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NOTICES

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, do please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.

If there is a journal you feel I should be tracking on a regular basis, do let me know.

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

EAORC NEWS – 1. New Website Preview Available

Since the creation of EAORC I have been using Webplus from Serif. Originally X4, I updated to X5, X6, X7 and X8, and I found it to be an outstanding product. Unfortunately, as is the way of anything outstanding in this World, Serif ceased to support the software in August 2018. Since then I have been using X8, despite its increasing unreliability, and trying out other web design solutions to find an alternative.

Eventually, out of desperation, I tried to redesign one of my websites (the EAORC site, because it’s the simplest) in Microsoft products – mostly Word, with PowerPoint and Paint (good old Paint) to help gussy things up. It turns out that this is a quite good solution. I have now produced a reasonable version of the EAORC website, which is available for your inspection at http://martinedwardes.me.uk/eaorc_test/. If people are content with this new site then I will replace the existing website in September.

Many thanks to those who have already responded.

EAORC NEWS – 2. Biennial Membership Check

2020 is a membership checking year; this normally begins in June, but I have delayed the check until September because of the 2020 plethora of crises. However, in September I will start asking for confirmation that you wish to continue receiving the bulletins. Anyone who has not indicated they wish to continue will be taken off the list at the end of October. This biennial membership check has been in operation since 2008, and GDPR has made it even more important that it is carried out regularly.

EAORC NEWS – 3. PDF bulletins? Your choice

It has been suggested that, as I produce a weekly pdf bulletin for the website, I could send that to the email group instead of the text email. The pdf has several advantages over the current email in terms of presentation, curation, and searching, but it has the disadvantage of being larger: the average EAORC pdf for the past few months has been about 350kb, the average bulletin email has been (I think) about 80kb. There are also issues to be considered of how your security system reacts to emails with a lot of links, or how it reacts to emails with attachments.

Let me know which option you prefer by sending me a two-word email: EAORC pdf or EAORC email. I will go with the majority choice. I will leave the voting open until end August to allow people otherwise out of contact to

Many thanks to those who have already responded.

SCIENCE NEWS – World's oldest camp bedding found in South African cave

Border Cave is a deep gash in a cliff face, high in the Lebombo Mountains of South Africa. Sheltered from the elements, the spot has yielded bones, tools, and preserved plant material that paint a detailed picture of the lives of human inhabitants for more than 200,000 years. Now, there's a new sketch emerging: Plant remains point to evidence that the cave's occupants used grass bedding about 200,000 years ago. Researchers speculate that the cave's occupants laid their bedding on ash to repel insects.

https://www.sciencemag.org/news/2020/08/world-s-oldest-camp-bedding-found-south-african-cave?utm_campaign=news_daily_2020-08-13&et rid=17774313&et cid=3445815

BREAKING SCIENCE – Neolithic Arabians Used Same Fluting Technology as Ancient Native Americans

An international team of archaeologists has excavated and examined 8,000-year-old projectile points (spear- and arrowheads) at two sites in Yemen and Oman. They've found that ancient Arabians independently invented a process to create distinctive projectile points — called fluting — that was first used by Native Americans about 5,000 years earlier.

Fluting is an iconic [...]

http://feedproxy.google.com/~r/BreakingScienceNews/~3/mOauTNoUR5o/fluting-neolithic-arabia-08731.html?utm_source=feedburner&utm_medium=email

SCIENCE DAILY – Authors' 'invisible' words reveal blueprint for storytelling

The "invisible" words that shaped Dickens classics also lead audiences through Spielberg dramas. And according to new research, these small words can be found in a similar pattern across most storylines, no matter the length or format.

<https://www.sciencedaily.com/releases/2020/08/200807153641.htm>

SCIENCE DAILY – Biology blurs line between sexes, behaviors

Biological sex is typically understood in binary terms: male and female. However, there are many examples of animals that are able to modify sex-typical biological and behavioral features and even change sex. A new study identifies a genetic switch in brain cells that can toggle between sex-specific states when necessary, findings that question the idea of sex as a fixed property.

