EAORC BULLETIN 993 – 26 June 2022

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, 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, let me know.
And if you have any other ideas for extending the "EAORC experience", please contact me.

ACADEMIA.EDU – Bab al Mandab vs the Nile-Levant

In African Archaeological Review 23, 5-30 (2006).

AMANUEL BEYIN – The Bab al Mandab vs the Nile-Levant: An Appraisal of the Two Dispersal Routes for Early Modern Humans Out of Africa

There is a growing convergence of paleontological, archaeological and genetic evidence for the African origin of modern humans and their successive dispersals. However, there is disagreement about the route or routes taken by early humans during their migration out of Africa. This article examines the Middle Paleolithic/Middle Stone Age archaeological evidence from the Horn of Africa, the Nile Valley/eastern Sahara, the Arabian Peninsula and the Levant, and assesses their relevance to this question. Specific reduction techniques and typological variables are used to compare industries across these regions. This study shows that there are more evident technological and typological similarities among assemblages from the Horn, the Nile Valley and Arabia than between any of these regions and the Levant.
https://www.academia.edu/530870/The_Bab_al_Mandab_vs_the_Nile_Levant_an_appraisal_of_the_two_dispersal_routes_for_early_modern_humans_out_of_Africa

CONFERENCE ALERT – CFP GLOCAL AFALA 2022 (Kenya) Call For Abstracts

The Global Council on Anthropological Linguistics (GLOCAL) Conference on African Linguistic Anthropology (AFALA), University of Nairobi, Kenya, 19-22 October 2022.

Deadline: 8 July 2022.

The GLOCAL AFALA 2022 theme, "Linguistic Landscapes, Cultural Climates," "Mazingira Ya Lugha, Hali Ya Hewa Ya Kitamaduni," well symbolizes the complexity of the complex set of inter-subjective identities throughout African urban and suburban centres. These increasingly complex climates become a highly fertile ground for Linguistic Anthropological scholarly attention, while scholars can draw from a range of peripheral yet pertinent fields to inform work on these geographical and cultural localities. The GLOCAL AFALA 2022 thus invites work which addresses the complexity of African Linguistic Landscapes and their Cultural Climates. Papers and posters should acknowledge and describe processes of Linguistic complexity at these cultural centres, that is, of African regions, and by those working in African regions.
https://afala2021.uonbi.ac.ke/cfp/

NEWS

BREAKING SCIENCE – Early Humans were Present in Southeast Britain 620,000 Years Ago

The archaeological site of Fordwich in northeast Kent, England, reveals the presence of Acheulean hominins — possibly Homo erectus or Homo heidelbergensis — in what is now southeast Britain between 620,000 and 560,000 years ago. Northern Europe experienced cycles of hominin habitation and absence during the Middle Pleistocene.
http://www.sci-news.com/othersciences/anthropology/britain-homo-heidelbergensis-10931.html

SAPIENS – Ancient "Swiss Army Knives"

An archaeologist explains how stone tools show wider social connections among our ancestors living 65,000 years ago in Southern Africa.
https://sapiens.us11.list-manage.com/track/click?u=80f6cf678900daf984bf763b7&id=a6dd62fc3e&e=dc0eff6180

SCIENCE DAILY – How humans evolved to get along (to extent that we do)

The research shows that four neighboring groups of bonobos they studied at the Kokolopori Bonobo Reserve in the Democratic Republic of Congo maintained exclusive and stable social and spatial borders between them, showing they are indeed part of distinct social groups that interact regularly and peacefully with each other.
https://www.sciencedaily.com/releases/2022/06/220622141900.htm

SCIENCE NEWS – Modern city dwellers have lost about half their gut microbes

Comparing genomes of intestinal bacteria in various primates and human populations begins to pinpoint the possibly helpful microbes that have gone missing from our guts.
https://www.science.org/content/article/modern-city-dwellers-have-lost-about-half-their-gut-microbes

THE CONVERSATION – Celibacy: its surprising evolutionary advantages – new research

Reproduction is at the very heart of evolution. So why has celibacy persisted for so long?
https://theconversation.com/celibacy-its-surprising-evolutionary-advantages-new-research-184967

