

EAORC BULLETIN 1,076 – 28 January 2024

CONTENTS

NOTICES	2
PUBLICATION ALERTS.....	2
EDITORIAL INTERJECTIONS.....	2
ACADEMIA.EDU – Early Stone Tool Use and the Evolution of Human Cognition.....	2
KAITLYNN R. ALARIE – Early Stone Tool Use and the Evolution of Human Cognition.....	2
ACADEMIA.EDU – Changes in Raw Material Selection and Use at 400,000 Years BP.....	2
FRANCESCA ROMAGNOLI – Changes in Raw Material Selection and Use at 400,000 Years BP: A Novel, Symbolic Relationship between Humans and Their World. Discussing Technological, Social and Cognitive Arguments.....	2
ACADEMIA.EDU – The origins of symboling.....	3
ROBERT G. BEDNARIK – The origins of symboling.....	3
NEWS	3
GUARDIAN SCIENCE – How dogs got their tail wag.....	3
SCIENCEADVISER – Artificial understanding.....	3
THE CONVERSATION – Could quantum physics be the key that unlocks the secrets of human behaviour?.....	3
PUBLICATIONS	3
Animal Behaviour.....	3
PAPERS	3
RACHNA B. REDDY et al – Maternal conflict intervention is more frequent in chimpanzee compared to bonobo development.....	3
Current Biology.....	4
ARTICLES	4
EMEL KÜÇÜK & DAVID PITCHER – Visual neuroscience: A brain area tuned for processing social interactions.....	4
MICHAEL GROSS – Of elephants and men.....	4
PAPERS	4
HAIGANG MA et al – Small apes adjust rhythms to facilitate song coordination.....	4
eLife.....	4
NEWS	4
Calls within calls.....	4
Frontiers in Complex Systems.....	4
PAPERS	4
NEIL G. MACLAREN et al – Cooperation and the social brain hypothesis in primate social networks.....	4
Frontiers in Human Neuroscience.....	5
PAPERS	5
THOMAS WEITIN et al – Is badfiction processed differently by the human brain? An electrophysical study on reading experience.....	5
Frontiers in Neuroscience.....	5
PAPERS	5
MEISAM K. ARJMANDI & ROOZBEH BEHROOZMAND – On the interplay between speech perception and production: insights from research and theories.....	5
Frontiers in Psychology.....	5
PAPERS	5
ANNE PYCHA, TESSA CULLETON & JAE YUNG SONG – The role of speech style, frequency, and density in recognition memory for spoken words..	5
GIORGIO MARCHETTI – The self and conscious experience.....	5
Nature Communications.....	6
PAPERS	6
ANNA MAI et al with TIMOTHY Q. GENTNER – Acoustic and language-specific sources for phonemic abstraction from speech.....	6
Nature Reviews Neuroscience.....	6
PAPERS	6
ILYA E. MONOSOV – Curiosity: primate neural circuits for novelty and information seeking.....	6
Nature Scientific Reports.....	6
PAPERS	6
ASHENA GORGAN MOHAMMADI & MOHAMMAD GANJTABESH – On computational models of theory of mind and the imitative reinforcement learning in spiking neural networks.....	6
MOUNCEF SEDRATI et al – A Late Pleistocene hominin footprint site on the North African coast of Morocco.....	7

JAMES P. TRUJILLO & JUDITH HOLLER – Conversational facial signals combine into compositional meanings that change the interpretation of speaker intentions.....	7
New Scientist	7
ARTICLES.....	7
ALICE KLEIN – Why do women live so long after the menopause?	7
Philosophical Transactions of the Royal Society B	7
PAPERS.....	7
KRISTIN ANDREWS, SIMON FITZPATRICK & EVAN WESTRA – Human and nonhuman norms: a dimensional framework.....	7
PLoS One.....	7
PAPERS.....	7
CAMERON MORIN & JACK GRIEVE – The semantics, sociolinguistics, and origins of double modals in American English: New insights from social media.....	7
Trends in Cognitive Sciences	8
PAPERS.....	8
ANGUS F. CHAPMAN & VIOLA S. STÖRMER – Representational structures as a unifying framework for attention.....	8
SUBSCRIBE to the EAORC Bulletin	8
UNSUBSCRIBE from the EAORC Bulletin	8
PRODUCED BY AND FOR THE EAORC EMAIL GROUP.....	8

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 – Early Stone Tool Use and the Evolution of Human Cognition

Journal of the University of Manitoba Anthropology Students' Association 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 researchers 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

ACADEMIA.EDU – Changes in Raw Material Selection and Use at 400,000 Years BP

Cambridge Archaeological Journal 31:2, 325-336 (2021).

