erectus buried lithic horizon from the Eastern Saharan Africa. EDAR 7 - an Acheulean assemblage with Kombewa method from the Eastern Desert, Sudan
Although essential for reconstructing hominin behaviour during the Early Palaeolithic, only a handful of Acheulean sites have been dated in the Eastern Sahara region. This is due to the scarcity of sites for this time period and the lack of datable material. However, recent excavations in the Atbara region (Sudan) have provided unique opportunities to analyse and date Acheulean stone tools. We report here on EDAR 7, part of a cluster of Acheulean and Middle Stone Age (MSA) sites that were recently discovered in the Eastern Desert Atbara River (EDAR) region, located in the Eastern Desert (Sudan) far from the Nile valley. At EDAR 7, a 3.5 metre sedimentary sequence was excavated, allowing an Acheulean assemblage to be investigated using a combination of sedimentology, stone tool studies and optically stimulated luminescence dating (OSL). The site has delivered a complete Acheulean knapping chaine opératoire, providing new information about the Saharan Acheulean. The EDAR 7 site is interpreted as a remnant of a campsite based on the co-occurrence of two reduction modes: one geared towards the production of Large Cutting Tools (LCTs), and the other based on the flaking of small debitage and production of flake tools. Particularly notable in the EDAR 7 assemblage is the abundance of cleavers, most of which display evidence of

flake production. Implementation of giant Kombewa flakes was also observed. A geometric morphometric analysis of hand-axes was conducted to verify a possible Late Acheulean assemblage standardisation in the Nubian Sahara. In addition, the analysis of micro-traces and wear on the artefacts has provided information on the use history of the Acheulean stone tools. Sediment analyses and OSL dating show that the EDAR 7 sequence contains the oldest Acheulean encampment remains in the Eastern Sahara, dated to the MIS 11 or earlier. This confirms that Homo erectus occupied the EDAR region during Middle Pleistocene humid periods, and demonstrates that habitable corridors existed between the Ethiopian Highlands, the Nile and the Red Sea coast, allowing population dispersals across the continent and out of it.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0248279

THERESA REDL et al – The male bias of a generically-intended masculine pronoun: Evidence from eye-tracking and sentence evaluation
Two experiments tested whether the Dutch possessive pronoun zijn 'his' gives rise to a gender inference and thus causes a male bias when used generically in sentences such as Everyone was putting on his shoes. Experiment 1 (N = 120, 48 male) was a conceptual replication of a previous eye-tracking study that had not found evidence of a male bias. The results of the current eye-tracking experiment showed the generically-intended masculine pronoun to trigger a gender inference and cause a male bias, but for male participants and in stereotypically neutral stereotype contexts only. No evidence for a male bias was thus found in stereotypically female and male context nor for female participants altogether. Experiment 2 (N = 80, 40 male) used the same stimuli as Experiment 1, but employed the sentence evaluation paradigm. No evidence of a male bias was found in Experiment 2. Taken together, the results suggest that the generically-intended masculine pronoun zijn 'his' can cause a male bias for male participants even when the referents are previously introduced by inclusive and grammatically gender-unmarked iedereen 'everyone'. This male bias surfaces with eye-tracking, which taps directly into early language processing, but not in offline sentence evaluations. Furthermore, the results suggest that the intended generic reading of the masculine possessive pronoun zijn 'his' is more readily available for women than for men.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0249309

VICKY CHUQIAO YANG, TAMARA VAN DER DOES & HENRIK OLSSON – Falling through the cracks: Modeling the formation of social category boundaries
Social categorizations divide people into "us" and "them", often along continuous attributes such as political ideology or skin color. This division results in both positive consequences, such as a sense of community, and negative ones, such as group conflict. Further, individuals in the middle of the spectrum can fall through the cracks of this categorization process and are seen as out-group by individuals on either side of the spectrum, becoming inbetweeners. Here, we propose a quantitative, dynamical-system model that studies the joint influence of cognitive and social processes. We model where two social groups draw the boundaries between "us" and 'them" on a continuous attribute. Our model predicts that both groups tend to draw a more restrictive boundary than the middle of the spectrum. As a result, each group sees the individuals in the middle of the attribute space as an out-group. We test this prediction using U.S. political survey data on how political independents are perceived by registered party members as well as existing experiments on the perception of racially ambiguous faces, and find support.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0247562

