

EAORC BULLETIN 1,050 – 30 July 2023

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NOTICES

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, 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.

ACADEMIA.EDU – Communities on the Edge of Civilization

In Lucy to Language: The Benchmark Papers, Oxford University Press (2014).

FIONA COWARD & R.I.M. DUNBAR – Communities on the Edge of Civilization

This chapter examines the social problems faced by early Holocene groups in establishing permanent settlements and that resulted from their subsequent expansion. It first considers why it is very difficult to form large, permanent groups, paying particular attention to short, trade-offs between the benefits and costs of group living and their effect on group size. It then turns to a discussion of social networks in the Neolithic and archaeological evidence for changes in social organisation, religion, and ideology. It suggests that the dramatic scaling-up of social lives apparent among early Neolithic groups must have presented significant ecological and cognitive constraints that needed to be overcome before long-term aggregations could be established. The chapter explores the role of material culture, social organisation, and group and religious beliefs in making this possible.

[https://www.academia.edu/7033080/Coward F and Dunbar R Communities on the edge of civilization](https://www.academia.edu/7033080/Coward_F_and_Dunbar_R_Communities_on_the_edge_of_civilization)

ACADEMIA.EDU – An eight-grade model for the evolution and expansion of cultural capacities

Journal of Anthropological Sciences 93, 43-70 (2015).

MIRIAM NOËL HAIDLE ET AL WITH NICHOLAS J. CONARD, APRIL NOWELL & ANDREW WHITEN – The Nature of Culture: an eight-grade model for the evolution and expansion of cultural capacities in hominins and other animals

Tracing the evolution of human culture through time is arguably one of the most controversial and complex scholarly endeavors, and a broad evolutionary analysis of how symbolic, linguistic, and cultural capacities emerged and developed in our species is lacking. Here we present a model that, in broad terms, aims to explain the evolution and portray the expansion of human cultural capacities (the EECC model), that can be used as a point of departure for further multidisciplinary discussion and more detailed investigation. The EECC model is designed to be flexible, and can be refined to accommodate future archaeological, paleoanthropological, genetic or evolutionary psychology/behavioral analyses and discoveries. Our proposed concept of cultural behavior differentiates between empirically traceable behavioral performances and behavioral capacities that are theoretical constructs. Based largely on archaeological data (the ‘black box’ that most directly opens up hominin cultural evolution), and on the extension of observable problem-solution distances, we identify eight grades of cultural capacity. Each of these grades is considered within evolutionary-biological and historical-social trajectories. Importantly, the model does not imply an inevitable progression, but focuses on expansion of cultural capacities based on the integration of earlier achievements. We conclude that there is not a single cultural capacity or a single set of abilities that enabled human culture; rather, several grades of cultural capacity in animals and hominins expanded during our evolution to shape who we are today.

[https://www.academia.edu/33378494/The Nature of Culture an eight grade model for the evolution and expansion of cultural capacities in hominins and other animals](https://www.academia.edu/33378494/The_Nature_of_Culture_an_eight_grade_model_for_the_evolution_and_expansion_of_cultural_capacities_in_hominins_and_other_animals)

ACADEMIA.EDU – A scientific approach to silent consciousness

Frontiers in Psychology 4, 678 (2013).

BERNARD J. BAARS – A scientific approach to silent consciousness

All mammals show the physiological correlates of waking, dreaming and deep sleep. Many contemplative traditions propose a fourth state of consciousness, “silent consciousness,” defined as consciousness without reportable contents. For example, the Mandukya Upanishad, one of the root texts of Vedanta philosophy, explicitly claims a fourth state of “consciousness without content.” (Sharma, 1997) The classical summary of yogic thought, Patanjali’s Yoga Sutras, recommends “Let there be soundless repetition of (the inner mantra) OM and meditation thereon.” (Feuerstein, 1989). The classical texts of Zen Buddhism also cite consciousness without reportable contents many times (Reps and Senzaki, 1998; Hori, 2000). About a fifth of the world population is Hindu or Buddhist. “Silent consciousness” may sound paradoxical to Western ears, but such reports are widespread in Asian, Western, Middle Eastern, and shamanic traditions. While contemplative practices are very diverse, “inner silence” is often taken to be a goal.