THE CONVERSATION – Kinyafranglais: how Rwanda became a melting pot of official languages

Colonisation, genocide and changes in official languages have resulted in the hybridisation of languages. A mix of Kinyarwanda, French and English is dubbed kinyafranglais.
https://theconversation.com/kinyafranglais-how-rwanda-became-a-melting-pot-of-official-languages-185441

PUBLICATIONS

Current Biology

ARTICLES

MICHAEL GROSS – Shopping with hunter-gatherers

Two million years before agriculture swept the globe, the innovation of the hunter-gatherer band brought a substantial change in food provision for early humans and set us on a separate evolutionary path from our great ape cousins. New research suggests time efficiency rather than energy efficiency was the key driver in this revolutionary change as well as in later ones. Michael Gross reports.
https://www.cell.com/current-biology/fulltext/S0960-9822(22)00905-8

PAPERS

TANIA QUINTELA-LÓPEZ, HIROKO SHIINA & DAVID ATTWELL – Neuronal energy use and brain evolution

Consider how advantageous it might be to have eyes on our hands, rather than on our faces: depth perception would be improved by the greater distance between the eyes, and it would be easy to look into relatively inaccessible spaces by appropriate movement of the hands. The absence of mammals that use this visual strategy draws attention to constraints on how evolution is able to 'design' the nervous system. Energy use in particular, in this case the large amount of energy that would be needed to send visual information along the ~106 optic nerve axons over the length of the arms to the brain (instead of along the much shorter optic nerve), imposes significant design constraints on the nervous system.
https://www.cell.com/current-biology/fulltext/S0960-9822(22)00227-5

SANDRA A. HELDSTAB et al with CAREL P. VAN SCHAIK – The economics of brain size evolution in vertebrates

Across the animal kingdom, we see remarkable variation in brain size. This variation has even increased over evolutionary time. Traditionally, studies aiming to explain brain size evolution have looked at the fitness benefits of increased brain size in relation to its increased cognitive performance in the social and/or ecological domain. However, brains are among the most energetically expensive tissues in the body and also require an uninterrupted energy supply. If not compensated, these energetic demands inevitably lead to a reduction in energy allocation to other vital functions. In this review, we summarize how an increasing number of studies show that to fully comprehend brain size evolution and the large variation in brain size across lineages, it is important to look at the economics of brains, including the different pathways through which the high energetic costs of brains can be offset. We further show how numerous studies converge on the conclusion that cognitive abilities can only drive brain size evolution in vertebrate lineages where they result in an improved energy balance through favourable ecological preconditions. Cognitive benefits that do not directly improve the organism's energy balance can only be selectively favoured when they produce such large improvements in reproduction or survival that they outweigh the negative energetic effects of the large brain.
https://www.cell.com/current-biology/fulltext/S0960-9822(22)00735-7

BRUNO ARIANO et al – Ancient Maltese genomes and the genetic geography of Neolithic Europe

Archaeological consideration of maritime connectivity has ranged from a biogeographical perspective that considers the sea as a barrier to a view of seaways as ancient highways that facilitate exchange. Our results illustrate the former. We report three Late Neolithic human genomes from the Mediterranean island of Malta that are markedly enriched for runs of homozygosity, indicating inbreeding in their ancestry and an effective population size of only hundreds, a striking illustration of maritime isolation in this agricultural society. In the Late Neolithic, communities across mainland Europe experienced a resurgence of hunter-gatherer ancestry, pointing toward the persistence of different ancestral strands that subsequently admixed. This is absent in the Maltese genomes, giving a further indication of their genomic insularity. Imputation of genome-wide genotypes in our new and 258 published ancient individuals allowed shared identity-by-descent segment

analysis, giving a fine-grained genetic geography of Neolithic Europe. This highlights the differentiating effects of seafaring Mediterranean expansion and also island colonization, including that of Ireland, Britain, and Orkney. These maritime effects contrast profoundly with a lack of migratory barriers in the establishment of Central European farming populations from Anatolia and the Balkans.
https://www.cell.com/current-biology/fulltext/S0960-9822(22)00705-9

