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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, do please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.

If there is a journal you feel I should be tracking on a regular basis, do let me know.

And if you have any other ideas for extending the “EAORC experience”, please contact me.

ACADEMIA.EDU – Origins and Adaptations of Early Homo: What Archeology Tells Us

In Frederick E. Grine, John G. Fleagle & Richard E. Leakey (eds.), The First Humans -Origin and Early Evolution of the Genus Homo. Contributions from the Third Stony Brook Human Evolution Symposium and Workshop, October 3-October 7 2006, ch12 (2009).

HÉLÈNE ROCHE, ROBERT J. BLUMENSCHINE & JOHN J. SHEA – Origins and Adaptations of Early Homo: What Archeology Tells Us

Brain enlargement, reduction in molar tooth size, increased stature and other features of early Homo did not evolve in a vacuum. These evolutionary changes reflect shifts in a complex web of relationships among their populations, between early Homo and other hominin species, and between their biotic community and abiotic forces (i.e., climate change). Archeological evidence complements and balances inferences from hominin fossil remains, non-hominin vertebrate paleontology, geology, and other component fields of paleoanthropology. This paper represents an attempt to pull together the various strands of its authors’ expertise to shed light on the origins and adaptations of early Homo. It is not intended to be a comprehensive review of Oldowan sites, their chronology, lithic typology, paleontological associations, and interpretive issues. For recent overviews of these subjects, see Plummer (2004), Schick and Toth (2006) as well as papers in Toth and Schick (2006), Ungar (2007) and Hovers and Braun (2009). The coincidence of knapped stone tools, butchery-marked bones and fossil remains of early Homo is usually linked to increased hominin carnivory. This paper reviews evidence for this hypothesis, and considers alternative hypotheses as well.

https://www.academia.edu/17214146/Origins_and_Adaptations_of_Early_Homo_What_Archeology_Tells_Us

RESEARCHGATE – The Earliest South African Hominids

In Annual Review of Anthropology 50, 125-143 (2021)

RONALD J. CLARKE et al – The Earliest South African Hominids

The earliest South African hominids (humans and their ancestral kin) belong to the genera Australopithecus, Paranthropus, and Homo, with the oldest being a ca. 3.67 million-year-old nearly complete skeleton of Australopithecus (StW 573) from

Sterkfontein Caves. This skeleton has provided, for the first time in almost a century of research, the full anatomy of an Australopithecus individual with indisputably associated skull and postcranial bones that give complete limb lengths. The three genera are also found in East Africa, but scholars have disagreed on the taxonomic assignment for some fossils owing to historical preconceptions. Here we focus on the South African representatives to help clarify these debates. The uncovering of the StW 573 skeleton in situ revealed significant clues concerning events that had affected it over time and demonstrated that the associated stalagmite flowstones can-not provide direct dating of the fossil, as they are infillings of voids caused by post-depositional collapse.

<https://www.researchgate.net/publication/355569720> [The Earliest South African Hominids](#)

NEWS

SCIENCE DAILY – Perceptual links between sound and shape may unlock origins of spoken words

Most people around the world agree that the made-up word 'bouba' sounds round in shape, and the made-up word 'kiki' sounds pointy -- a discovery that may help to explain how spoken languages develop, according to a new study. Language scientists have discovered that this effect exists independently of the language that a person speaks or the writing system that they use, and it could be a clue to the origins of spoken words.

<https://www.sciencedaily.com/releases/2021/11/211117100114.htm>

SCIENCE DAILY – Scientists key in on brain’s mechanism for singing, learning

New research reveals that specialized cells within neural circuitry that triggers complex learning in songbirds bears a striking resemblance to a type of neural cell associated with the development of fine motor skills in the cortex of the human brain.

<https://www.sciencedaily.com/releases/2021/11/211119085130.htm>

SCIENCE DAILY – Scientists capture humor’s earliest emergence

Young children's ability to laugh and make jokes has been mapped by age for the first time using data from a new study involving nearly 700 children from birth to 4 years of age, from around the world. The findings identify the earliest age humor emerges and how it typically builds in the first years of life.

