EAORC BULLETIN 919 – 24 January 2021

CONTENTS

EAORC NOTICES

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, do please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.
If there is a journal you feel I should be tracking on a regular basis, do let me know.
And if you have any other ideas for extending the "EAORC experience", please contact me.

ACADEMIA.EDU – A multi-disciplinary approach to the origins of music

Journal of Anthropological Sciences Vol. 92 (2014), pp. 147-177.

IAIN MORLEY – A multi-disciplinary approach to the origins of music: perspectives from anthropology, archaeology, cognition and behaviour

Archaeological evidence for musical activities pre-dates even the earliest-known cave art and it remains the case that no human culture has yet been encountered that does not practise some recognisably musical activity. Yet the human abilities to make and appreciate music have been described as "amongst the most mysterious with which [we are] endowed" (Charles Darwin, 1872) and music itself as "the supreme mystery of the science of man" (Claude Levi-Strauss, 1970). Like language, music has been the subject of keen investigation across a great diversity of fields, from neuroscience and psychology, to ethnography, to studies of its structures in its own dedicated field, musicology; unlike the evolution of human language abilities, it is only recently that the origins of musical capacities have begun to receive dedicated attention. It is increasingly clear that human musical abilities are fundamentally related to other important human abilities, yet much remains mysterious about this ubiquitous human phenomenon, not least its prehistoric origins. It is evident that no single field of investigation can address the wide range of issues relevant to answering the question of music's origins. This review brings together evidence from a wide range of anthropological and human sciences, including palaeoanthropology, archaeology, neuroscience, primatology and developmental psychology, in an attempt to elucidate the nature of the foundations of music, how they have evolved, and how they are related to capabilities underlying other important human behaviours. It is proposed that at their most fundamental level musical behaviours (including both vocalisation and dance) are forms of deliberate metrically-organised gesture, and constitute a specialised use of systems dedicated to the expression and comprehension of social and emotional information between individuals. The abilities underlying these behaviours are selectively advantageous themselves; in addition, various mechanisms by which the practice of musical activities themselves could be advantageous are outlined.
https://www.academia.edu/7295330/A_Multi_Disciplinary_Approach_to_the_Origins_of_Music_Perspectives_from_Anthropology_Archaeology_Cognition_and_Behaviour

ACADEMIA.EDU – The Emergence of the Representation of Animals in Palaeoart

Rock Art Research 2006 - Volume 23, Number 1, pp. 3-40.

DEREK HODGSON & PATRICIA A. HELVENSTON – The Emergence of the Representation of Animals in Palaeoart: Insights from evolution and the cognitive, limbic and visual systems of the human brain

The organisation and evolution of the brain is beginning to provide clues as to how, why and when certain crucial behaviours may have arisen in hominins. As palaeoart constitutes evidence of such behaviour, it can therefore be understood within the broader context of hominin evolution as part of a series of connected biopsychosocial events that eventually led to the Upper Palaeolithic representations of animals. Iconic representation is accordingly shown to be linked in complex ways to how 'representation' occurred in the evolving brain in relation to the demands and dynamics of the evolutionary niche occupied by hominins.
https://www.academia.edu/2190689/The_Emergence_of_the_Representation_of_Animals_in_Palaeoart_Insights_from_evolution_and_the_cognitive_limbic_and_visual_systems_of_the_human_brain

ACADEMIA.EDU – Cognitive Archaeology and the Cognitive Sciences

In E. Bruner (ed.), Human Paleoneurology, (Vol. 3, pp. 177–208). Berlin: Springer.

FREDERICK L. COOLIDGE et al – Cognitive Archaeology and the Cognitive Sciences

Cognitive archaeology uses cognitive and psychological models to interpret the archaeological record. This chapter outlines several components that may be essential in building effective cognitive archaeological arguments. It also presents a two-stage perspective for the development of modern cognition, primarily based upon the work of Coolidge and Wynn. The first describes the transition from arboreal to terrestrial life in later Homo and the possible cognitive repercussions of terrestrial sleep. The second stage proposes that a genetic event may have enhanced working memory in Homo sapiens (specifically in

terms of Baddeley's multicomponent working memory model). The present chapter also reviews the archaeological and neurological bases for modern thinking, and the latter arguments are primarily grounded in the significance of the morphometric rescaling of the parietal lobes, which appears to have distinguished Homo sapiens from Neandertals.
https://www.academia.edu/3427716/Cognitive_archaeology_and_the_cognitive_sciences?email_work_card=title

