EAORC BULLETIN 1,140 – 20 April 2025

CONTENTS

NOTICES

FORMATTED VERSION OF THIS BULLETIN

A pdf formatted version of this Bulletin is available for download at martinedwardes.me.uk/eaorc/eaorc_bulletins.htm.

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, and doesn't object to being called out on it.

NEWS

NATURE BRIEFING – Crows make expert shape spotters

Carrion crows (Corvus corone) can add geometry to their already impressive list of mathematical skills. Researchers showed sets of six shapes to two crows and tasked them with spotting the odd one out. The birds aced simple tests, picking a crescent moon from a group of stars with little trouble. Even on more difficult tasks — picking out one slightly distorted quadrilateral from a group of otherwise very similar regular shapes — the crows still performed well, even when the shapes were randomly rotated and scaled.
https://www.earth.com/news/crows-can-recognize-geometric-patterns-in-shapes/

SCIENCEADVISER – Crows share our geometric intuition

The set-up where crows flexed their geometrical knowledge. Schmidbauer et al./Science Advances (2025)

Humans have an innate sense for geometry. Once we reach preschool age, give or take, we can spot the differences between shapes like rectangles and squares even without formal training, a kind of geometric intuition thought to be lacking in other animals. But no one had asked crows for their thoughts on geometry—until now.

Researchers first had the clever corvids learn to peck at a particular shape, like a moon, to get a treat. Then they placed that shape amidst four different ones—stars, for instance. When the birds had no trouble spotting the outlier, the team jacked up the difficulty, asking the animals to spot an irregular quadrilateral amongst a sea of squares. Though monkeys previously failed at this test, the birds excelled.

"The general view among scientists was that proper geometrical, Euclidean knowledge as applied to objects … was probably limited to humans," neuroscientist Giorgio Vallortigara told Scientific American. Now, with crows demonstrating the ability, he and other experts suspect the ability is more widespread. "I would never dare to say that this is the only species," co-author Andreas Nieder told NPR, "it's just now opening this field of investigation."

https://www.science.org/doi/10.1126/sciadv.adt3718

SCIENCE DAILY – Ancient tools from a South African cave reveal connections between prehistoric people

In a cave overlooking the ocean on the southern coast of South Africa, archaeologists discovered thousands of stone tools, created by ancient humans roughly 20,000 years ago. By examining tiny details in the chipped edges of the blades and stones, archaeologists are able to tell how the tools were made -- which revealed that people were sharing crafting techniques over wide distances.

https://www.sciencedaily.com/releases/2025/04/250409212539.htm

SCIENCE DAILY – Scientists complete largest wiring diagram and functional map of the brain to date

From a tiny sample of tissue no larger than a grain of sand, scientists have come within reach of a goal once thought unattainable: building a complete functional wiring diagram of a portion of the brain.

https://www.sciencedaily.com/releases/2025/04/250409114838.htm

SCIENCE DAILY – Mediterranean hunter gatherers navigated long-distance sea journeys before farmers

Evidence shows that hunter-gatherers were crossing at least 100 kilometers (km) of open water to reach the Mediterranean island of Malta 8,500 years ago, a thousand years before the arrival of the first farmers.

https://www.sciencedaily.com/releases/2025/04/250409114713.htm

SCIENCE DAILY – Six ape genomes sequenced telomere-to-telomere

Comprehensive reference genomes have now been assembled for six ape species: siamang (a Southeast Asian gibbon), Sumatran orangutan, Bornean orangutan, gorilla, bonobo and chimpanzee. Areas of their genomes previously inaccessible because of structural complexity have now mostly been resolved. The resource is already lending itself to comparative studies that offer new insights into human and ape evolution, and into what underlies the functional differences among these species.

https://www.sciencedaily.com/releases/2025/04/250409114521.htm

SCIENCE DAILY – Comparing sizes of 50,000 ancient houses shows common but not inevitable inequality

We're living in a period where the gap between rich and poor is dramatic, and it's continuing to widen. But inequality is nothing new. In a new study researchers compared house size distributions from more than 1,000 sites around the world, covering the last 10,000 years. They found that while inequality is widespread throughout human history, it's not inevitable, nor is it expressed to the same degree at every place and time.

https://www.sciencedaily.com/releases/2025/04/250414162054.htm

SCIENCE DAILY – Wealth inequality's deep roots in human prehistory

Wealth inequality began shaping human societies more than 10,000 years ago, long before the rise of ancient empires or the invention of writing. That's according to a new study that challenges traditional views that disparities in wealth emerged suddenly with large civilizations like Egypt or Mesopotamia.

https://www.sciencedaily.com/releases/2025/04/250414162044.htm

THE CONVERSATION – The largest flood in Earth's history refilled the Mediterranean in just a few years

