EAORC BULLETIN 1,036 – 23 April 2023

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.

EDITORIAL INTERJECTIONS

Comments in curly brackets are editorial interjections. The Editor reserves the right to be wrong.

NEWS

SAPIENS – My Search for the Origins of Clothing

Could you survive the frigid temperatures of winter without a thick coat—or a gala without formal attire? Do you wear special garments for work or play? Despite our dependence on (and love of) clothing, scholars still have many questions about its origins. In this piece, an archaeologist, who is also trained as a medical doctor, digs into this Paleolithic puzzle. Although no Stone Age garments have survived, he examines other lines of evidence that suggest how and why ancient humans developed clothing.
https://www.sapiens.org/archaeology/paleolithic-clothing-origins/

SAPIENS – Why Shamans Stand Apart

Modern-day shamans in a variety of sectors appear to tame uncertainty by embracing their otherness.
https://www.sapiens.org/culture/shaman-uncertainty-specialists/

SCIENCE.ORG NEWS – Politically savvy princesses wove together a vast ancient empire

Elite women from Xiongnu society solidified alliances among far-flung tribes.
https://www.science.org/content/article/politically-savvy-princesses-wove-together-vast-ancient-empire

THE CONVERSATION – Animal consciousness: why it's time to rethink our human-centred approach

Our motives for classifying animals may be more about guilt than curiosity.
https://theconversationuk.cmail20.com/t/r-l-ttvjdit-khhlilahh-s/

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

BENJAMIN M. AUERBACH, KRISTEN R. R. SAVELL & ELIZABETH R. AGOSTO – Morphology, evolution, and the whole organism imperative: Why evolutionary questions need multi-trait evolutionary quantitative genetics

Since Washburn's New Physical Anthropology, researchers have sought to understand the complexities of morphological evolution among anatomical regions in human and non-human primates. Researchers continue, however, to preferentially use comparative and functional approaches to examine complex traits, but these methods cannot address questions about evolutionary process and often conflate function with fitness. Moreover, researchers also tend to examine anatomical elements in isolation, which implicitly assumes independent evolution among different body regions. In this paper, we argue that questions asked in primate evolution are best examined using multiple anatomical regions subjected to model-bound methods built from an understanding of evolutionary quantitative genetics. A nascent but expanding number of studies over the last two decades use this approach, examining morphological integration, evolvability, and selection modeling. To help readers learn how to use these methods, we review fundamentals of evolutionary processes within a quantitative genetic framework, explore the importance of neutral evolutionary theory, and explain the basics of evolutionary quantitative genetics, namely the calculation of evolutionary potential for multiple traits in response to selection. Leveraging these methods, we demonstrate their use to understand non-independence in possible evolutionary responses across the limbs, limb girdles, and basicranium of humans. Our results show that model-bound quantitative genetic methods can reveal unexpected genetic covariances among traits that create a novel but measurable understanding of evolutionary complexity among multiple traits. We advocate for evolutionary quantitative genetic methods to be a standard whenever appropriate to keep studies of primate morphological evolution relevant for the next seventy years and beyond.
https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24733

Biology Letters

PAPERS

YOTAM BEN-OREN et al with ERELLA HOVERS – Modelling effects of inter-group contact on links between population size and cultural complexity

Human populations rely on cultural artefacts for their survival. Populations vary dramatically in the size of their tool repertoires, and the determinants of these cultural repertoire sizes have been the focus of extensive study. A prominent hypothesis, supported by computational models of cultural evolution, asserts that tool repertoire size increases with population size. However, not all empirical studies have found such a correlation, leading to a contentious and ongoing debate. As a possible resolution to this longstanding controversy, we suggest that accounting for even rare cultural migration events that allow sharing of knowledge between different-sized populations may help explain why a population's size might not always predict its cultural repertoire size. Using an agent-based model to test assumptions about the effects of population size and connectivity on tool repertoires, we find that cultural exchange between a focal population and others, particularly with large populations, may significantly boost its tool repertoire size. Thus, two populations of identical size may have drastically different tool repertoire sizes, hinging upon their access to other groups' knowledge. Intermittent contact between populations boosts cultural repertoire size and still allows for the development of unique tool repertoires that have limited overlap between populations.
https://royalsocietypublishing.org/doi/10.1098/rsbl.2023.0020