[https://www.academia.edu/104860834/Baars BJ A scientific approach to silent consciousness](https://www.academia.edu/104860834/Baars_BJ_A_scientific_approach_to_silent_consciousness)

ACADEMIA.EDU – An aetiology of hominin behaviour*HOMO – Journal of Comparative Human Biology* 63, 319-335 (2012).**ROBERT G. BEDNARIK – An aetiology of hominin behaviour**

A rough framework for a first attempt to formulate a preliminary aetiology of hominin behaviour is proposed, based on scientific rather than archaeological evidence and reasoning. Distinctive precursors of modernity in human behaviour were present several million years ago, and since then have become gradually more established. By the beginning of the Middle Pleistocene, modern human cognitive processes seem to have been largely established. However, full modernity of behaviour can only have occurred in recent centuries, and there remain great variations in it even among extant conspecifics. This model differs significantly from all narratives offered by mainstream archaeology, which generally place the advent of modern human behaviour 30 or 40 millennia ago. These notions and the hypotheses they are based on appear to be false, however such behaviour is defined.

https://www.academia.edu/14201033/An_aetiology_of_hominin_behaviour

ACADEMIA.EDU – Early Stone Tool Use and the Evolution of Human Cognition*UMASA Journal* 32 (2014).**KAITLYNN R. ALARIE – Early Stone Tool Use and the Evolution of Human Cognition**

Modern humans display a unique degree of social and cognitive complexity. As species we are capable of creating diverse and complex technologies to overcome the limitations of our biology and our external environments. This observed mental uniqueness, has led many researches to coin behavioural and cognitive complexity as the ‘hallmark of humanity’ and ‘behavioural modernity’. Human intelligence has evolved through time and selection, and we as a species owe our current abilities to the evolutionary precursors which came before us. Researchers in the burgeoning field of paleocognition have sought to identify the emergence of our human-like cognition within our hominin lineage through the analysis of the hominin brain size and stone tool technologies produced by extant hominins. Paleocognitive researchers have begun to systematically approach such complex issues as defining human cognition, testing long held assumptions about great ape and human cognitive analogies, and ultimately identifying the evolution of our uniquely human intelligence.

https://www.academia.edu/10522220/Early_stone_tool_use_and_the_evolution_of_human_cognition

NEWS**NATURE BRIEFING – Seven generations of a prehistoric family**

A Neolithic farming community from 6,500 years ago in modern-day France was mostly one big family. DNA analysis of 94 individuals found at a burial site revealed that two-thirds were members of a single family that spanned seven generations. No half-siblings were uncovered, suggesting that monogamy was standard. And most adult women were not closely related to others in the group, which indicates that male descendants tended to stay put, whereas women moved around.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=7590bc8ce6&e=1db4b9a19b>

SAPIENS – Extinguishing the Idea That Hobbits Had Fire

Research has overturned earlier claims that a diminutive human relative, *Homo floresiensis*, lit fires—but big stories die hard.

<https://www.sapiens.org/archaeology/homo-floresiensis-fire/>

SAPIENS – Can Machine Learning Translate Ancient Egyptian Texts?

A new program aims to use AI to help academics and the public decipher hieroglyphs. Here’s an inside look at how—and whether—it works.

<https://www.sapiens.org/archaeology/machine-learning-egyptian-hieroglyphs/>

SCIENCE.ORG NEWS – New language database narrows search for first speakers of Indo-European

The study proposes a compromise solution to long-standing debate over origins of this incredibly widespread language family.

<https://www.science.org/content/article/new-language-database-narrows-search-first-speakers-indo-european>

THE CONVERSATION – Extensive Mesolithic discovery shows importance of pits for early Britain

The pits are important for rethinking how we have previously considered life and society during the Mesolithic period.

<https://theconversationuk.cmail20.com/t/r-l-ttduirhk-khhiliah-a/>

THE CONVERSATION – In a Stone Age cemetery, DNA reveals ‘founding father’ and a legacy of prosperity

In the largest study of its kind, researchers have used DNA from a 6,700-year-old cemetery in France to reconstruct the lives of everyday Neolithic people.

<https://theconversationuk.cmail19.com/t/r-l-tthlzld-khhiliah-yd/>

PUBLICATIONS

Biolinguistics

PAPERS

HANS-MARTIN GÄRTNER – Merge vs. "Lerge:" Problems of Association

It is shown that the proposal of identifying Merge and the Leibnizian addition operator runs up against the obstacle that the latter is associative while the former is not. The confound is attributed to insufficient appreciation of the difference between a calculus for natural language syntax and a calculus of concepts.

