EAORC BULLETIN 1,041 – 28 May 2023

CONTENTS

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.

NEWS

THE CONVERSATION – Humans were using fire in Europe 50,000 years earlier than we thought

Signs of controlled fire use from Spain are at least 50,000 years older than previous evidence.
https://theconversationuk.cmail19.com/t/r-l-ttjhijdd-khhlilahh-yd/

THE CONVERSATION – World's oldest Homo sapiens footprint identified on South Africa's south coast

This was an area in which early anatomically modern humans survived, evolved and thrived, before spreading out of Africa to other continents.
https://theconversationuk.cmail20.com/t/r-l-ttjultjd-khhlilahh-g/

PUBLICATIONS

Current Anthropology

REVIEWS

ANDREW J. STRATHERN & PAMELA J. STEWART (STRATHERN) – Contemporaneous Prehistories: Chronotypes from the Island of Flores

Review of 'Between Ape and Human: An Anthropologist on the Trail of a Hidden Hominoid' by Gregory Forth. Pegasus, 2022.
https://www.journals.uchicago.edu/doi/abs/10.1086/724682

Current Biology

ARTICLES

DANIEL C. HYDE – Cognitive neuroscience: An abstract sense of number in the infant brain

The human infant brain automatically extracts number from the environment. A new study recovers an abstract code for number from the brain electrophysiology of sleeping infants.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00399-8

MARCO PAOLI, YUAN LAI & MARTIN GIURFA – Neuroethology: Perceived danger inhibits the wanting system of bees

A dopaminergic wanting system drives foraging in honey bees. A new study shows that encounters with the Asian hornet, a fierce bee predator, decrease brain dopamine levels and thus foraging. Stop signals, used to terminate the waggle dances of receivers, have the same effect, showing the power of bee communication.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00454-2

FRÉDÉRIC THEUNISSEN – Language and music: Singing voices and music talent

Native speakers of tonal languages show enhanced musical melody perception but diminished rhythm abilities. This effect has now been rigorously demonstrated in a new study that tested the musical IQ of half a million human participants across the globe.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00444-X

PAPERS

JINGXUAN LIU et al – Language experience predicts music processing in a half-million speakers of fifty-four languages

Tonal languages differ from other languages in their use of pitch (tones) to distinguish words. Lifelong experience speaking and hearing tonal languages has been argued to shape auditory processing in ways that generalize beyond the perception of linguistic pitch to the perception of pitch in other domains like music. We conducted a meta-analysis of prior studies testing this idea, finding moderate evidence supporting it. But prior studies were limited by mostly small sample sizes representing a small number of languages and countries, making it challenging to disentangle the effects of linguistic experience from variability in music training, cultural differences, and other potential confounds. To address these issues, we used web-based citizen science to assess music perception skill on a global scale in 34,034 native speakers of 19 tonal languages (e.g., Mandarin, Yoruba). We compared their performance to 459,066 native speakers of other languages, including 6 pitch-accented (e.g., Japanese) and 29 non-tonal languages (e.g., Hungarian). Whether or not participants had taken music lessons, native speakers of all 19 tonal languages had an improved ability to discriminate musical melodies on average, relative to speakers of non-tonal languages. But this improvement came with a trade-off: tonal language speakers were also worse at processing the musical beat. The results, which held across native speakers of many diverse languages and were robust to geographic and demographic variation, demonstrate that linguistic experience shapes music perception, with implications for relations between music, language, and culture in the human mind.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00387-1

GIULIA GENNARI, STANISLAS DEHAENE, CHANEL VALERA & GHISLAINE DEHAENE-LAMBERTZ – Spontaneous supra-modal encoding of number in the infant brain

The core knowledge hypothesis postulates that infants automatically analyze their environment along abstract dimensions, including numbers. According to this view, approximate numbers should be encoded quickly, pre-attentively, and in a supra-modal manner by the infant brain. Here, we directly tested this idea by submitting the neural responses of sleeping 3-month-old infants, measured with high-density electroencephalography (EEG), to decoders designed to disentangle numerical and non-numerical information. The results show the emergence, in approximately 400 ms, of a decodable number representation, independent of physical parameters, that separates auditory sequences of 4 vs. 12 tones and generalizes to visual arrays of 4 vs. 12 objects. Thus, the infant brain contains a number code that transcends sensory modality, sequential or simultaneous presentation, and arousal state.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00382-2