<https://www.sciencedaily.com/releases/2020/08/200810140949.htm>

SCIENCE DAILY – Individual differences in the brain

If selection reinforces a behavior, brain activities soon change as well.

<https://www.sciencedaily.com/releases/2020/08/200810113222.htm>

SCIENCE DAILY – How boundaries become bridges in evolution

The mechanisms that make organisms locally fit and those responsible for change are distinct and occur sequentially in evolution.

<https://www.sciencedaily.com/releases/2020/08/200810183902.htm>

SCIENCE DAILY – Evolutionary theory of economic decisions

When survival over generations is the end game, researchers say it makes sense to undervalue long shots that could be profitable and overestimate the likelihood of rare bad outcomes.

<https://www.sciencedaily.com/releases/2020/08/200811163313.htm>

SCIENCE DAILY – Primate voice boxes are evolving at rapid pace

Scientists have discovered that the larynx, or voice box, of primates is significantly larger relative to body size, has greater variation, and is under faster rates of evolution than in other mammals.

<https://www.sciencedaily.com/releases/2020/08/200811142902.htm>

SCIENCE DAILY – Young children would rather explore than get rewards

Young children will pass up rewards they know they can collect to explore other options, a new study suggests. Researchers found that when adults and 4- to 5-year-old children played a game where certain choices earned them rewards, both adults and children quickly learned what choices would give them the biggest returns. But while adults then used that knowledge to maximize their prizes, children continued exploring the other options.

<https://www.sciencedaily.com/releases/2020/08/200812153637.htm>

SCIENCE DAILY – Adaptation in single neurons provides memory for language processing

To understand language, we have to remember the words that were uttered and combine them into an interpretation. How does the brain retain information long enough to accomplish this, despite the fact that neuronal firing events are very short-lived? Researchers propose a neurobiological explanation bridging this discrepancy. Neurons change their spike rate based on experience and this adaptation provides memory for sentence processing.

<https://www.sciencedaily.com/releases/2020/08/200812144024.htm>

SCIENCE DAILY – Recalling memories from 3rd-person perspective changes how our brain processes them

Adopting a third-person, observer point of view when recalling your past activates different parts of your brain than recalling a memory seen through your own eyes, according to a new article.

<https://www.sciencedaily.com/releases/2020/08/200813134553.htm>

SCIENCE DAILY – 200,000 years ago, humans preferred to kip cozy

Researchers in South Africa's Border Cave have found evidence that people have been using grass bedding to create comfortable areas for sleeping and working on at least 200,000 years ago.

<https://www.sciencedaily.com/releases/2020/08/200814123205.htm>

THE CONVERSATION – Boxgrove: how we found Europe's oldest bone tools

The Boxgrove people, like all other human species, were capable of sharing time, care and knowledge in all parts of their life.

<https://theconversationuk.cmail20.com/t/r-l-jkklalt-khhiliah-k/>

OTHER NEWS – Smithsonian – What Can Bonobos Teach Us About the Nature of Language?

A famed researcher's daring investigation into ape communication—and the backlash it has caused.

<https://www.smithsonianmag.com/science-nature/bonobos-teach-humans-about-nature-language-180975191/>

OTHER NEWS – LiveScience – 4,500-year-old 'timber circles' discovered in Portugal

They would have resembled Stonehenge-like monuments.

https://www.livescience.com/ancient-timber-circles-discovered-portugal.html?fbclid=IwAR37gLKx_C2R59LY8sdE0Jdd0TDkHq4x-ha8863saWnXLt4mtA6thAy25ks

PUBLICATIONS

Evolutionary Anthropology

PAPERS

MICHELLE C. LANGLEY & THOMAS SUDDENDORF – Mobile containers in human cognitive evolution studies: Understudied and underrepresented

Mobile carrying devices—slings, bags, boxes, containers, etc.—are a ubiquitous tool form among recent human communities. So ingrained are they to our present lifeways that the fundamental relationship between mobile containers and foresight is easily overlooked, resulting in their significance in the study of human cognitive development being largely unrecognized.