<https://www.sciencedaily.com/releases/2021/11/211118203810.htm>

SCIENCE NEWS – Orangutan drawings change with season and mood

Findings may provide clues to origins of human artistic ability.

https://www.science.org/content/article/orangutan-drawings-change-season-and-mood?utm_campaign=news_daily_2021-11-15

SCIENCE NEWS – Nonsense words make people around the world think of the same shapes

“Bouba” is round and “kiki” is pointy, no matter which writing system you use.

<https://www.science.org/content/article/nonsense-words-make-people-around-world-think-same-shapes>

SCIENCE NEWS – First child’s skull of Homo naledi unveiled

Remains may suggest possible burial.

<https://www.science.org/content/article/first-child-s-skull-homo-naledi-unveiled>

PUBLICATIONS

American Journal of Biological Anthropology

PAPERS

HIDEKI AMANO et al – Morphological invariant of the midsagittal deep brain anatomy between humans and African great apes

Efforts have been made to mathematically reconstruct the brain morphology from human fossil crania to clarify the evolutionary changes in the brain that are associated with the emergence of human cognitive ability. However, because conventional reconstruction methods are based solely on the endocranial shape, deep brain structures cannot be estimated with sufficient accuracy. Our study aims to investigate the possible morphological correspondence between the cranial and deep brain morphologies based on humans and African great apes, with the goal of a more precise reconstruction of fossil brains.

Midsagittal endocranial and deep brain landmarks were obtained from magnetic resonance images of humans and three species of African great apes. The average midsagittal endocranial profile of all four species was calculated after Procrustes registration. The spatial deformation function from each of the endocranial profiles to the average endocranial profile was defined, and the brain landmarks enclosed in the endocranium were transformed using the deformation function to evaluate the interspecific variabilities of the positions of the brain landmarks on the average endocranial profile.

The interspecific differences in the shape-normalized positions of the corpus callosum, anterior commissure, thalamus center, and brainstem were approximately within the range of 2% of the human cranial length, indicating that the interspecific variabilities of the positions of these deep brain structures were relatively small among the four species.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24414>

REVIEWS

LESLIE C. AIELLO – Walking through human evolution

Review of 'First steps: How upright walking made us human' by Jeremy DeSilva. HarperCollins Publishers. 2021.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24418>

Current Biology

PAPERS

HEATHER L. KOSAKOWSKI et al with NANCY KANWISHER – Selective responses to faces, scenes, and bodies in the ventral visual pathway of infants

Three of the most robust functional landmarks in the human brain are the selective responses to faces in the fusiform face area (FFA), scenes in the parahippocampal place area (PPA), and bodies in the extrastriate body area (EBA). Are the selective responses of these regions present early in development or do they require many years to develop? Prior evidence leaves this question unresolved. We designed a new 32-channel infant magnetic resonance imaging (MRI) coil and collected high-quality functional MRI (fMRI) data from infants (2–9 months of age) while they viewed stimuli from four conditions—faces, bodies, objects, and scenes. We find that infants have face-, scene-, and body-selective responses in the location of the adult FFA, PPA, and EBA, respectively, powerfully constraining accounts of cortical development.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)01508-6](https://www.cell.com/current-biology/fulltext/S0960-9822(21)01508-6)

Nature

PAPERS

RAUNAK BASU et al – The orbitofrontal cortex maps future navigational goals

Accurate navigation to a desired goal requires consecutive estimates of spatial relationships between the current position and future destination throughout the journey. Although neurons in the hippocampal formation can represent the position of an animal as well as its nearby trajectories, their role in determining the destination of the animal has been questioned. It is, thus, unclear whether the brain can possess a precise estimate of target location during active environmental exploration. Here we describe neurons in the rat orbitofrontal cortex (OFC) that form spatial representations persistently pointing to the subsequent goal destination of an animal throughout navigation. This destination coding emerges before the onset of navigation, without direct sensory access to a distal goal, and even predicts the incorrect destination of an animal at the beginning of an error trial. Goal representations in the OFC are maintained by destination-specific neural ensemble dynamics, and their brief perturbation at the onset of a journey led to a navigational error. These findings suggest that the OFC is part of the internal goal map of the brain, enabling animals to navigate precisely to a chosen destination that is beyond the range of sensory perception.