Proceedings of the Royal Society B

PAPERS

PHILIPPA R. LAKER et al – The modularity of a social group does not affect the transmission speed of a novel, socially learned behaviour, or the formation of local variants
The structure of a group is critical in determining how a socially learnt behaviour will spread. Predictions from theoretical models indicate that specific parameters of social structure differentially influence social transmission. Modularity describes how the structure of a group or network is divided into distinct subgroups or clusters. Theoretical modelling indicates that the modularity of a network will predict the rate of behavioural spread within a group, with higher modularity slowing the rate of spread and facilitating the establishment of local behavioural variants which can prelude local cultures. Despite prolific modelling approaches, empirical tests via manipulations of group structure remain scarce. We experimentally manipulated the modularity of populations of domestic fowl chicks, Gallus gallus domesticus, to affect the transmission of a novel foraging behaviour. We compared the spread of behaviour in populations with networks of high or low modularity against control populations where social transmission was prevented. We found the foraging behaviour to spread socially between individuals when the social transmission was permitted; however, modularity did not increase the speed of behavioural spread nor lead to the initial establishments of shared behavioural variants. This result suggests that factors in the social transmission process additional to the network structure may influence behavioural spread.
https://royalsocietypublishing.org/doi/abs/10.1098/rspb.2020.2614

Royal Society Open Science

PAPERS

FREDERIC GNEPA MEHON & CLAUDIA STEPHAN – Female putty-nosed monkeys (Cercopithecus nictitans) vocally recruit males for predator defence

Alarm calls can trigger very different behavioural changes in receivers and signallers might apply different alarm call strategies based on their individual cost-benefit ratio. These cost-benefit ratios can also vary as a function of sex. For instance, male but not female forest guenons possess loud alarms that serve warning and predator deterrence functions, but also intergroup spacing and male–male competition. In some forest guenons, the context specificity and alarm call repertoire size additionally differs between females and males but it remains unclear if this corresponds to similar sexual dimorphisms in alarm calling strategies. We here experimentally investigated whether general female and more context-specific male alarm calls in putty-nosed monkeys (Cercopithecus nictitans) had different effects on the opposite sex's behaviour and whether they might serve different female and male alarm calling strategies. We presented a leopard model separately to the females or to the male of several groups while ensuring that the opposite sex only heard alarm calls of target individuals. While female alarms led to the recruitment of males in the majority of cases, male alarms did not have a similar effect on female behaviour. Males further seem to vocally advertise their engagement in group defence with more unspecific alarms while approaching their group. Males switched alarm call types once they spotted the leopard model and started mobbing behaviour. Females only ceased to alarm call when males produced calls typically associated with anti-predator defence, but not when males produced unspecific alarm calls. Our results suggest that sexual dimorphisms in the context specificity of alarms most likely correspond to different alarm calling strategies in female and male putty-nosed monkeys.
https://royalsocietypublishing.org/doi/full/10.1098/rsos.202135

STEPHANIE L. KING et al – Evidence that bottlenose dolphins can communicate with vocal signals to solve a cooperative task

Cooperation experiments have long been used to explore the cognition underlying animals' coordination towards a shared goal. While the ability to understand the need for a partner in a cooperative task has been demonstrated in a number of species, there has been far less focus on cooperation experiments that address the role of communication. In humans, cooperative efforts can be enhanced by physical synchrony, and coordination problems can be solved using spoken language. Indeed, human children adapt to complex coordination problems by communicating with vocal signals. Here, we investigate whether bottlenose dolphins can use vocal signals to coordinate their behaviour in a cooperative button-pressing task. The two dolphin dyads used in this study were significantly more likely to cooperate successfully when they used whistles prior to pressing their buttons, with whistling leading to shorter button press intervals and more successful trials. Whistle timing was important as the dolphins were significantly more likely to succeed if they pushed their buttons together after the last whistle, rather than pushing independently of whistle production. Bottlenose dolphins are well known for cooperating extensively in the wild, and while it remains to be seen how wild dolphins use communication to coordinate cooperation, our results reveal that at least some dolphins are capable of using vocal signals to facilitate the successful execution of coordinated, cooperative actions.
https://royalsocietypublishing.org/doi/full/10.1098/rsos.202073