Current Biology

PAPERS

GIULIA GENNARI, STANISLAS DEHAENE, CHANEL VALERA & GHISLAINE DEHAENE-LAMBERTZ – Spontaneous supra-modal encoding of number in the infant brain

The core knowledge hypothesis postulates that infants automatically analyze their environment along abstract dimensions, including numbers. According to this view, approximate numbers should be encoded quickly, pre-attentively, and in a supra-modal manner by the infant brain. Here, we directly tested this idea by submitting the neural responses of sleeping 3-month-old infants, measured with high-density electroencephalography (EEG), to decoders designed to disentangle numerical and non-numerical information. The results show the emergence, in approximately 400 ms, of a decodable number

representation, independent of physical parameters, that separates auditory sequences of 4 vs. 12 tones and generalizes to visual arrays of 4 vs. 12 objects. Thus, the infant brain contains a number code that transcends sensory modality, sequential or simultaneous presentation, and arousal state.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00382-2

Frontiers in Communication

PAPERS

JACOB B. PHILLIPS, LENORE A. GRENOBLE & PEGGY MASON – The unembodied metaphor: comprehension and production of tactile metaphors without somatosensation

Proposals for embodied metaphor and embodied cognition have suggested abstract concepts are understood indirectly through the simulation of previous sensory experiences in a different domain. While exceptions have been observed for sensory deficits and impairments that are common, such as vision and audition, it is commonly assumed that somatosensation (proprioception, haptic touch, pain, pressure, temperature, etc.) is fundamental for the comprehension of production of sensory metaphors and much abstract thought in general. In this way, our past sensory experiences are critical to our understanding not just of the world around us but also of our sense of selves. This would suggest that Kim, who was born without somatosensation, would have difficulty understanding, using, or even thinking about many abstract concepts typically linked to different sensory experiences through metaphor, including a creation of a sense of self.
To examine her comprehension of sensory metaphors, Kim was asked to select the best sensory idiomatic expression given its context. Her friends and family as well as a representative sample of individuals online were recruited to complete the survey as controls. Additionally, we transcribed and analyzed six hours of unprompted speech to determine if Kim spontaneously uses somatosensory metaphors appropriately.
Results from the idiomatic expression survey indicate that Kim performs as well as controls despite lacking any previous direct sensory experiences of these concepts. Analysis of the spontaneous speech highlights that Kim appropriately uses tactile expressions in both their concrete sensory and abstract metaphorical meanings.
Taken together, these two studies demonstrate that what is lost in sensory experiences can be made up in linguistic experiences, as Kim's understanding of tactile words was acquired in the complete absence of somatosensory experiences. This study demonstrates that individuals can comprehend and use tactile language and metaphor without recruiting past somatosensory experiences, and thus challenges a strong definition of embodied cognition which requires sensory simulations in language comprehension and abstract thought.
https://www.frontiersin.org/articles/10.3389/fcomm.2023.1144018/full

ARIE VERHAGEN – The origins of perspective taking lie in iconic language use: Unifying theories of signs, conversation, and narrative perspective

This paper proposes a theoretical reduction of the existence of perspective taking in discourse to the combination of two basic methods of communication: iconic simulation, and description by means of conventional symbols. This includes an integration of the depiction theory of quotation and a pragmatic version of the theory of signs. Perspective taking is argued to be a consequence of the iconic simulation of acts, linguistic acts in particular. The basic fact that a single utterance can comprise both depictive and descriptive components is in turn the basis for the occurrence of different variants of speech and thought representation, which are traditionally discussed under the rubric of indirect and free indirect discourse. On this basis, it is argued that the phenomena can actually be analyzed more insightfully (and more simply) directly in terms of interactions between specific linguistic items and the distinction between depiction and description. In addition, this "composite utterance" approach to perspective taking combines abstract conceptual clarity and simplicity with a high degree of flexibility in the way such interactions can work out in specific situations, which allows it to also serve as a basis for the analysis of "multiperspectival" and "doublevoiced" discourse.
https://www.frontiersin.org/articles/10.3389/fcomm.2023.623662/full