<https://www.nature.com/articles/s41586-021-04042-9>

Nature Humanities & Social Sciences Communications

PAPERS

PATRICK SCHMIDT – Steak tournedos or beef Wellington: an attempt to understand the meaning of Stone Age transformative techniques

Research into human uniqueness is gaining increasing importance in prehistoric archaeology. The most striking behaviour unique to early and modern humans among other primates is perhaps that they used fire to transform the properties of materials. In Archaeology, these processes are sometimes termed “engineering” or “transformative techniques” because they aim at producing materials with altered properties. Were such transformative techniques cognitively more demanding than other tool making processes? Were they the key factors that separated early humans, such as Neanderthals and early Homo sapiens, from other hominins? Many approaches to investigating these techniques rely on their complexity. The rationale behind this is that some techniques required more steps than others, thus revealing the underlying mechanisms of human uniqueness (e.g., unique human culture). However, it has been argued that the interpretation of process complexity may be prone to arbitrariness (i.e., different researchers have different notions of what is complex). Here I propose an alternative framework for interpreting transformative techniques. Three hypotheses are derived from an analogy with well-understood processes in modern-day cuisine. The hypotheses are about i) the requirement in time and/or raw materials of transformative techniques, ii) the difficulty to succeed in conducting transformative techniques and iii) the necessity to purposefully invent transformative techniques, as opposed to discovering them randomly. All three hypotheses make testable predictions.

<https://www.nature.com/articles/s41599-021-00971-y>

Nature Scientific Reports

PAPERS

FRANCESCA CONCA et al – In search of different categories of abstract concepts: a fMRI adaptation study

Concrete conceptual knowledge is supported by a distributed neural network representing different semantic features according to the neuroanatomy of sensory and motor systems. If and how this framework applies to abstract knowledge is currently debated. Here we investigated the specific brain correlates of different abstract categories. After a systematic a priori selection of brain regions involved in semantic cognition, i.e. responsible of, respectively, semantic representations and cognitive control, we used a fMRI-adaptation paradigm with a passive reading task, in order to modulate the neural response to abstract (emotions, cognitions, attitudes, human actions) and concrete (biological entities, artefacts) categories. Different portions of the left anterior temporal lobe responded selectively to abstract and concrete concepts. Emotions and attitudes adapted the left middle temporal gyrus, whereas concrete items adapted the left fusiform gyrus. Our results suggest that, similarly to concrete concepts, some categories of abstract knowledge have specific brain correlates corresponding to the prevalent semantic dimensions involved in their representation.

<https://www.nature.com/articles/s41598-021-02013-8>

OKSANA ZINCHENKO, OLGA SAVELO & VASILY KLUCHAREV – Role of the prefrontal cortex in prosocial and self-maximization motivations: an rTMS study

More than a decade of neuroimaging and brain stimulation studies point to a crucial role for the right dorsolateral prefrontal cortex (rDLPFC) in prosocial behavior. The intuitive prosociality model postulates that the rDLPFC controls intuitive prosocial behavior, whereas the reflective model assumes that the rDLPFC controls selfish impulses during prosocial behavior. The intuitive prosociality model implies that the transient disruption of the rDLPFC should increase voluntary transfers in both dictator and generosity games. In contrast, the reflective model suggests that the transient disruption of the rDLPFC should decrease transfers in the dictator game, without affecting voluntary transfers in the generosity game, in which selfish motives are minimized. The aim of this paper was to compare predictions of the intuitive and reflective models using the classic dictator game and generosity game and continuous theta burst stimulation (cTBS). In this study, two groups of healthy participants (dictators) received either cTBS over the rDLPFC or right extrastriate visual areas. As shown by the results, the transient disruption of the rDLPFC significantly promoted prosocial motives in the dictator game only, particularly in the trials with the lowest dictator's costs. These findings partially support the notion that the rDLPFC controls intuitive prosocial behavior.

<https://www.nature.com/articles/s41598-021-01588-6>

New Scientist

NEWS

Using tools helps you understand language and vice versa

Language and tool use seem to be governed by the same brain region, suggests a study involving an fMRI scanner.