New evidence supports theory of 'Zanclean megaflood' 5 million years ago.

https://theconversation.com/the-largest-flood-in-earths-history-burst-through-gibraltar-and-sicily-and-refilled-the-entire-mediterranean-in-just-a-few-years-249242

PUBLICATIONS

Current Biology

PAPERS

RACHEL S. CHAROENTHAMMANON & JOSHUA J. GOOLEY – The adolescent circadian clock entrains to social time rather than sun time

The circadian timing of sleep is an important determinant of performance and health. There are opposing viewpoints, however, on whether light entrainment of the human circadian clock is mediated primarily by social time or solar time. Here, we provide evidence that adolescents' circadian clock entrains to their behavioral light-dark cycle determined by social demands. The circadian timing of sleep was compared between school and holiday periods in adolescents (n = 112) whose sleep was either constrained or unconstrained by early school start times. The circadian rhythm of melatonin (dim-light melatonin onset [DLMO]) closely tracked adolescents' earlier and shorter actigraphy-determined sleep pattern during the school week. The phase of entrainment from DLMO to sleep (darkness) midpoint was the same between holiday and school periods. As a consequence of obtaining short sleep on school nights, however, adolescents went to sleep later and woke up earlier relative to their melatonin onset. Hence, adolescents were "biologically ready" to go to bed earlier, and they likely woke up closer to the circadian minimum of alertness compared with their holiday sleep. Our results suggest that, in modern society, social constraints on sleep and associated light exposure (natural sunlight and electrical light) play an important role in entraining the circadian clock. Key strategies that may improve the duration and circadian timing of sleep in adolescents include advancing bedtimes, stabilizing sleep across weekdays and weekends, and delaying wake-up times by starting school later.

https://www.cell.com/current-biology/fulltext/S0960-9822(25)00375-6

ELISE KANBER et al – Representations of personally familiar voices are better resolved in the brain

The human voice is highly flexible, allowing for diverse expression during communication, but presents perceptual challenges through large acoustic variability. The ability to recognize an individual person's voice depends on the listener's ability to overcome this within-speaker variability to extract a single identity percept. Previous work has found that this process is greatly assisted by familiarity, with evidence suggesting that more extensive and varied exposure to a voice is associated with the formation of a more robust mental representation of it. Here, we used functional magnetic resonance imaging (fMRI) with representational similarity analysis to characterize how personal familiarity with a voice is reflected in neural representations. We measured and compared brain responses with voices of differing familiarity—a personally familiar voice, a voice familiarized through lab training, and a new (untrained) voice—while listeners identified these voices from naturally varying, spontaneous speech clips. Personally familiar voices elicited brain response patterns in voice-, face-, and person-selective cortices that showed higher within- and between-speaker dissimilarity, compared with lower-familiarity lab-trained and untrained voices. These findings indicated that representations for the sounds of personally familiar voices are better resolved from each other in the brain, and they align with other research reporting intelligibility advantages for speech produced by familiar talkers. Overall, our findings suggest that extensive and varied exposure to personally familiar voices results in the development of finer-grained representations of those voices, which cannot be achieved via short-term lab training.

https://www.cell.com/current-biology/fulltext/S0960-9822(25)00428-2

JOJI TSUNADA & STEVEN J. ELIADES – Frontal-auditory cortical interactions and sensory prediction during vocal production in marmoset monkeys

The control of speech and vocal production involves the calculation of error between the intended vocal output and the resulting auditory feedback. This model has been supported by evidence that the auditory cortex (AC) is suppressed immediately before and during vocal production yet remains sensitive to differences between vocal output and altered auditory feedback. This suppression has been suggested to be the result of top-down signals about the intended vocal output, potentially originating from frontal cortical (FC) areas. However, whether FC is the source of suppressive and predictive signaling to AC during vocalization remains unknown. Here, we simultaneously recorded neural activity from both AC and FC of marmoset monkeys during self-initiated vocalizations. We found increases in neural activity in both brain areas from 1 to 0.5 s before vocal production (early pre-vocal period), specifically changes in both multi-unit activity and theta-band power. Connectivity analysis using Granger causality demonstrated that FC sends directed signaling to AC during this early pre-vocal period. Importantly, early pre-vocal activity correlated with both vocalization-induced suppression in AC as well as the structure and acoustics of subsequent calls, such as fundamental frequency. Furthermore, bidirectional auditory-frontal interactions emerged during experimentally altered vocal feedback and predicted subsequent compensatory vocal behavior. These results suggest that FC communicates with AC during vocal production, with frontal-to-auditory signals that may reflect the transmission of sensory prediction information before vocalization and bidirectional signaling during vocalization suggestive of error detection that could drive feedback-dependent vocal control.