SHIHAO DONG et al – An inhibitory signal associated with danger reduces honeybee dopamine levels

Positive and negative experiences can alter animal brain dopamine levels. When first arriving at a rewarding food source or beginning to waggle dance and recruit nestmates to food, honeybees have increased brain dopamine levels, indicating a desire for food. We provide the first evidence that an inhibitory signal, the stop signal, which counters waggle dancing and is triggered by negative events at the food source, can decrease head dopamine levels and dancing, independent of the dancer having any negative experiences. The hedonic value of food can therefore be depressed simply by the receipt of an inhibitory signal. Increasing the brain dopamine levels reduced the aversive effects of an attack, increasing the time that bees spent subsequently feeding and waggle dancing and decreasing their stop signaling and time spent in the hive. Because honeybees regulate food recruitment and its inhibition at the colony level, these results highlight the complex integration of colony information with a basic and highly conserved neural mechanism in mammals and insects.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)00392-5

Frontiers in Child & Adolescent Psychiatry

PAPERS

MARC H. BORNSTEIN et al – The nature and structure of maternal parenting practices and infant behaviors in U.S. national and international samples

Twenty maternal parenting practices and 15 behaviors of their 5½-month-old infants in a U.S. national sample (N = 360) and 9 international samples (N = 653) were microcoded from videorecords of naturalistic interactions at home and aggregated into domains. Altogether, the samples were recruited from Argentina, Belgium, Brazil, France, Israel, Italy, Japan, Kenya, as well as the United States.

A previous test of three competing models of the nature and structure of the maternal parenting practices supported a hybrid 2 factor/6 domain model as superior to a 1-factor dimensional model and a multi-factor style model: Maternal parenting practices are structured into nurture, physical, social, didactic, material, and language domains undergirded by dyadic and extradyadic factors. Infant behaviors were organized into physical, social, exploration, nondistress vocalization, and distress communication domains. The current study sought to examine links connecting these previously identified maternal domains and factors with infant behavior domains using structural equation models.

Mothers' dyadic factor is associated with infant social behaviors with mother; and mothers' extradyadic factor and encouragement of infant physical development are associated with infant exploration of their immediate physical environment and physical development. Infant distress communication (and less nondistress vocalization) is associated with more maternal nurturing.

Mothers' parenting practices in the middle of the first year of infant life are commonly structured and adapted to specific needs and developmental tasks of infants. Evaluations of mother-infant interactions with national and international samples permit a wide yet judicious analysis of common vs. specific models of mother-infant relationships.
https://www.frontiersin.org/articles/10.3389/frcha.2023.1124037/full

Frontiers in Earth Science

PAPERS

ANDREU OLLÉ et al – The earliest European Acheulean: new insights into the large shaped tools from the late Early Pleistocene site of Barranc de la Boella (Tarragona, Spain)

Since the oldest known Acheulean lithic techno-typological features in Europe were reported at the site of Barranc de la Boella (Tarragona, Spain), continuous fieldwork has been conducted there in archeological deposits of the late Early Pleistocene age (0.99–0.78 Ma). As a result, excavations in two of the three open-air localities have significantly expanded the collection of lithic and faunal remains, allowing us to make progress in the interpretation of the hominin behaviors in an open-air fluvial-deltaic sedimentary environment. This includes examples of cumulative palimpsests, such as those found at the locality of La Mina, in which hominins only had a minimal role as modifying agents, as well as the extraordinary mammoth butchery site recorded at the Pit 1 locality. The aim of this paper is to present a comprehensive update of the collection of large shaped tools and to assess its significance in the framework of the earliest occurrence of the Acheulean in Europe. This cultural entity is increasingly well-documented for the early Middle Pleistocene, but very little is known about its