FRANCESCA ROMAGNOLI – Changes in Raw Material Selection and Use at 400,000 Years BP: A Novel, Symbolic Relationship between Humans and Their World. Discussing Technological, Social and Cognitive Arguments

Approximately 400,000 years BP, novel technological behaviours appeared in the archaeological record, attested by evidence of the exploitation of previously unused resources and the production of new tools. I have reviewed such innovations, and I discuss them in the frame of the anthropological, palaeoneurological, genetic and behavioural changes that appeared in the Middle Pleistocene. I propose that at this chronology humans started to see the resources as ‘other-than-human’ sentient co-dwellers. The technological innovations expressed this novel cognitive complexity and the possible new things-things, human-things and environment-things relationships. Artefacts and technologies acquired multiple semiotic meanings that were strongly interconnected with the functional value. Ethnoarchaeological evidence suggested the possible symbolic acting beyond these innovations in material culture. This perspective has relevant implications in the archaeology of the ancient Palaeolithic. It suggests the need for a new view of material culture, one that goes beyond the classical list approach in the definition of modern symbolic mediated behaviour. Further, it allows one to overcome the traditional juxtaposition between

ancient cultures and Homo sapiens in terms of complexity. The evidence discussed in this paper suggests that the ontological hypothesis could change our view of Middle Pleistocene hominids and the origin and definition of modern behaviour, and test the archaeological visibility of cognition in prehistory.

https://www.academia.edu/45070452/Changes_in_Raw_Material_Selection_and_Use_at_400_000_Years_BP_A_Novel_Symbolic_Relationship_between_Humans_and_Their_World_Discussing_Technological_Social_and_Cognitive_Arguments

ACADEMIA.EDU – The origins of symboling

Signs 2, 82-113 (2008).

ROBERT G. BEDNARIK – The origins of symboling

The archaeological data traditionally utilized in considering the beginnings of symbol use by humans are described here as inadequate for this purpose. It is contended that Pleistocene finds of several types imply the use of symboling for at least several hundred millennia. Such empirical evidence includes the maritime colonization of various landmasses up to one million years ago, which is thought to demand the use of language and relatively complex technology; and the temporal distribution of first pigment use, beads and pendants, as well as engravings and proto-figurines during the Middle Pleistocene. The introduction of iconic referents is chronologically placed into the same period. It is argued that the cognitive evolution of hominins has been neglected in favor of less suitable indicators of humanness, such as cranial shape and perceived stone tool typology. This paper presents an alternative approach to reviewing the evolution of human cognition and symbol use.

https://www.academia.edu/12807050/The_origins_of_symboling

NEWS

GUARDIAN SCIENCE – How dogs got their tail wag

Dogs might wag their tails because the humans who domesticated them tens of thousands of years ago liked the rhythmic movement. Wolves also wag their tails, but even those that have been hand-reared seem to do so less often than dogs. “We put forth a new hypothesis that humans consciously or unconsciously selected for tail wagging during the domestication process,” says bioacoustics researcher Silvia Leonetti. Another possibility is that wagging arose as a byproduct of selection for other traits, such as a tame and docile character.

<https://www.theguardian.com/science/2024/jan/17/dogs-wag-tails-behaviour-humans-domestication-process>

SCIENCEADVISER – Artificial understanding

New theory suggests that chatbots and large language models are more than “stochastic parrots” and may actually understand text.

<https://www.quantamagazine.org/new-theory-suggests-chatbots-can-understand-text-20240122/>

THE CONVERSATION – Could quantum physics be the key that unlocks the secrets of human behaviour?

