

EAORC BULLETIN 1,071 – 24 December 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.

CONFERENCE ALERT –Pragmatics & Literature workshop at Poetics And Linguistics Association conference

There will be a Special Interest Group workshop on 'Pragmatics and Literature' at next year's PALA (Poetics And Linguistics Association) conference taking place from 26th to 29th June 2024 at Sheffield Hallam University, UK. PALA is a very broad and welcoming organisation with a significant number of student members. Student membership is free.

The description of the Special Interest Group is below along with the link to the conference call for papers. The deadline for submissions is 15 JANUARY 2024. If you'd like your abstract to be considered for this workshop, don't forget to say YES when you get to the question about Special Interest Groups in the submission form!

PRAGMATICS AND LITERATURE SPECIAL INTEREST GROUP WORKSHOP 2024

Organisers: Professor Siobhan Chapman (src@liverpool.ac.uk) and Professor Billy Clark (billy.clark@northumbria.ac.uk).

The Pragmatics and Literature Special Interest Group brings together researchers interested in applying ideas from any area in linguistic pragmatics to the analysis of literary texts, broadly understood.

The aim of the workshop is to promote interaction among those working with different theoretical approaches, while sharing a focus on the pragmatic stylistic analysis of specific literary texts. Building on previous workshops of the SIG, we are interested in papers which apply ideas from pragmatic theory to develop understanding of the production, interpretation or evaluation of texts from a variety of historical periods and of literary genres.

CONFERENCE CALL FOR PAPERS: <https://www.pala2024.com/pala2024/home-page/call-for-papers/>

CONFERENCE WEBSITE: <https://www.pala2024.com/pala2024/>

PALA WEBSITE: <https://www.pala.ac.uk>

PALA MEMBERSHIP: <https://www.pala.ac.uk/membership.html>

FUNDING ALERT – Society for the Study of Evolution: 2024 R. C. Lewontin Early Awards

The Society for the Study of Evolution is now accepting applications for the 2024 R. C. Lewontin Early Awards. These grants offer up to \$2,500 USD in research funding to assist early graduate students. This year, 1st year Master's students as well as 1st and 2nd year PhD students are eligible.

These grants are part of the SSE Graduate Research Excellence Grants.

<https://www.evolutionsociety.org/content/society-awards-and-prizes/graduate-research-excellence-grants.html>

See full details on our website:

<https://www.evolutionsociety.org/content/society-awards-and-prizes/graduate-research-excellence-grants/rc-lewontin-early-award.html>

Deadline: February 23, 2024

NEWS

SCIENCEADVISER – Early risers

Morning person or night owl? If you prefer to wake up at the crack of dawn, inherited Neanderthal DNA may be the reason why.

<https://www.science.org/content/article/neanderthals-were-morning-people>

SCIENCEADVISER – Great apes never forget a face

If you hadn't seen a close relative for more than a quarter century, would you still recognize them? Louise could. The bonobo spent most of her life at a separate sanctuary from her sister and nephew, yet the moment she spotted them on a computer screen 26 years later, she stared hard at their faces—a sign that she knew who they were.

Louise was part of a new study, wherein researchers showed more than two dozen chimpanzees and bonobos photos of the faces of two apes placed side by side on the screen for three seconds. The apes gazed about a quarter-second, or 11% to 14% longer, at the faces of apes they used to know and associated with good times, compared to the faces of strangers. In some cases, the animal hadn't seen the ape depicted on the screen for five or ten years—or, in Louise's case—much longer.

Other animals, such as dolphins, elephants, and dogs, use sound or smell to recognize another familiar individual's call or scent. But the ability to use visual cues to remember a friend's face years after parting has long been seen as unique to humans and critical to our ancestors' survival, says Frans de Waal, a primatologist at Emory University who was not involved with the work. The research, he says, raises the possibility that other animals also can do this and may remember far more than we give them credit for. "It's a remarkable finding."

<https://www.science.org/content/article/chimps-remember-faces-old-friends-and-family-decades>

SCIENCEADVISER – Kids with chattier parents are more talkative themselves

Why do some kids learn to speak faster than others? Linguists have pointed to everything from socioeconomic status, to gender, to multilingualism. But a new study points to a much simpler explanation: An analysis of nearly 40,000 hours of audio recordings from children around the world found that kids spoke more when the adults around them are more talkative,

while factors like gender, multilingualism and social class made no difference, researchers report this month in Proceedings of the National Academy of Sciences.

The study authors amassed 2865 days of audio from 1001 kids in 12 countries using “talk pedometers”—small audio devices that estimate how much a wearer speaks and hears. They found that, on average, kids spoke 27 times more per hour for every 100 extra adult vocalizations they heard per hour. But surprisingly, a mother’s level of education—a measure of social class—had no bearing on their children’s speech.

So what should parents do with this information? Harvard University developmental psychologist Erika Bergelson says they shouldn’t feel they need to aim a torrent of speech at their kids. But it’s still a great idea to interact with your kids, she says: “not because you’re hoping they’re going to produce more speech ... [but] to support them, love them, and care for them.”

<https://www.science.org/content/article/kids-chattier-parents-are-more-talkative-may-have-bigger-vocabulary>

SCIENCE.ORG NEWS – Neanderthals were morning people

Genes inherited from our ancient ancestors may explain why some people like to wake up early.

<https://www.science.org/content/article/neanderthals-were-morning-people>

SCIENCE.ORG NEWS – Why do most dogs have brown eyes?

Humans may have selected for a color they found friendlier—and less threatening.

<https://www.science.org/content/article/why-do-most-dogs-have-brown-eyes>

SCIENCE.ORG NEWS – Kids with chattier parents are more talkative, may have bigger vocabulary

Global data set suggests socioeconomic status does not play a role in children’s language development.