Exactly when this game-changing innovation appeared and became an essential component of the human toolkit is currently unknown. Taphonomic processes are obviously a significant factor in this situation; however, we argue that these devices have also not received the attention that they deserve from human evolution researchers. Here we discuss what the current archeological evidence is for Pleistocene-aged mobile containers and outline the various lines of evidence that they provide for the origins and development of human cognitive and cultural behavior.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21857?campaign=wolearlyview>

AMY L. BAUERNFEIND & COURTNEY C. BABBITT – Metabolic changes in human brain evolution

Because the human brain is considerably larger than those of other primates, it is not surprising that its energy requirements would far exceed that of any of the species within the order. Recently, the development of stem cell technologies and single-cell transcriptomics provides novel ways to address the question of what specific genomic changes underlie the human brain's unique phenotype. In this review, we consider what is currently known about human brain metabolism using a variety of methods from brain imaging and stereology to transcriptomics. Next, we examine novel opportunities that stem cell

technologies and single-cell transcriptomics provide to further our knowledge of human brain energetics. These new experimental approaches provide the ability to elucidate the functional effects of changes in genetic sequence and expression levels that potentially had a profound impact on the evolution of the human brain.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21831?campaign=woletoc>

Frontiers in Psychology

PAPERS

HANNAH S. SARVASY & SOONJA CHOI – Beyond the Two-Clause Sentence: Acquisition of Clause Chaining in Six Languages

Clause chains are a special type of complex sentence, found in hundreds of languages outside Western Europe, in which clauses are dependent but not embedded, and dozens of clauses can be combined into a single sentential unit. Unlike English complex sentences, clause chains' distribution is partially predictable in that they can, most fundamentally, be linked to a particular semantic context: description of temporally sequential events or actions. This and the morphological simplicity of verb forms in clause chains may combine to accelerate their acquisition by children, relative to complex sentences in other languages. No previous cross-linguistic studies of the acquisition of complex sentences have investigated clause chaining. In this paper, we report insights from a survey of the acquisition of clause chaining in six languages of diverse stocks with child speech databases spanning 1;1 to 10 years. Overall, children acquiring clause chaining languages begin to produce 2-clause chains between around 1;11 and 2;6. An initial stage in which chains are limited to just two clauses in length is followed by a stage in which longer chains of 3–5 clauses are also produced. Children acquiring languages in which adults produce both same-subject and different-subject clause chains produce a similar mix from early on; for some languages, this involves morphological “switch-reference” marking that anticipates the identity of the subject of an upcoming clause. This survey broadens our understanding of the acquisition of complex sentences by adding new data on the acquisition timing, semantics, and reference continuity of early clause chains.

https://www.frontiersin.org/articles/10.3389/fpsyg.2020.01586/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1401267_69_Psycho_20200811_arts_A

NARAYANAN SRINIVASAN – Consciousness Without Content: A Look at Evidence and Prospects

Many traditions in the East have proposed that consciousness without content is possible and could be achieved with mental training. However, it is not clear whether such a state is possible given that intentionality is a critical property of mentality and consciousness in many theories of consciousness. A prominent recent attempt to account for such states of “minimal phenomenal experience” is the ascending reticular arousal system (ARAS) model, which proposes a specific type of non-conceptual representational content to address such a state. Consciousness without content can also be understood by studying related or similar states of minimal phenomenal experience and this paper discusses such findings from such states including dreamless sleep experience and their implications. One way to argue for the need for proposing consciousness without content is to locate a property of consciousness that would necessitate postulating it. A continuous state of consciousness without content may be needed to understand continuity of conscious experience. Finally, I discuss the implications of consciousness without content for current theories of consciousness.

https://www.frontiersin.org/articles/10.3389/fpsyg.2020.01992/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1401267_69_Psycho_20200811_arts_A

Nature Communications

PAPERS

SHIR SHAHAL et al – Synchronization of complex human networks

The synchronization of human networks is essential for our civilization and understanding its dynamics is important to many aspects of our lives. Human ensembles were investigated, but in noisy environments and with limited control over the network parameters which govern the network dynamics. Specifically, research has focused predominantly on all-to-all coupling, whereas current social networks and human interactions are often based on complex coupling configurations. Here, we study the synchronization between violin players in complex networks with full and accurate control over the network connectivity, coupling strength, and delay. We show that the players can tune their playing period and delete connections by ignoring frustrating signals, to find a stable solution. These additional degrees of freedom enable new strategies and yield better solutions than are possible within current models such as the Kuramoto model. Our results may influence numerous fields, including traffic management, epidemic control, and stock market dynamics.