SUSKA NOLTE & JOSEP CALL – Targeted helping and cooperation in zoo-living chimpanzees and bonobos

Directly comparing the prosocial behaviour of our two closest living relatives, bonobos and chimpanzees, is essential to deepening our understanding of the evolution of human prosociality. We examined whether helpers of six dyads of chimpanzees and bonobos transferred tools to a conspecific. In the experiment 'Helping', transferring a tool did not benefit the helper, while in the experiment 'Cooperation', the helper only obtained a reward by transferring the correct tool. Chimpanzees did not share tools with conspecifics in either experiment, except for a mother–daughter pair, where the mother shared a tool twice in the experiment 'Helping'. By contrast, all female–female bonobo dyads sometimes transferred a tool even without benefit. When helpers received an incentive, we found consistent transfers in all female–female bonobo dyads but none in male–female dyads. Even though reaching by the bonobo receivers increased the likelihood that a transfer occurred, we found no significant species difference in whether receivers reached to obtain tools. Thus, receivers' behaviour did not explain the lack of transfers from chimpanzee helpers. This study supports the notion that bonobos might have a greater ability to understand social problems and the collaborative nature of such tasks.
https://royalsocietypublishing.org/doi/full/10.1098/rsos.201688

Trends in Cognitive Sciences

PAPERS

THOMAS O'ROURKE et al with CEDRIC BOECKX – Capturing the Effects of Domestication on Vocal Learning Complexity

Domesticated and vocal learning species can serve as informative model organisms for the reduction of reactive aggression and emergence of speech in our lineage. Amidst mounting evidence that domestication modifies vocal repertoires across different species, we focus on the domesticated Bengalese finch, which has a more complex song than the wild-type white-rumped munia. Our explanation for this effect revolves around the glutamate neurotransmitter system. Glutamate signaling (i) is implicated in birdsong learning, (ii) controls dopamine activity in neural circuits crucial for vocal learning, (iii) is

disproportionately targeted in the evolution of domesticates, and (iv) regulates stress responses and aggressive behaviors attenuated under domestication. We propose that attenuated excitation of stress-related neural circuits potentiates vocal learning via altered dopaminergic signaling.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00066-8?dgcid=raven_jbs_aip_email

ALON HAFRI & CHAZ FIRESTONE – The Perception of Relations
The world contains not only objects and features (red apples, glass bowls, wooden tables), but also relations holding between them (apples contained in bowls, bowls supported by tables). Representations of these relations are often developmentally precocious and linguistically privileged; but how does the mind extract them in the first place? Although relations themselves cast no light onto our eyes, a growing body of work suggests that even very sophisticated relations display key signatures of automatic visual processing. Across physical, eventive, and social domains, relations such as support, fit, cause, chase, and even socially interact are extracted rapidly, are impossible to ignore, and influence other perceptual processes. Sophisticated and structured relations are not only judged and understood, but also seen — revealing surprisingly rich content in visual perception itself.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00008-5?dgcid=raven_jbs_aip_email

Trends in Ecology and Evolution

PAPERS

MATTHEW J. SILK & DAVID J. HODGSON – Differentiated Social Relationships and the Pace-of-Life-History
When selection is imposed by both social and ecological environments, the costs and benefits of social relationships can depend on life-history strategy. We argue that the formation and maintenance of differentiated social relationships will prevail in species and individuals with slow life histories. Social behaviours that benefit survival can promote slower life histories. Meanwhile, longer lifespan promotes the development of strong and stable social bonds by allowing fitness payoffs to be postponed. Differentiated social behaviours should be favoured for fast life histories only when they promote the rate of reproduction. Finally, associations between life-history strategies and other traits (e.g., personality) provide a mechanism to drive inter-individual variation in social relationships, making life-history important for sociality across taxonomic scales.
https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(21)00057-4?dgcid=raven_jbs_aip_email

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