https://www.cell.com/current-biology/fulltext/S0960-9822(25)00393-8

CORRECTIONS

JINGXUAN LIU et al – Language experience predicts music processing in a half-million speakers of fifty-four languages
Corrected: JINGXUAN LIU et al – Language experience predicts music processing in a half-million speakers of fifty-four languages, Current Biology 33, 1916-1925, e1-e4 (2023).
After publication, we were contacted by Sarah Creel, who, in the course of related work on auditory processing in speakers of the Akan tonal language (Creel et al., 2023, https://doi.org/10.3758/s13421-023-01416-4), discovered an error in our analysis code pertaining to Figure 4 and associated text in the summary and main text. We are grateful to Professor Creel for notifying us of the error and appreciate her generosity in spending time and effort to help us correct it.
https://www.cell.com/current-biology/fulltext/S0960-9822(25)00445-2?dgcid=raven_jbs_aip_email

Frontiers in Psychology

PAPERS

TING GUO et al – The role of object-based attention in semantic working memory
Recent studies suggest that working memory (WM) temporarily stores and processes bindings, while semantically related WM processing interacts with long-term memory (LTM). Semantic information can be categorized into grammatically connected sentences, which benefit from LTM-based semantic and syntactic integration, and isolated word lists, which lack meaningful structural connections. The sentence superiority effect refers to the enhanced memory performance of sentences compared to word lists. This study explores how object-based attention resources contribute to semantic WM processing in second language (L2) learners and examines the impact of object attention task load on sentence superiority. We employed the Duncan task as an interference paradigm to investigate whether object-based attention load influences the sentence superiority effect in L2 learners. Participants completed memory tasks involving either isolated word lists or connected sentences while simultaneously performing the interference task.
Findings revealed that connected sentences were more resistant to attention interference compared to word lists, indicating that sentence processing in WM benefits from structural and semantic integration.
These results suggest distinct mechanisms of attention resource deployment in semantic processing. The study provides insights into how linguistic context modulates the interaction between attention resources and working memory, highlighting the role of structured language input in cognitive processing.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2025.1560745/full

CORRECTIONS

ANTONIO BENÍTEZ-BURRACO – Corrigendum: How (and why) languages became more complex as we evolved more prosocial: the human self-domestication view
In the published article, there was an error in the Funding statement and some funding information was omitted.
https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2025.1598542/full

Nature Communications

PAPERS

ERIN E. HECHT et al – Individual variation in the chimpanzee arcuate fasciculus predicts vocal and gestural communication
Whether language has its evolutionary origins in vocal or gestural communication has long been a matter of debate. In humans, the arcuate fasciculus, a major fronto-temporal white matter tract, is left-lateralized, is larger than in nonhuman apes, and is linked to language. However, the extent to which the arcuate fasciculus of nonhuman apes is linked to vocal and/or manual communication is currently unknown. Here, using probabilistic tractography in 67 chimpanzees (45 female, 22 male), we report that the chimpanzee arcuate fasciculus is not left-lateralized at the population level, in marked contrast with humans. However, individual variation in the anatomy and leftward asymmetry of the chimpanzee arcuate fasciculus is associated with individual variation in the use of both communicative gestures and communicative sounds under volitional orofacial motor control. This indicates that the arcuate fasciculus likely supported both vocal and gestural communication in the chimpanzee/human last common ancestor, 6–7 million years ago.
https://www.nature.com/articles/s41467-025-58784-5

SHENG-HAO CAO et al – Hand position fields of neurons in the premotor cortex of macaques during natural reaching
While hippocampus represents spatial information through place cells for body navigation, whether motor areas employ a similar framework to guide hand reaching remains unknown. Here, we investigate tuning properties in dorsal premotor cortex (PMd) during naturalistic reach-and-grasp tasks in four monkeys. We find that 22% (132/601) of PMd neurons increase firing rates when the monkey's hand occupies specific positions in space, forming the position fields. These cells represent the hand position highly efficiently, achieving ~80% accuracy for decoding hand trajectories with only 50 most dedicated position tuned cells (~ 10% of all recorded neurons). The hand position is co-represented with hand moving direction, speed, and reward location in the same population of PMd neurons, forming a mixed-selective framework to integrate positional

and kinematic information. Our findings suggest field-like positional coding may be a mechanism shared across brain regions for spatial representation in goal-directed movements, including body navigation and forelimb reaching.
https://www.nature.com/articles/s41467-025-58786-3

Nature Communications Psychology

PAPERS

QIAWEN LIU, JEROEN VAN PARIDON & GARY LUPYAN – Learning about color from language

