EAORC BULLETIN 895 – 9 August 2020

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.

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.

BREAKING SCIENCE – Denisovans Interbred with Mysterious Archaic Hominin: Study

In a new study published in the journal PLoS Genetics, researchers analyzed the genomes of two Neanderthals, a Denisovan, and two African humans; and found that 1% of the Denisovan genome was introgressed from an unknown archaic hominin ancestor; about 15% of these archaic regions were, in turn, introgressed into modern humans and continue to exist in the genomes of people alive today.
http://feedproxy.google.com/~r/BreakingScienceNews/~3/271bt9NMQEM/denisovans-archaic-hominin-08723.html?utm_source=feedburner&utm_medium=email

SCIENCE DAILY – Key brain region was 'recycled' as humans developed the ability to read

A new study offers evidence that the brain's inferotemporal cortex, which is specialized to perform object recognition, has been repurposed for a key component of reading called orthographic processing -- the ability to recognize written letters and words.
https://www.sciencedaily.com/releases/2020/08/200804134734.htm

SCIENCE DAILY – Monkeying around: Study finds older primates father far fewer babies

Older male rhesus monkeys sire fewer offspring, even though they appear to be mating as much as younger monkeys with similarly high social status. Sperm quality or quantity, or the survival of infants, may decline with the age of the would-be father, the new study suggests. A new study has implications for understanding some age-related aspects of male reproductive health in primates, including humans.
https://www.sciencedaily.com/releases/2020/08/200803160457.htm

SCIENCE DAILY – Energy demands limit our brains' information processing capacity

Our brains have an upper limit on how much they can process at once due to a constant but limited energy supply, according to a new study using a brain imaging method that measures cellular metabolism.
https://www.sciencedaily.com/releases/2020/08/200803140046.htm

SCIENCE DAILY – An iconic Native American stone tool technology discovered in Arabia

A new article examines fluted projectile points from southern Arabia, detailing production methods and technical aspects that indicate differences in function from the technology of the Americas, despite similarities in form. Findings from experimentation and comparative analysis suggest that highly-skilled, convergent technologies can have varying anthropological implications.
https://www.sciencedaily.com/releases/2020/08/200805160938.htm

SCIENCE DAILY – DNA from an ancient, unidentified ancestor was passed down to humans living today

A new analysis of ancient genomes suggests that different branches of the human family tree interbred multiple times, and that some humans carry DNA from an archaic, unknown ancestor.
https://www.sciencedaily.com/releases/2020/08/200806153558.htm

SAPIENS – Theory of mind

Scientists are trying to create artificial intelligence that can think about others' thoughts. What might this reveal about perspective-taking in AI, humans, and animals?
https://sapiens.us11.list-manage.com/track/click?u=80f6cf678900daf984bf763b7&id=3ef840921e&e=dc0eff6180

PUBLICATIONS

American Journal of Physical Anthropology

PAPERS

BRIAN J. ADDISON & DANIEL E. LIEBERMAN – Assessing patterns of variation in BV /TV in the calcaneus and C2 vertebra of Gorilla gorilla , Pan troglodytes , and populations of Homo sapiens from the Pleistocene and Holocene that differ in physical activity levels

Because trabecular bone volume fraction (BV/TV) is influenced by variations in physical activity recent declines in BV/TV in humans are often attributed to modern sedentary lifestyles. This study tests the hypothesis that presumed variations in mechanical loading between groups can predict the observed BV/TV patterns in humans, chimpanzees and gorillas in two bones: the calcaneus which experiences high and well characterized impact forces, and the C2 vertebrae which experiences reduced locomotor forces.

BV/TV and other structural variables were quantified from high-resolution microCT scans in gorillas, chimpanzees, and four Homo sapiens populations: Pleistocene, semi-sedentary Natufians; Holocene hunter-gatherers from Point Hope, Alaska; Holocene nomadic pastoralists from medieval Europe; and modern, sedentary Americans.