<https://www.nature.com/articles/s41467-020-17540-7>

Nature Human Behaviour

ARTICLES

ARMAND M. LEROI et al – Neutral syndrome

Neutral models of evolution assume the absence of natural selection. Formerly confined to ecology and evolutionary biology, neutral models are spreading. In recent years they've been applied to explaining the diversity of baby names, scientific citations, cryptocurrencies, pot decorations, literary lexica, tumour variants and much more besides. Here, we survey

important neutral models and highlight their similarities. We investigate the most widely used tests of neutrality, show that they are weak and suggest more powerful methods. We conclude by discussing the role of neutral models in the explanation of diversity. We suggest that the ability of neutral models to fit low-information distributions should not be taken as evidence for the absence of selection. Nevertheless, many studies, in increasingly diverse fields, make just such claims. We call this tendency 'neutral syndrome'.

<https://www.nature.com/articles/s41562-020-0844-7>

PAPERS

ALEX MCAVOY, BENJAMIN ALLEN & MARTIN A. NOWAK – Social goods dilemmas in heterogeneous societies

Prosocial behaviours are encountered in the donation game, the prisoner's dilemma, relaxed social dilemmas and public goods games. Many studies assume that the population structure is homogeneous, meaning that all individuals have the same number of interaction partners or that the social good is of one particular type. Here, we explore general evolutionary dynamics for arbitrary spatial structures and social goods. We find that heterogeneous networks, in which some individuals have many more interaction partners than others, can enhance the evolution of prosocial behaviours. However, they often accumulate most of the benefits in the hands of a few highly connected individuals, while many others receive low or negative payoff. Surprisingly, selection can favour producers of social goods even if the total costs exceed the total benefits. In summary, heterogeneous structures have the ability to strongly promote the emergence of prosocial behaviours, but they also create the possibility of generating large inequality.

<https://www.nature.com/articles/s41562-020-0881-2>

Nature Scientific Reports

PAPERS

ARNE ROETS et al – Utilitarianism in minimal-group decision making is less common than equality-based morality, mostly harm-oriented, and rarely impartial

In the study of utilitarian morality, the sacrificial dilemma paradigm has been the dominant approach for years. However, to address some of the most pressing issues in the current research literature, the present studies adopt an alternative approach by using a minimal group paradigm in which participants have to make decisions about the allocation of resources. This approach allows not only to pit utilitarianism against equality-based morality, but also to study these modes of morality for both harm and benefit, and to directly address the role of group identity affecting the (im)partial nature of 'utilitarian' (i.e., outcome maximizing) decisions. In our experiments, across four different samples (total N = 946), we demonstrate that although participants generally prefer equality-based allocations over maximizing distributions, outcome maximizing choices become more prevalent when they served to minimize harm compared to maximizing benefit. Furthermore, reducing the objective value of the equal distribution outcomes further prompts participants to adopt a more utilitarian approach in situations involving harm, but has little effect in situations where benefits have to be distributed. Finally, the introduction of (minimal) group identity consistently demonstrates that decisions that maximize the overall outcome are more likely if they also serve the ingroup compared to when they rather serve the outgroup. We discuss how these findings have meaningful implications that may be especially relevant for recent movements that advocate a utilitarian approach to charity, and for our understanding of (im)partiality in lay people's 'utilitarian' decision making.