Certain colors are strongly associated with certain adjectives (e.g. red is hot, blue is cold). Some of these associations are grounded in visual experiences such as seeing glowing red embers. Surprisingly, despite having no visual experience, many congenitally blind people show very similar color associations which are likely learned through language. We show that these associations are indeed embedded in the statistical structure of language. We apply a projection method to word embeddings trained on corpora of spoken and written language to identify color-adjective associations as they are represented in English. These projections were predictive of color-adjective associations reported by blind and sighted English speakers. The most predictive projections were generated by embeddings derived from a corpus of fiction, which outperformed even the state-of-the-art large language model, GPT-4. By augmenting the training corpora in various ways we discover the types of sentences most responsible for conveying the color-adjective associations to the models. We find that word embedding models learn these associations from indirect (second-order) co-occurrences, and that when prompted, people are able to identify some of the words that are most informative for associating colors with specific adjectives. Learning through linguistic co-occurrences is one way word meanings can be continually aligned across language users despite large variations in perceptual experience.
https://www.nature.com/articles/s44271-025-00230-9

J. LUKAS THÜRMER, SEAN M. MCCREA & HIKARI BECK – Message source effects on rejection and costly punishment of criticism across cultures

Subgroups of societies evaluate information differently, leading to partisan polarization and societal rifts world-wide. Beyond mere disagreement about facts or different preferences, we identify a group-based mechanism predicting the rejection of critical messages and costly punishment of the commenter across three previously understudied and representative cultures. Our pre-registration was peer-reviewed within the Leibniz-Institute for Psychology lab-track scheme prior to data collection and, once accepted, funded. Participants (N = 2207) from China (collectivism, n = 786), Canada (individualism, n = 666), and Japan (honor, n = 755) consistently rejected criticism of their own national group that was attributed to a source from a different national group (intergroup criticism), as compared to the same criticism from within their group. These intergroup sensitivity effects were larger in China than in Canada or Japan. In Canada and Japan only, a bystander intergroup sensitivity effect emerged such that participants rejected criticism of another national group (i.e., they do not belong to) that was attributed to a source from a different national group (intergroup criticism), as compared to the same criticism from within that group. Apparently, the processes underlying this robust effect differ between cultures. We conclude that group-based message rejection contributes to societal rifts in many different cultures.
https://www.nature.com/articles/s44271-025-00248-z

Nature Human Behaviour

PAPERS

JUSTIN SULIK et al with GARY LUPYAN – Differences in psychologists' cognitive traits are associated with scientific divides

Scientific research is often characterized by schools of thought. We investigate whether these divisions are associated with differences in researchers' cognitive traits such as tolerance for ambiguity. These differences may guide researchers to prefer different problems, tackle identical problems in different ways, and even reach different conclusions when studying the same problems in the same way. We surveyed 7,973 researchers in psychological sciences and investigated links between what they research, their stances on open questions in the field, and their cognitive traits and dispositions. Our results show that researchers' stances on scientific questions are associated with what they research and with their cognitive traits. Further, these associations are detectable in their publication histories. These findings support the idea that divisions in scientific fields reflect differences in the researchers themselves, hinting that some divisions may be more difficult to bridge than suggested by a traditional view of data-driven scientific consensus.
https://www.nature.com/articles/s41562-025-02153-1

Nature Humanities & Social Sciences Communications

PAPERS

XIDAN XIAO & YIRAN WANG – The influence of vicarious exclusion on prosocial behavioral intentions and the role of belief in a just world

To examine the impact of vicarious exclusion on prosocial behavior intentions and the positive moderating role of belief in a just world, two experiments were conducted. Study 1 recruited 176 participants aged 18–22 years (57 males, 119 females)

and manipulated vicarious exclusion using a situational imagery paradigm to assess its effect on prosocial behavior intentions. Study 2 involved 284 participants aged 18–22 years (97 males, 187 females) and utilized the Cyberball paradigm to manipulate vicarious exclusion, further exploring the moderating role of belief in a just world. The results revealed that vicarious exclusion significantly predicted a decrease in prosocial behavior intentions. Furthermore, belief in a just world positively moderated this relationship, such that individuals with higher belief in a just world were less affected by the negative impact of vicarious exclusion on their prosocial behavior intentions. This study highlights the negative influence of vicarious exclusion on prosocial behavior intentions and the protective role of belief in a just world, providing theoretical support for understanding individuals' coping mechanisms in response to social exclusion.
https://www.nature.com/articles/s41599-025-04829-5

Nature Scientific Reports

PAPERS

MANUELA FILIPPA et al – Maternal and paternal infant directed speech is modulated by the child's age in in two and three person interactions