LECTURE ALERT – Celebrating the 150th anniversary of The Descent of Man

The Center for the Dynamics of Social Complexity (http://dysoc.org) is happy to announce a series of free webinars on ***Human origins and cultural evolution: Celebrating the 150th anniversary of The Descent of Man.***

This series is a continuation of the Fall 2020 DySoC/NIMBioS Webinar Series on Cultural Evolution
http://www.dysoc.org/ces_webinars

Register once for the entire series:
https://tennessee.zoom.us/webinar/register/WN_yJ5vObgNTPSTXP_94OiUxA

Schedule:

Feb 2, 12:15 p.m. EST, Joe Henrich (Human Evolutionary Biology, Harvard Univ.) "The Secret of Our Success"
Feb 9, 11:45 a.m. EST, Marta Lahr (Human Evolutionary Studies, Univ. of Cambridge, UK) Topic TBA
Feb 16, 11:45 a.m. EST, Johannes Krause (Max Planck Institute for the Science of Human History, Jena, Germany) Topic TBA
Feb 23, 11:45 a.m. EST, Chris Stringer (Human Evolution, Natural History Museum, London, UK) "What is Homo sapiens?"
Mar 2, 11:45 a.m. EST, Polly Wiessner (Human Evolution and Social Change, Arizona State Univ.) "The Embers of Society: Firelight Talk among the Ju/'hoansi Bushmen"
Mar 9, 12:15 p.m. EST, Michael Muthukrishna (Economic Psychology, London School of Economics, UK) "Cultural Brain Hypothesis, Collective Brains, and the Evolution of Intelligence"
Mar 16, 11:45 a.m. EDT, Louise Barrett (Psychology, Univ. of Lethbridge, Alberta, Canada) "Thinking Outside the Head: Cognitive Ecologies and Evolutionary Psychology"
Mar 23, 11:45 a.m. EDT, Sarah Mathew (Human Evolution and Social Change, Arizona State Univ.) "War and Peace: The Cultural Evolution of Large-scale Conflict and Cooperation"
Mar 30, 11:45 a.m. EDT, Fiona Jordan (Anthropology, Univ. of Bristol, UK) "'A subject too large and complex' for Darwin: The cultural evolution of kinship terminology"
Apr 6, 11:45 a.m. EDT, Manvir Singh (Human Evolutionary Biology, Institute for Advanced Studies, Toulouse, France) "Human social organization during the Late Pleistocene: Challenging the nomadic-egalitarian model"
Apr 13, 11:45 a.m. EDT, Thomas Currie (Cultural Evolution, Biosciences, Univ. of Exeter, UK) "The descent of rules: Investigating the cultural evolution and ecology of institutions"
Apr 20, 11:15 a.m. EDT, Maria Lapinski (Health and Risk Communication Center, Michigan State Univ.) "Communicating Cultural and Social Norms"

More detail: http://www.dysoc.org/dom_webinars
Previous webinars: http://www.dysoc.org/seminars

NEWS

NATURE BRIEFING – Scammers hijack journal's peer-review process

A 'rogue editor network' infiltrated a journal's peer-review system in an attempt to publish sub-standard papers. The hijackers created fake e-mail accounts and web domains to impersonate respected academics, and managed to accept 19 papers for publication at The Journal of Nanoparticle Research, before suspicious activity was flagged by journal editors and by the research-integrity department of the publisher (Springer Nature).
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=8da166065a&e=1db4b9a19b

NATURE BRIEFING – The lives of Neanderthal women

The concept of knuckle-dragging cavemen is long expired, but there is still plenty to learn about how female Neanderthals (Homo neanderthalensis) lived. From babyhood, through sexual maturity and childbirth, to the lasting marks of women's work on their bones, palaeolithic archaeologist Rebecca Wragg Sykes explores the evidence.
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=f35a256688&e=1db4b9a19b

SCIENCE DAILY – Early humans used chopping tools to break animal bones and consume the marrow

Researchers found that stone tools of the type known as 'chopping tools' were used to break open the bones of animals. Tools of this type were used for over two million years. They were found in large quantities at prehistoric sites all over the Old World, but no one understood their exact function.
https://www.sciencedaily.com/releases/2021/01/210121132129.htm

SCIENCE NEWS – Mice feel for each other

Mice seem to experience the pain and the relief of other mice, even when they themselves are not hurt, The Scientist reports.
https://www.sciencemag.org/news/2021/01/mice-feel-each-other?utm_campaign=news_daily_2021-01-15&et_rid=17774313&et_cid=3632014

SOCIETY FOR SCIENCE – The oldest known abrading tool was used around 350,000 years ago