<https://www.newscientist.com/article/2297259-using-tools-helps-you-understand-language-and-vice-versa/#ixzz7Cby7VVN7>

Origins of Japanese and Turkish language family traced back 9000 years

Millet farmers living 9000 years ago in what is now north-east China may have spoken a proto-Transeurasian language that gave rise to Japanese, Turkish and other modern tongues.

<https://www.newscientist.com/article/2296962-origins-of-japanese-and-turkish-language-family-traced-back-9000-years/#ixzz7CbyGTNIL>

ARTICLES

GRAHAM LAWTON – Why are we irrational? How a logical flaw stops us solving problems

Myths and stories trump rational reasoning when it comes to analysing distant threats like climate change. But we have tools to combat that – and it's a myth irrationality is on the rise.

<https://www.newscientist.com/article/0-why-are-we-irrational-how-a-logical-flaw-stops-us-solving-problems/#ixzz7CbzcSSy3>

DANIEL COSSINS – Why is quantum theory so strange? The weirdness could be in our heads

Quantum theory is peerless at explaining reality, but assaults our intuitions of how reality should be. It seems likely the fault lies with our intuitions.

<https://www.newscientist.com/article/0-why-is-quantum-theory-so-strange-the-weirdness-could-be-in-our-heads/#ixzz7CbzshBwm>

ALISON GEORGE – Why are we conscious? The answer lies in other animals' heads

It's easy to think human conscious experience is unique, but a better understanding of consciousness's mysteries comes by tracing it back in the evolutionary tree.

<https://www.newscientist.com/article/0-why-are-we-conscious-the-answer-lies-in-other-animals-heads/#ixzz7Cc07pMzt>

GRAHAM LAWTON – Why are we good and evil? A single quality may be at the root of it

The human capacity for both good and evil has long mystified philosophers. Evolutionary biology suggests they are both offshoots of one of our oddest character traits.

<https://www.newscientist.com/article/0-why-are-we-good-and-evil-a-single-quality-may-be-at-the-root-of-it/#ixzz7Cc0RZkQ6>

CATHERINE DE LANGE – Why do we grieve? The surprising origin of the feeling of loss

The debilitating pain we sometimes feel at the loss of those we love is an evolutionary mystery. It could all come down to what happens in our childhoods.

<https://www.newscientist.com/article/0-why-do-we-grieve-the-surprising-origin-of-the-feeling-of-loss/#ixzz7Cc0hpkRd>

Philosophical Transactions of the Royal Society B

PAPERS

KATARZYNA PISANSKI, ANDREY ANIKIN & DAVID REBY – Vocal size exaggeration may have contributed to the origins of vocalic complexity

Vocal tract elongation, which uniformly lowers vocal tract resonances (formant frequencies) in animal vocalizations, has evolved independently in several vertebrate groups as a means for vocalizers to exaggerate their apparent body size. Here, we propose that smaller speech-like articulatory movements that alter only individual formants can serve a similar yet less energetically costly size-exaggerating function. To test this, we examine whether uneven formant spacing alters the perceived body size of vocalizers in synthesized human vowels and animal calls. Among six synthetic vowel patterns, those characterized by the lowest first and second formant (the vowel /u/ as in 'boot') are consistently perceived as produced by the largest vocalizer. Crucially, lowering only one or two formants in animal-like calls also conveys the impression of a larger body size, and lowering the second and third formants simultaneously exaggerates perceived size to a similar extent as rescaling all formants. As the articulatory movements required for individual formant shifts are minor compared to full vocal tract extension, they represent a rapid and energetically efficient mechanism for acoustic size exaggeration. We suggest that, by favouring the evolution of uneven formant patterns in vocal communication, this deceptive strategy may have contributed to the origins of the phonemic diversification required for articulated speech.