<https://www.nature.com/articles/s41598-020-70199-4>

THOMAS W. DAVIES et al with JEAN-JACQUES HUBLIN & LEE R. BERGER – Distinct mandibular premolar crown morphology in *Homo naledi* and its implications for the evolution of *Homo* species in southern Africa

Homo naledi displays a combination of features across the skeleton not found in any other hominin taxon, which has hindered attempts to determine its placement within the hominin clade. Using geometric morphometrics, we assess the morphology of the mandibular premolars of the species at the enamel-dentine junction (EDJ). Comparing with specimens of *Paranthropus*, *Australopithecus* and *Homo* (n = 97), we find that the *H. naledi* premolars from the Dinaledi chamber consistently display a suite of traits (e.g., tall crown, well-developed P3 and P4 metaconid, strongly developed P3 mesial marginal ridge, and a P3 > P4 size relationship) that distinguish them from known hominin groups. Premolars from a second locality, the Lesedi Chamber, are consistent with this morphology. We also find that two specimens from South Africa, SK 96 (usually attributed to *Paranthropus*) and Stw 80 (*Homo* sp.), show similarities to the species, and we discuss a potential evolutionary link between *H. naledi* and hominins from Sterkfontein and Swartkrans.

<https://www.nature.com/articles/s41598-020-69993-x>

SANDRINE YAZBEK et al – Functional MRI study of language organization in left-handed and right-handed trilingual subjects

Functional MRI (fMRI) is gaining importance in the preoperative assessment of language. Selecting the appropriate language to test by fMRI in trilingual patients is intricate. Our objective is to compare fMRI maps for all three languages in left- and right-handed trilingual subjects. 15 right- and 15 left-handed trilingual volunteers were included in the study. We performed fMRI for each volunteer with a visual responsive naming paradigm that was repeated three times, once in each language. The activated areas and the laterality indices were calculated and correlation with the age of acquisition and proficiency of each language was determined. Strong statistical correlation was found between the Laterality Index (LI) of the three languages, in

both the right and left-handed groups. Discordant lateralization of language was only observed in four left-handed subjects who demonstrated bilateral and left-lateralization. In right-handed subjects, the activation maps for the first and the second acquired language were similar. The largest activation was seen with the last acquired language. Irrespective of language proficiency and age of acquisition, the language lateralization might change for left-handed subjects. In right-handed subjects, there is no change and the last acquired language results in the largest activation. fMRI performed for a single language can accurately determine language lateralization in right-handed subjects, whereas in left-handed subjects, it is mandatory to test all languages.

<https://www.nature.com/articles/s41598-020-70167-y>

New Scientist

ARTICLES

MICHAEL MARSHALL – First poison arrows may have been loosed 70,000 years ago in Africa

Hunter-gatherers in Africa may have been using poison-tipped arrows for more than 70,000 years, according to a new analysis of ancient arrowheads.

<https://www.newscientist.com/article/2250799-first-poison-arrows-may-have-been-loosed-70000-years-ago-in-africa/#ixzz6V2ry3OsF>

PLoS Biology

PAPERS

LEA ROUMAZEILLES et al – Longitudinal connections and the organization of the temporal cortex in macaques, great apes, and humans

This is an uncorrected proof.

The temporal association cortex is considered a primate specialization and is involved in complex behaviors, with some, such as language, particularly characteristic of humans. The emergence of these behaviors has been linked to major differences in temporal lobe white matter in humans compared with monkeys. It is unknown, however, how the organization of the temporal lobe differs across several anthropoid primates. Therefore, we systematically compared the organization of the major temporal lobe white matter tracts in the human, gorilla, and chimpanzee great apes and in the macaque monkey. We show that humans and great apes, in particular the chimpanzee, exhibit an expanded and more complex occipital–temporal white matter system; additionally, in humans, the invasion of dorsal tracts into the temporal lobe provides a further specialization. We demonstrate the reorganization of different tracts along the primate evolutionary tree, including distinctive connectivity of human temporal gray matter.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000810>

DANIEL L. BOWLING et al with W. TECUMSEH FITCH – Rapid evolution of the primate larynx?