Evolutionary Anthropology

OBITUARY

ANNA K. BEHRENSMEYER et al – Richard Erskine Frere Leakey (1944–2022)
No summary offered.
https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21947

Frontiers in Psychology

PAPERS

DAVID J. HAUSER & NORBERT SCHWARZ – Implicit Bias Reflects the Company That Words Keep
In everyday language, concepts appear alongside (i.e., collocate with) related concepts. Societal biases often emerge in these collocations; e.g., female (vs. male) names collocate with art- (vs. science-) related concepts, and African American (vs. White American) names collocate with negative (vs. positive) concepts. It is unknown whether such collocations merely reflect societal biases or contribute to them. Concepts that are themselves neutral in valence but nevertheless collocate with valenced concepts provide a unique opportunity to address this question. For example, when asked, most people evaluate the concept “cause” as neutral, but “cause” is frequently followed by negative concepts (e.g., death, pain, and trouble). We use such semantically prosodic concepts to test the influence of collocation on the emergence of implicit bias: do neutral concepts that frequently collocate with valenced concepts have corresponding implicit bias? In evaluative priming tasks, participants evaluated positive/negative nouns (Study 1) or pictures (Study 2) after seeing verb primes that were (a) strongly valenced (e.g., hate and comfort), (b) neutral in valence but collocated with valenced concepts in corpora (e.g., ease and gain), or (c) neutral in valence and not collocated with valenced concepts in corpora (e.g., reply and describe). Throughout, neutral primes with positive (negative) collocates facilitated the evaluation of positive (negative) targets much like strongly valenced primes, whereas neutral primes without valenced collocates did not. That neutral concepts with valenced collocates parallel the influence of valenced concepts suggests that their collocations in natural language may be sufficient for fostering implicit bias. Societal implications of the causal embedding hypothesis are discussed.
https://www.frontiersin.org/articles/10.3389/fpsyg.2022.871221/full

DIVITA SINGH & HARISH KARNICK – Self-Prioritization Effect in Children and Adults
Self-related information is processed with priority, an effect known as the self-prioritization effect (SPE). Recent studies on SPE show enhanced cognitive processing of the newly learned self-association compared to non-self (such as mother, friend, and stranger) associations among younger and older adults. However, developmental influences on the magnitude of SPE remain poorly understood. In order to examine the developmental impacts on the SPE, in the present study, we recruited participants ranging from 9–22 years of age and divided them into three age groups: older children (age 9–13), teenagers (age 14–17), and young adult (age 18–22) and compared their performance in the matching judgment task. Our results show more significant bias toward self than mother, friend, or stranger condition in all the three age groups, showing robust SPE in the 9-22-year-old age group. We also observed a more significant bias toward mother-association than friend and stranger-association in all the age groups showing an enhanced bias toward mother. Our study extends the SPE in older children and teenagers and shows that SPE remains robust and stable throughout childhood.
https://www.frontiersin.org/articles/10.3389/fpsyg.2022.726230/full

Nature Communications

PAPERS

JINGE WANG et al – Face identity coding in the deep neural network and primate brain
A central challenge in face perception research is to understand how neurons encode face identities. This challenge has not been met largely due to the lack of simultaneous access to the entire face processing neural network and the lack of a comprehensive multifaceted model capable of characterizing a large number of facial features. Here, we addressed this challenge by conducting in silico experiments using a pre-trained face recognition deep neural network (DNN) with a diverse array of stimuli. We identified a subset of DNN units selective to face identities, and these identity-selective units demonstrated generalized discriminability to novel faces. Visualization and manipulation of the network revealed the importance of identity-selective units in face recognition. Importantly, using our monkey and human single-neuron recordings, we directly compared the response of artificial units with real primate neurons to the same stimuli and found that artificial units shared a similar representation of facial features as primate neurons. We also observed a region-based feature coding mechanism in DNN units as in human neurons. Together, by directly linking between artificial and primate neural systems, our results shed light on how the primate brain performs face recognition tasks.
https://www.nature.com/articles/s42003-022-03557-9

Nature Scientific Reports

PAPERS

KASPER OTTEN – Human competition is not lower if competing is socially wasteful instead of socially beneficial