<https://www.science.org/content/article/kids-chattier-parents-are-more-talkative-may-have-bigger-vocabulary>

THE CONVERSATION – How writing ‘made us human’ – from ancient Iraq to the present day

Evidence suggests that writing was probably invented in southern Iraq sometime before 3000BC. But what happened next?

<https://theconversation.com/how-writing-made-us-human-an-emotional-history-from-ancient-iraq-to-the-present-day-219739>

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

IAN TOWLE, MATTHEW R. BORTHS & CAROLINA LOCH – Tooth chipping patterns and dental caries suggest a soft fruit diet in early anthropoids

Fossils from the Fayum Depression, Egypt, are crucial for understanding anthropoid evolution due to the abundance of taxa and the time interval they represent (late Eocene to early Oligocene). Dietary and foraging behavioral interpretations suggest fruits were their dominant food source, although hard foods (e.g., seeds and nuts) and leaves could have been important dietary components for particular groups. In this study, we compare dental chipping patterns in five Fayum primate genera with chipping data for extant primates, to assess potential hard object feeding in early anthropoids.

Original specimens were studied (Aegyptopithecus: n = 100 teeth; Parapithecus: n = 72, Propliopithecus: n = 99, Apidium: n = 82; Catopithecus: n = 68); with the number, severity, and position of chips recorded. Dental caries was also recorded, due to its association with soft fruit consumption in extant primates.

Tooth chipping was low across all five genera studied, with a pooled chipping prevalence of 5% (21/421). When split into the three anthropoid families represented, chipping prevalence ranged from 2.6% (4/154) in Parapithecidae, 6% (12/199) in Propliopithecidae, and 7.4% (5/68) in Oligopithecidae. Three carious lesions were identified in Propliopithecidae.

The chipping prevalence is low when compared to extant anthropoids (range from 4% to 40%) and is consistent with a predominantly soft fruit diet, but not with habitual hard food mastication. The presence of caries supports consumption of soft, sugary fruits, at least in Propliopithecidae. Our results add support for low dietary diversity in early anthropoids, with soft fruits as likely dominant food sources.

<https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.24884>

Biology Letters

PAPERS

J. S. ZEWARD & A. M. I. AUERSPERG – Dunking rusk: innovative food soaking behaviour in Goffin's cockatoos (*Cacatua goffiniana*)

Foraging innovations in animals involving the processing of resources that are already edible in an unprocessed state, yet of improved quality in a processed state, are rare but important to study the evolution of food preparation. Here, we present the first scientific report of food dunking behaviours in parrots by Goffin's cockatoos, a model species for innovative problem

solving. Observations during lunch showed seven out of 18 cockatoos placing their food into water and soaking it prior to consumption. This was largely done with dry rusk which was eaten almost exclusively when dunked. Furthermore, their transport effort and waiting times before retrieving food from the water indicate their willingness to invest considerable time to prepare a soaked rusk piece of a higher texture quality. Our present results suggest that the function of this behaviour is to soak the food. Because only some individuals dunked food and dunking has not been observed in the wild, we believe this to be a spontaneous foraging innovation either by one or multiple individuals.

<https://royalsocietypublishing.org/doi/full/10.1098/rsbl.2023.0411>

Current Biology

PAPERS

CHAONA CHEN et al – Cultural facial expressions dynamically convey emotion category and intensity information

Communicating emotional intensity plays a vital ecological role because it provides valuable information about the nature and likelihood of the sender's behavior. For example, attack often follows signals of intense aggression if receivers fail to retreat. Humans regularly use facial expressions to communicate such information. Yet how this complex signaling task is achieved remains unknown. We addressed this question using a perception-based, data-driven method to mathematically model the specific facial movements that receivers use to classify the six basic emotions—"happy," "surprise," "fear," "disgust," "anger," and "sad"—and judge their intensity in two distinct cultures (East Asian, Western European; total n = 120). In both cultures, receivers expected facial expressions to dynamically represent emotion category and intensity information over time, using a multi-component compositional signaling structure. Specifically, emotion intensifiers peaked earlier or later than emotion classifiers and represented intensity using amplitude variations. Emotion intensifiers are also more similar across emotions than classifiers are, suggesting a latent broad-plus-specific signaling structure. Cross-cultural analysis further revealed similarities and differences in expectations that could impact cross-cultural communication. Specifically, East Asian and Western European receivers have similar expectations about which facial movements represent high intensity for threat-related emotions, such as "anger," "disgust," and "fear," but differ on those that represent low threat emotions, such as happiness and sadness. Together, our results provide new insights into the intricate processes by which facial expressions can achieve complex dynamic signaling tasks by revealing the rich information embedded in facial expressions.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(23\)01656-1](https://www.cell.com/current-biology/fulltext/S0960-9822(23)01656-1)

Developmental Cell

PAPERS

SHYAM K. AKULA, DAVID EXPOSITO-ALONSO & CHRISTOPHER A. WALSH – Shaping the brain: The emergence of cortical structure and folding

The cerebral cortex—the brain's covering and largest region—has increased in size and complexity in humans and supports higher cognitive functions such as language and abstract thinking. There is a growing understanding of the human cerebral cortex, including the diversity and number of cell types that it contains, as well as of the developmental mechanisms that shape cortical structure and organization. In this review, we discuss recent progress in our understanding of molecular and cellular processes, as well as mechanical forces, that regulate the folding of the cerebral cortex. Advances in human genetics, coupled with experimental modeling in gyrencephalic species, have provided insights into the central role of cortical progenitors in the gyrification and evolutionary expansion of the cerebral cortex. These studies are essential for understanding the emergence of structural and functional organization during cortical development and the pathogenesis of neurodevelopmental disorders associated with cortical malformations.