<https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2020.0401>

SVEN GRAWUNDER et al with ROMAN M. WITTIG & CATHERINE CROCKFORD – Chimpanzee vowel-like sounds and voice quality suggest formant space expansion through the hominoid lineage

The origins of human speech are obscure; it is still unclear what aspects are unique to our species or shared with our evolutionary cousins, in part due to a lack of a common framework for comparison. We asked what chimpanzee and human vocal production acoustics have in common. We examined visible supra-laryngeal articulators of four major chimpanzee vocalizations (hoos, grunts, barks, screams) and their associated acoustic structures, using techniques from human phonetic and animal communication analysis. Data were collected from wild adult chimpanzees, Tai National Park, Ivory Coast. Both discriminant and principal component classification procedures revealed classification of call types. Discriminating acoustic features include voice quality and formant structure, mirroring phonetic features in human speech. Chimpanzee lip and jaw articulation variables also offered similar discrimination of call types. Formant maps distinguished call types with different vowel-like sounds. Comparing our results with published primate data, humans show less F1–F2 correlation and further expansion of the vowel space, particularly for [i] sounds. Unlike recent studies suggesting monkeys achieve human vowel space, we conclude from our results that supra-laryngeal articulatory capacities show moderate evolutionary change, with vowel space expansion continuing through hominoid evolution. Studies on more primate species will be required to substantiate this.

<https://royalsocietypublishing.org/doi/full/10.1098/rstb.2020.0455>

JUAN DAVID LEONGÓMEZ, JAN HAVLÍČEK & S. CRAIG ROBERTS – Musicality in human vocal communication: an evolutionary perspective

Studies show that specific vocal modulations, akin to those of infant-directed speech (IDS) and perhaps music, play a role in communicating intentions and mental states during human social interaction. Based on this, we propose a model for the evolution of musicality—the capacity to process musical information—in relation to human vocal communication. We suggest that a complex social environment, with strong social bonds, promoted the appearance of musicality-related abilities. These social bonds were not limited to those between offspring and mothers or other carers, although these may have been especially influential in view of altriciality of human infants. The model can be further tested in other species by comparing levels of sociality and complexity of vocal communication. By integrating several theories, our model presents a radically different view of musicality, not limited to specifically musical scenarios, but one in which this capacity originally evolved to aid parent–infant communication and bonding, and even today plays a role not only in music but also in IDS, as well as in some adult-directed speech contexts.

<https://royalsocietypublishing.org/doi/full/10.1098/rstb.2020.0391>

ALEKSANDRA ĆWIEK et al with DAN DEDIU – The bouba/kiki effect is robust across cultures and writing systems

The bouba/kiki effect—the association of the nonce word bouba with a round shape and kiki with a spiky shape—is a type of correspondence between speech sounds and visual properties with potentially deep implications for the evolution of spoken language. However, there is debate over the robustness of the effect across cultures and the influence of orthography. We report an online experiment that tested the bouba/kiki effect across speakers of 25 languages representing nine language families and 10 writing systems. Overall, we found strong evidence for the effect across languages, with bouba eliciting more congruent responses than kiki. Participants who spoke languages with Roman scripts were only marginally more likely to show the effect, and analysis of the orthographic shape of the words in different scripts showed that the effect was no stronger for scripts that use rounder forms for bouba and spikier forms for kiki. These results confirm that the bouba/kiki phenomenon is rooted in crossmodal correspondence between aspects of the voice and visual shape, largely independent of orthography. They provide the strongest demonstration to date that the bouba/kiki effect is robust across cultures and writing systems.

<https://royalsocietypublishing.org/doi/full/10.1098/rstb.2020.0390>

ROZA G. KAMILOĞLU, AKIHIRO TANAKA, SOPHIE K. SCOTT AND DISA A. SAUTER – Perception of group membership from spontaneous and volitional laughter

Laughter is a ubiquitous social signal. Recent work has highlighted distinctions between spontaneous and volitional laughter, which differ in terms of both production mechanisms and perceptual features. Here, we test listeners' ability to infer group identity from volitional and spontaneous laughter, as well as the perceived positivity of these laughs across cultures. Dutch (n = 273) and Japanese (n = 131) participants listened to decontextualized laughter clips and judged (i) whether the laughing person was from their cultural in-group or an out-group; and (ii) whether they thought the laughter was produced spontaneously or volitionally. They also rated the positivity of each laughter clip. Using frequentist and Bayesian analyses, we show that listeners were able to infer group membership from both spontaneous and volitional laughter, and that performance was equivalent for both types of laughter. Spontaneous laughter was rated as more positive than volitional laughter across the two cultures, and in-group laughs were perceived as more positive than out-group laughs by Dutch but not Japanese listeners. Our results demonstrate that both spontaneous and volitional laughter can be used by listeners to infer laughers' cultural group identity.