EVA M. NUNNEMANN, HELENE KREYSA & PIA KNOEFERLE – The effects of referential gaze in spoken language comprehension: Human speaker vs. virtual agent listener gaze

Four studies addressed effects of human speaker gaze vs. virtual agent listener gaze on eye movements during spoken sentence comprehension.
Participants saw videos in which a static scene depicting three characters was presented on a screen. Eye movements were recorded as participants listened to German subject-verb-object (SVO) sentences describing an interaction between two of these characters. Participants' task was to verify whether the sentence matched a schematic depiction of the event. Two critical factors were manipulated across all four experiments: (1) whether the human speaker—uttering the sentence—was visible, and (2) whether the agent listener was present. Moreover, in Experiments 2 and 4, the target second noun phrase (NP2) was made inaudible, and in Experiments 3 and 4, the gaze time course of the agent listener was altered: it looked at the NP2 referent about 400 ms before the speaker did. These manipulations served to increase the value of the speaker's and listener's gaze cues for correctly anticipating the NP2 referent.
Human speaker gaze led to increased fixations of the NP2 referent in all experiments, but primarily after the onset of its mention. Only in Experiment 3 did participants reliably anticipate the NP2 referent, in this case making use of both the

human speaker's and the virtual agent listener's gaze. In all other cases, virtual agent listener gaze had no effect on visual anticipation of the NP2 referent, even when it was the exclusive cue.
Such information on the use of gaze cues can refine theoretical models of situated language processing and help to develop virtual agents that act as competent communication partners in conversations with human interlocutors.
https://www.frontiersin.org/articles/10.3389/fcomm.2023.1029157/full

Frontiers in Language Sciences

PAPERS

MATTEO GRECO et al – False perspectives on human language: Why statistics needs linguistics

A sharp tension exists about the nature of human language between two opposite parties: those who believe that statistical surface distributions, in particular using measures like surprisal, provide a better understanding of language processing, vs. those who believe that discrete hierarchical structures implementing linguistic information such as syntactic ones are a better tool. In this paper, we show that this dichotomy is a false one. Relying on the fact that statistical measures can be defined on the basis of either structural or non-structural models, we provide empirical evidence that only models of surprisal that reflect syntactic structure are able to account for language regularities.
Language processing does not only rely on some statistical surface distributions, it needs to be integrated with syntactic information.
https://www.frontiersin.org/articles/10.3389/flang.2023.1178932/full

Nature Communications

PAPERS

ERNST SCHWARTZ et al – Evolution of cortical geometry and its link to function, behaviour and ecology

Studies in comparative neuroanatomy and of the fossil record demonstrate the influence of socio-ecological niches on the morphology of the cerebral cortex, but have led to oftentimes conflicting theories about its evolution. Here, we study the relationship between the shape of the cerebral cortex and the topography of its function. We establish a joint geometric representation of the cerebral cortices of ninety species of extant Euarchontoglires, including commonly used experimental model organisms. We show that variability in surface geometry relates to species' ecology and behaviour, independent of overall brain size. Notably, ancestral shape reconstruction of the cortical surface and its change during evolution enables us to trace the evolutionary history of localised cortical expansions, modal segregation of brain function, and their association to behaviour and cognition. We find that individual cortical regions follow different sequences of area increase during evolutionary adaptations to dynamic socio-ecological niches. Anatomical correlates of this sequence of events are still observable in extant species, and relate to their current behaviour and ecology. We decompose the deep evolutionary history of the shape of the human cortical surface into spatially and temporally conscribed components with highly interpretable functional associations, highlighting the importance of considering the evolutionary history of cortical regions when studying their anatomy and function.
https://www.nature.com/articles/s41467-023-37574-x

Nature Communications Earth & Environment

PAPERS

ROBERT PATALANO et al with MIKE W. MORLEY – Ecological stability of Late Pleistocene-to-Holocene Lesotho, southern Africa, facilitated human upland habitation