[https://www.cell.com/developmental-cell/fulltext/S1534-5807\(23\)00580-4](https://www.cell.com/developmental-cell/fulltext/S1534-5807(23)00580-4)

Frontiers in Artificial Intelligence

PAPERS

SEIYA NAKATA & MASANORI TAKEZAWA – Hierarchical structures emerge from the cultural transmission: an iterated learning experiment using a non-linguistic task

Human language is characterized by complex structural features, such as the hierarchical combination of words to form sentences. Although other animals use communication systems, empirical evidence of hierarchical structures is rare. Computational studies of language evolution have suggested that cultural transmission plays a key role in the emergence of structural features in human languages, including hierarchy. While the previous study demonstrated the emergence of hierarchical structures in non-linguistic systems, we argue that their laboratory study may have overestimated the role of cultural transmission because of a lack of appropriate controls and analyses. To directly test the effect of cultural transmission, we conducted an experiment with no cultural transmission as a control (individual condition) in addition to replicating the previous transmission experiment (transmission condition). Our study has added a quantitative analysis of the hierarchical depth. We found that sequences became more structured as the number of generations increased; however, those produced under the transmission condition were more structured than those under the individual condition. These findings suggest that cultural transmission plays an important role in the emergence of hierarchical structures, which cannot

be explained by increased learnability alone. The emergence of complex structural properties in human culture, such as language, technology, and music, may have resulted from information transmission processes between different individuals. In conclusion, this study provides evidence of the crucial role of cultural transmission in the emergence of hierarchical structures in non-linguistic communication systems. Our results contribute to the ongoing debate on the origins of human language and the emergence of complex cultural artifacts. The results of this study have implications for the study of cultural evolution and the role of transmission in shaping the emergence of structural features across diverse domains.

<https://www.frontiersin.org/articles/10.3389/frai.2023.1221329/full>

Heliyon

PAPERS

ÖMER ERDOĞAN – A system approach to the self: Interpretive phenomenological analysis

The study aims to determine the life experiences that affect the formation of permanent identity features that form the self during adolescence and to determine the importance of these identity features for adolescents. For this purpose, in-depth interviews were conducted with 8 participants, 4 of whom were women and 4 of whom were men, between the ages of 22–24, to understand the life experiences that affect their self-development during childhood and adolescence. Four of the participants are university students, and 4 of them are high school graduates. Interviews and analyses were carried out within the Interpretive phenomenological analysis principles framework. According to the results of the analysis obtained from the interviews, it was found that the most influential factor on self-development was family communication orientation in childhood, and the participants who grew up in families with a conversation orientation had more positive emotions during childhood, saw themselves as part of the family more, and established more successful friendships. On the other hand, participants from families with a conformity orientation had more negative feelings in childhood, had a lower sense of belonging to the family, and were found to be less successful in friendships.

[https://www.cell.com/heliyon/fulltext/S2405-8440\(23\)10468-3](https://www.cell.com/heliyon/fulltext/S2405-8440(23)10468-3)

Human Nature

PAPERS

MICHAEL TOMASELLO – Differences in the Social Motivations and Emotions of Humans and Other Great Apes

Humans share with other mammals and primates many social motivations and emotions, but they are also much more cooperative than even their closest primate relatives. Here I review recent comparative experiments and analyses that illustrate humans' species-typical social motivations and emotions for cooperation in comparison with those of other great apes. These may be classified most generally as (i) 'you > me' (e.g., prosocial sympathy, informative and pedagogical motives in communication); (ii) 'you = me' (e.g., feelings of mutual respect, fairness, resentment); (iii) 'we > me' (e.g., feelings of obligation and guilt); and (iv) 'WE (in the group) > me' (e.g., in-group loyalty and conformity to norms, shame, and many in-group biases). The existence of these species-typical and species-universal motivations and emotions provides compelling evidence for the importance of cooperative activities in the human species.

<https://link.springer.com/article/10.1007/s12110-023-09464-0>

LINDSAY MURRAY, JADE GODDARD & DAVID GORDON – Facial Expression of TIPI Personality and CHMP-Tri Psychopathy Traits in Chimpanzees (*Pan troglodytes*): Evidence for Honest Signalling?

Honest signalling theory suggests that humans and chimpanzees can extract socially relevant information relating to personality from the faces of their conspecifics. Humans are also able to extract information from chimpanzees' faces. Here, we examine whether personality characteristics of chimpanzees, including measures of psychopathy, can be discerned based purely on facial morphology in photographs. Twenty-one chimpanzees were given naïve and expert personality ratings on the Ten Item Personality Inventory (TIPI) and the Chimpanzee Triarchic Model of Psychopathy (CHMP-Tri) before and following behavioural observations. Characteristics relating to openness, conscientiousness, extraversion, and disinhibition could be distinguished from the faces of chimpanzees. Individuals higher on disinhibition have lower scores on conscientiousness and emotional stability and higher scores on extraversion, while those higher on meanness have lower conscientiousness and agreeableness. Facial expressions are linked to personality traits present in the TIPI and CHMP-Tri models: the Relaxed Face and the Grooming Face were displayed more by chimpanzees higher on agreeableness, whereas the Compressed Lips Face was observed more in those individuals higher on boldness, and the Full Open Grin was displayed more by chimpanzees higher on extraversion but lower on emotional stability and conscientiousness. Facial expressions were also found to be associated with particular behavioural contexts, namely the Grooming Face in affiliative contexts and the Relaxed and Relaxed Open Mouth Faces in neutral contexts. Dominant chimpanzees display higher levels of boldness and more Compressed Lips Faces, Relaxed Open Mouth Faces, and Grooming Faces than subordinate individuals. These findings support and extend evidence for an honest signalling system and a personality structure shared between humans and chimpanzees. Future research could further explore how personality is conveyed through the face, perhaps through more than just singular aspects of character, and maybe reflecting what chimpanzees themselves are able to do.