<https://royalsocietypublishing.org/doi/full/10.1098/rstb.2020.0404>

PLoS Biology

PAPERS

ALEX MCAVOY, ANDREW RAO & CHRISTOPH HAUERT – Intriguing effects of selection intensity on the evolution of prosocial behaviors

This is an uncorrected proof.

In many models of evolving populations, genetic drift has an outsized role relative to natural selection, or vice versa. While there are many scenarios in which one of these two assumptions is reasonable, intermediate balances between these forces are also biologically relevant. In this study, we consider some natural axioms for modeling intermediate selection intensities, and we explore how to quantify the long-term evolutionary dynamics of such a process. To illustrate the sensitivity of evolutionary dynamics to drift and selection, we show that there can be a “sweet spot” for the balance of these two forces, with sufficient noise for rare mutants to become established and sufficient selection to spread. This balance allows prosocial traits to evolve in evolutionary models that were previously thought to be un conducive to the emergence and spread of altruistic behaviors. Furthermore, the effects of selection intensity on long-run evolutionary outcomes in these settings, such as when there is global competition for reproduction, can be highly non-monotonic. Although intermediate selection intensities (neither weak nor strong) are notoriously difficult to study analytically, they are often biologically relevant; and the results we report suggest that they can elicit novel and rich dynamics in the evolution of prosocial behaviors.

<https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1009611>

PLoS One

PAPERS

NELE OTS – Cognitive constraints on advance planning of sentence intonation

Pitch peaks tend to be higher at the beginning of longer than shorter sentences (e.g., ‘A farmer is pulling donkeys’ vs ‘A farmer is pulling a donkey and goat’), whereas pitch valleys at the ends of sentences are rather constant for a given speaker. These data seem to imply that speakers avoid dropping their voice pitch too low by planning the height of sentence-initial pitch peaks prior to speaking. However, the length effect on sentence-initial pitch peaks appears to vary across different types of sentences, speakers and languages. Therefore, the notion that speakers plan sentence intonation in advance due to the limitations in low voice pitch leaves part of the data unexplained. Consequently, this study suggests a complementary cognitive account of length-dependent pitch scaling. In particular, it proposes that the sentence-initial pitch raise in long sentences is related to high demands on mental resources during the early stages of sentence planning. To tap into the cognitive underpinnings of planning sentence intonation, this study adopts the methodology of recording eye movements during a picture description task, as the eye movements are the established approximation of the real-time planning processes. Measures of voice pitch (Fundamental Frequency) and incrementality (eye movements) are used to examine the

relationship between (verbal) working memory (WM), incrementality of sentence planning and the height of sentence-initial pitch peaks.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0259343>

PNAS

PAPERS

SARA STILLESJÖ et al – Active math and grammar learning engages overlapping brain networks

We here demonstrate common neurocognitive long-term memory effects of active learning that generalize over course subjects (mathematics and vocabulary) by the use of fMRI. One week after active learning, relative to more passive learning, performance and fronto-parietal brain activity was significantly higher during retesting, possibly related to the formation and reactivation of semantic representations. These observations indicate that active learning conditions stimulate common processes that become part of the representations and can be reactivated during retrieval to support performance. Our findings are of broad interest and educational significance related to the emerging consensus of active learning as critical in promoting good long-term retention.

<https://www.pnas.org/content/118/46/e2106520118.abstract>

T. HANNAGAN et al with S. DEHAENE – Emergence of a compositional neural code for written words: Recycling of a convolutional neural network for reading

The visual word form area (VWFA) is a region of human inferotemporal cortex that emerges at a fixed location in the occipitotemporal cortex during reading acquisition and systematically responds to written words in literate individuals. According to the neuronal recycling hypothesis, this region arises through the repurposing, for letter recognition, of a subpart of the ventral visual pathway initially involved in face and object recognition. Furthermore, according to the biased connectivity hypothesis, its reproducible localization is due to preexisting connections from this subregion to areas involved in spoken-language processing. Here, we evaluate those hypotheses in an explicit computational model. We trained a deep convolutional neural network of the ventral visual pathway, first to categorize pictures and then to recognize written words invariantly for case, font, and size. We show that the model can account for many properties of the VWFA, particularly when a subset of units possesses a biased connectivity to word output units. The network develops a sparse, invariant representation of written words, based on a restricted set of reading-selective units. Their activation mimics several properties of the VWFA, and their lesioning causes a reading-specific deficit. The model predicts that, in literate brains, written words are encoded by a compositional neural code with neurons tuned either to individual letters and their ordinal position relative to word start or word ending or to pairs of letters (bigrams).