In the calcaneal tuberosity, Natufian BV/TV was 36, 46, and 46% greater than Alaskans (p = .02), Europeans (p = .005) and modern Americans (p = .002), respectively, but not significantly different from apes. BV/TV was not significantly different between modern Americans and Alaskans or Europeans. In the C2, Natufian BV/TV was 53 and 25% greater than in the Alaskan (p = .0001) and European (p = .048) populations.
These results suggest that phenomena other than or in addition to variations in physical activity are needed to explain BV/TV patterns observed in H. sapiens, and point to a systemic decline in H. sapiens BV/TV after the Pleistocene.
https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24064?campaign=wolearlyview

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Animal Behaviour

PAPERS

MARLEN FRÖHLICH et al – Social interactions and interaction partners in infant orang-utans of two wild populations
Temporary associations with conspecifics provide critical opportunities for the acquisition and development of socioecological skills, especially in species where these interaction opportunities are not readily available. In fact, social interactions can have far-reaching consequences for the cultural and communicative repertoire on both the species and population level. However, to what extent interaction rates are linked to association patterns, which depend on individual and ecological factors, is often overlooked. Here, we examined the sources of variation in immatures' social behaviour, in relation to both activity and partner type, in one Sumatran (Suaq) and one Bornean population (Tuanan) of wild orang-utans (Pongo spp.) that are known to differ in sociability. Specifically, we examined to what extent the time spent in social interactions and with specific social partners was related to study population, but also individual (e.g. age), ecological (food availability) and social variables (e.g. presence of specific associates). Overall, we found that study population and the presence of specific associates (siblings, peers, adult males) had a profound effect on the occurrence of different social activities, while local variation in food availability did not appear to play a major role. Although proportions of time spent in interactions was overall higher at Suaq, we found no difference between the two sites regarding the use of interaction opportunities when partners were available. Begging was mainly directed at mothers, whereas peers and older siblings served primarily as play partners, and unflanged males were frequent targets of social gazing. Our study suggests that orang-utan infants use interaction opportunities differently depending on social partners and interaction type.
https://www.sciencedirect.com/science/article/pii/S0003347220301676?dgcid=raven_sd_via_email

MAURICIO CANTOR, LUCY M. APLIN & DAMIEN R. FARINE – A primer on the relationship between group size and group performance
Living in groups can benefit individuals in many ways, including in innovative problem solving. Several hypotheses have suggested mechanisms to explain why larger groups disproportionately outperform smaller groups, including the skill pool and pool of competence effects. However, disentangling these potential mechanisms from the effects of group size alone has been challenging. Here, we first outline key ways in which group size can shape performance in innovative problem solving. We then detail the nonlinear nature of the mathematical relationship between group size and various measures of group performance. Finally, we use simulations to confirm that measures of group performance in innovative problem solving scale nonlinearly with group size, even in the absence of any other effect. Our study provides guidance on how best to evaluate hypotheses about group composition on innovative problem solving, and clarity to help future studies make appropriate assumptions when developing null hypotheses against which to test their empirical data.
https://www.sciencedirect.com/science/article/abs/pii/S0003347220301767?dgcid=raven_sd_via_email

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Current Biology

ARTICLES

MICHAEL GROSS – Clever and colourful characters
Parrots have long been appreciated as pets for their ability to mimic human speech, but do they understand what they say? Studies into the nature of their considerable intelligence and possible consciousness still have questions to answer. Although feral parrots invading cities may create the impression of resilience, many species are currently at risk of extinction.
https://www.cell.com/current-biology/fulltext/S0960-9822(20)31066-6?dgcid=raven_jbs_etoc_email

NICOLE DRUMMOND – Model-based decision making and model-free learning
Free will is anything but free. With it comes the onus of choice: not only what to do, but which inner voice to listen to — our 'automatic' response system, which some consider 'impulsive' or 'irrational', or our supposedly more rational deliberative one. Rather than a devil and angel sitting on our shoulders, research suggests that we have two decision-making systems residing in the brain, in our basal ganglia. Neither system is the devil and neither is irrational. They both have our best interests at heart and aim to suggest the best course of action calculated through rational algorithms. However, the algorithms they use are qualitatively different and do not always agree on which action is optimal. The rivalry between habitual, fast action and deliberative, purposeful action is an ongoing one.
https://www.cell.com/current-biology/fulltext/S0960-9822(20)30903-9?dgcid=raven_jbs_etoc_email

MICHAEL J. SHEEHAN – Socially Distanced Wasps Learn About Rivals
Tracking the outcomes of third-party social interactions is a vital social skill but thought to be cognitively complicated. Paper wasps can learn about others' fighting abilities from observation, suggesting surprisingly complex understanding of social networks in a miniature brain.
https://www.cell.com/current-biology/fulltext/S0960-9822(20)30775-2?dgcid=raven_jbs_etoc_email