<https://link.springer.com/article/10.1007/s12110-023-09462-2>

KRISTIE L. POOLE & HEATHER A. HENDERSON – Social Cognitive Correlates of Contagious Yawning and Smiling

It has been theorized that the contagion of behaviors may be related to social cognitive abilities, but empirical findings are inconsistent. We recorded young adults' behavioral expression of contagious yawning and contagious smiling to video stimuli and employed a multi-method assessment of sociocognitive abilities including self-reported internal experience of emotional contagion, self-reported trait empathy, accuracy on a theory of mind task, and observed helping behavior. Results revealed that contagious yawners reported increases in tiredness from pre- to post-video stimuli exposure, providing support for the internal experience of emotional contagion, and were more likely to provide help to the experimenter relative to non-contagious yawners. Contagious smilers showed stably high levels of self-reported happiness from pre- to post-video exposure, were more likely to provide help to the experimenter, and had increased accuracy on a theory of mind task relative to non-contagious smilers. There were no differences in self-reported trait empathy for contagious versus non-contagious yawners or smilers. Contagious yawning may be related to some basic (i.e., emotional contagion) and advanced (i.e., helping behavior) sociocognitive processes, whereas contagious smiling is related to some advanced sociocognitive processes (i.e., theory of mind and helping behavior).

<https://link.springer.com/article/10.1007/s12110-023-09463-1>

PAUL ROSCOE – Social Substitutability and the Emergence of War and Segmental, Multilevel Society

Raymond Kelly's widely cited *Warless Societies and the Origin of War* (University of Michigan Press, 2000) seeks to explain the origins of two central signatures of human society: war and segmented—i.e., multilevel—societies. Both, he argues, arose with the emergence of a social-substitutability principle, a rule that establishes a collective identity among a set of individuals such that any one member becomes equivalent to, and responsible for the actions of, the others. This principle emerged during the Holocene, when population increase gave rise to the first lethal ambushes. By its nature, ambush obscures attackers' identities. Those attempting to retaliate for the ambush were therefore obliged to target members of the ambushers' group indiscriminately—i.e., based on a social-substitutability principle. Kelly's proposals draw welcome attention to a widespread, deeply influential, and unsettling human behavior, the disposition to hold everyone in a group culpable for the actions of a few, a proclivity that all too often results in mass slaughter. His general argument, however, is logically and empirically deficient, and cross-cultural evidence on ambush in contact-era New Guinea undermines his anonymity-of-ambush hypothesis. What then accounts for war and multilevel society? The New Guinea evidence strongly supports a contention that social-substitutability behavior arose not from offensive military action (i.e., ambush) but from the defensive military response to ambush. These findings render the social-substitutability argument's unconventional definition of war superfluous, undermine its chronology for the emergence of war, and underwrite an alternative scenario for the origins of multilevel, segmented society.

<https://link.springer.com/article/10.1007/s12110-023-09465-z>

Interface: Journal of the Royal Society**PAPERS****PETER STEIGLECHNER et al – Social identity bias and communication network clustering interact to shape patterns of opinion dynamics**

Social influence aligns people's opinions, but social identities and related in-group biases interfere with this alignment. For instance, the recent rise of young climate activists (e.g. 'Fridays for Future' or 'Last Generation') has highlighted the importance of generational identities in the climate change debate. It is unclear how social identities affect the emergence of opinion patterns, such as consensus or disagreement, in a society. Here, we present an agent-based model to explore this question. Agents communicate in a network and form opinions through social influence. The agents have fixed social identities which involve homophily in their interaction preferences and in-group bias in their perception of others. We find that the in-group bias has opposing effects depending on the network topology. The bias impedes consensus in highly random networks by promoting the formation of echo chambers within social identity groups. By contrast, the bias facilitates consensus in highly clustered networks by aligning dispersed in-group agents across the network and, thereby, preventing the formation of isolated echo chambers. Our model uncovers the mechanisms underpinning these opposing effects of the in-group bias and highlights the importance of the communication network topology for shaping opinion dynamics.

<https://royalsocietypublishing.org/doi/full/10.1098/rsif.2023.0372>

iScience**PAPERS****MARGARITA JAMBRINA-ENRÍQUEZ et al – Microstratigraphic, lipid biomarker and stable isotope study of a Middle Palaeolithic combustion feature from Axló, Spain**

Archaeological research has increasingly focused on studying combustion features as valuable sources of information regarding past technological and cultural aspects. The use of microstratigraphic and biomolecular techniques enables the identification of combustion residues and substrate components, and infer about past fire-related activities and the environments. Our study conducted on a combustion feature (Level N, ~100 Ka) at the Axló cave, a Middle Paleolithic site in northern Iberia, exemplifies the interdisciplinary approach in combustion features. Micromorphological features revealed depositional activities associated with occupation such as hearth rake-out and trampling. Through molecular (n-alkanes, n-

alcohols and n-fatty acids) and isotopic analysis ($\delta^{13}C_{16:0}$ and $\delta^{13}C_{18:0}$), we infer the good preservation of organic matter, the contributions of non-ruminant fats, and the dead-wood gathering strategies by Neanderthal groups. By combining microstratigraphic and biomolecular approaches, our study significantly contributes to the advancement of our current understanding of Neanderthal pyrotechnology.

[https://www.cell.com/iscience/fulltext/S2589-0042\(23\)02832-8](https://www.cell.com/iscience/fulltext/S2589-0042(23)02832-8)

Nature

ARTICLES

RICHARD VAN NOORDEN & SHAMINI BUNDELL – What ChatGPT is and what it's not: a three minute guide

A whistle-stop tour under the hood of Chat GPT in which we ask whether we should be calling LLMs intelligent in the first place.