Humans compete for jobs, promotions, income, status, and many other scarce goods. In some situations, allocating scarce goods via competition is socially beneficial. In other situations, competition is not necessary to allocate goods, and nevertheless engaging in competition creates inefficiencies and welfare loss. We use an incentivized lab experiment to study whether people compete differently depending on whether allocating scarce goods via competition is socially wasteful or socially beneficial. We find that competition behavior is strikingly similar in situations where competing is socially wasteful and socially beneficial. Accordingly, there is large excess competition in situations of wasteful competition, creating considerable efficiency losses. We find evidence of a social trap involved in this excess competition. People are considerably more likely to compete if they believe others compete, and their beliefs on others' competition are similar in situations where competing is socially wasteful and socially beneficial. Interventions aimed at lowering beliefs on others' competition may be an effective method of lowering excess competition to prevent inefficiencies and welfare loss.
https://www.nature.com/articles/s41598-022-14891-7

PAUL A. MAIER et al – African mitochondrial haplogroup L7: a 100,000-year-old maternal human lineage discovered through reassessment and new sequencing

Archaeological and genomic evidence suggest that modern Homo sapiens have roamed the planet for some 300–500 thousand years. In contrast, global human mitochondrial (mtDNA) diversity coalesces to one African female ancestor ("Mitochondrial Eve") some 145 thousand years ago, owing to the ¼ gene pool size of our matrilineally inherited haploid genome. Therefore, most of human prehistory was spent in Africa where early ancestors of Southern African Khoisan and Central African rainforest hunter-gatherers (RFHGs) segregated into smaller groups. Their subdivisions followed climatic oscillations, new modes of subsistence, local adaptations, and cultural-linguistic differences, all prior to their exodus out of Africa. Seven African mtDNA haplogroups (L0–L6) traditionally captured this ancient structure—these L haplogroups have formed the backbone of the mtDNA tree for nearly two decades. Here we describe L7, an eighth haplogroup that we estimate to be ~ 100 thousand years old and which has been previously misclassified in the literature. In addition, L7 has a phylogenetic sublineage L7a*, the oldest singleton branch in the human mtDNA tree (~ 80 thousand years). We found that L7 and its sister group L5 are both low-frequency relics centered around East Africa, but in different populations (L7: Sandawe; L5: Mbuti). Although three small subclades of African foragers hint at the population origins of L5'7, the majority of subclades are divided into Afro-Asiatic and eastern Bantu groups, indicative of more recent admixture. A regular re-estimation of the entire mtDNA haplotype tree is needed to ensure correct cladistic placement of new samples in the future.
https://www.nature.com/articles/s41598-022-13856-0

PLoS Biology

PAPERS

ALBERT GIDON, JAAN ARU & MATTHEW EVAN LARKUM – Does brain activity cause consciousness? A thought experiment

Rapid advances in neuroscience have provided remarkable breakthroughs in understanding the brain on many fronts. Although promising, the role of these advancements in solving the problem of consciousness is still unclear. Based on technologies conceivably within the grasp of modern neuroscience, we discuss a thought experiment in which neural activity, in the form of action potentials, is initially recorded from all the neurons in a participant's brain during a conscious experience and then played back into the same neurons. We consider whether this artificial replay can reconstitute a conscious experience. The possible outcomes of this experiment unravel hidden costs and pitfalls in understanding consciousness from the neurosciences' perspective and challenge the conventional wisdom that causally links action potentials and consciousness.

{This thought experiment clearly cannot work: enacting the conscious experience the first time changes the brain, so you cannot replay everything as was. As Heraclitus should have said, "No person ever steps in the same brain twice, for it is not the same brain and they are not the same person."}

https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001651

PLoS One

PAPERS

YURI NISHIKAWA & YASUO IHARA – Cultural transmission of traditional songs in the Ryukyu Archipelago