Investigation of Homo sapiens' palaeogeographic expansion into African mountain environments are changing the understanding of our species' adaptions to various extreme Pleistocene climates and habitats. Here, we present a vegetation and precipitation record from the Ha Makotoko rockshelter in western Lesotho, which extends from ~60,000 to 1,000 years ago. Stable carbon isotope ratios from plant wax biomarkers indicate a constant C3-dominated ecosystem up to about 5,000 years ago, followed by C4 grassland expansion due to increasing Holocene temperatures. Hydrogen isotope ratios indicate a drier, yet stable, Pleistocene and Early Holocene compared to a relatively wet Late Holocene. Although relatively cool and dry, the Pleistocene was ecologically reliable due to generally uniform precipitation amounts, which incentivized persistent habitation because of dependable freshwater reserves that supported rich terrestrial foods and provided prime locations for catching fish.
https://www.nature.com/articles/s43247-023-00784-8

Nature Scientific Reports

PAPERS

GAŠPER BEGUŠ, ALAN ZHOU & T. CHRISTINA ZHAO – Encoding of speech in convolutional layers and the brain stem based on language experience

Comparing artificial neural networks with outputs of neuroimaging techniques has recently seen substantial advances in (computer) vision and text-based language models. Here, we propose a framework to compare biological and artificial neural

computations of spoken language representations and propose several new challenges to this paradigm. The proposed technique is based on a similar principle that underlies electroencephalography (EEG): averaging of neural (artificial or biological) activity across neurons in the time domain, and allows to compare encoding of any acoustic property in the brain and in intermediate convolutional layers of an artificial neural network. Our approach allows a direct comparison of responses to a phonetic property in the brain and in deep neural networks that requires no linear transformations between the signals. We argue that the brain stem response (cABR) and the response in intermediate convolutional layers to the exact same stimulus are highly similar without applying any transformations, and we quantify this observation. The proposed technique not only reveals similarities, but also allows for analysis of the encoding of actual acoustic properties in the two signals: we compare peak latency (i) in cABR relative to the stimulus in the brain stem and in (ii) intermediate convolutional layers relative to the input/output in deep convolutional networks. We also examine and compare the effect of prior language exposure on the peak latency in cABR and in intermediate convolutional layers. Substantial similarities in peak latency encoding between the human brain and intermediate convolutional networks emerge based on results from eight trained networks (including a replication experiment). The proposed technique can be used to compare encoding between the human brain and intermediate convolutional layers for any acoustic property and for other neuroimaging techniques.
https://www.nature.com/articles/s41598-023-33384-9

GIOVANNI ROSSI et al with MARK DINGEMANSE & JÖRG ZINKEN – Shared cross-cultural principles underlie human prosocial behavior at the smallest scale

Prosociality and cooperation are key to what makes us human. But different cultural norms can shape our evolved capacities for interaction, leading to differences in social relations. How people share resources has been found to vary across cultures, particularly when stakes are high and when interactions are anonymous. Here we examine prosocial behavior among familiars (both kin and non-kin) in eight cultures on five continents, using video recordings of spontaneous requests for immediate, low-cost assistance (e.g., to pass a utensil). We find that, at the smallest scale of human interaction, prosocial behavior follows cross-culturally shared principles: requests for assistance are very frequent and mostly successful; and when people decline to give help, they normally give a reason. Although there are differences in the rates at which such requests are ignored, or require verbal acceptance, cultural variation is limited, pointing to a common foundation for everyday cooperation around the world.
https://www.nature.com/articles/s41598-023-30580-5

CHRISTIAN STEPHAN-OTTO et al – Neurocognitive bases of self-monitoring of inner speech in hallucination prone individuals

Verbal hallucinations in schizophrenia patients might be seen as internal verbal productions mistaken for perceptions as a result of over-salient inner speech and/or defective self-monitoring processes. Similar cognitive mechanisms might underpin verbal hallucination proneness in the general population. We investigated, in a non-clinical sample, the cerebral activity associated with verbal hallucinatory predisposition during false recognition of familiar words —assumed to stem from poor monitoring of inner speech—vs. uncommon words. Thirty-seven healthy participants underwent a verbal recognition task. High- and low-frequency words were presented outside the scanner. In the scanner, the participants were then required to recognize the target words among equivalent distractors. Results showed that verbal hallucination proneness was associated with higher rates of false recognition of high-frequency words. It was further associated with activation of language and decisional brain areas during false recognitions of low-, but not high-, frequency words, and with activation of a recollective brain area during correct recognitions of low-, but not high-, frequency words. The increased tendency to report familiar words as targets, along with a lack of activation of the language, recollective, and decisional brain areas necessary for their judgement, suggests failure in the self-monitoring of inner speech in verbal hallucination-prone individuals.
https://www.nature.com/articles/s41598-023-32042-4