A flat-ended rock found in an Israeli cave marks an early technological shift by human ancestors to make stone tools for grinding rather than cutting.
http://click.societyforscience-email.com/?qs=19682ae321d8d5cf27818b634e63e20307ff98be66afb926e328af2cce6709028c0b101b3f3cd775890afb4f39c77e930f7529cc879167e5

THE CONVERSATION – 'Male' vs 'female' brains: having a mix of both is common and offers advantages

While there are small differences between male and female brains, most of us have a mix of both.
{So perhaps it's time to think of biological sex as symptomatic and not causative?}
https://theconversationuk.cmail20.com/t/r-l-jukhklll-khhlilahh-n/

PUBLICATIONS

Frontiers in Neuroscience

PAPERS

RINALDO LIVIO PERRI et al – Now You See One Letter, Now You See Meaningless Symbols: Perceptual and Semantic Hypnotic Suggestions Reduce Stroop Errors Through Different Neurocognitive Mechanisms

Compelling literature has suggested the possibility of adopting hypnotic suggestions to override the Stroop interference effect. However, most of these studies mainly reported behavioral data and were conducted on highly hypnotizable individuals. Thus, the question of the neural locus of the effects and their generalizability remains open. In the present study, we used the Stroop task in a within-subject design to test the neurocognitive effects of two hypnotic suggestions: the perceptual request to focus only on the central letter of the words and the semantic request to observe meaningless symbols. Behavioral results indicated that the two types of suggestions did not alter response time (RT), but both favored more accurate performance compared to the control condition. Both types of suggestions increased sensory awareness and reduced discriminative visual attention, but the perceptual request selectively engaged more executive control of the prefrontal cortex (PFC), and the semantic request selectively suppressed the temporal cortex activity devoted to graphemic analysis of the words. The present findings demonstrated that the perceptual and the semantic hypnotic suggestions reduced Stroop errors through common and specific top-down modulations of different neurocognitive processes but left the semantic activation unaltered. Finally, as we also recruited participants with a medium level of hypnotizability, the present data might be considered potentially representative of the majority of the population.
https://www.frontiersin.org/articles/10.3389/fnins.2020.600083/full

Mind & Language

PAPERS

HEATHER DYKE – Weak neo-Whorfianism and the philosophy of time

According to a thesis I call the linguistic assumption, the structure of language is a guide to the fundamental nature of reality. It is deployed in the metaphysical debate over the nature of time. In that debate, it is more radical than the Sapir–Whorf hypothesis, and should be rejected. A weak interpretation of the Sapir–Whorf hypothesis makes the empirical claim that speakers of different languages experience, perceive, or think about aspects of the world differently. I survey recent experimental evidence that supports this hypothesis which, I argue, gives us further reason to reject the linguistic assumption.
https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12339?campaign=wolearlyview

Nature Communications

PAPERS

LIRAN SAMUNI, CATHERINE CROCKFORD & ROMAN M. WITTIG – Group-level cooperation in chimpanzees is shaped by strong social ties

Humans maintain extensive social ties of varying preferences, providing a range of opportunities for beneficial cooperative exchange that may promote collective action and our unique capacity for large-scale cooperation. Similarly, non-human animals maintain differentiated social relationships that promote dyadic cooperative exchange, but their link to cooperative collective action is little known. Here, we investigate the influence of social relationship properties on male and female

chimpanzee participations in a costly form of group action, intergroup encounters. We find that intergroup encounter participation increases with a greater number of other participants as well as when participants are maternal kin or social bond partners, and that these effects are independent from one another and from the likelihood to associate with certain partners. Together, strong social relationships between kin and non-kin facilitate group-level cooperation in one of our closest living relatives, suggesting that social bonds may be integral to the evolution of cooperation in our own species.
https://www.nature.com/articles/s41467-020-20709-9

Nature Human Behaviour

ARTICLES

MARKUS ULLSPERGER – Imprecise learning and uncertainty
A study in Nature Human Behaviour proposes a biologically plausible algorithm producing near-optimal behaviour in uncertain and volatile environments through computational imprecision. A complementary study in the same issue shows that, depending on context, uncertainty itself guides different decisions and is differentially represented in the brain.
https://www.nature.com/articles/s41562-020-00992-8