Tissue vibrations in the larynx produce most sounds that comprise vocal communication in mammals. Larynx morphology is thus predicted to be a key target for selection, particularly in species with highly developed vocal communication systems. Here, we present a novel database of digitally modeled scanned larynges from 55 different mammalian species, representing a wide range of body sizes in the primate and carnivoran orders. Using phylogenetic comparative methods, we demonstrate that the primate larynx has evolved more rapidly than the carnivoran larynx, resulting in a pattern of larger size and increased deviation from expected allometry with body size. These results imply fundamental differences between primates and carnivorans in the balance of selective forces that constrain larynx size and highlight an evolutionary flexibility in primates that may help explain why we have developed complex and diverse uses of the vocal organ for communication.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000764>

PLoS Genetics

PAPERS

MELISSA J. HUBISZ, AMY L. WILLIAMS & ADAM SIEPEL – Mapping gene flow between ancient hominins through demography-aware inference of the ancestral recombination graph

The sequencing of Neanderthal and Denisovan genomes has yielded many new insights about interbreeding events between extinct hominins and the ancestors of modern humans. While much attention has been paid to the relatively recent gene flow from Neanderthals and Denisovans into modern humans, other instances of introgression leave more subtle genomic evidence and have received less attention. Here, we present a major extension of the ARGweaver algorithm, called ARGweaver-D, which can infer local genetic relationships under a user-defined demographic model that includes population splits and migration events. This Bayesian algorithm probabilistically samples ancestral recombination graphs (ARGs) that specify not only tree topologies and branch lengths along the genome, but also indicate migrant lineages. The sampled ARGs can therefore be parsed to produce probabilities of introgression along the genome. We show that this method is well powered to detect the archaic migration into modern humans, even with only a few samples. We then show that the method can also detect introgressed regions stemming from older migration events, or from unsampled populations. We apply it to human, Neanderthal, and Denisovan genomes, looking for signatures of older proposed migration events, including ancient humans into Neanderthal, and unknown archaic hominins into Denisovans. We identify 3% of the Neanderthal genome that

is putatively introgressed from ancient humans, and estimate that the gene flow occurred between 200–300kya. We find no convincing evidence that negative selection acted against these regions. Finally, we predict that 1% of the Denisovan genome was introgressed from an unsequenced, but highly diverged, archaic hominin ancestor. About 15% of these “super-archaic” regions—comprising at least about 4Mb—were, in turn, introgressed into modern humans and continue to exist in the genomes of people alive today.

<https://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1008895>

PLoS One

PAPERS

AARON D. NICHOLS et al with DAN ARIELY – Replicating and extending the effects of auditory religious cues on dishonest behavior

Although scientists agree that replications are critical to the debate on the validity of religious priming research, religious priming replications are scarce. This paper attempts to replicate and extend previously observed effects of religious priming on ethical behavior. We test the effect of religious instrumental music on individuals’ ethical behavior with university participants (N = 408) in the Czech Republic, Japan, and the US. Participants were randomly assigned to listen to one of three musical tracks (religious, secular, or white noise) or to no music (control) for the duration of a decision-making game. Participants were asked to indicate which side of a vertically-bisected computer screen contained more dots and, in every trial, indicating that the right side of the screen had more dots earned participants the most money (irrespective of the number of dots). Therefore, participants were able to report dishonestly to earn more money. In agreement with previous research, we did not observe any main effects of condition. However, we were unable to replicate a moderating effect of self-reported religiosity on the effects of religious music on ethical behavior. Nevertheless, further analyses revealed moderating effects for ritual participation and declared religious affiliation congruent with the musical prime. That is, participants affiliated with a religious organization and taking part in rituals cheated significantly less than their peers when listening to religious music. We also observed significant differences in cheating behavior across samples. On average, US participants cheated the most and Czech participants cheated the least. We conclude that normative conduct is, in part, learned through active membership in religious communities and our findings provide further support for religious music as a subtle, moral cue.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0237007>

PNAS

ARTICLES

NOBUHITO ABE – Overriding a moral default for honesty or dishonesty

There is a long-standing paradox concerning the cognitive nature of honesty: Is it a matter of “will” or “grace” (1)? The will hypothesis assumes that honesty requires cognitive control to suppress temptation to cheat, while dishonest behavior to serve self-interest is people’s automatic response. In contrast, the grace hypothesis assumes that honesty flows automatically without active resistance to temptation, while dishonest behavior is realized by cognitive control to override honest impulses. The previous findings related to this debate are mixed: Some studies have empirically supported the will hypothesis (2, 3), but others have empirically supported the grace hypothesis (4, 5). In an ambitious study in PNAS, Speer et al. (6) provide reconciliation between these two competing hypotheses, indicating that the prefrontal network could orchestrate both the honesty of individuals who are generally dishonest and the dishonesty of those who are generally honest through cognitive control, which depends on the individual’s moral default.