Prosody in infant-directed speech (IDS) serves important functions for the infant's attention, regulation, and emotional expression. However, how the structural characteristics of this vocal signal are influenced by the presence or absence of one or two parents at different infant ages remains under-investigated. This study aimed to identify the acoustic characteristics of parental vocalizations in 69 families during specific phases of the Lausanne Trilogue Play (LTP) setting. Vocalizations were analyzed in both two-person contexts (mother-baby or father-baby interacting with the infant individually) and three-person contexts (mother-baby or father-baby interactions in the presence of the other parent) at three time points: when the infant was 3, 9, and 18 months old. Videos of interactions were coded, and the parental vocalizations were extracted. Five components of acoustic features related to the prosodic aspects of speech were extracted for subsequent analysis: intensity and its variability, pitch and pitch variability, formant amplitude, the intensity of specific speech frequency bands affecting sound timbre, and the rate of voiced and unvoiced segments per second. The study demonstrated a main effect of infant age on parental acoustic prosodic characteristics, along with significant interactions between infant age and interaction context (two- versus three-person) and between infant age and parental role (mother versus father). Across contexts and parental roles, intensity, pitch, and their variability consistently increased from 3 to 9 months. By 9 months, distinct prosodic patterns emerged, including a reduced syllable rate and formant amplitude, along with an increase in pauses. The mother's voice exhibited a steady increase in intensity, as well as in pitch and intensity variability. Interestingly, when comparing parents across the two contexts, IDS in the three-person context is characterized by a higher rate of syllables and fewer pauses, with the most pronounced changes observed at 9 months of age. The development of prosodic characteristics in IDS is not constant across age and it is influenced by the complex interactions between age phases, parental gender, and contextual factors, with a dynamic adaptation of the communication strategies in three-person contexts. The current study underscores the importance of taking a comprehensive perspective in analyzing infant-directed speech within an interactive context involving both fathers and mothers in two- and three-person settings.
https://www.nature.com/articles/s41598-025-98047-3

SETH PHILLIPS et al – Wild chimpanzee termite mound inspections converge with the onset of rain

How and when to inspect for hidden and ephemeral food sources presents a cognitive challenge for wild animals. Observational data suggests a high degree of seasonality in the chimpanzees' preferred termite prey at the site of Issa Valley, Tanzania. This allows us to consider hypotheses on chimpanzees' ability to predict termite activity and to efficiently forage for termites based on seasonal rainfall trends. We analyzed 6806 min (113 h) of camera trap videos recorded over 48 months (from 2016–2019) from termite mounds and documented chimpanzee inspection behavior in the Issa Valley, western Tanzania. Our results suggest that Issa chimpanzees initiated foraging for termites, adjusted the period in which they prepared tools in advance, and inspected termite mounds in association with rainfall trends. Chimpanzee planning and foraging behaviors have implications for hominin decision making, forethought, and seasonal landscape utilization.
https://www.nature.com/articles/s41598-025-90382-9

BENJAMIN MUTIN et al – New radiocarbon dates of human tooth enamel reveal a late appearance of farming life in the Indus Valley

The domestication of plants and animals is believed to have commenced around 9500 BCE in the Near East. If the timing of the westward diffusion of the Neolithic transition is well documented, the precise mechanisms by which agriculture emerged between the Iranian Plateau, Central Asia, and South Asia remain unclear. In this context, the archaeological site of Mehrgarh (Pakistan) represents an essential point of reference. It is the sole site in the region where Neolithic occupation deposits have been extensively excavated, thereby providing the most essential insights into this period in northwest South Asia. Nevertheless, the accurate dating of these deposits remains a matter of contention, with implications for the most critical question of the emergence of agricultural life in the regions between the Fertile Crescent in the west and the Indus Valley in the east. Bayesian modelling of new radiocarbon dates performed on human tooth enamel from 23 Neolithic burials indicates that the aceramic Neolithic cemetery at Mehrgarh started between 5200 and 4900 BCE and lasted for a period of between two and five centuries. This result is in stark contrast with the previously proposed chronology of Neolithic

Mehrgarh, which had not only suggested an early beginning around 8000 BCE but also a much longer duration of three millennia. This new, younger chronology implies that agriculture emerged in the Indus Valley as the result of a late diffusion of farmers into this region. Additionally, the data suggest that the thick Neolithic occupation deposits of Mehrgarh were formed at a faster rate than previously assumed, and that pottery production and its utilization in present-day Pakistan emerged not before the mid-fifth millennium BCE.
https://www.nature.com/articles/s41598-025-92621-5