<https://bioling.psychopen.eu/index.php/bioling/article/view/11715>

Current Biology

ARTICLES

KIP D. LACY & DANIEL J.C. KRONAUER – Evolution: How sweat bees gained and lost eusociality

Eusocial insects divide labor between reproductive and non-reproductive individuals. The molecular mechanisms underlying the evolution of these castes have remained mysterious. A comparative genomic study of sweat bees points to a familiar factor as a regulator of behavioral specialization: juvenile hormone.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(23\)00746-7](https://www.cell.com/current-biology/fulltext/S0960-9822(23)00746-7)

SJOUKE A. KINGMA – Social evolution: Life is better in groups

Animal societies are rife with conflict over resources and reproduction, raising the question of how such societies nonetheless persist. A long-term study on birds shows that larger groups are less likely to go extinct, making individuals offer reproductive concessions to unrelated competitors joining the group.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(23\)00753-4](https://www.cell.com/current-biology/fulltext/S0960-9822(23)00753-4)

eLife

PAPERS

TIMO VAN KERKORLE et al with STANISLAS DEHAENE & GHISLAINE DEHAENE-LAMBERTZ – Brain mechanisms of reversible symbolic reference: a potential singularity of the human brain

The emergence of symbolic thinking has been proposed as a dominant cognitive criterion to distinguish humans from other primates during hominization. Although the proper definition of a symbol has been the subject of much debate, one of its simplest features is bidirectional attachment: the content is accessible from the symbol, and vice versa. Behavioral observations scattered over the past four decades suggest that this criterion might not be met in non-human primates, as they fail to generalize an association learned in one temporal order (A to B) to the reverse order (B to A). Here, we designed an implicit fMRI test to investigate the neural mechanisms of arbitrary audio-visual and visual-visual pairing in monkeys and humans and probe their spontaneous reversibility. After learning a unidirectional association, humans showed surprise signals when this learned association was violated. Crucially, this effect occurred spontaneously in both learned and reversed directions, within an extended network of high-level brain areas, including, but also going beyond the language network. In monkeys, by contrast, violations of association effects occurred solely in the learned direction and were largely confined to sensory areas. We propose that a human-specific brain network may have evolved the capacity for reversible symbolic reference.

<https://elifesciences.org/reviewed-preprints/87380>

ESTEBAN VILLAR-RODRÍGUEZ et al – What happens to the inhibitory control functions of the right inferior frontal cortex when this area is dominant for language?

A low number of individuals show an atypical brain control of language functions that differs from the typical lateralization in the left cerebral hemisphere. In these cases, the neural distribution of other cognitive functions is not fully understood.

Although there is a bias towards a mirrored brain organization consistent with the Causal hypothesis, some individuals are found to be exceptions to this rule. However, no study has focused on what happens to the homologous language areas in the right frontal inferior cortex. Using an fMRI-adapted stop-signal task in a healthy non right-handed sample (50 typically lateralized and 36 atypically lateralized for language production), our results show that atypical lateralization is associated with a mirrored brain organization of the inhibitory control network in the left hemisphere: inferior frontal cortex, presupplementary motor area, and subthalamic nucleus. However, the individual analyses revealed a large number of cases with a noteworthy overlap in the inferior frontal gyrus, which shared both inhibitory and language functions. Further analyses showed that atypical lateralization was associated with stronger functional and structural interhemispheric connectivity.

Importantly, we did not find task performance differences as a function of lateralization, but there was an association between atypical dominance in the inferior frontal cortex and higher scores on schizotypy and autistic spectrum traits, as well as worse performance on a reading accuracy test. Together, these results partially support the Causal hypothesis of

hemispheric specialization and provide further evidence of the link between atypical hemispheric lateralization and increased interhemispheric transfer through the corpus callosum.

<https://elifesciences.org/reviewed-preprints/86797>

Frontiers in Human Neuroscience

PAPERS

AGNIESZKA DĘBSKA et al – Beyond the Visual Word Form Area – a cognitive characterization of the left ventral occipitotemporal cortex

The left ventral occipitotemporal cortex has been traditionally viewed as a pathway for visual object recognition including written letters and words. Its crucial role in reading was strengthened by the studies on the functionally localized “Visual Word Form Area” responsible for processing word-like information. However, in the past 20 years, empirical studies have challenged the assumptions of this brain region as processing exclusively visual or even orthographic stimuli. In this review, we aimed to present the development of understanding of the left ventral occipitotemporal cortex from the visually based letter area to the modality-independent symbolic language related region. We discuss theoretical and empirical research that includes orthographic, phonological, and semantic properties of language. Existing results showed that involvement of the left ventral occipitotemporal cortex is not limited to unimodal activity but also includes multimodal processes. The idea of the integrative nature of this region is supported by the broad functional and structural connectivity with language-related and attentional brain networks. We conclude that although the function of the area is not yet fully understood in human cognition, its role goes beyond visual word form processing. The left ventral occipitotemporal cortex seems to be crucial for combining higher-level language information with abstract forms that convey meaning independently of modality.