PAPERS

ELIZABETH A. TIBBETTS, ELLERY WONG & SARAH BONELLO – Wasps Use Social Eavesdropping to Learn about Individual Rivals
Many animals minimize the costs of conflict by using social eavesdropping to learn about the fighting ability of potential rivals before they interact. Learning about individual conspecifics via social eavesdropping allows individuals to assess potential opponents without personal risk. However, keeping track of a network of individually differentiated social relationships is thought to be cognitively challenging. Here, we test how Polistes fuscatus nest-founding queens use social eavesdropping to assess individual rivals. Bystanders watched conspecifics fight through a clear partition. Then, bystanders were allowed to interact with fighters. Bystander behavior toward fighters was strongly influenced by the observed fight; bystanders were less aggressive toward fighters that were seen to initiate more and receive less aggression. Control trials allow us to reject alternative explanations for the link between observed aggression and bystander behavior, including priming or winner/loser effects. Therefore, P. fuscatus wasps observe and remember a complex network of social interactions between individual conspecifics rather than only paying attention to individuals they interact with directly. Wasps have an impressive capacity to learn, remember, and make social deductions about individuals. These results indicate that insects can have surprisingly complex social lives involving a network of individually differentiated social relationships.
https://www.cell.com/current-biology/fulltext/S0960-9822(20)30740-5?dgcid=raven_jbs_etoc_email

SONJA WILD et al – Integrating Genetic, Environmental, and Social Networks to Reveal Transmission Pathways of a Dolphin Foraging Innovation
Cultural behavior, which is transmitted among conspecifics through social learning, is found across various taxa. Vertical social transmission from parent to offspring is thought to be adaptive because of the parental generation being more skilled than maturing individuals. It is found throughout the animal kingdom, particularly in species with prolonged parental care. Social learning can also occur among members of the same generation or between older, non-parental individuals and younger generations via horizontal or oblique transmission, respectively. Extensive work on primate culture has shown that horizontal transmission of foraging behavior is biased toward species with broad cultural repertoires and those with increased levels of social tolerance, such as great apes. Vertical social transmission has been established as the primary transmission mechanism of foraging behaviors in the Indo-Pacific bottlenose dolphin (Tursiops aduncus) population of Shark Bay, Western Australia. Here, we investigated the spread of another foraging strategy, “shelling”, whereby some dolphins in this population feed on prey trapped inside large marine gastropod shells. Using a multi-network version of “network-based diffusion analysis” (NBDA), we show that shelling behavior spreads primarily through non-vertical social transmission. By statistically accounting for both environmental and genetic influences, our findings thus represent the first evidence of non-vertical transmission of a foraging tactic in toothed whales. This research suggests there are multiple transmission pathways of foraging behaviors in dolphins, highlighting the similarities between cetaceans and great apes in the nature of the transmission of cultural behaviors.
https://www.cell.com/current-biology/fulltext/S0960-9822(20)30756-9?dgcid=raven_jbs_etoc_email

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Mind & Language

PAPERS

HUGH MELLOR & RICHARD BRADLEY – Conditionals: Truth, safety, and success
Whether I take some action that aims at desired consequence C depends on whether or not I take it to be true that if I so act, I will bring C about and that if I do not, I will fail to. And the action will succeed if and only if my beliefs are true. We argue that two theses follow: (I) To believe a conditional is to be disposed to infer its consequent from the truth of its antecedent, and (II) The conditional is true iff the inference would not make a true belief in the antecedent cause a false belief in the consequent.
https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12322?campaign=wolearlyview

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Nature

NEWS

Evidence grows that peopling of the Americas began more than 20,000 years ago
The long-debated timing of the peopling of the Americas comes into focus, thanks to some archaeological findings. What are the implications of a revised timeline for our understanding of these earliest inhabitants?
https://www.nature.com/articles/d41586-020-02137-3

PAPERS

CIPRIAN F. ARDELEAN et al with ESKE WILLERSLEV – Evidence of human occupation in Mexico around the Last Glacial Maximum