LENA POLLERHOFF et al – Adult age differences in the integration of values for self and other
Previous research suggests that older adults may display more prosocial behavior than younger adults. However, recent meta-analyses indicate that effects are heterogeneous, may be small, and are influenced by how prosociality is measured. Further, the precise cognitive and computational factors contributing to age-related differences in prosocial behavior remain largely unknown. In this study, we utilized a modified dictator game to combine a value-based decision framework with Bayesian hierarchical drift-diffusion modeling to investigate prosocial decision-making in a sample of younger (n = 63) and older adults (n = 48). We observed differences in how older and younger individuals incorporate information corresponding to potential gains for themselves (self) and another person (other) to reach a (potentially prosocial) decision. Younger adults integrated values for benefits for themselves and others in the decision-making process and demonstrated increased decision-making efficiency by effectively integrating both sources of information. In contrast, older adults showed improved decision-making efficiency when solely considering values for self and others separately. Interestingly, individual differences in the capacity of inhibitory control in older adults moderated the observed age effects: older adults with stronger inhibitory control abilities made decisions based on the integrated information of benefits for themselves and others. Together, these findings offer new insights into the behavioral and computational mechanisms influencing age effects in prosocial decision-making.
https://www.nature.com/articles/s41598-025-96656-6

COMMENTARIES

RÉMI ANSELME, FRANÇOIS PELLEGRINO & DAN DEDIU – Not just the alveolar trill, but all "r-like" sounds are associated with roughness across languages, pointing to a more general link between sound and touch
In a recent and fascinating paper, Winter and colleagues (henceforth WSPD) argue that languages with the alveolar trill [r] (henceforth trill) in their sound inventory tend to overrepresent "r" sounds in the words whose meaning is linked to the tactile sensation of "roughness". Compiling data on hundreds of languages, they therefore postulate a cross-modal association between physical touch and the acoustic characteristics of the trill sound. Critically, their claim hinges on the data and the process used to decide whether a given language has a trill in its sound inventory. Perhaps surprisingly, this decision is far from trivial because, in language descriptions, the trill symbol [r] tends to represent a generic "r-like" sound (i.e. a rhotic) rather than the specific acoustic trill. We show here, using a more principled coding and checking procedure, and an extended statistical reanalysis, that "r-like" sounds in general—and not just trills—are associated with "roughness". Therefore, we confirm the existence of a tactile-speech association, but a more general one than that postulated by WSPD. A different explanatory framework is therefore required, drawing for instance on wider sound symbolic properties of "r-like" sounds irrespective of their diverse acoustic properties, or to diachronic or cognitive processes that retain these associations despite a limited frequency of actual trills.
https://www.nature.com/articles/s41598-025-94850-0

MÁRTON SÓSKUTHY, MARK DINGEMANSE, BODO WINTER & MARCUS PERLMAN – Reply to: Not just the alveolar trill, but all "r-like" sounds are associated with roughness across languages, pointing to a more general link between sound and touch
In Winter et al., we reported evidence for a cross-modal iconic association between the trilled r sound and the sensory dimension of roughness in spoken vocabularies. One of our studies showed that the word 'rough' is more likely to contain an r than the word 'smooth' across 332 languages, but only when the language has a trilled r. Anselme, Pellegrino & Dediu (APD) present a reanalysis of our data based on a more rigorous coding of trilled versus non-trilled r. They confirm the link between trilled r and roughness but find an equally strong effect for languages with a non-trilled r, suggesting that the unique properties of trills 'cannot be the main cause to this tactile-sound association.' We question this conclusion. In making our case, we point out an important methodological dilemma: while pre-existing cross-linguistic data sets are often noisy, using manual coding to reduce this noise may introduce biases that distort the results. Indeed, a simulation shows that the effect size for languages with non-trilled r in APD's analysis is larger than expected under an unbiased approach to recoding. While APD convincingly demonstrate the existence of an effect for non-trilled r, it is not clear that the effect is as strong as that for trilled r. It remains possible that trills play a distinctive role in carrying an iconic association with roughness across vocabularies.
https://www.nature.com/articles/s41598-025-94854-w

ORIGINAL PAPER:

BODO WINTER, MÁRTON SÓSKUTHY, MARCUS PERLMAN & MARK DINGEMANSE – Trilled /r/ is associated with roughness, linking sound and touch across spoken languages

Cross-modal integration between sound and texture is important to perception and action. Here we show this has repercussions for the structure of spoken languages. We present a new statistical universal linking speech with the evolutionarily ancient sense of touch. Words that express roughness—the primary perceptual dimension of texture—are highly likely to feature a trilled /r/, the most commonly occurring rhotic consonant. In four studies, we show the pattern to be extremely robust, being the first widespread pattern of iconicity documented not just across a large, diverse sample of the world's spoken languages, but also across numerous sensory words within languages. Our deep analysis of Indo-European languages and Proto-Indo-European roots indicates remarkable historical stability of the pattern, which appears to date back at least 6000 years.

https://www.nature.com/articles/s41598-021-04311-7

Neuron

PAPERS

JESSICA M. PHILLIPS et al – Primate thalamic nuclei select abstract rules and shape prefrontal dynamics