Human behaviour is often irrational if viewed through the lens of “classical” physics and probability theory.

<https://theconversationuk.cmail19.com/t/r-l-tijirtl-khhilalah-u/>

PUBLICATIONS

Animal Behaviour

PAPERS

RACHNA B. REDDY et al – Maternal conflict intervention is more frequent in chimpanzee compared to bonobo development

One way mammalian mothers support offspring is by intervening on their behalf when they receive conspecific aggression. Maternal intervention protects offspring and facilitates mother–offspring rank correlation in several female-philopatric species. We tested the hypothesis that maternal intervention during development similarly facilitates mother–offspring rank correlation in one of our two male-philopatric closest living relatives: bonobos, *Pan paniscus*, for whom male ranks have been described as matrifocal but mechanisms of status transmission are unclear. We predicted mothers would intervene at higher rates in bonobos compared to chimpanzees, *Pan troglodytes*, where sons earn adult ranks independently. We expected this difference would be especially pronounced for sons as they reached reproductive age (~8 years) and when aggressors were adult males, which female bonobos, but not female chimpanzees, often dominate. However, for both sons and daughters of all ages (0.5–16 years) and against aggressors of varying age and sex, bonobo mothers in Kokolopori, DRC (N = 22 pairs, 210 conflicts) intervened less frequently than did chimpanzee mothers at Ngogo, Uganda (N = 66 pairs, 221 conflicts), doing so in 8% versus 49% of all conflicts. These differences persisted regardless of the severity of aggression offspring received and the distress they demonstrated. Our results provide no support for our hypothesis that conflict intervention facilitates mother–son rank correlation in bonobos. Nor are patterns explained by additional alternative hypotheses related to species variation in costs of retaliation, quality of female–female relationships or infanticide risk. We introduce two new hypotheses: (1) that

success in aggressive competition is less important for male bonobos than for male chimpanzees and (2) proclivities for support are heightened in chimpanzees compared to bonobos because of increased ingroup protectiveness in chimpanzees. The latter hypothesis arises from our unexpected, preliminary observation that nonmother bonobo bystanders intervened less often than nonmother chimpanzee bystanders during these events.

<https://www.sciencedirect.com/science/article/abs/pii/S0003347223002956>

Current Biology

ARTICLES

EMEL KÜÇÜK & DAVID PITCHER – Visual neuroscience: A brain area tuned for processing social interactions

Socialising with others is part of everyday life. A new study demonstrates that a brain area specialised for visual body perception is attuned to processing social interactions between two people. Intriguingly, this area is lateralised in the left hemisphere.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(23\)01671-8](https://www.cell.com/current-biology/fulltext/S0960-9822(23)01671-8)

MICHAEL GROSS – Of elephants and men

Three species of elephant are among the rare survivors of the Pleistocene megafauna now clinging on to their existence. Although they are among the most iconic and best-loved mammal species, all three are now in danger of extinction within this century. The key problem is their relationship with humans, which got off to a bad start in the Palaeolithic.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(24\)00001-0](https://www.cell.com/current-biology/fulltext/S0960-9822(24)00001-0)

PAPERS

HAIGANG MA et al – Small apes adjust rhythms to facilitate song coordination

Song coordination is a universal characteristic of human music. Many animals also produce well-coordinated duets or choruses that resemble human music. However, the mechanism and evolution of song coordination have only recently been studied in animals. Here, we studied the mechanism of song coordination in three closely related species of wild *Nomascus* gibbons that live in polygynous groups. In each species, song bouts were dominated by male solo sequences (referred to hereafter as male sequence), and females contributed stereotyped great calls to coordinate with males. Considering the function of rhythm in facilitating song coordination in human music and animal vocalizations, we predicted that adult males adjust their song rhythm to facilitate song coordination with females. In support of this prediction, we found that adult males produced significantly more isochronous rhythms with a faster tempo in male sequences that were followed by successful female great calls (a complete sequence with “introductory” and “wa” notes). The difference in isochrony and tempos between successful great call sequences and male sequences was smaller in *N. concolor* compared with the other two species, which may make it difficult for females to predict a male’s precise temporal pattern. Consequently, adult females of *N. concolor* produced more failed great call (an incomplete sequence with only introductory notes) sequences. We propose that the high degree of rhythm change functions as an unambiguous signal that can be easily perceived by receivers. In this regard, gibbon vocalizations offer an instructive model to understand the origins and evolution of human music.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(23\)01771-2](https://www.cell.com/current-biology/fulltext/S0960-9822(23)01771-2)