<https://www.pnas.org/content/early/2020/08/12/2014489117?etoc=>

PAPERS

THOMAS P. URBACH et al – An exploratory data analysis of word form prediction during word-by-word reading

In 2005, we reported evidence indicating that upcoming phonological word forms—e.g., kite vs. airplane—were predicted during reading. We recorded brainwaves (electroencephalograms [EEGs]) as people read word-by-word and then correlated the predictability in context of indefinite articles that preceded nouns (a kite vs. an airplane) with the average event-related brain potentials (ERPs) they elicited [K. A. DeLong, T. P. Urbach, M. Kutas, *Nat. Neurosci.* 8, 1117–1121 (2005)]. Amid a broader controversy about the role of word-form prediction in comprehension, those findings were recently challenged by a failed putative direct replication attempt [M. S. Nieuwland et al., *eLife* 7, e33468 (2018); nine labs, one experiment, and 2.6e4 observations]. To better understand the empirical justification for positing an association between prenominal article predictability and scalp potentials, we conducted a wide-ranging exploratory data analysis (EDA), pooling our original data with extant data from two followup studies (one lab, three experiments, and 1.2e4 observations). We modeled the time course of article predictability in the single-trial data by fitting linear mixed-effects regression (LMER) models at each time point and scalp location spanning a 3-s interval before, during, and after the article. Model comparisons based on Akaike information criteria (AIC) and slope-regression ERPs [rERPs; N. J. Smith, M. Kutas, *Psychophysiology* 52, 157–168 (2015)] provide substantial empirical support for a small positive association between article predictability and scalp potentials approximately 300 to 500 ms after article onset, predominantly over bilateral posterior scalp. We think this effect may reasonably be attributed to prediction of upcoming word forms.

<https://www.pnas.org/content/early/2020/08/10/1922028117.abstract?etoc>

RYAN V. RAUT, ABRAHAM Z. SNYDER & MARCUS E. RAICHLE – Hierarchical dynamics as a macroscopic organizing principle of the human brain

Accumulating evidence suggests that, during task performance, information is encoded at shorter timescales in primary sensory regions as compared to longer timescales in higher-order cortical regions. These encoding timescales correlate with the timescales of activity within these regions. Here, we test the hypothesis that a hierarchy of activity timescales represents a general organizing principle of brain function. Using functional imaging of the human brain in the eyes-open resting state, we find that the timescales of ongoing activity are hierarchically organized as gradients across the entire cerebral cortex. Further, whole-brain coverage permitted examination of subcortical structures, which exhibited hierarchical timescale gradients parallel to cerebral cortex. Altogether, our results support the existence of hierarchical gradients that globally organize human brain dynamics.

<https://www.pnas.org/content/early/2020/08/11/2003383117.abstract?etoc>

Proceedings of the Royal Society B

PAPERS

YITZCHAK BEN MOCHA – Why do human and non-human species conceal mating? The cooperation maintenance hypothesis

Despite considerable cultural differences, a striking uniformity is argued to exist in human preferences for concealing sexual intercourse from the sensory perception of conspecifics. However, no systematic accounts support this claim, with only limited attempts to understand the selective pressures acting on the evolution of this preference. Here, I combine cross-cultural and cross-species comparative approaches to investigate these topics. First, an analysis of more than 4572 ethnographies from 249 cultures presents systematic evidence that the preference to conceal mating is widespread across cultures. Second, I argue that current anthropological hypotheses do not sufficiently explain why habitual concealment of mating evolved in humans but is only seldom exhibited by other social species. Third, I introduce the cooperation maintenance hypothesis, which postulates that humans, and a specific category of non-human species, conceal matings to prevent sexual arousal in witnesses (proximate explanation). This allows them to simultaneously maintain mating control over their partner(s) and cooperation with group members who are prevented from mating (ultimate explanations). I conclude by presenting a comparative framework and predictions to be tested across species and human cultures.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2020.1330>

Science

ARTICLES

ELIZABETH LEVY PALUCK & CHELSEY S. CLARK – Can playing together help us live together?