Flexible behavior depends on abstract rules to generalize beyond specific instances and outcome monitoring to adjust actions. Cortical circuits are posited to read out rules from high-dimensional representations of task-relevant variables in prefrontal cortex (PFC). We instead hypothesized that converging inputs from PFC, directly or via basal ganglia (BGs), enable the thalamus to select rules. We measured activity across PFC and connected thalamic nuclei of monkeys applying rules. Abstract rule information first appeared in ventroanterior thalamus (VA)—the main thalamic hub between BG and PFC. Mediodorsal thalamus (MD) also represented rule information before PFC, persisting to help maintain activation of relevant PFC cell ensembles. MD, a major recipient of midbrain dopamine input, was the first to represent information about behavioral outcomes. A PFC-BG-thalamus model reproduced key findings, and thalamic-lesion modeling disrupted PFC rule representations. This suggests that the thalamus selects high-level cognitive information from PFC and monitors behavioral outcomes of these selections.

https://www.cell.com/neuron/abstract/S0896-6273(25)00221-1

PANAGIOTIS KRATIMENOS et al – The shifting landscape of the preterm brain

Preterm birth remains a significant global health concern despite advancements in neonatal care. While survival rates have increased, the long-term neurodevelopmental consequences of preterm birth persist. Notably, the profile of the preterm infant has shifted, with infants at earlier gestational ages surviving and decreased rates of gross structural injury secondary to intracranial hemorrhage. However, these infants are still vulnerable to insults, including hypoxia-ischemia, inflammation, and disrupted in utero development, impinging on critical developmental processes, which can lead to neuronal and oligodendrocyte injury and impaired brain function. Consequently, preterm infants often experience a range of neurodevelopmental disorders, such as cognitive impairment and behavioral problems. Here, we address mechanisms underlying preterm brain injury and explore existing and new investigational therapeutic strategies. We discuss how gestational age influences brain development and how interventions, including pharmacological and non-pharmacological approaches, mitigate the effects of preterm birth complications and improve the long-term outcomes of preterm infants.

https://www.cell.com/neuron/abstract/S0896-6273(25)00224-7

New Scientist

NEWS

Denisovan fossil from Taiwan gives clue to mysterious ancient humans

A fossil jawbone found by fishers in the Taiwan Strait has extended the known range of ancient Denisovan people thousands of kilometres to the east.

https://www.newscientist.com/article/2475938-denisovan-fossil-from-taiwan-gives-clue-to-mysterious-ancient-humans/

PLoS Biology

PAPERS

ALEXIS HERVAIS-ADELMAN & SIMON W. TOWNSEND – How did vocal communication come to dominate human language? A view from the womb

This is an uncorrected proof.

Whether human language evolved via a gestural or a vocal route remains an unresolved and contentious issue. Given the existence of two preconditions—a "language faculty" and the capacity for imitative learning both vocally and manually—there is no compelling evidence for gesture being inherently inferior to vocalization as a mode of linguistic expression; indeed, signed languages are capable of the same expressive range as spoken ones. Here, we revisit this conundrum, championing recent methodological advances in human neuroimaging (specifically, in utero functional magnetic resonance imaging) as a window into the role of the prenatal gestational period in language evolution, a critical, yet currently

underexplored environment in which fetuses are exposed to, and become attuned to, spoken language. In this Unsolved Mystery, we outline how, compared to visual sensitivity, the ontogenically earlier development of auditory sensitivity, beginning in utero and persisting for several months post-partum, alongside the relative permeability of the uterine environment to sound, but not light, may constitute a small but significant contribution to the current dominance of spoken language.
https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3003141

PLoS One

PAPERS

ANVESH NAIK & SATYAJIT AMBIKE – Handy divisions: Hand-specific specialization of prehensile control in bimanual tasks

When hammering a nail, why do right-handers wield the hammer in the right hand? The complementary dominance theory suggests a somewhat surprising answer. The two hands are specialized for different types of tasks: the dominant for manipulating objects, and the non-dominant for stabilizing objects. Right-handers wield the moving object with their right hand to leverage the skills of both hands. Functional specialization in hand use is often illustrated using examples of object manipulation. However, the complementary dominance theory is supported by wrist kinematics rather than object manipulation data. Therefore, our goal was to determine whether this theory extends to object manipulation. We hypothesized that hand-specific differences will be evident in the kinematics of hand-held objects and in the control of grip forces in right-handed individuals. Right-handed participants held two instrumented objects that were coupled by a spring. They moved one object while stabilizing the other object in various bimanual tasks. They performed motions of varying difficulty by tracking predictable or unpredictable targets. The two hands switched roles (stabilization vs movement) in various experimental blocks. The changing spring length perturbed both objects. We quantified the movement performance by measuring the objects' positions, and grip force control by measuring grip-load coupling in the moving hand and mean grip force in the stabilizing hand. The right hand produced more accurate object movement, along with stronger grip-load coupling, indicating superior predictive control of the right hand. In contrast, the left hand stabilized the object better and exerted a higher grip force, indicating superior impedance control of the left hand. Task difficulty had a weak effect on grip-load coupling during object movement and no effect on mean grip force during object stabilization. These behavioral results demonstrate that complementary dominance extends to object manipulation, though the weak effect of task difficulty on grip characteristics warrants further investigation. Neurophysiological investigations can now examine the hemisphere-specific neural mechanisms underlying these behavioral differences.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0321739