<https://www.nature.com/articles/d41586-023-04156-2>

Nature Communications

PAPERS

COLIN W. HOY et al – Asymmetric coding of reward prediction errors in human insula and dorsomedial prefrontal cortex

The signed value and unsigned salience of reward prediction errors (RPEs) are critical to understanding reinforcement learning (RL) and cognitive control. Dorsomedial prefrontal cortex (dMPFC) and insula (INS) are key regions for integrating reward and surprise information, but conflicting evidence for both signed and unsigned activity has led to multiple proposals for the nature of RPE representations in these brain areas. Recently developed RL models allow neurons to respond differently to positive and negative RPEs. Here, we use intracranially recorded high frequency activity (HFA) to test whether this flexible asymmetric coding strategy captures RPE coding diversity in human INS and dMPFC. At the region level, we found a bias towards positive RPEs in both areas which paralleled behavioral adaptation. At the local level, we found spatially interleaved neural populations responding to unsigned RPE salience and valence-specific positive and negative RPEs. Furthermore, directional connectivity estimates revealed a leading role of INS in communicating positive and unsigned RPEs to dMPFC. These findings support asymmetric coding across distinct but intermingled neural populations as a core principle of RPE processing and inform theories of the role of dMPFC and INS in RL and cognitive control.

<https://www.nature.com/articles/s41467-023-44248-1>

Nature Communications Psychology

PAPERS

ZHIMENG LI et al – Emotional event perception is related to lexical complexity and emotion knowledge

Inferring emotion is a critical skill that supports social functioning. Emotion inferences are typically studied in simplistic paradigms by asking people to categorize isolated and static cues like frowning faces. Yet emotions are complex events that unfold over time. Here, across three samples (Study 1 N = 222; Study 2 N = 261; Study 3 N = 101), we present the Emotion Segmentation Paradigm to examine inferences about complex emotional events by extending cognitive paradigms examining event perception. Participants were asked to indicate when there were changes in the emotions of target individuals within continuous streams of activity in narrative film (Study 1) and documentary clips (Study 2, preregistered, and Study 3 test-retest sample). This Emotion Segmentation Paradigm revealed robust and reliable individual differences across multiple metrics. We also tested the constructionist prediction that emotion labels constrain emotion inference, which is traditionally studied by introducing emotion labels. We demonstrate that individual differences in active emotion vocabulary (i.e., readily accessible emotion words) correlate with emotion segmentation performance.

<https://www.nature.com/articles/s44271-023-00039-4>

Nature Computational Science

COMMENTARIES

ALEXIS PALMER, NOAH A. SMITH & ARTHUR SPIRLING – Using proprietary language models in academic research requires explicit justification

Calls for scientists to develop and use open AI systems are growing — especially for language models (LMs). Beyond concerns about reproducibility of results from closed models, being able to audit the data being used by the system helps researchers understand its behavior. Yet despite these appeals, researchers continue to use closed technologies in many disciplines. If — as many believe — open systems are preferable, this is dispiriting. Admonishing scientists not to use closed models is unlikely to be immediately successful. Here we survey reasons why proprietary models continue to be popular, and suggest how we as a scientific community can increase uptake of open technologies. Our proposal is simple and low cost: we ask that scientists explicitly justify their use of proprietary models when they employ them in research.

<https://www.nature.com/articles/s43588-023-00585-1>

Nature Human Behaviour

PAPERS

KENNY R. COVENTRY et al – Spatial communication systems across languages reflect universal action constraints

The extent to which languages share properties reflecting the non-linguistic constraints of the speakers who speak them is key to the debate regarding the relationship between language and cognition. A critical case is spatial communication, where it has been argued that semantic universals should exist, if anywhere. Here, using an experimental paradigm able to separate variation within a language from variation between languages, we tested the use of spatial demonstratives—the most fundamental and frequent spatial terms across languages. In $n = 874$ speakers across 29 languages, we show that speakers of all tested languages use spatial demonstratives as a function of being able to reach or act on an object being referred to. In some languages, the position of the addressee is also relevant in selecting between demonstrative forms. Commonalities and differences across languages in spatial communication can be understood in terms of universal constraints on action shaping spatial language and cognition.

<https://www.nature.com/articles/s41562-023-01697-4>

STEPHAN C. MEYLAN et al – How adults understand what young children say

Children's early speech often bears little resemblance to that of adults, and yet parents and other caregivers are able to interpret that speech and react accordingly. Here we investigate how adult listeners' inferences reflect sophisticated beliefs about what children are trying to communicate, as well as how children are likely to pronounce words. Using a Bayesian framework for modelling spoken word recognition, we find that computational models can replicate adult interpretations of children's speech only when they include strong, context-specific prior expectations about the messages that children will want to communicate. This points to a critical role of adult cognitive processes in supporting early communication and reveals how children can actively prompt adults to take actions on their behalf even when they have only a nascent understanding of the adult language. We discuss the wide-ranging implications of the powerful listening capabilities of adults for theories of first language acquisition.

<https://www.nature.com/articles/s41562-023-01698-3>

JULIAN DE FREITAS et al – Self-orienting in human and machine learning

A current proposal for a computational notion of self is a representation of one's body in a specific time and place, which includes the recognition of that representation as the agent. This turns self-representation into a process of self-orientation, a challenging computational problem for any human-like agent. Here, to examine this process, we created several 'self-finding' tasks based on simple video games, in which players ($N = 124$) had to identify themselves out of a set of candidates in order to play effectively. Quantitative and qualitative testing showed that human players are nearly optimal at self-orienting. In contrast, well-known deep reinforcement learning algorithms, which excel at learning much more complex video games, are far from optimal. We suggest that self-orienting allows humans to flexibly navigate new settings.