New Scientist

NEWS

Early break-up of eastern African forests shaped our ape ancestors

Forests in eastern Africa started turning into grassland 10 million years earlier than previously thought, which may have driven the evolution of upright apes.
https://www.newscientist.com/article/2368938-early-break-up-of-eastern-african-forests-shaped-our-ape-ancestors/

Bone fragment reveals humans wore leather clothes 39,000 years ago

A study of an ancient bone from Spain with a strange pattern of notches hints that it was used by early Homo sapiens in Europe as a punch board for making holes in leather.
https://www.newscientist.com/article/2368783-bone-fragment-reveals-humans-wore-leather-clothes-39000-years-ago/

Philosophical Transactions of the Royal Society B

PAPERS

PRITI BANGAL & HARI SRIDHAR – Revisiting the 'nuclear species' concept: do we really know what we think we know?
The idea of 'nuclear species' has received a lot of attention in mixed-species flock research. Our impression of this literature is that referenced statements tend to cite the same papers in support of a small set of ideas, and often there is a mismatch between what papers contain and what they're cited for. Motivated by these impressions, we built and quantitatively examined a database of referenced statements about nuclearity in flocks. This confirmed our impression quantitatively, but more strikingly, a single paper stood out in its influence on ideas around nuclearity in flocks. Moynihan's 1962 monograph on mixed-species flocks in Panama, 'The organization and probable evolution of some mixed-species flocks of neotropical birds' published in Smithsonian Miscellaneous Collections, was cited twice as much as the next most-cited paper and was the most-cited paper for 10 out of 15 most-discussed ideas related to nuclearity. Further, a number of other highly cited papers are strongly influenced by Moynihan's ideas, i.e. its influence is much greater than what a count of citations conveys. We also found that Moynihan was mis-cited frequently. We juxtapose what we found from the citation analysis with what the paper actually contains to better understand the nature of support that Moynihan provides, and discuss the implications of our findings for what we know about and how we research nuclearity in flocks.
https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2022.0108

SOPHIA DAOUDI-SIMISON et al – Do mixed-species groups of capuchin (Sapajus apella) and squirrel monkeys (Saimiri sciureus) synchronize their behaviour?
In the wild, coordinated behaviour across group members is essential for maintaining spatial coherence, with potential implications for individual fitness. Such coordination often leads to behavioural synchrony (performing the same behaviour at the same time). Tufted capuchins (Sapajus apella) and squirrel monkeys (Saimiri sciureus) are known to form mixed-species groups (MSGs), travelling and foraging together. Yet, it is unclear if it is necessary to synchronize behaviours in captivity when ecological pressures are minimal compared to the wild. We investigated the extent to which two MSGs of capuchins (N = 35) and squirrel monkeys (N = 26) synchronized their behaviour with conspecifics and heterospecifics at the Living Links to Human Evolution Research Centre, RZSS, Edinburgh Zoo, UK. Group activities were sampled by instantaneous scans of all visible individuals. Scans (n = 180) were analysed for five most frequently observed behaviours. Intraspecies synchrony was calculated using Simpson's Diversity Index, and interspecies synchrony was measured using cross-correlations. Intraspecific synchrony was significantly greater compared to randomly aggregated data, while cross-correlations indicated interspecific asynchrony. Living together did not lead to interspecific synchrony as may be expected given the coordination and behaviour described in the wild, and shared husbandry in captivity. Overall, our findings highlight differences in the behavioural structure of single- versus MSGs.
https://royalsocietypublishing.org/doi/full/10.1098/rstb.2022.0111