Geographic patterns of cultural variations are affected by how cultural traits are transmitted within and between populations. It has been argued that cultural traits are transmitted in different manners depending on their characteristics; for example, words for basic concepts are less liable to horizontal transmission between populations (i.e., borrowing) than other words. Here we examine the geographic variation of traditional songs in the Ryukyu Archipelago, southwestern islands of Japan, to explore cultural evolution of music with a focus on different social contexts in which songs are sung. Published scores of 1,342 traditional songs are coded using the CantoCore song classification scheme and distances between the songs

are calculated from the codings. Neighbor-Net graphs of regions/islands are generated on the basis of the musical distances, and delta scores are obtained to examine the treelikeness of the networks. We also perform analysis of molecular variance (AMOVA) to evaluate the extent of musical diversification among regions/islands. Our results suggest that horizontal transmission between populations has played a greater role in the formation of musical diversity than that of linguistic diversity in the Ryukyu Archipelago and that the social context in which songs are sung has an effect on how they are transmitted within and between populations. In addition, we compare the observed patterns of song diversity among regions/islands with those of lexical and mitochondrial-DNA (mtDNA) diversity, showing that the variation of songs sung in the "work" context are associated with the linguistic variation, whereas no association is found between the musical and genetic variation.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0270354

BENJAMIN UTTING – Geochemical fingerprinting of Pleistocene stone tools from the Tràng An Landscape Complex, Ninh Bình Province, Vietnam
Raw material analyses of prehistoric stone tool assemblages can reveal insight into mobility and exchange patterns in hunter-gatherer populations by reconstructing the circulation of stone throughout ancient landscapes. In Pleistocene Southeast Asia, stone tools are generally thought to have been fashioned from easily accessible local raw materials. However, despite the consistent presence of stone tools made of igneous raw material at prehistoric sites throughout the Tràng An Landscape Complex in northern Vietnam, there are no sources of igneous raw material in the immediate vicinity. This paper presents the results of geochemical sourcing analysis of late Pleistocene igneous stone tools from Tràng An: the first analysis of its type in mainland Southeast Asia. The results shed light on mobility and raw material provisioning strategies in Pleistocene mainland Southeast Asian hunter-gatherer populations and raise questions surrounding the relationship between technological organization, raw material, and expediency in Southeast Asian stone tool assemblages.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0269658

SANDEEP BODDA & SHYAM DIWAKAR – Exploring EEG spectral and temporal dynamics underlying a hand grasp movement
For brain-computer interfaces, resolving the differences between pre-movement and movement requires decoding neural ensemble activity in the motor cortex's functional regions and behavioural patterns. Here, we explored the underlying neural activity and mechanisms concerning a grasped motor task by recording electroencephalography (EEG) signals during the execution of hand movements in healthy subjects. The grasped movement included different tasks; reaching the target, grasping the target, lifting the object upwards, and moving the object in the left or right directions. 163 trials of EEG data were acquired from 30 healthy participants who performed the grasped movement tasks. Rhythmic EEG activity was analysed during the premovement (alert task) condition and compared against grasped movement tasks while the arm was moved towards the left or right directions. The short positive to negative deflection that initiated around -0.5ms as a wave before the onset of movement cue can be used as a potential biomarker to differentiate movement initiation and movement. A rebound increment of 14% of beta oscillations and 26% gamma oscillations in the central regions was observed and could be used to distinguish pre-movement and grasped movement tasks. Comparing movement initiation to grasp showed a decrease of 10% in beta oscillations and 13% in gamma oscillations, and there was a rebound increment 4% beta and 3% gamma from grasp to grasped movement. We also investigated the combination MRCPs and spectral estimates of α, β, and γ oscillations as features for machine learning classifiers that could categorize movement conditions. Support vector machines with 3rd order polynomial kernel yielded 70% accuracy. Pruning the ranked features to 5 leaf nodes reduced the error rate by 16%. For decoding grasped movement and in the context of BCI applications, this study identifies potential biomarkers, including the spatio-temporal characteristics of MRCPs, spectral information, and choice of classifiers for optimally distinguishing initiation and grasped movement.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0270366