The initial colonization of the Americas remains a highly debated topic, and the exact timing of the first arrivals is unknown. The earliest archaeological record of Mexico—which holds a key geographical position in the Americas—is poorly known and understudied. Historically, the region has remained on the periphery of research focused on the first American populations. However, recent investigations provide reliable evidence of a human presence in the northwest region of Mexico, the Chiapas Highlands, Central Mexico and the Caribbean coast during the Late Pleistocene and Early Holocene epochs. Here we present results of recent excavations at Chiquihuite Cave—a high-altitude site in central-northern Mexico—that corroborate previous findings in the Americas of cultural evidence that dates to the Last Glacial Maximum (26,500–19,000 years ago), and which push back dates for human dispersal to the region possibly as early as 33,000–31,000 years ago. The site yielded about 1,900 stone artefacts within a 3-m-deep stratified sequence, revealing a previously unknown lithic industry that underwent only minor changes over millennia. More than 50 radiocarbon and luminescence dates provide chronological control, and genetic, palaeoenvironmental and chemical data document the changing environments in which the occupants lived. Our results provide new evidence for the antiquity of humans in the Americas, illustrate the cultural diversity of the earliest dispersal groups (which predate those of the Clovis culture) and open new directions of research.
https://www.nature.com/articles/s41586-020-2509-0

LORENA BECERRA-VALDIVIA & THOMAS HIGHAM – The timing and effect of the earliest human arrivals in North America

The peopling of the Americas marks a major expansion of humans across the planet. However, questions regarding the timing and mechanisms of this dispersal remain, and the previously accepted model (termed 'Clovis-first')—suggesting that the first inhabitants of the Americas were linked with the Clovis tradition, a complex marked by distinctive fluted lithic points—has been effectively refuted. Here we analyse chronometric data from 42 North American and Beringian archaeological sites using a Bayesian age modelling approach, and use the resulting chronological framework to elucidate spatiotemporal patterns of human dispersal. We then integrate these patterns with the available genetic and climatic evidence. The data obtained show that humans were probably present before, during and immediately after the Last Glacial Maximum (about 26.5–19 thousand years ago) but that more widespread occupation began during a period of abrupt warming, Greenland Interstadial 1 (about 14.7–12.9 thousand years before AD 2000). We also identify the near-synchronous commencement of Beringian, Clovis and Western Stemmed cultural traditions, and an overlap of each with the last dates for the appearance of 18 now-extinct faunal genera. Our analysis suggests that the widespread expansion of humans through North America was a key factor in the extinction of large terrestrial mammals.
https://www.nature.com/articles/s41586-020-2491-6

Nature Communications

PAPERS

RISHI RAJALINGHAM et al with STANISLAS DEHAENE – The inferior temporal cortex is a potential cortical precursor of orthographic processing in untrained monkeys

The ability to recognize written letter strings is foundational to human reading, but the underlying neuronal mechanisms remain largely unknown. Recent behavioral research in baboons suggests that non-human primates may provide an opportunity to investigate this question. We recorded the activity of hundreds of neurons in V4 and the inferior temporal cortex (IT) while naïve macaque monkeys passively viewed images of letters, English words and non-word strings, and tested the capacity of those neuronal representations to support a battery of orthographic processing tasks. We found that simple linear read-outs of IT (but not V4) population responses achieved high performance on all tested tasks, even matching the performance and error patterns of baboons on word classification. These results show that the IT cortex of untrained primates can serve as a precursor of orthographic processing, suggesting that the acquisition of reading in humans relies on the recycling of a brain network evolved for other visual functions.
https://www.nature.com/articles/s41467-020-17714-3

Nature Scientific Reports

PAPERS

JULIAN PACKHEISER et al – A large-scale estimate on the relationship between language and motor lateralization

Human language is dominantly processed in the left cerebral hemisphere in most of the population. While several studies have suggested that there are higher rates of atypical right-hemispheric language lateralization in left-/mixed-handers, an accurate estimate of this association from a large sample is still missing. In this study, we comprised data from 1,554 individuals sampled in three previous studies in which language lateralization measured via dichotic listening, handedness and footedness were assessed. Overall, we found a right ear advantage indicating typical left-hemispheric language lateralization in 82.1% of the participants. While we found significantly more left-handed individuals with atypical language lateralization on the categorical level, we only detected a very weak positive correlation between dichotic listening lateralization quotients (LQs) and handedness LQs using continuous measures. Here, only 0.4% of the variance in language