B. A. COPPINGER et al – Mixed-species groups and the question of dominance in the social ecosystem
Dominance interactions and hierarchies are of long-standing interest in the field of animal behaviour. Currently, dominance hierarchies are viewed as complex social structures formed by repeated interactions between individuals. Most studies on this phenomenon come from single-species groups. However, animals are constantly surrounded by and interact with individuals of other species. Behaviour and social interactions of individuals can be shaped by the presence or behaviour of other species in their social ecosystem, which has important implications for social behaviour in groups. Given how ubiquitous mixed-species animal groups are, deeper study of the relationships between mixed-species group (MSG) structure and dominance will be key to understanding constraints on individual behaviour and decision making. Here we call for more research into dominance interactions among individuals in MSGs. Greater understanding of the dynamics of dominance relationships among individuals in MSGs, whose size and composition can change considerably over shorter and longer term time frames, will be crucial to understanding their structure and functioning.
https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2022.0097

TATJANA KRAMA et al – Selective selfishness in alarm calling behaviour by some members of wintering mixed-species groups of crested tits and willow tits
Animals adjust their use of alarm calls depending on social environments. We tested whether dominant (adult) and subordinate (juvenile non-kin) male crested tits (Lophophanes cristatus) warn each other and heterospecific willow tits (Poecile montanus) across the wintering season. Birds rarely alarm called when feeding alone. Both adult and juvenile crested tits warned each other in early winter, and adults did so in the middle of wintering season. However, juvenile males rarely warned conspecific adult males in the middle of the winter. Both adult and juvenile males stopped giving alarm calls when feeding together at the end of wintering season. The results suggest that the mid-winter reduction of juvenile alarms could increase the likelihood of successful predator attacks on adults, increasing the chances for juveniles to replace adults and acquire their territories. By contrast, both adult and juvenile males produced alarm calls throughout the season when foraging together with willow tits. Whether juvenile male crested tits could be selectively altering alarm call propensity to endanger adult males, thereby selfishly enhancing their own succession to territory ownership, is discussed. The results add to the understanding of the origin of mixed-species groups and explain the dynamics of social communication.

https://royalsocietypublishing.org/doi/full/10.1098/rstb.2022.0102

PLoS One

PAPERS

SHOUNAN LU, GE ZHU & JIANHUA DAI – Willingness intensity and co-evolution of decision rationality depending on aspiration enhance cooperation in the spatial public goods game

The Fermi rule states that rational or irrational sentiment affects individual decision-making. Existing studies have assumed that individuals' irrational sentiments and behavior willingness have fixed values and do not change with time. In reality, people's rationality sentiment and behavior willingness may be influenced by some factors. Therefore, we propose a spatial public goods game mechanism, in which individuals' rational sentiment is co-evolution synchronously depending on the difference between aspiration and payoff. Moreover, the intensity of their subjective willingness to change the status quo depends on the gap between aspiration and payoff. We likewise compare the combined promotion effect of the stochastic "Win-Stay-Lose-Shift" (WSLS) and random imitation (IM) rules. Simulation experiments indicate that high enhancement factors are not conducive to cooperation under the IM rules. When aspiration is small, WSLS is more conducive to promoting cooperation than IM, while increasing aspiration, and the opposite phenomenon will appear. The heterogeneous strategic update rule is beneficial to the evolution of cooperation. Lastly, we find that this mechanism performs better than the traditional case in enhancing cooperation.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0280015

PNAS

ARTICLES

KELLY STEWART – Dorothy Leavitt Cheney, 1950–2018: Primatologist and cognitive scientist who opened a window into the minds of wild monkeys

When Dorothy Cheney died in 2018, we lost one of the greats. She is celebrated for her ground-breaking work on the communication, and social behavior of wild primates, research conducted in collaboration with her husband, Robert Seyfarth. The team is best known for pioneering playback experiments, which were used to explore the function and meaning of vocal signals, and the extent of the monkeys' knowledge about their social world. The research is so significant because its subjects were wild animals living in their natural habitats. Dorothy and Robert designed and interpreted experiments within the context of social, ecological, and demographic data. Their work had a lasting and sometimes transformative impact on fields beyond primatology, including cognitive psychology, behavioral ecology, linguistics, and even philosophy.
https://www.pnas.org/doi/full/10.1073/pnas.2304070120