<https://www.pnas.org/content/118/46/e2104779118.abstract>

Science Advances

PAPERS

JULIAN JARA-ETTINGER & PAULA RUBIO-FERNANDEZ – Quantitative mental state attributions in language understanding

Human social intelligence relies on our ability to infer other people's mental states such as their beliefs, desires, and intentions. While people are proficient at mental state inference from physical action, it is unknown whether people can make inferences of comparable granularity from simple linguistic events. Here, we show that people can make quantitative mental state attributions from simple referential expressions, replicating the fine-grained inferential structure characteristic of nonlinguistic theory of mind. Moreover, people quantitatively adjust these inferences after brief exposures to speaker-specific speech patterns. These judgments matched the predictions made by our computational model of theory of mind in language, but could not be explained by a simpler qualitative model that attributes mental states deductively. Our findings show how the connection between language and theory of mind runs deep, with their interaction showing in one of the most fundamental forms of human communication: reference.

<https://www.science.org/doi/full/10.1126/sciadv.abj0970>

Trends in Cognitive Sciences

PAPERS

LOUISA BOGAERTS et al with MORTEN H. CHRISTIANSEN – Is there such a thing as a 'good statistical learner'?

A growing body of research investigates individual differences in the learning of statistical structure, tying them to variability in cognitive (dis)abilities. This approach views statistical learning (SL) as a general individual ability that underlies performance across a range of cognitive domains. But is there a general SL capacity that can sort individuals from 'bad' to 'good' statistical learners? Explicating the suppositions underlying this approach, we suggest that current evidence supporting it is meager. We outline an alternative perspective that considers the variability of statistical environments within different cognitive domains. Once we focus on learning that is tuned to the statistics of real-world sensory inputs, an alternative view of SL computations emerges with a radically different outlook for SL research.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(21\)00282-5](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00282-5)

Trends in Ecology and Evolution

PAPERS

STEFANIE MUFF et al – Rewriting results sections in the language of evidence

Despite much criticism, black-or-white null-hypothesis significance testing with an arbitrary P-value cutoff still is the standard way to report scientific findings. One obstacle to progress is likely a lack of knowledge about suitable alternatives. Here, we suggest language of evidence that allows for a more nuanced approach to communicate scientific findings as a simple and intuitive alternative to statistical significance testing. We provide examples for rewriting results sections in research papers accordingly. Language of evidence has previously been suggested in medical statistics, and it is consistent with reporting approaches of international research networks, like the Intergovernmental Panel on Climate Change, for example. Instead of re-inventing the wheel, ecology and evolution might benefit from adopting some of the ‘good practices’ that exist in other fields.

[https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(21\)00284-6](https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(21)00284-6)

Trends in Neurosciences

PAPERS

ROHIT MENON et al – Neurobiology of the lateral septum: regulation of social behavior

Social interactions are essential for mammalian life and are regulated by evolutionary conserved neuronal mechanisms. An individual’s internal state, experiences, and the nature of the social stimulus are critical for determining apt responses to social situations. The lateral septum (LS) – a structure of the basal forebrain – integrates abundant cortical and subcortical inputs, and projects to multiple downstream regions to generate appropriate behavioral responses. Although incoming cognitive information is indispensable for contextualizing a social stimulus, neuromodulatory information related to the internal state of the organism significantly influences the behavioral outcome as well. This review article provides an overview of the neuroanatomical properties of the LS, and examines its neurochemical (neuropeptidergic and hormonal) signaling, which provide the neuromodulatory information essential for fine-tuning social behavior across the lifespan.

[https://www.cell.com/trends/neurosciences/fulltext/S0166-2236\(21\)00210-1](https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(21)00210-1)

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