eLife

NEWS

Calls within calls

Analysing the vocalisations of wild orangutans reveals that they combine vocal units in patterns previously thought to be unique to humans.

<https://elifesciences.org/digests/88348/calls-within-calls>

Frontiers in Complex Systems

PAPERS

NEIL G. MACLAREN et al – Cooperation and the social brain hypothesis in primate social networks

The social brain hypothesis posits that species with larger brains tend to have greater social complexity. Various lines of empirical evidence have supported the social brain hypothesis, including evidence from the structure of social networks. Cooperation is a key component of group living, particularly among primates, and theoretical research has shown that particular structures of social networks foster cooperation more easily than others. Therefore, we hypothesized that species with a relatively large brain size tend to form social networks that better enable cooperation. In the present study, we combine data on brain size and social networks with theory on the evolution of cooperation on networks to test this hypothesis in non-human primates. We have found a positive effect of brain size on cooperation in social networks even after controlling for the effect of other structural properties of networks that are known to promote cooperation.

<https://www.frontiersin.org/articles/10.3389/fcpxs.2023.1344094/full>

Frontiers in Human Neuroscience

PAPERS

THOMAS WEITIN et al – Is badfiction processed differently by the human brain? An electrophysical study on reading experience

Literary reception is a special case of language processing. The judgment of literature reveals deep social patterns with embodied cognition. In this study, we investigate how differences in literary quality resonate in the human brain. Modifying a series of stimuli previously used in studies of the emotional potential of Harry Potter, we alternate passages from the original novels with passages from imitative and intentionally poorly written fanfiction. EEG data shows how the three text types are processed differently by the brain. Comparing the brain activity of the readers for the various text types, we see a difference in the absolute power but not in the relative power of the frequency bands. Reading badfiction evokes the lowest activity. However, the functionality of this activity is the same for all texts since the relative power of the frequency bands does not differ. When comparing the participant groups, we observe the opposite situation. Here, different relative powers of the frequency bands reflect different judgments and reading habits of participants. For example, fans of Harry Potter, regular readers of fantasy texts, and generally frequent readers read the texts more attentively, which is reflected in a pronounced relative activity of the theta and alpha frequency bands. Non-frequent readers and readers who are not devoted to Harry Potter and fantasy in general have increased activity in the delta frequency band. This suggests their saliency detection is more prominent because they are less familiar with reading or the subject matter. To support our findings, we use the EEG data without averaging over stimuli and participants, capturing the participants' responses on the level of individual stimuli. A Kohonen self-organizing map trained on this more extensive data finds reliably detectable differences in the responses to passages from the original Harry Potter novels and fan- and badfiction. Our study allows for an interpretation of an adaptive brain response. Readers who enjoy Harry Potter or have experience with the fantasy genre show different reactions from those who do not. Thus, badfiction appears to be processed differently by the human brain, but not for all readers in the same way.

<https://www.frontiersin.org/articles/10.3389/fnhum.2023.1333965/full>

Frontiers in Neuroscience

PAPERS

MEISAM K. ARJMANDI & ROOZBEH BEHROOZMAND – On the interplay between speech perception and production: insights from research and theories

The study of spoken communication has long been entrenched in a debate surrounding the interdependence of speech production and perception. This mini review summarizes findings from prior studies to elucidate the reciprocal relationships between speech production and perception. We also discuss key theoretical perspectives relevant to speech perception-production loop, including hyper-articulation and hypo-articulation (H&H) theory, speech motor theory, direct realism theory, articulatory phonology, the Directions into Velocities of Articulators (DIVA) and Gradient Order DIVA (GODIVA) models, and predictive coding. Building on prior findings, we propose a revised auditory-motor integration model of speech and provide insights for future research in speech perception and production, focusing on the effects of impaired peripheral auditory systems.