lateralization were explained by handedness. We complemented these analyses with Bayesian statistics and found no evidence in favor of the hypothesis that language lateralization and handedness are related. Footedness LQs were not correlated with dichotic listening LQs, but individuals with atypical language lateralization also exhibited higher rates of atypical footedness on the categorical level. We also found differences in the extent of language lateralization between males and females with males exhibiting higher dichotic listening LQs indicating more left-hemispheric language processing. Overall, these findings indicate that the direct associations between language lateralization and motor asymmetries are much weaker than previously assumed with Bayesian correlation analyses even suggesting that they do not exist at all. Furthermore, sex differences seem to be present in language lateralization when the power of the study is adequate suggesting that endocrinological processes might influence this phenotype.
https://www.nature.com/articles/s41598-020-70057-3

JULIETTE AYCHET et al – Red-capped mangabeys (Cercocebus torquatus) adapt their interspecific gestural communication to the recipient's behaviour
Sensitivity to recipient's attention and responsiveness are critical markers of intentional communication. Although previous research showed that ape gestures can be intentional, few studies have yet addressed this question concerning monkeys. Here, we characterise the effect of a recipient's presence, attentional state and responsiveness on the interspecific gestural communication of captive red-capped mangabeys (Cercocebus torquatus). Previous reports showed that they produced learnt begging gestures towards a human recipient preferentially when the latter was facing them. We used here a novel setup that allows subjects to move around an experimenter and to use different modalities (visual and acoustic) to communicate. We found that when the recipient was not facing them, mangabeys moved to a position in the visual field of their recipient rather than using attention-getters. Interestingly, unlike apes, they did not elaborate their communication visually or acoustically when the experimenter did not respond favourably to their begging. However, our results may suggest that begging gestures were goal-directed, since mangabeys inhibited them when the experimenter was not available to answer immediately (i.e. give a reward). Overall, red-capped mangabeys' interspecific visual communication presented intentionality features, but their use of begging gestures was less flexible than that of great apes in similar situations.
https://www.nature.com/articles/s41598-020-69847-6

KONSTANTINA MARGIOTOUDI & FRIEDEMANN PULVERMÜLLER – Action sound–shape congruencies explain sound symbolism
Sound symbolism, the surprising semantic relationship between meaningless pseudowords (e.g., 'maluma', 'takete') and abstract (round vs. sharp) shapes, is a hitherto unexplained human-specific knowledge domain. Here we explore whether abstract sound symbolic links can be explained by those between the sounds and shapes of bodily actions. To this end, we asked human subjects to match pseudowords with abstract shapes and, in a different experimental block, the sounds of actions with the shapes of the trajectories of the actions causing these same sounds. Crucially, both conditions were also crossed. Our findings reveal concordant matching in the sound symbolic and action domains, and, importantly, significant correlations between them. We conclude that the sound symbolic knowledge interlinking speech sounds and abstract shapes is explained by audiovisual information immanent to action experience along with acoustic similarities between speech and action sounds. These results demonstrate a fundamental role of action knowledge for abstract sound symbolism, which may have been key to human symbol-manipulation ability.
https://www.nature.com/articles/s41598-020-69528-4

PeerJ

PAPERS

JULIE ANDRIEU et al with KLAUS ZUBERBÜHLER – White-handed gibbons discriminate context-specific song compositions
White-handed gibbons produce loud and acoustically complex songs when interacting with their neighbours or when encountering predators. In both contexts, songs are assembled from a small number of units although their composition differs in context-specific ways. Here, we investigated whether wild gibbons could infer the 'meaning' when hearing exemplars recorded in both contexts (i.e. 'duet songs' vs. 'predator songs'). We carried out a playback experiment by which we simulated the presence of a neighbouring group producing either its duet or a predator song in order to compare subjects' vocal and locomotor responses. When hearing a recording of a duet song, subjects reliably responded with their own duet song, which sometimes elicited further duet songs in adjacent groups. When hearing a recording of a predator song, however, subjects typically remained silent, apart from one of six groups which replied with its own predator song. Moreover, in two of six trials, playbacks of predator songs elicited predator song replies in non-adjacent groups. Finally, all groups showed strong anti-predator behaviour to predator songs but never to duet songs. We concluded that white-handed gibbons discriminated between the two song types and were able to infer meaning from them. We discuss the implications of these findings in light of the current debate on the evolutionary origins of syntax.
https://peerj.com/articles/9477/