<https://www.frontiersin.org/articles/10.3389/fnhum.2023.1199366/full>

Frontiers in Psychology

PAPERS

JIZHENG ZHAO & JING HUANG – A comparative study of frequency effect on acquisition of grammar and meaning of words between Chinese and foreign learners of English language

Frequency effect on vocabulary acquisition has been widely investigated in second language acquisition (SLA) research, whereas comparative studies of vocabulary acquisition of learners from different language types, such as hieroglyphic writing and alphabetic writing, are still rarely found. This type of studies could be of great significance in exploring some unique characteristics of how second language learners of native languages of different writing perceive and acquire second language. Using artificial words of alphabetic writing and low-frequency English words as experimental materials, this study aims to compare the effect of frequency on the acquisition of grammar and meaning of alphabetic words between Chinese learners of the hieroglyphic native language and foreign learners of alphabetic native languages. Specifically, the study intends to find out whether frequency effect plays the key role in language acquisition; to what extent frequency effect affects language acquisition; and whether there are any differences between learners of different language types for vocabulary acquisition in terms of frequency effect. The results show that Chinese and foreign learners of English language have no significant differences as a whole in terms of type of languages affecting the acquisition of grammar and meaning of artificial words and English words, indicating the difference in the type of mother tongue might not be the factor causing differences on grammar and meaning acquisition of vocabulary. Learner types, language types, frequency and part of speech of a word have interaction effect toward the acquisition of grammar and meaning of a word. However, exposure frequency of vocabulary plays the determining role in the acquisition of grammar and meaning of words.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1125483/full>

PETER KRAMER – Icono: a universal language that shows what it says

This article lays out the foundation of a new language for easier written communication that is inherently reader-friendly and inherently international. Words usually consist of strings of sounds or squiggles whose meanings are merely a convention. In Icono, instead, they typically are strings of icons that illustrate what they stand for. “Train,” for example, is expressed with the icon of a train, “future” with the icon of a clock surrounded by a clockwise arrow, and “mammal” with the icons of a cow and a mouse—their combination’s meaning given by what they have in common. Moreover, Icono reveals sentence structure graphically before, rather than linguistically after, one begins reading. On smartphones and computers, writing icons can now be faster than writing alphabetic words. And using simple pictures as words helps those who struggle with conditions like dyslexia, aphasia, cerebral palsy, and autism with speech impairment. Because learning its pronunciation or phonetic spelling is optional rather than a prerequisite, and because it shows what it says, Icono is bound to be easier to learn to read—and then easier to read—than any other language, including our own.

{The author’s final example sums up the problem: “And although the icon of a magnifying glass on a person’s skull may not remind everyone of “psychology” (people getting their heads examined), learning this association is far from a challenge”. Why the head as the centre of thinking? For most of Western history, it has been the heart. And the representation of a magnifying loupe relies on a single fictional character, Sherlock Holmes; without him it is just a circle with a straight line.}

<https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1149381/full>

ROBYN CARSTON – The relevance of words and the language/communication divide

First, the wide applicability of the relevance-theoretic pragmatic account of how new (ad hoc) senses of words and new (ad hoc) words arise spontaneously in communication/comprehension is demonstrated. The lexical pragmatic processes of meaning modulation and metonymy are shown to apply equally to simple words, noun to verb ‘conversions’, and morphologically complex cases with non-compositional (atomic) meanings. Second, this pragmatic account is situated within a specific view of the cognitive architecture of language and communication, with the formal side of language, its recursive combinatorial system, argued to have different developmental, evolutionary and cognitive characteristics from the meaning side of language, which is essentially pragmatic/communicative. Words straddle the form/meaning (syntax/pragmatics) divide: on the one hand, they are phrasal structures, consisting of a root and variable numbers of functors, with no privileged status in the syntax; on the other hand, they are salient to language users as basic units of communication and are stored as such, in a communication lexicon, together with their families of related senses, which originated as cases of pragmatically derived (ad hoc) senses but have become established, due to their communicative efficacy and frequency of use. Third, in an attempt to find empirical evidence for the proposed linguistic form-meaning divide, two very different cases of atypical linguistic and communicative development are considered: autistic children and deaf children who develop Homesign. The morpho-syntax (the formal side of language) appears to unfold in much the same way in both cases and is often not much different from that of typically developing children, but they diverge markedly from each other in their communication/pragmatics and their development of a system (a lexicon) of meaningful words/signs.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1187343/full>