<https://www.frontiersin.org/articles/10.3389/fnins.2024.1347614/full>

Frontiers in Psychology

PAPERS

ANNE PYCHA, TESSA CULLETON & JAE YUNG SONG – The role of speech style, frequency, and density in recognition memory for spoken words

What determines whether listeners remember a spoken word? The Effortfulness Hypothesis claims that memory is modulated by a word's intelligibility during real-time processing, while the Distinctiveness Hypothesis claims that it is modulated by a word's distinguishing characteristics. We tested these differing predictions using American English words that varied along three dimensions known to affect both intelligibility and distinctiveness: speech style (clear versus casual), frequency (high versus low), and neighborhood density (high versus low). In a recognition memory experiment, participants (n = 66) listened to a set of study words, and then gave yes/no judgments to indicate whether or not they had heard the word earlier. Results showed that those words which exhibited distinctive characteristics – whether due to clear speech style, low frequency, or low density – were remembered better. The finding supports the Distinctiveness Hypothesis, suggesting that our capacity for remembering words relies on their distinctiveness, rather than on our capacity for recognizing them in real time.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2024.1277624/full>

GIORGIO MARCHETTI – The self and conscious experience

The primary determinant of the self (S) is the conscious experience (CE) we have of it. Therefore, it does not come as a surprise that empirical research on S mainly resorts to the CE (or lack of CE) that subjects have of their S. What comes as a surprise is that empirical research on S does not tackle the problem of how CE contributes to building S. Empirical research

investigates how S either biases the cognitive processing of stimuli or is altered through a wide range of means (meditation, hypnosis, etc.). In either case, even for different reasons, considerations of how CE contributes to building S are left unspecified in empirical research. This article analyzes these reasons and proposes a theoretical model of how CE contributes to building S. According to the proposed model, the phenomenal aspect of consciousness is produced by the modulation—engendered by attentional activity—of the energy level of the neural substrate (that is, the organ of attention) that underpins attentional activity. The phenomenal aspect of consciousness supplies the agent with a sense of S and informs the agent on how its S is affected by the agent's own operations. The phenomenal aspect of consciousness performs its functions through its five main dimensions: qualitative, quantitative, hedonic, temporal, and spatial. Each dimension of the phenomenal aspect of consciousness can be explained by a specific aspect of the modulation of the energy level of the organ of attention. Among other advantages, the model explains the various forms of S as outcomes resulting from the operations of a single mechanism and provides a unifying framework for empirical research on the neural underpinnings of S.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2024.1340943/full>

Nature Communications

PAPERS

ANNA MAI et al with TIMOTHY Q. GENTNER – Acoustic and language-specific sources for phonemic abstraction from speech

Spoken language comprehension requires abstraction of linguistic information from speech, but the interaction between auditory and linguistic processing of speech remains poorly understood. Here, we investigate the nature of this abstraction using neural responses recorded intracranially while participants listened to conversational English speech. Capitalizing on multiple, language-specific patterns where phonological and acoustic information diverge, we demonstrate the causal efficacy of the phoneme as a unit of analysis and dissociate the unique contributions of phonemic and spectrographic information to neural responses. Quantitative higher-order response models also reveal that unique contributions of phonological information are carried in the covariance structure of the stimulus-response relationship. This suggests that linguistic abstraction is shaped by neurobiological mechanisms that involve integration across multiple spectro-temporal features and prior phonological information. These results link speech acoustics to phonology and morphosyntax, substantiating predictions about abstractness in linguistic theory and providing evidence for the acoustic features that support that abstraction.