CHARUSMITA GADEKAR et al – Microlithic variation and the Mesolithic occupations of western India
Considerable confusion and uncertainty persist on the cultural and chronological contexts of Holocene microlithic assemblages reported from South Asia. The paucity of securely dated sites with microlithic remains has compounded the confusion. Evidence from sites securely attributed to the Mesolithic based on a holistic approach (including direct evidence of plant and animal exploitation strategies) is needed to provide a better understanding of Mesolithic lithic tool-kits. This study uses morphometric and statistical methods to assess the nature of the Holocene hunter-gatherer microlithic tools-kit from a radiometrically secured chronological context at Vaharvo Timbo, a recently excavated Mesolithic site in North Gujarat (India). The assemblage is further compared with the nearby contemporary site of Loteshwar to highlight similarities and differences within hunter-gatherer lithic assemblages, understanding which can provide detailed information about subsistence strategies as well as patterns of settlement and mobility. The results show general standardisation between these two sites regarding raw materials and manufacturing technique but variation in the relative abundance of tool types between these two sites, despite their close proximity, indicating diverse strategies of resource exploitation by the Holocene hunter-gatherer groups in western India.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0267654

PNAS

PAPERS

YISI S. ZHANG & ASIF A. GHAZANFAR – Evolving alternative neural pathways for vocal dexterity

No summary offered, so:

We have vocal dexterity, other primates don't. How this might have happened.

https://www.pnas.org/doi/10.1073/pnas.2205899119

Science Advances

PAPERS

VANESSA A. D. WILSON, KLAUS ZUBERBÜHLER & BALTHASAR BICKEL – The evolutionary origins of syntax: Event cognition in nonhuman primates

Languages tend to encode events from the perspective of agents, placing them first and in simpler forms than patients. This agent bias is mirrored by cognition: Agents are more quickly recognized than patients and generally attract more attention. This leads to the hypothesis that key aspects of language structure are fundamentally rooted in a cognition that decomposes events into agents, actions, and patients, privileging agents. Although this type of event representation is almost certainly universal across languages, it remains unclear whether the underlying cognition is uniquely human or more widespread in animals. Here, we review a range of evidence from primates and other animals, which suggests that agent-based event decomposition is phylogenetically older than humans. We propose a research program to test this hypothesis in great apes and human infants, with the goal to resolve one of the major questions in the evolution of language, the origins of syntax.

https://www.science.org/doi/full/10.1126/sciadv.abn8464?et_rid=17774313

MATTHIAS ALLRITZ et al with JOSEP CALL – Chimpanzees (Pan troglodytes) navigate to find hidden fruit in a virtual environment

Almost all animals navigate their environment to find food, shelter, and mates. Spatial cognition of nonhuman primates in large-scale environments is notoriously difficult to study. Field research is ecologically valid, but controlling confounding variables can be difficult. Captive research enables experimental control, but space restrictions can limit generalizability. Virtual reality technology combines the best of both worlds by creating large-scale, controllable environments. We presented six chimpanzees with a seminaturalistic virtual environment, using a custom touch screen application. The chimpanzees exhibited signature behaviors reminiscent of real-life navigation: They learned to approach a landmark associated with the presence of fruit, improving efficiency over time; they located this landmark from novel starting locations and approached a different landmark when necessary. We conclude that virtual environments can allow for standardized testing with higher ecological validity than traditional tests in captivity and harbor great potential to contribute to longstanding questions in primate navigation, e.g., the use of landmarks, Euclidean maps, or spatial frames of reference.

https://www.science.org/doi/full/10.1126/sciadv.abm4754

PETER TURCHIN et al with SERGEY GAVRILETS – Disentangling the evolutionary drivers of social complexity: A comprehensive test of hypotheses

During the Holocene, the scale and complexity of human societies increased markedly. Generations of scholars have proposed different theories explaining this expansion, which range from broadly functionalist explanations, focusing on the provision of public goods, to conflict theories, emphasizing the role of class struggle or warfare. To quantitatively test these theories, we develop a general dynamical model based on the theoretical framework of cultural macroevolution. Using this model and Seshat: Global History Databank, we test 17 potential predictor variables proxying mechanisms suggested by major theories of sociopolitical complexity (and >100,000 combinations of these predictors). The best-supported model indicates a strong causal role played by a combination of increasing agricultural productivity and invention/adoption of military technologies (most notably, iron weapons and cavalry in the first millennium BCE).

https://www.science.org/doi/full/10.1126/sciadv.abn3517

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