Mind & Language**PAPERS****GUIDO LÖHR – Does the mind care about whether a word is abstract or concrete? Why concreteness is probably not a natural kind**

Many psychologists currently assume that there is a psychologically real distinction to be made between concepts that are abstract and concepts that are concrete. It is for example largely agreed that concepts and words are more easily processed if they are concrete. Moreover, it is assumed that this is because these words and concepts are concrete. It is thought that interesting generalizations can be made about certain concepts because they are concrete. I argue that we have surprisingly little reason to believe that the abstract-concrete distinction is psychologically real.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12473>

COMMENTARIES**NICOLÒ D'AGRUMA – From the epistemic perspectives in experimental semantics to the ambiguity of proper names: Is the inference warranted? A critical notice of Jintai Li's The referential mechanism of proper names**

In her engaging book, *The referential mechanism of proper names*, Li presents empirical studies involving American and Chinese laypeople. Li interprets her results as supporting an epistemic-perspective reading of the variability in referential intuitions on proper names. Building upon this thesis, Li defends the ambiguity view, claiming that names are ambiguous between a descriptivist and a causal-historical meaning. I argue that either Li's data do not enable a comparison of the two theories of reference, or support for the ambiguity view is limited to the Chinese sample at most and does not rely upon the inference that Li employs.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12472>

MICHAEL DEVITT – Red herrings in experimental semantics: Cultural variation and epistemic perspectives. A critical notice of Jintai Li's The referential mechanism of proper names

Concerns with cultural variation and epistemic perspectives have played major roles in experimental semantics. They dominate Li's book (2023). Li's own experimental work provides two promising explanations of the cultural variation: Chinese, but not Americans, tend to agree with a character's false statement because they think it is not her fault that she is wrong or because they are socially conforming. So, the notice argues, the cultural variation is a red herring to the theory of reference. Li preferred explanation is that Chinese and Americans take different epistemic perspectives. The notice argues that this is misguided and another red herring.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12468>

JINCAI LI – Cross-cultural variation and perspectivalism: Alignment of two red herrings?

In this brief reply I respond to criticisms of my book, *The referential mechanism of proper names*, from Michael Devitt and Nicolo D'Agruma. I focus on the question of whether the perspectivism advocated in the book explains the empirical results there detailed.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12470>

Nature

NEWS

Sharp criticism of controversial ancient-human claims tests eLife's revamped peer-review model

High-profile researchers say small-brained Homo naledi exhibited advanced behaviours such as burials, but peer reviewers say there's no evidence.

<https://www.nature.com/articles/d41586-023-02415-w>

AI search of Neanderthal proteins resurrects 'extinct' antibiotics

Scientists identify protein snippets made by extinct hominins.

<https://www.nature.com/articles/d41586-023-02403-0>

Seven generations of a prehistoric family mapped with ancient DNA

Unprecedented genealogical tree reveals details of prehistoric social relationships.

<https://www.nature.com/articles/d41586-023-02402-1>

Nature Climate Change

ARTICLES

QUYNH NGUYEN – Drought experience and altruism

Natural disasters can trigger conflictive behaviour among affected individuals. Now, research based on survey experiments with Syrian and Iraqi refugees shows how people behave altruistically after experiencing drought, but only towards ingroup members.

<https://www.nature.com/articles/s41558-023-01751-z>

PAPERS

STEFAN DÖRING & JONATHAN HALL – Drought exposure decreases altruism with salient group identities as key moderator

Previous research on climate change impact regularly considers conflict outcomes, thereby disregarding cooperative behaviour such as altruism. Drought has the potential to fuel inter-ethnic cleavages, thus contributing to conflicts. Yet this runs against resilience arguments suggesting people who experience environmental hardship are more cooperative. Here we examine altruism in survey experiments in a natural setting among refugees from Syria and Iraq. We match survey responses to observational data on drought and socioeconomic variables. Our findings speak to both arguments. First, we show that drought exposure is associated with decreased altruism for survey respondents generally. We further show how group identity moderates the relationship between drought and altruism. Our results suggest a decrease in altruism due to drought is much larger when the target of altruism is presented as a member of an antagonistic ethno-religious outgroup.