<https://www.nature.com/articles/s41562-023-01696-5>

Nature Scientific Reports

PAPERS

ÉMILIE COURTEAU, PHAEDRA ROYLE & KARSTEN STEINHAEUER – Number agreement processing in adolescents with and without developmental language disorder (DLD): evidence from event-related brain potentials

In morphologically richer languages, including French, one must learn the specific properties of number agreement in order to understand the language, and this learning process continues into adolescence. This study examined similarities and differences between French-speaking adolescents with and without developmental language disorder (DLD) when processing number agreement, and investigated how morpho-syntactic regularity affected language processing. Using event-related potentials (ERP) and only grammatical sentences with audio-visual mismatches, we studied ERP correlates to three types of number agreement: (1) regular determiner agreement in noun phrases, (2) regular subject-verb plural liaison, and (3) irregular subject-verb agreement. We also included a lexico-semantic mismatch condition to investigate lexico-semantic processing in our participants. 17 adolescents with DLD ($M = 14.1$ years) and 20 (pre)teens with typical language (TL, $M = 12.2$ years) participated in the study. Our results suggest three patterns. First, French-speaking teenagers without DLD are still consolidating their neurocognitive processing of morpho-syntactic number agreement and generally display ERP profiles typical of lower language proficiency than adult native speakers. Second, differences in morphosyntactic processing between teenagers with and without DLD seem to be limited to rule-based (regular) number agreement. Third, there is little evidence for corresponding differences in lexico-semantic processing.

<https://www.nature.com/articles/s41598-023-49121-1>

RICCARDO LOCONTE et al – Verbal lie detection using Large Language Models

Human accuracy in detecting deception with intuitive judgments has been proven to not go above the chance level. Therefore, several automatized verbal lie detection techniques employing Machine Learning and Transformer models have been developed to reach higher levels of accuracy. This study is the first to explore the performance of a Large Language

Model, FLAN-T5 (small and base sizes), in a lie-detection classification task in three English-language datasets encompassing personal opinions, autobiographical memories, and future intentions. After performing stylometric analysis to describe linguistic differences in the three datasets, we tested the small- and base-sized FLAN-T5 in three Scenarios using 10-fold cross-validation: one with train and test set coming from the same single dataset, one with train set coming from two datasets and the test set coming from the third remaining dataset, one with train and test set coming from all the three datasets. We reached state-of-the-art results in Scenarios 1 and 3, outperforming previous benchmarks. The results revealed also that model performance depended on model size, with larger models exhibiting higher performance. Furthermore, stylometric analysis was performed to carry out explainability analysis, finding that linguistic features associated with the Cognitive Load framework may influence the model's predictions.

<https://www.nature.com/articles/s41598-023-50214-0>

CHARLOTTE GANNON, RUSSELL A. HILL & ADRIANO R. LAMEIRA – Open plains are not a level playing field for hominid consonant-like versus vowel-like calls

Africa's paleo-climate change represents an "ecological black-box" along the evolutionary timeline of spoken language; a vocal hominid went in and, millions of years later, out came a verbal human. It is unknown whether or how a shift from forested, dense habitats towards drier, open ones affected hominid vocal communication, potentially setting stage for speech evolution. To recreate how arboreal proto-vowels and proto-consonants would have interacted with a new ecology at ground level, we assessed how a series of orangutan voiceless consonant-like and voiced vowel-like calls travelled across the savannah. Vowel-like calls performed poorly in comparison to their counterparts. Only consonant-like calls afforded effective perceptibility beyond 100 m distance without requiring repetition, as is characteristic of loud calling behaviour in nonhuman primates, typically composed by vowel-like calls. Results show that proto-consonants in human ancestors may have enhanced reliability of distance vocal communication across a canopy-to-ground ecotone. The ecological settings and soundscapes experienced by human ancestors may have had a more profound impact on the emergence and shape of spoken language than previously recognized.

<https://www.nature.com/articles/s41598-023-48165-7>

MARTINA FARESE et al – The Mediterranean archive of isotopic data, a dataset to explore lifeways from the Neolithic to the Iron Age

We present the open-access Mediterranean Archive of Isotopic dAta (MAIA) dataset, which includes over 48,000 isotopic measurements from prehistoric human, animal and plant samples from archaeological sites in the Mediterranean basin dating from the Neolithic to the Iron Age (ca. 6000 – 600 BCE). MAIA collates isotopic measurements ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{34}\text{S}$, $\delta^{18}\text{O}$ and $87\text{Sr}/86\text{Sr}$) alongside supporting information (e.g. chronology, location and bibliographic reference). MAIA can be used to explore past human and animal diets and mobility, reconstruct paleo-ecological and -climatic phenomena and investigate human-environment interaction throughout later prehistory in the Mediterranean. MAIA has multiple research applications and here we show how it can be used to evaluate sample preservation and identify data gaps to be addressed in future research. MAIA is available in an open-access format and can be employed in archaeological, anthropological, and paleo-ecological research.

<https://www.nature.com/articles/s41597-023-02783-y>

JEFFREY C. ZEMLA, DIANE C. GOODING & JOSEPH L. AUSTERWEIL – Evidence for optimal semantic search throughout adulthood

As people age, they learn and store new knowledge in their semantic memory. Despite learning a tremendous amount of information, people can still recall information relevant to the current situation with ease. To accomplish this, the mind must efficiently organize and search a vast store of information. It also must continue to retrieve information effectively despite changes in cognitive mechanisms due to healthy aging, including a general slowing in information processing and a decline in executive functioning. How effectively does the mind of an individual adjust its search to account for changes due to aging? We tested 746 people ages 25 through 69 on a semantic fluency task (free listing animals) and found that, on average, retrieval follows an optimal path through semantic memory. Participants tended to list a sequence of semantically related animals (e.g., lion, tiger, puma) before switching to a semantically unrelated animal (e.g., whale). We found that the timing of these transitions to semantically unrelated animals was remarkably consistent with an optimal strategy for maximizing the overall rate of retrieval (i.e., the number of animals listed per unit time). Age did not affect an individual's deviation from the optimal strategy given their general performance, suggesting that people adapt and continue to search memory optimally throughout their lives. We argue that this result is more likely due to compensating for a general slowing than a decline in executive functioning.