Proceedings of the Royal Society B

PAPERS

CHRISTIAN KLIESCH – Postnatal dependency as the foundation of social learning in humans

Humans have developed a sophisticated system of cultural transmission that allows for complex, non-genetically specified behaviours to be passed on from one generation to the next. This system relies on understanding others as social and communicative partners. Some theoretical accounts argue for the existence of domain-specific cognitive adaptations that prioritize social information, while others suggest that social learning is itself a product of cumulative cultural evolution based on domain-general learning mechanisms. The current paper explores the contribution of humans' unique ontogenetic environment to the emergence of social learning in infancy. It suggests that the prolonged period of post-natal dependency experienced by human infants contributes to the development of social learning. Because of motor limitations, infants learn to interact with and act through caregivers, establishing social learning abilities and skills that continue to develop as children become less dependent. According to this perspective, at least some key aspects of social development can be attributed to a developmental trajectory guided by infants' early motor development that radically alters how they experience the world.
https://royalsocietypublishing.org/doi/full/10.1098/rspb.2024.2818

KIA RADOVANOVIĆ et al with JOSEP CALL – Bonobos respond aversively to unequal reward distributions

Inequity aversion (IA) is the resistance to unequitable rewards given similar investments. It has been postulated as an important mechanism by which human cooperation thrives. To understand the evolutionary origin of human IA and its distribution across the animal kingdom, many species have been tested on IA, with mixed results. Whereas chimpanzees were originally found to show IA, more recent studies showed that their IA response could be explained by social disappointment. We conducted two studies on IA in bonobos using established paradigms: a token-exchange task and the social disappointment task. Bonobos could exchange tokens for equal or less-preferred food rewards than their partners (Study 1) and were tested with humans and machines to control for social disappointment effects (Study 2). We found that bonobos responded aversively to unequal food distributions in both studies, which was reflected by more refusals to participate when disadvantaged. Notably, and contrary to chimpanzees, this effect could not be explained by social disappointment, although Study 2 was only partially consistent with an IA explanation. Overall, our findings indicate that

bonobos possess the sensitivity to recognize and respond to unfair treatment, which supports the notion that IA may have coevolved as a stabilizing mechanism for cooperation.
https://royalsocietypublishing.org/doi/full/10.1098/rspb.2024.2873

Trends in Cognitive Sciences

PAPERS

STANISLAS DEHAENE, MATHIAS SABLÉ-MEYER & LORENZO CICCIONE – Origins of numbers: a shared language-of-thought for arithmetic and geometry?

Concepts of exact number are often thought to originate from counting and the successor function, or from a refinement of the approximate number system (ANS). We argue here for a third origin: a shared language-of-thought (LoT) for geometry and arithmetic that involves primitives of repetition, concatenation, and recursive embedding. Applied to sets, those primitives engender concepts of exact integers through recursive applications of additions and multiplications. Links between geometry and arithmetic also explain the emergence of higher-level notions (squares, primes, etc.). Under our hypothesis, understanding a number means having one or several mental expressions for it, and their minimal description length (MDL) determines how easily they can be mentally manipulated. Several historical, developmental, linguistic, and brain imaging phenomena provide preliminary support for our proposal.
https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(25)00059-2

Trends in Ecology and Evolution

PAPERS

CRISTIÁN GUTIÉRREZ-IBÁÑEZ et al – How do big brains evolve?

In both birds and mammals, variation in brain size predominantly reflects variation in mass or volume of the pallium (neocortex) and, to a lesser extent, of the cerebellum, suggesting convergent coevolution of brains and cognition. When brain measures are based on neuron counts, however, a surprisingly different picture emerges: The number of neurons in the cerebellum surpasses those in the pallium of all mammals (including humans and other primates) and in many but not all birds studied to date. In particular, parrots and corvids, clades known for cognitive abilities that match those of primates, have brains that contain more pallial than cerebellar neurons. Birds and mammals may thus have followed different evolutionary routes of pallial–cerebellar coordination behind enhanced cognitive complexity.
https://www.cell.com/trends/ecology-evolution/abstract/S0169-5347(25)00063-1

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