<https://www.nature.com/articles/s41558-023-01732-2>

Nature Communications Biology

PAPERS

ANNI PITKÄNIEMI et al – Hodological organization of spoken language production and singing in the human brain

Theories expounding the neural relationship between speech and singing range from sharing neural circuitry, to relying on opposite hemispheres. Yet, hodological studies exploring their shared and distinct neural networks remain scarce. In this study, we combine a white matter connectometry approach together with comprehensive and naturalistic appraisal of verbal expression during spoken language production and singing in a sample of individuals with post-stroke aphasia. Our results reveal that both spoken language production and singing are mainly supported by the left hemisphere language network and projection pathways. However, while spoken language production mostly engaged dorsal and ventral streams of speech processing, singing was associated primarily with the left ventral stream. These findings provide evidence that speech and singing share core neuronal circuitry within the left hemisphere, while distinct ventral stream contributions explain frequently observed dissociations in aphasia. Moreover, the results suggest prerequisite biomarkers for successful singing-based therapeutic interventions.

<https://www.nature.com/articles/s42003-023-05152-y>

Nature Human Behaviour

NEWS

Scientific publishing has a language problem

Science is international, but scientific publishing is dominated by English-language publications. This disproportionately benefits native or fluent English speakers. We want to take steps to address the imbalance this creates, and new technology may help.

<https://www.nature.com/articles/s41562-023-01679-6>

Nature Scientific Reports

PAPERS

FRANCESCO FONTANI et al – Bioarchaeological and paleogenomic profiling of the unusual Neolithic burial from Grotta di Pietra Sant'Angelo (Calabria, Italy)

The Neolithic burial of Grotta di Pietra Sant'Angelo (CS) represents a unique archaeological finding for the prehistory of Southern Italy. The unusual placement of the inhumation at a rather high altitude and far from inhabited areas, the lack of funerary equipment and the prone deposition of the body find limited similarities in coeval Italian sites. These elements have prompted wider questions on mortuary customs during the prehistory of Southern Italy. This atypical case requires an interdisciplinary approach aimed to build an integrated bioarchaeological profile of the individual. The paleopathological investigation of the skeletal remains revealed the presence of numerous markers that could be associated with craft activities, suggesting possible interpretations of the individual's lifestyle. CT analyses, carried out on the maxillary bones, showed the presence of a peculiar type of dental wear, but also a good density of the bone matrix. Biomolecular and micromorphological analyses of dental calculus highlight the presence of a rich Neolithic-like oral microbiome, the composition of which is consistent with the presence pathologies. Finally, paleogenomic data obtained from the individual were compared with ancient and modern Mediterranean populations, including unpublished high-resolution genome-wide data for 20 modern inhabitants of the nearby village of San Lorenzo Bellizzi, which provided interesting insights into the biodemographic landscape of the Neolithic in Southern Italy.

<https://www.nature.com/articles/s41598-023-39250-y>

New Scientist

NEWS

Ancient humans hunted animals by throwing a stick like a boomerang

Analysis of a wooden stick thought to be around 300,000 years old suggests it was designed to be thrown rotationally, rather than as a spear.

<https://www.newscientist.com/article/2383392-ancient-humans-hunted-animals-by-throwing-a-stick-like-a-boomerang/>

Postmenopausal orcas seem to prevent sons from getting into fights

Male orcas with a surviving postmenopausal mother have fewer signs of injury than those whose mothers are dead or still reproducing.

<https://www.newscientist.com/article/2383509-postmenopausal-orcas-seem-to-prevent-sons-from-getting-into-fights/>

PeerJ

PAPERS

FAKE MA & HUWEI LI – Online painting image clustering for the mental health of college art students based on Improved CNN and SMOTE

In modern education, mental health problems have become the focus and difficulty of students' education. Painting therapy has been integrated into the school's art education as an effective mental health intervention. Deep learning can automatically learn the image features and abstract the low-level image features into high-level features. However, traditional image classification models are prone to lose background information, resulting in poor adaptability of the classification model. Therefore, this article extracts the lost colour of painting images based on K-means clustering and proposes a painting style classification model based on an improved convolutional neural network (CNN), where a modified Synthetic Minority Oversampling Technique (SMOTE) is proposed to amplify the data. Then, the CNN network structure is optimized by adjusting the network's vertical depth and horizontal width. Finally, a new activation function, PPRELU, is proposed to suppress the excessive value of the positive part. The experimental results show that the proposed model has the highest accuracy in classifying painting image styles by comparing it with state-of-the-art methods, whose accuracy is up to 91.55%, which is 8.7% higher than that of traditional CNN.

<https://peerj.com/articles/cs-1462/>

JIANYU ZHENG & YING LIU – What does Chinese BERT learn about syntactic knowledge?