<https://www.nature.com/articles/s41598-023-49858-9>

ELISA BANDINI & CLAUDIO TENNIE – Naïve, adult, captive chimpanzees do not socially learn how to make and use sharp stone tools

Although once regarded as a unique human feature, tool-use is widespread in the animal kingdom. Some of the most proficient tool-users are our closest living relatives, chimpanzees. These repertoires however consist primarily of tool use,

rather than tool manufacture (for later use). Furthermore, most populations of chimpanzees use organic materials, such as sticks and leaves, rather than stones as tools. This distinction may be partly ecological, but it is also important as chimpanzees are often used as models for the evolution of human material culture, the oldest traces of which consist of manufactured sharp stone tools (so-called “flakes”). Thus, examining the conditions (if any) under which chimpanzees may develop flake manufacture and use can provide insight into the drivers of these behaviours in our own lineage. Previous studies on non-human apes’ ability to make and use flakes focused on enculturated apes, giving them full demonstrations of the behaviour immediately, without providing social information on the task in a stepwise manner. Here we tested naïve, captive chimpanzees (N = 4; three potentially enculturated and one unenculturated subject) in a social learning experimental paradigm to investigate whether enculturated and/or unenculturated chimpanzees would develop flake making and use after social information of various degrees (including a human demonstration) was provided in a scaffolded manner. Even though social learning opportunities were provided, neither the unenculturated subject nor any of the potentially enculturated subjects made or used flakes, in stark contrast to previous studies with enculturated apes. These data suggest that flake manufacture and use is outside of our tested group of captive chimpanzees’ individual and social learning repertoires. It also suggests that high levels of enculturation alongside human demonstrations (and/or training) may be required before captive chimpanzees can develop this behaviour.

<https://www.nature.com/articles/s41598-023-49780-0>

Philosophical Transactions of the Royal Society B

PAPERS

VINCENT K. M. CHEUNG et al with ANGELA D. FRIEDERICI – Cognitive and sensory expectations independently shape musical expectancy and pleasure

Expectation is crucial for our enjoyment of music, yet the underlying generative mechanisms remain unclear. While sensory models derive predictions based on local acoustic information in the auditory signal, cognitive models assume abstract knowledge of music structure acquired over the long term. To evaluate these two contrasting mechanisms, we compared simulations from four computational models of musical expectancy against subjective expectancy and pleasantness ratings of over 1000 chords sampled from 739 US Billboard pop songs. Bayesian model comparison revealed that listeners' expectancy and pleasantness ratings were predicted by the independent, non-overlapping, contributions of cognitive and sensory expectations. Furthermore, cognitive expectations explained over twice the variance in listeners' perceived surprise compared to sensory expectations, suggesting a larger relative importance of long-term representations of music structure over short-term sensory–acoustic information in musical expectancy. Our results thus emphasize the distinct, albeit complementary, roles of cognitive and sensory expectations in shaping musical pleasure, and suggest that this expectancy-driven mechanism depends on musical information represented at different levels of abstraction along the neural hierarchy.

<https://royalsocietypublishing.org/doi/full/10.1098/rstb.2022.0420>

AXEL CONSTANT, KARL JOHN FRISTON & ANDY CLARK – Cultivating creativity: predictive brains and the enlightened room problem

How can one conciliate the claim that humans are uncertainty minimizing systems that seek to navigate predictable and familiar environments with the claim that humans can be creative? We call this the Enlightened Room Problem (ERP). The solution, we suggest, lies not (or not only) in the error-minimizing brain but in the environment itself. Creativity emerges from various degrees of interplay between predictive brains and changing environments: ones that repeatedly move the goalposts for our own error-minimizing machinery. By (co)constructing these challenging worlds, we effectively alter and expand the space within which our own prediction engines operate, and that function as ‘exploration bubbles’ that enable information seeking, uncertainty minimizing minds to penetrate deeper and deeper into artistic, scientific and engineering space. In what follows, we offer a proof of principle for this kind of environmentally led cognitive expansion.

<https://royalsocietypublishing.org/doi/10.1098/rstb.2022.0415>

KARIN KUKKONEN – Designs on consciousness: literature and predictive processing

Predictive processing is a recent approach in cognitive science that describes the brain as an engine of probabilistic hierarchical inference. Initially proposed as a general theory of brain function, predictive processing has recently been expanding to account for questions of consciousness in philosophy and neuroscience. In my previous work (Kukkonen 2020 *Probability designs: literature and predictive processing*. New York, NY: Oxford University Press), I have shown how predictive processing can also be used to model our engagement with literary texts. In this article, I use my account of our engagement with literature in predictive processing terms, as well as recent work on predictive processing and consciousness, to explore how literature can shed light on various aspects of conscious experience, including qualia, counterfactual depth in conscious experience and sense of self. In the final section, I propose a number of theoretical questions that could be addressed by drawing on literature as a source of hypotheses and stimuli for possible experimental designs. The upshot is a picture where literature is not just a source of illustrative examples about conscious experience, but a designer environment through which we can explore and rethink consciousness.

<https://royalsocietypublishing.org/doi/10.1098/rstb.2022.0423>

PLoS One

PAPERS

QI WANG, ANGEL KHUU & MIRYAM JIVOTOVSKI – The self online: When meaning-making is outsourced to the cyber audience

This study examines the cyber audience's perception of social media users' persona based on their online posts from a cognitive meaning-making perspective. Participants (N = 158) answered questions about their personal characteristics and provided their 20 most recent Facebook status updates. Two groups of viewers, who viewed either the text-only or multimedia version of the status updates, answered questions about the Facebook users' personal characteristics. The viewers' perceptions of Facebook users deviated from the users' self-perceptions, although user characteristics that serve social motives were more accurately perceived. Multimedia viewers were more accurate than text viewers, whereas the latter showed a greater consensus. Gender and ethnic differences of Facebook users also emerged in online person perceptions, in line with gendered and cultured characteristics. These findings shed critical light on the dynamic interplay between social media users and the cyber audience in the co-construction of a digitally extended self.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0294990>