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

HELEN L. LONG et al – Social and endogenous infant vocalizations

Research on infant vocal development has provided notable insights into vocal interaction with caregivers, elucidating growth in foundations for language through parental elicitation and reaction to vocalizations. A role for infant vocalizations produced endogenously, potentially providing raw material for interaction and a basis for growth in the vocal capacity itself, has received less attention. We report that in laboratory recordings of infants and their parents, the bulk of infant speech-like vocalizations, or "protophones", were directed toward no one and instead appeared to be generated endogenously, mostly in exploration of vocal abilities. The tendency to predominantly produce protophones without directing them to others occurred both during periods when parents were instructed to interact with their infants and during periods when parents were occupied with an interviewer, with the infants in the room. The results emphasize the infant as an agent in vocal learning, even when not interacting socially and suggest an enhanced perspective on foundations for vocal language.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0224956

VERONICA Y. WOMACK et al – Culturally aware mentorship: Lasting impacts of a novel intervention on academic administrators and faculty

National efforts to address the diversity dilemma in Science, Technology, Engineering, and Math (STEM) often emphasize increasing numbers of historically underrepresented (HU) students and faculty, but fall short in instituting concrete changes for inclusion and belonging. Therefore, increasing the pool of senior faculty who wish to become guides and advocates for emerging scientists from HU populations is an essential step toward creating new pathways for their career advancement. As a step toward achieving this goal, we created a novel eight-hour intervention on Culturally Aware Mentoring (CAM), a program of the National Research Mentoring Network (NRMN) targeted to faculty and administrators. A previous report of surveys at the end of the CAM sessions revealed substantial awareness and knowledge gains, with participants expressing intentions to use and implement new skills they had learned. In this paper, we provide the results of our thematic analysis of qualitative interviews with academic administrators and faculty, 18–24 months after participation in CAM. Interviews were designed to determine: 1) What changes in self-perceptions and interactions occurred as a result of participation in CAM? 2) What specific components of CAM are associated with changes in individual beliefs and practices? 3) How did participants actively make changes after the CAM workshop? 4) What barriers or challenges do participants encounter after the CAM intervention? The results demonstrate the lasting influences of CAM on participants' awareness of cultural differences, their assumptions about and approaches toward interactions with colleagues and students, and their efforts to change their behaviors to promote inclusive practices in their mentoring and teaching of HU students in STEM. Our findings provide evidence that CAM can be incorporated into existing mentor training programs designed to improve the confidence and capacity of senior research faculty mentors to make culturally-informed, scholar-centered decisions to more deliberately recognize and respond to cultural differences within their mentoring and collegial relationships.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0236983

PNAS

PAPERS

STACY ROSENBAUM et al – Social bonds do not mediate the relationship between early adversity and adult glucocorticoids in wild baboons

In humans and other animals, harsh conditions in early life can have profound effects on adult physiology, including the stress response. This relationship may be mediated by a lack of supportive relationships in adulthood. That is, early life adversity may inhibit the formation of supportive social ties, and weak social support is itself often linked to dysregulated stress responses. Here, we use prospective, longitudinal data from wild baboons in Kenya to test the links between early adversity, adult social bonds, and adult fecal glucocorticoid hormone concentrations (a measure of hypothalamic–pituitary–adrenal [HPA] axis activation and the stress response). Using a causal inference framework, we found that experiencing one or more sources of early adversity led to a 9 to 14% increase in females' glucocorticoid concentrations across adulthood. However, these effects were not mediated by weak social bonds: The direct effects of early adversity on adult glucocorticoid concentrations were 11 times stronger than the effects mediated by social bonds. This pattern occurred, in part, because the effect of social bonds on glucocorticoids was weak compared to the powerful effects of early adversity on glucocorticoid levels in adulthood. Hence, in female baboons, weak social bonds in adulthood are not enough to explain the effects of early adversity on glucocorticoid concentrations. Together, our results support the well-established notions that early adversity and weak social bonds both predict poor adult health. However, the magnitudes of these two effects differ considerably, and they may act independently of one another.
https://www.pnas.org/content/early/2020/07/29/2004524117.abstract?etoc

SEBASTIAN P. H. SPEER, ALE SMIDTS & MAARTEN A. S. BOKSEM – Cognitive control increases honesty in cheaters but cheating in those who are honest