The contact hypothesis in psychology predicts that prejudice can be reduced when rival groups come together under optimal circumstances of cooperation and equal status. To date, the weight of real-world evidence for this hypothesis comes from self-reported attitudes after self-initiated contact, not from preregistered randomized trials that take intergroup contact as seriously as one would take a potential vaccine for conflict (1, 2). Consequently, on page 866 of this issue, the results of Mousa's (3) new field experiment are breaking news. Mousa intervened in amateur Christian soccer leagues across Northern Iraqi cities affected by ISIS violence. To assess the impact of this ambitious real-world intervention, she randomly assigned Muslim players to half of the teams, measured players' behavior up to 6 months later, and posted her preregistered analysis plan and data alongside the report. Mousa finds that having Muslim teammates causes Christian players to change their behavior for the better toward Muslim players, by including them, working with them, and awarding them material signs of respect. Team-based contact with minority group members reduced prejudiced behavior toward other minority group players.

<https://science.sciencemag.org/content/369/6505/769>

PAPERS

LYN WADLEY et al – Fire and grass-bedding construction 200 thousand years ago at Border Cave, South Africa

Early plant use is seldom described in the archaeological record because of poor preservation. We report the discovery of grass bedding used to create comfortable areas for sleeping and working by people who lived in Border Cave at least 200,000 years ago. Sheaves of grass belonging to the broad-leafed Panicoideae subfamily were placed near the back of the cave on ash layers that were often remnants of bedding burned for site maintenance. This strategy is one forerunner of more-complex behavior that is archaeologically discernible from ~100,000 years ago.

<https://science.sciencemag.org/content/369/6505/863>

Trends in Cognitive Sciences

PAPERS

CARSTEN K.W. DE DREU et al – Group Cooperation, Carrying-Capacity Stress, and Intergroup Conflict

Peaceful intergroup relations deteriorate when individuals engage in parochial cooperation and parochial competition. To understand when and why intergroup relations change from peaceful to violent, we present a theoretical framework mapping out the different interdependence structures between groups. According to this framework, cooperation can lead to group expansion and ultimately to carrying-capacity stress. In such cases of endogenously created carrying-capacity stress, intergroup relations are more likely to become negatively interdependent, and parochial competition can emerge as a response. We discuss the cognitive, neural, and hormonal building blocks of parochial cooperation, and conclude that conflict between groups can be the inadvertent consequence of human preparedness – biological and cultural – to solve cooperation problems within groups.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(20\)30146-7?dgcid=raven_jbs_etoc_email](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(20)30146-7?dgcid=raven_jbs_etoc_email)

Trends in Ecology and Evolution

PAPERS

DANIEL C. LAUGHLIN et al – The Net Effect of Functional Traits on Fitness

Generalizing the effect of traits on performance across species may be achievable if traits explain variation in population fitness. However, testing relationships between traits and vital rates to infer effects on fitness can be misleading. Demographic trade-offs can generate variation in vital rates that yield equal population growth rates, thereby obscuring the net effect of traits on fitness. To address this problem, we describe a diversity of approaches to quantify intrinsic growth rates of plant populations, including experiments beyond range boundaries, density-dependent population models built from long-term demographic data, theoretical models, and methods that leverage widely available monitoring data. Linking plant traits directly to intrinsic growth rates is a fundamental step toward rigorous predictions of population dynamics and community assembly.

[https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(20\)30190-7?dgcid=raven_jbs_aip_email](https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(20)30190-7?dgcid=raven_jbs_aip_email)

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