Pre-trained language models such as Bidirectional Encoder Representations from Transformers (BERT) have been applied to a wide range of natural language processing (NLP) tasks and obtained significantly positive results. A growing body of research has investigated the reason why BERT is so efficient and what language knowledge BERT is able to learn. However, most of these works focused almost exclusively on English. Few studies have explored the language information, particularly syntactic information, that BERT has learned in Chinese, which is written as sequences of characters. In this study, we adopted some probing methods for identifying syntactic knowledge stored in the attention heads and hidden states of Chinese BERT. The results suggest that some individual heads and combination of heads do well in encoding corresponding and overall syntactic relations, respectively. The hidden representation of each layer also contained syntactic information to different degrees. We also analyzed the fine-tuned models of Chinese BERT for different tasks, covering all levels. Our results suggest that these

fine-tuned models reflect changes in conserving language structure. These findings help explain why Chinese BERT can show such large improvements across many language-processing tasks.

<https://peerj.com/articles/cs-1478/>

PLoS One

PAPERS

SUWIJAK DEOISRES et al – Continuous speech with pauses inserted between words increases cortical tracking of speech envelope

tool for assessing the cortical tracking of speech envelope. It is used to analyse the correlation between the speech stimulus and the neural response. It is known that auditory late responses are enhanced with longer gaps between stimuli, but it is not clear if this applies to the decoder, and whether the addition of gaps/pauses in continuous speech could be used to increase the envelope reconstruction accuracy. We investigated this in normal hearing participants who listened to continuous speech with no added pauses (natural speech), and then with short (250 ms) or long (500 ms) silent pauses inserted between each word. The total duration for continuous speech stimulus with no, short, and long pauses were approximately, 10 minutes, 16 minutes, and 21 minutes, respectively. EEG and speech envelope were simultaneously acquired and then filtered into delta (1–4 Hz) and theta (4–8 Hz) frequency bands. In addition to analysing responses to the whole speech envelope, speech envelope was also segmented to focus response analysis on onset and non-onset regions of speech separately. Our results show that continuous speech with additional pauses inserted between words significantly increases the speech envelope reconstruction correlations compared to using natural speech, in both the delta and theta frequency bands. It also appears that these increase in speech envelope reconstruction are dominated by the onset regions in the speech envelope. Introducing pauses in speech stimuli has potential clinical benefit for increasing auditory evoked response detectability, though with the disadvantage of speech sounding less natural. The strong effect of pauses and onsets on the decoder should be considered when comparing results from different speech corpora. Whether the increased cortical response, when longer pauses are introduced, reflect improved intelligibility requires further investigation.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0289288>

REBEKAH MIFSUD & GORDON SAMMUT – Worldviews and the role of social values that underlie them

In today's ideologically diverse world, it is pertinent to have a better understanding of how our beliefs of the social world shape our thinking and behaviour. The purpose of this paper is to investigate the key social values that underlie particular sets of beliefs, referred to here as worldviews. Worldviews encompass beliefs that shape one's outlook on life and are, therefore, instrumental in providing meaning to one's reality and one's understanding as to how one fits in it. They can be classified into five unique types, namely, Localised, Orthodox, Pragmatist, Reward, and Survivor. In this paper we start by proposing a theoretical relationship between this five-factor typology and social values. Following this, we present findings that show that worldviews may be mapped onto the two higher order value dimensions of Openness to Change versus Conservation, and Self-transcendence versus Self-Enhancement. We conclude by outlining the implications that these findings have on understanding individual cognition and society in general.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0288451>

Proceedings of the Royal Society B

PAPERS

MOLLY H. F. MCENTEE et al – Sex bias in mortality risk changes over the lifespan of bottlenose dolphins

Research on sex biases in longevity in mammals often assumes that male investment in competition results in a female survival advantage that is constant throughout life. We use 35 years of longitudinal data on 1003 wild bottlenose dolphins (*Tursiops aduncus*) to examine age-specific mortality, demonstrating a time-varying effect of sex on mortality hazard over the five-decade lifespan of a social mammal. Males are at higher risk of mortality than females during the juvenile period, but the gap between male and female mortality hazard closes in the mid-teens, coincident with the onset of female reproduction. Female mortality hazard is non-significantly higher than male mortality hazard in adulthood, resulting in a moderate male bias in the oldest age class. Bottlenose dolphins have an intensely male-competitive mating system, and juvenile male mortality has been linked to social competition. Contrary to predictions from sexual selection theory, however, male–male competition does not result in sustained male-biased mortality. As female dolphins experience high costs of sexual coercion in addition to long and energetically expensive periods of gestation and lactation, this suggests that substantial female investment in reproduction can elevate female mortality risk and impact sex biases in lifespan.