Every day, we are faced with the conflict between the temptation to cheat for financial gains and maintaining a positive image of ourselves as being a "good person." While it has been proposed that cognitive control is needed to mediate this conflict between reward and our moral self-image, the exact role of cognitive control in (dis)honesty remains elusive. Here we identify this role, by investigating the neural mechanism underlying cheating. We developed a task which allows for inconspicuously measuring spontaneous cheating on a trial-by-trial basis in the MRI scanner. We found that activity in the nucleus accumbens promotes cheating, particularly for individuals who cheat a lot, while a network consisting of posterior cingulate cortex, temporoparietal junction, and medial prefrontal cortex promotes honesty, particularly in individuals who are generally honest. Finally, activity in areas associated with cognitive control (anterior cingulate cortex and inferior frontal gyrus) helped dishonest participants to be honest, whereas it enabled cheating for honest participants. Thus, our results suggest that cognitive control is not needed to be honest or dishonest per se but that it depends on an individual's moral default.
https://www.pnas.org/content/early/2020/07/23/2003480117.abstract?etoc

BRIAN J. LUCAS & LORAN F. NORDGREN – The creative cliff illusion

Across eight studies, we tested whether people understand the time course of their own creativity. Prior literature finds that creativity tends to improve across an ideation session. Here we compared people's beliefs against their actual creative performance. Consistent with prior research, we found that people's creativity, on aggregate, remained constant or improved across an ideation session. However, people's beliefs did not match this reality. We consistently found that people expected their creativity to decline over time. We refer to this misprediction as the creative cliff illusion. Study 1 found initial evidence of this effect across an ideation task. We found further evidence in a sample with high domain-relevant knowledge (study 2), when creativity judgments were elicited retrospectively (study 3), and across a multiday study (study 5). We theorized the effect occurs because people mistakenly associate creativity (the novelty and usefulness of an idea) with idea production (the ability to generate an idea). Study 4 found evidence consistent with this mechanism. The creative cliff illusion was attenuated among those with high levels of everyday creative experience (study 6) and after a knowledge intervention that increased awareness of the effect (study 7). Demonstrating the impact of creativity beliefs on downstream performance, study 8 found that declining creativity beliefs negatively influenced task persistence and creative performance, suggesting that people underinvest in ideation. This research contributes to work on prediction in the creative domain and demonstrates the importance of understanding creativity beliefs for predicting creative performance.
https://www.pnas.org/content/early/2020/07/31/2005620117.abstract?etoc

IAN M. BRIGHT RT AL – A temporal record of the past with a spectrum of time constants in the monkey entorhinal cortex

Episodic memory is believed to be intimately related to our experience of the passage of time. Indeed, neurons in the hippocampus and other brain regions critical to episodic memory code for the passage of time at a range of timescales. The origin of this temporal signal, however, remains unclear. Here, we examined temporal responses in the entorhinal cortex of macaque monkeys as they viewed complex images. Many neurons in the entorhinal cortex were responsive to image onset, showing large deviations from baseline firing shortly after image onset but relaxing back to baseline at different rates. This range of relaxation rates allowed for the time since image onset to be decoded on the scale of seconds. Further, these neurons carried information about image content, suggesting that neurons in the entorhinal cortex carry information about

not only when an event took place but also, the identity of that event. Taken together, these findings suggest that the primate entorhinal cortex uses a spectrum of time constants to construct a temporal record of the past in support of episodic memory.
https://www.pnas.org/content/early/2020/07/31/1917197117.abstract?etoc

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Trends in Cognitive Sciences

PAPERS

JOHN DUNCAN, MOATAZ ASSEM & SNEHA SHASHIDHARA – Integrated Intelligence from Distributed Brain Activity
How does organized cognition arise from distributed brain activity? Recent analyses of fluid intelligence suggest a core process of cognitive focus and integration, organizing the components of a cognitive operation into the required computational structure. A cortical 'multiple-demand' (MD) system is closely linked to fluid intelligence, and recent imaging data define nine specific MD patches distributed across frontal, parietal, and occipitotemporal cortex. Wide cortical distribution, relative functional specialization, and strong connectivity suggest a basis for cognitive integration, matching electrophysiological evidence for binding of cognitive operations to their contents. Though still only in broad outline, these data suggest how distributed brain activity can build complex, organized cognition.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(20)30169-8?dgcid=raven_jbs_aip_email

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