PAPERS

DAVID SLOAN WILSON – Multilevel cultural evolution: From new theory to practical applications

Evolutionary science has led to many practical applications of genetic evolution but few practical uses of cultural evolution. This is because the entire study of evolution was gene centric for most of the 20th century, relegating the study and application of human cultural change to other disciplines. The formal study of human cultural evolution began in the 1970s and has matured to the point of deriving practical applications. We provide an overview of these developments and examples for the topic areas of complex systems science and engineering, economics and business, mental health and well-being, and global change efforts.
https://www.pnas.org/doi/full/10.1073/pnas.2218222120

Royal Society Open Science

PAPERS

ABHIJEET PATRA et al – Variation in how cognitive control modulates sentence processing

Prior research suggests that cognitive control can assist the comprehension of sentences that create conflict between interpretations, at least under some circumstances. However, the mixed pattern of results suggests that cognitive control may not always be necessary for accurate comprehension. We tested whether cognitive control recruitment for language processing is systematically variable, depending on the type of sentential ambiguity or conflict, individual differences in cognitive control, and task demands. Participants completed two sessions in a web-based experiment. The first session tested conflict modulation using interleaved Stroop and sentence comprehension trials. Critical sentences contained syntax-semantics or phrase-attachment conflict. In the second session, participants completed three cognitive control and three working memory tasks. Exploratory factor analysis was used to index individual differences in a cognitive control factor and a working memory factor. At the group level, there were no significant conflict modulation effects for either syntax-semantics or phrase-attachment conflict. At the individual differences level, the cognitive control factor correlated with offline comprehension accuracy but not online processing measures for both types of conflict. Together, the results suggest that the role of cognitive control in sentence processing may vary according to task demands. When overt decisions are required, individual differences in cognitive control may matter such that better cognitive control results in better language

comprehension performance. The results add to the mixed evidence on conflict modulation and raise questions about the situations under which cognitive control influences online processing.
https://royalsocietypublishing.org/doi/10.1098/rsos.211969

Science Advances

PAPERS

HEDVIG SKIRGÅRD et mul with MARTIN HASPELMATH & QUENTIN D. ATKINSON – Grambank reveals the importance of genealogical constraints on linguistic diversity and highlights the impact of language loss

While global patterns of human genetic diversity are increasingly well characterized, the diversity of human languages remains less systematically described. Here, we outline the Grambank database. With over 400,000 data points and 2400 languages, Grambank is the largest comparative grammatical database available. The comprehensiveness of Grambank allows us to quantify the relative effects of genealogical inheritance and geographic proximity on the structural diversity of the world's languages, evaluate constraints on linguistic diversity, and identify the world's most unusual languages. An analysis of the consequences of language loss reveals that the reduction in diversity will be strikingly uneven across the major linguistic regions of the world. Without sustained efforts to document and revitalize endangered languages, our linguistic window into human history, cognition, and culture will be seriously fragmented.
https://www.science.org/doi/full/10.1126/sciadv.adg6175

Trends in Cognitive Sciences

PAPERS

ERIN E. HECHT et al – The evolutionary neuroscience of domestication

How does domestication affect the brain? This question has broad relevance. Domesticated animals play important roles in human society, and substantial recent work has addressed the hypotheses that a domestication syndrome links phenotypes across species, including Homo sapiens. Surprisingly, however, neuroscience research on domestication remains largely disconnected from current knowledge about how and why brains change in evolution. This article aims to bridge that gap. Examination of recent research reveals some commonalities across species, but ultimately suggests that brain changes associated with domestication are complex and variable. We conclude that interactions between behavioral, metabolic, and life-history selection pressures, as well as the role the role of experience and environment, are currently largely overlooked and represent important directions for future research.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00070-0

Trends in Ecology and Evolution

ARTICLES

GREGORY B. PAULY et al – Citizen science needs a name change

Amidst attention towards improving equality, inclusivity, and diversity, citizen science is woefully anachronistic in its name. There is a critical need for this field to distance itself from the exclusionary nature of the term 'citizen'. We provide reasoning for abandoning this term and an outline for adopting a new name.
https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(23)00057-5

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