<https://royalsocietypublishing.org/doi/10.1098/rspb.2023.0675>

Science

ARTICLES

SIMON J. GREENHILL – A shared foundation of language change

Short-term development and long-term evolution of language share mechanisms

<https://www.science.org/doi/full/10.1126/science.adj2154>

PAPERS**THOMAS BROCHHAGEN et al – From language development to language evolution: A unified view of human lexical creativity**

A defining property of human language is the creative use of words to express multiple meanings through word meaning extension. Such lexical creativity is manifested at different timescales, ranging from language development in children to the evolution of word meanings over history. We explored whether different manifestations of lexical creativity build on a common foundation. Using computational models, we show that a parsimonious set of semantic knowledge types characterize developmental data as well as evolutionary products of meaning extension spanning over 1400 languages. Models for evolutionary data account very well for developmental data, and vice versa. These findings suggest a unified foundation for human lexical creativity underlying both the fleeting products of individual ontogeny and the evolutionary products of phylogeny across languages.

<https://www.science.org/doi/10.1126/science.ade7981>

PAUL HEGGARTY et al with JOHANNES KRAUSE & QUENTIN D. ATKINSON – Language trees with sampled ancestors support a hybrid model for the origin of Indo-European languages

Almost half the world's population speaks a language of the Indo-European language family. It remains unclear, however, where this family's common ancestral language (Proto-Indo-European) was initially spoken and when and why it spread through Eurasia. The "Steppe" hypothesis posits an expansion out of the Pontic-Caspian Steppe, no earlier than 6500 years before present (yr B.P.), and mostly with horse-based pastoralism from ~5000 yr B.P. An alternative "Anatolian" or "farming" hypothesis posits that Indo-European dispersed with agriculture out of parts of the Fertile Crescent, beginning as early as ~9500 to 8500 yr B.P. Ancient DNA (aDNA) is now bringing valuable new perspectives, but these remain only indirect interpretations of language prehistory. In this study, we tested between the time-depth predictions of the Anatolian and Steppe hypotheses, directly from language data. We report a new framework for the chronology and divergence sequence of Indo-European, using Bayesian phylogenetic methods applied to an extensive new dataset of core vocabulary across 161 Indo-European languages.

<https://www.science.org/doi/full/10.1126/science.abg0818>

Trends in Cognitive Sciences**PAPERS****ALEX LLOYD et al – Understanding patch foraging strategies across development**

Patch foraging is a near-ubiquitous behaviour across the animal kingdom and characterises many decision-making domains encountered by humans. We review how a disposition to explore in adolescence may reflect the evolutionary conditions under which hunter-gatherers foraged for resources. We propose that neurocomputational mechanisms responsible for reward processing, learning, and cognitive control facilitate the transition from exploratory strategies in adolescence to exploitative strategies in adulthood – where individuals capitalise on known resources. This developmental transition may be disrupted by psychopathology, as there is emerging evidence of biases in explore/exploit choices in mental health problems. Explore/exploit choices may be an informative marker for mental health across development and future research should consider this feature of decision-making as a target for clinical intervention.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(23\)00172-9](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00172-9)

Trends in Ecology and Evolution**PAPERS****THORE J. BERGMAN & JACINTA C. BEEHNER – Information Ecology: an integrative framework for studying animal behavior**

Information is simultaneously a valuable resource for animals and a tractable variable for researchers. We propose the name Information Ecology to describe research focused on how individual animals use information to enhance fitness. An explicit focus on information in animal behavior is far from novel – we simply build on these ideas and promote a unified approach to how and why animals use information. The value of information to animals favors the theoretically rich adaptive approach of field-based research. Simultaneously, our ability to manipulate information lends itself to the strong methods of laboratory-based research. Information Ecology asks three questions: What information is available? How is it used (or not)? And, why is it used (or not)?

[https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(23\)00140-4](https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(23)00140-4)

Trends in Neurosciences**PAPERS****ANDREAS NIEDER – Neuroscience of cognitive control in crows**

Crows, a group of corvid songbird species, show superb behavioral flexibility largely stemming from their advanced cognitive control functions. These functions mainly originate from the associative avian pallium that evolved independently from the

mammalian cerebral cortex. This article presents a brief overview of cognitive control functions and their neuronal foundation in crows.

[https://www.cell.com/trends/neurosciences/fulltext/S0166-2236\(23\)00162-5](https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(23)00162-5)

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