<https://www.nature.com/articles/s41467-024-44844-9>

Nature Reviews Neuroscience

PAPERS

ILYA E. MONOSOV – Curiosity: primate neural circuits for novelty and information seeking

For many years, neuroscientists have investigated the behavioural, computational and neurobiological mechanisms that support value-based decisions, revealing how humans and animals make choices to obtain rewards. However, many decisions are influenced by factors other than the value of physical rewards or second-order reinforcers (such as money). For instance, animals (including humans) frequently explore novel objects that have no intrinsic value solely because they are novel and they exhibit the desire to gain information to reduce their uncertainties about the future, even if this information cannot lead to reward or assist them in accomplishing upcoming tasks. In this Review, I discuss how circuits in the primate brain responsible for detecting, predicting and assessing novelty and uncertainty regulate behaviour and give rise to these behavioural components of curiosity. I also briefly discuss how curiosity-related behaviours arise during postnatal development and point out some important reasons for the persistence of curiosity across generations.

<https://www.nature.com/articles/s41583-023-00784-9>

Nature Scientific Reports

PAPERS

ASHENA GORGAN MOHAMMADI & MOHAMMAD GANJTABESH – On computational models of theory of mind and the imitative reinforcement learning in spiking neural networks

Theory of Mind is referred to the ability of inferring other's mental states, and it plays a crucial role in social cognition and learning. Biological evidences indicate that complex circuits are involved in this ability, including the mirror neuron system. The mirror neuron system influences imitation abilities and action understanding, leading to learn through observing others. To simulate this imitative learning behavior, a Theory-of-Mind-based Imitative Reinforcement Learning (ToM-based ImRL) framework is proposed. Employing the bio-inspired spiking neural networks and the mechanisms of the mirror neuron system, ToM-based ImRL is a bio-inspired computational model which enables an agent to effectively learn how to act in an interactive environment through observing an expert, inferring its goals, and imitating its behaviors. The aim of this paper is to review some computational attempts in modeling ToM and to explain the proposed ToM-based ImRL framework which is tested in the environment of River Raid game from Atari 2600 series.

<https://www.nature.com/articles/s41598-024-52299-7>

MOUNCEF SEDRATI et al – A Late Pleistocene hominin footprint site on the North African coast of Morocco

Footprints represent a relevant vestige providing direct information on the biology, locomotion, and behaviour of the individuals who left them. However, the spatiotemporal distribution of hominin footprints is heterogeneous, particularly in North Africa, where no footprint sites were known before the Holocene. This region is important in the evolution of hominins. It notably includes the earliest currently known *Homo sapiens* (Jebel Irhoud) and the oldest and richest African Middle Stone Age hominin sites. In this fragmented ichnological record, we report the discovery of 85 human footprints on a Late Pleistocene now indurated beach surface of about 2800 m² at Larache (Northwest coast of Morocco). The wide range of sizes of the footprints suggests that several individuals from different age groups made the tracks while moving landward and seaward across a semi-dissipative bar-trough sandy beach foreshore. A geological investigation and an optically stimulated luminescence dating of a rock sample extracted from the tracksite places this hominin footprint surface at 90.3 ± 7.6 ka (MIS 5, Late Pleistocene). The Larache footprints are, therefore, the oldest attributed to *Homo sapiens* in Northern Africa and the Southern Mediterranean.

<https://www.nature.com/articles/s41598-024-52344-5>

JAMES P. TRUJILLO & JUDITH HOLLER – Conversational facial signals combine into compositional meanings that change the interpretation of speaker intentions

Human language is extremely versatile, combining a limited set of signals in an unlimited number of ways. However, it is unknown whether conversational visual signals feed into the composite utterances with which speakers communicate their intentions. We assessed whether different combinations of visual signals lead to different intent interpretations of the same spoken utterance. Participants viewed a virtual avatar uttering spoken questions while producing single visual signals (i.e., head turn, head tilt, eyebrow raise) or combinations of these signals. After each video, participants classified the communicative intention behind the question. We found that composite utterances combining several visual signals conveyed different meaning compared to utterances accompanied by the single visual signals. However, responses to combinations of signals were more similar to the responses to related, rather than unrelated, individual signals, indicating a consistent influence of the individual visual signals on the whole. This study therefore provides first evidence for compositional, non-additive (i.e., Gestalt-like) perception of multimodal language.