ELVIRA SUSANA ALONSO-FERNÁNDEZ et al – Refits, cobbles, and fire: Approaching the temporal nature of an expedient Gravettian lithic assemblage from Lagar Velho (Leiria, Portugal)

Upper Paleolithic lithic assemblages have traditionally been considered a paramount example of the high level of complexity characterizing the technological behavior of prehistoric modern humans. The diversity and standardization of tools, as well as the systematic production of blades and bladelets, show the high investment of time, energy and knowledge often associated with Upper Paleolithic technocomplexes. However, more expedient behaviors have also been documented. In some cases, such low-cost behaviors can be dominant or almost exclusive, giving assemblages of Upper Paleolithic age an "archaic" appearance. In this paper, we address these expedient Upper Paleolithic technologies through the study of a lithic assemblage recovered from a Gravettian-age layer from the Lagar Velho rockshelter (Leiria, Portugal). Due to the specific formation processes characterizing this site, we also discuss the distinction between artifacts and geofacts, an aspect that is particularly difficult in expedient assemblages. Moreover, the combination of lithic refitting and data on thermal damage allows us to approach the temporal nature of the lithic assemblage and the timing of the different agents contributing to its formation.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0294866>

Royal Society Open Science

PAPERS

RUTH E. CORPS, FANG YANG & MARTIN J. PICKERING – Evidence against egocentric prediction during language comprehension

Although previous research has demonstrated that language comprehension can be egocentric, there is little evidence for egocentricity during prediction. In particular, comprehenders do not appear to predict egocentrically when the context makes it clear what the speaker is likely to refer to. But do comprehenders predict egocentrically when the context does not make it clear? We tested this hypothesis using a visual-world eye-tracking paradigm, in which participants heard sentences containing the gender-neutral pronoun They (e.g. They would like to wear...) while viewing four objects (e.g. tie, dress, drill, hairdryer). Two of these objects were plausible targets of the verb (tie and dress), and one was stereotypically compatible with the participant's gender (tie if the participant was male; dress if the participant was female). Participants rapidly fixated targets more than distractors, but there was no evidence that participants ever predicted egocentrically, fixating objects stereotypically compatible with their own gender. These findings suggest that participants do not fall back on their own egocentric perspective when predicting, even when they know that context does not make it clear what the speaker is likely to refer to.

{Or, alternatively, gender is not part of our subliminal unmodelled self; it is only significant to our modelled cultural selves. The four objects used in the testing would tend to support this alternative view, in that they are gendered (or de-gendered) dependent on the subject's culture and personal choices (e.g. I never use a hairdryer, but my civil partner does.)}

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.231252>

AKITSUGU KONNO et al – Are dark-eyed dogs favoured by humans? Domestication as a potential driver of iris colour difference between dogs and wolves

Comparative studies have shown that the eye morphology of primates has been shaped by a variety of selection pressures (e.g. communication, environmental factors). To comprehensively elucidate the complex links between ocular morphology and its evolutionary drive, attention should be paid to other phylogenetic groups. Here, we address a new question regarding the evolution of eye colour patterns in the oldest domesticated animal, namely, the domestic dog (*Canis familiaris*). In this study, we conducted an image analysis of dogs and their closest relatives, grey wolves (*Canis lupus*), to compare the colours of their irises, with the aim of assessing whether eye colours of dogs affect how humans perceived dogs. We found that the irises of dogs were significantly darker than those of wolves. We also found that facial images of dark-eyed dogs were

perceived as more friendly and immature, potentially eliciting caregiving responses from humans. Our findings are consistent with our expectation that humans favour dark-eyed dogs over light-eyed ones and provide an updated hypothesis that dogs with dark eyes may have evolved by acquiring a facial trait that sends a non-threatening gaze signal to humans.

<https://royalsocietypublishing.org/doi/abs/10.1098/rsos.230854>

ANNA WILSON et al – Multimodal analysis of disinformation and misinformation

The use of disinformation and misinformation campaigns in the media has attracted much attention from academics and policy-makers. Multimodal analysis or the analysis of two or more semiotic systems—language, gestures, images, sounds, among others—in their interrelation and interaction is essential to understanding dis-/misinformation efforts because most human communication goes beyond just words. There is a confluence of many disciplines (e.g. computer science, linguistics, political science, communication studies) that are developing methods and analytical models of multimodal communication. This literature review brings research strands from these disciplines together, providing a map of the multi- and interdisciplinary landscape for multimodal analysis of dis-/misinformation. It records the substantial growth starting from the second quarter of 2020—the start of the COVID-19 epidemic in Western Europe—in the number of studies on multimodal dis-/misinformation coming from the field of computer science. The review examines that category of studies in more detail. Finally, the review identifies gaps in multimodal research on dis-/misinformation and suggests ways to bridge these gaps including future cross-disciplinary research directions. Our review provides scholars from different disciplines working on dis-/misinformation with a much needed bird's-eye view of the rapidly emerging research of multimodal dis-/misinformation.

<https://royalsocietypublishing.org/doi/10.1098/rsos.230964>

AMI EIDELS – Prior beliefs and the interpretation of scientific results

How do prior beliefs affect the interpretation of scientific results? I discuss a hypothetical scenario where researchers publish results that could either support a theory they believe in, or refute that theory, and ask if the two instances carry the same weight. More colloquially, I ask if we should overweigh scientific results supporting a given theory and reported by a researcher, or a team, that initially did not support that theory. I illustrate the challenge using two examples from psychology: evidence accumulation models, and extra sensory perception.

<https://royalsocietypublishing.org/doi/10.1098/rsos.231613>

Science

NEWS

Chimps remember the faces of old friends and family for decades

Recognition ability rivals all other animals, including humans.

<https://www.science.org/content/article/chimps-remember-faces-old-friends-and-family-decades>

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