PAPERS

M. FLORENCIA ASSANEO et al with DAVID POEPPEL – Speaking rhythmically can shape hearing
Evidence suggests that temporal predictions arising from the motor system can enhance auditory perception. However, in speech perception, we lack evidence of perception being modulated by production. Here we show a behavioural protocol that captures the existence of such auditory–motor interactions. Participants performed a syllable discrimination task immediately after producing periodic syllable sequences. Two speech rates were explored: a 'natural' (individually preferred) and a fixed 'non-natural' (2 Hz) rate. Using a decoding approach, we show that perceptual performance is modulated by the stimulus phase determined by a participant's own motor rhythm. Remarkably, for 'natural' and 'non-natural' rates, this finding is restricted to a subgroup of the population with quantifiable auditory–motor coupling. The observed pattern is compatible with a neural model assuming a bidirectional interaction of auditory and speech motor cortices. Crucially, the model matches the experimental results only if it incorporates individual differences in the strength of the auditory–motor connection.
https://www.nature.com/articles/s41562-020-00962-0

REBECCA L. JACKSON, TIMOTHY T. ROGERS & MATTHEW A. LAMBON RALPH – Reverse-engineering the cortical architecture for controlled semantic cognition
We employ a reverse-engineering approach to illuminate the neurocomputational building blocks that combine to support controlled semantic cognition: the storage and context-appropriate use of conceptual knowledge. By systematically varying the structure of a computational model and assessing the functional consequences, we identified the architectural properties that best promote some core functions of the semantic system. Semantic cognition presents a challenging test case, as the brain must achieve two seemingly contradictory functions: abstracting context-invariant conceptual representations across time and modalities, while producing specific context-sensitive behaviours appropriate for the immediate task. These functions were best achieved in models possessing a single, deep multimodal hub with sparse connections from modality-specific regions, and control systems acting on peripheral rather than deep network layers. The reverse-engineered model provides a unifying account of core findings in the cognitive neuroscience of controlled semantic cognition, including evidence from anatomy, neuropsychology and functional brain imaging.
https://www.nature.com/articles/s41562-020-01034-z

Nature Reviews

PAPERS

YAARA YESHURUN, MAI NGUYEN & URI HASSON – The default mode network: where the idiosyncratic self meets the shared social world
The default mode network (DMN) is classically considered an 'intrinsic' system, specializing in internally oriented cognitive processes such as daydreaming, reminiscing and future planning. In this Perspective, we suggest that the DMN is an active and dynamic 'sense-making' network that integrates incoming extrinsic information with prior intrinsic information to form rich, context-dependent models of situations as they unfold over time. We review studies that relied on naturalistic stimuli, such as stories and movies, to demonstrate how an individual's DMN neural responses are influenced both by external information accumulated as events unfold over time and by the individual's idiosyncratic past memories and knowledge. The integration of extrinsic and intrinsic information over long timescales provides a space for negotiating a shared neural code, which is necessary for establishing shared meaning, shared communication tools, shared narratives and, above all, shared communities and social networks.
https://www.nature.com/articles/s41583-020-00420-w

Nature Scientific Reports

PAPERS

IVAN NORSCIA et al – Yawn contagion in domestic pigs (Sus scrofa)

Contrary to spontaneous yawning—an ancient phenomenon common to vertebrates—contagious yawning (elicited by others' yawns) has been found only in highly social species and may reflect an emotional inter-individual connection. We investigated yawn contagion in the domestic pig, Sus scrofa. Owing to the complex socio-emotional and cognitive abilities of Sus scrofa, we posited that yawn contagion could be present in this species (Prediction 1) and influenced by individual/social factors (Prediction 2). In June-November 2018, on 104 semi-free ranging adolescent/adult pigs, 224 videos were recorded for video analysis on yawning. Kinship information was refined via genetic analyses. Statistical elaboration was conducted via GLMMs and non-parametric/randomization/cross-tabulation tests. We found yawn contagion in Sus scrofa, as it was more likely that pigs yawned when perceiving rather than not perceiving (yawning/control condition) others' yawns (response peak in the first out of three minutes). Yawn contagion was more likely: (1) in response to males' yawns; (2) as the age increased; (3) within short distance (1 m); (4) between full siblings, with no significant association between kinship and distance. The influence of kinship suggests that—as also hypothesized for Homo sapiens—yawn contagion might be linked with emotional communication and possibly contagion.

https://www.nature.com/articles/s41598-020-80545-1

PLoS Biology

PAPERS

SAMUEL PLANTON et al with STANISLAS DEHAENE – A theory of memory for binary sequences: Evidence for a mental compression algorithm in humans

This is an uncorrected proof.