<https://www.nature.com/articles/s41598-024-52589-0>

New Scientist**ARTICLES****ALICE KLEIN – Why do women live so long after the menopause?**

Genetic studies suggest postmenopausal women are so crucial to the survival of grandchildren that we evolved genes to keep their brains healthy.

<https://www.newscientist.com/article/mg26134750-900-why-do-women-live-so-long-after-the-menopause/>

Philosophical Transactions of the Royal Society B**PAPERS****KRISTIN ANDREWS, SIMON FITZPATRICK & EVAN WESTRA – Human and nonhuman norms: a dimensional framework**

Human communities teem with a variety of social norms. In order to change unjust and harmful social norms, it is crucial to identify the psychological processes that give rise to them. Most researchers take it for granted that social norms are uniquely human. By contrast, we approach this matter from a comparative perspective, leveraging recent research on animal social behaviour. While there is currently only suggestive evidence for norms in nonhuman communities, we argue that human social norms are likely produced by a wide range of mechanisms, many of which we share with nonhuman animals. Approaching this variability from a comparative perspective can help norm researchers expand and reframe the range of hypotheses they test when attempting to understand the causes of socially normative behaviours in humans. First, we diagnose some of the theoretical obstacles to developing a comparative science of social norms, and offer a few basic constructs and distinctions to help norm researchers overcome these obstacles. Then we develop a six-dimensional model of the psychological and social factors that contribute to variability in both human and potential nonhuman norms.

<https://royalsocietypublishing.org/doi/10.1098/rstb.2023.0026>

PLoS One**PAPERS****CAMERON MORIN & JACK GRIEVE – The semantics, sociolinguistics, and origins of double modals in American English: New insights from social media**

In this paper, we analyze double modal use in American English based on a multi-billion-word corpus of geolocated posts from the social media platform Twitter. We identify and map 76 distinct double modals totaling 5,349 examples, many more types and tokens of double modals than have ever been observed. These descriptive results show that double modal structure and use in American English is far more complex than has generally been assumed. We then consider the relevance of these results to three current theoretical debates. First, we demonstrate that although there are various semantic

tendencies in the types of modals that most often combine, there are no absolute constraints on double modal formation in American English. Most surprisingly, our results suggest that double modals are used productively across the US. Second, we argue that there is considerable dialect variation in double modal use in the southern US, with double modals generally being most strongly associated with African American Language, especially in the Deep South. This result challenges previous sociolinguistic research, which has often highlighted double modal use in White Southern English, especially in Appalachia. Third, we consider how these results can help us better understand the origins of double modals in American English: although it has generally been assumed that double modals were introduced by Scots-Irish settlers, we believe our results are more consistent with the hypothesis that double modals are an innovation of African American Language.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0295799>

Trends in Cognitive Sciences

PAPERS

ANGUS F. CHAPMAN & VIOLA S. STÖRMER – Representational structures as a unifying framework for attention

Our visual system consciously processes only a subset of the incoming information. Selective attention allows us to prioritize relevant inputs, and can be allocated to features, locations, and objects. Recent advances in feature-based attention suggest that several selection principles are shared across these domains and that many differences between the effects of attention on perceptual processing can be explained by differences in the underlying representational structures. Moving forward, it can thus be useful to assess how attention changes the structure of the representational spaces over which it operates, which include the spatial organization, feature maps, and object-based coding in visual cortex. This will ultimately add to our understanding of how attention changes the flow of visual information processing more broadly.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(24\)00002-0](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(24)00002-0)

SUBSCRIBE to the EAORC Bulletin

If you would like to subscribe to this free weekly newsletter, please contact martin.edwardes@btopenworld.com.

UNSUBSCRIBE from the EAORC Bulletin

Send an email to martin.edwardes@btopenworld.com with the subject "EAORC unsubscribe".

PRODUCED BY AND FOR THE EAORC EMAIL GROUP

EAORC is a fee-free academic internet news service and has no commercial sponsorship or other commercial interests.

EAORC website information is at <http://martinedwardes.me.uk/eaorc/>

If you have received this bulletin, and are unhappy about receiving it, please contact martin.edwardes@btopenworld.com.