Working memory capacity can be improved by recoding the memorized information in a condensed form. Here, we tested the theory that human adults encode binary sequences of stimuli in memory using an abstract internal language and a recursive compression algorithm. The theory predicts that the psychological complexity of a given sequence should be proportional to the length of its shortest description in the proposed language, which can capture any nested pattern of repetitions and alternations using a limited number of instructions. Five experiments examine the capacity of the theory to predict human adults' memory for a variety of auditory and visual sequences. We probed memory using a sequence violation paradigm in which participants attempted to detect occasional violations in an otherwise fixed sequence. Both subjective complexity ratings and objective violation detection performance were well predicted by our theoretical measure of complexity, which simply reflects a weighted sum of the number of elementary instructions and digits in the shortest formula that captures the sequence in our language. While a simpler transition probability model, when tested as a single predictor in the statistical analyses, accounted for significant variance in the data, the goodness-of-fit with the data significantly improved when the language-based complexity measure was included in the statistical model, while the variance explained by the transition probability model largely decreased. Model comparison also showed that shortest description length in a recursive language provides a better fit than six alternative previously proposed models of sequence encoding. The data support the hypothesis that, beyond the extraction of statistical knowledge, human sequence coding relies on an internal compression using language-like nested structures.

{Very interesting paper, but I feel that the final sentence of the abstract may imply a confusion of correlation with causation. I see no evidence that the nested structures of language necessarily precede the nested structures of memory compression; and it seems quite possible that memory compression is a prerequisite for language, and not the other way round.}

https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1008598

PLoS One

PAPERS

LEYLA EGHBALZAD, JOANNE A. DEOCAMPO & CHRISTOPHER M. CONWAY – How statistical learning interacts with the socioeconomic environment to shape children's language development

Language is acquired in part through statistical learning abilities that encode environmental regularities. Language development is also heavily influenced by social environmental factors such as socioeconomic status. However, it is unknown to what extent statistical learning interacts with SES to affect language outcomes. We measured event-related potentials in 26 children aged 8–12 while they performed a visual statistical learning task. Regression analyses indicated that children's learning performance moderated the relationship between socioeconomic status and both syntactic and vocabulary language comprehension scores. For children demonstrating high learning, socioeconomic status had a weaker effect on language compared to children showing low learning. These results suggest that high statistical learning ability can provide a buffer against the disadvantages associated with being raised in a lower socioeconomic status household.

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0244954

PAMELA FRAGNOLI – Re-assessing the notion(s) of craft standardization through diversity statistics: A pilot study on Late Chalcolithic pottery from Arslantepe in Eastern Anatolia
This paper proposes a new range of diversity indexes applicable to ceramic petrographic and geochemical data and potentially to any archaeological data of both metric and non-metric nature in order to assess the degree of craft standardization. The case study is the Late Chalcolithic pottery from Arslantepe in eastern Anatolia, ideal to test the standardization hypothesis, i.e. the assumed correspondence between craft standardization and increased rates of production, which in turn correlate with economic specialization. The results suggest that the procurement and processing of raw materials are more sensible indicators of standardization than vessel shape variability. Higher standardization is connected with the scale of production rather than with the use of the wheel or its rotational speed. The socio-economic centralization marks a process of labor division within the operational sequence and, more generally, a shift from communal to more segregated potting practices. As a result, the variability of both technical procedures and end products increases. In contrast univocal trends towards standardization can be found in coeval contexts from northern Mesopotamia, where the incipient urbanization served to create bonds between vessel makers, favoring the transmission of models and practices regardless of the centralized power.
{Does this have implications for the Acheulean stone industries?}
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0245660

Science Advances

PAPERS

LEHTI SAAG et al – Genetic ancestry changes in Stone to Bronze Age transition in the East European plain
The transition from Stone to Bronze Age in Central and Western Europe was a period of major population movements originating from the Ponto-Caspian steppe. Here, we report new genome-wide sequence data from 30 individuals North of this area, from the understudied western part of present-day Russia, including 3 Stone Age hunter-gatherers (10,800 to 4250 cal BCE) and 26 Bronze Age farmers from the corded ware complex Fatyanovo culture (2900 to 2050 cal BCE). We show that Eastern hunter-gatherer ancestry was present in Northwestern Russia already from around 10,000 BCE. Furthermore, we see a change in ancestry with the arrival of farming—Fatyanovo culture individuals were genetically similar to other corded ware cultures, carrying a mixture of steppe and European early farmer ancestry. Thus, they likely originate from a fast migration toward the Northeast from somewhere near modern-day Ukraine—the closest area where these ancestries coexisted from around 3000 BCE.
https://advances.sciencemag.org/content/7/4/eabd6535?utm_campaign=toc_advances_2021-01-22&et_rid=17774313&et_cid=3639867

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