presence in Europe before the Brunhes–Matuyama boundary. Large shaped tools appear in the three localities explored in the Unit II of Barranc de la Boella, including choppers (unifacial and bifacial) and standard Acheulean forms, such as picks, knives, and cleaver-like forms. Techno-typological and morphometrical analyses revealed a basic heavy-duty component obtained through simple shaping sequences coupled with significantly more elaborate tools produced on various large blanks (cobbles, slabs, or flakes). The complete bifacial and bilateral shapings have yet to be documented, but the present specific tool assemblage attests to the Early Acheulean technological threshold. Hence, the archaeological data from Barranc de la Boella provide insights into the first appearance of the Acheulean technology in Europe and add critical information to the debate on the technological variability of the Early Pleistocene hominin occupation of the continent. The results of this study revealed a technological assemblage unique in the known late Early Pleistocene archeological record from Europe, different from the rest of ancient Acheulean sites in this continent, which are dated at the Middle Pleistocene. This lends support to the hypothesis that Barranc de la Boella may represent a previously unrecognized Early Acheulean dispersion out of Africa connected to its first evidence at the gates of Eurasia, potentially moving over the northern Mediterranean coastal road to reach Western Europe.
https://www.frontiersin.org/articles/10.3389/feart.2023.1188663/full

Frontiers in Ecology and Evolution

PAPERS

ALLISON R. LAU, ASHLEY D. CUNNINGHAM & KAREN L. BALES – Pairing status and stimulus type predict responses to audio playbacks in female titi monkeys

Some paired primates use complex, coordinated vocal signals to communicate within and between family groups. The information encoded within those signals is not well understood, nor is the intricacy of individuals' behavioral and physiological responses to these signals. Considering the conspicuous nature of these vocal signals, it is a priority to better understand paired primates' responses to conspecific calls. Pair-bonded titi monkeys (Plecturocebus cupreus) sing duets comprised of the male and female's long call. Here, we use a playback study to assess female titi monkeys' responses to different vocal stimuli based on the subject's pairing status. Six adult female titi monkeys participated in the study at two timepoints—pre-pairing and post-pairing. At each timepoint, subjects underwent three distinct playbacks—control recording, male solo vocalization, and pair duet. Behaviors such as locomotion and vocalizations were scored during and after the playback, and cortisol and androgen values were assessed via a plasma blood sample. Female titi monkeys attended more to social signals compared to the control, regardless of pairing status. However, in the time immediately following any playback type, female titi monkeys trilled more and spent a greater proportion of time locomoting during pre-pairing timepoints (compared to post-pairing). Female titi monkeys' behavioral responses to social audio stimuli, combined with subjects' increases in cortisol and androgens as paired individuals, imply female titi monkeys attend and respond to social signals territorially.
https://www.frontiersin.org/articles/10.3389/fevo.2023.1145205/full

Frontiers in Language Sciences

PAPERS

BRENNAN GONERING & DAVID P. CORINA – The neurofunctional network of syntactic processing: cognitive systematicity and representational specializations of objects, actions, and events

Theoretical accounts of syntax are broadly divided into lexicalist or construction-based viewpoints, where lexicalist traditions argue that a great deal of syntactic information is stored in lexical representations, while construction-based views argue for separate representations of multiword syntactic structures. Moreover, a strict autonomy between syntactic and semantic processing has been posited based on the grammatical well-formedness of non-sense sentences such as This round table is square. In this paper, we provide an overview of these competing conceptions of syntactic structure and the role of syntax in grammar. We review converging neuroimaging, electrophysiological, behavioral, electrocorticographic, and computational modeling evidence that challenge these views. In particular, we show that a temporal lobe ventral stream is crucial in processing phrases involving nouns and attributive adjectives, while a dorsal stream involving left parietal regions, including the angular gyrus, is crucial in processing constructions involving verbs and relational adjectives. We additionally support this interpretation by examining divergent pathways in the visual system for processing object information and event/spatial information, on the basis of integration across visual and auditory modalities. Our interpretation suggests that combinatorial operations which combine words into phrases cannot be isolated to a single anatomical location, as has been previously proposed—instead, it is an instantiation of a more general neural computation, one that is implemented across various brain regions and can be utilized in service of constructing linguistic phrases. Based on this orientation, we explore how abstract syntactic constructions, such as the transitive construction, both mirror and could emerge from semantics. These abstract construction representations are argued to be distinct from, and stored in regions functionally downstream from, lexical representations of verbs. Comprehension therefore involves the integration of both representations via feedforward and feedback connections. We implicate the IFG in communicating across the language network, including correctly integrating nominal phrases with the overall event representation and serving as one interface between processing streams. Overall, this approach accords more generally with conceptions of the development of cognitive systematicity, and further draws

attention to a potential role for the medial temporal lobe in syntactic behaviors, often overlooked in current neurofunctional accounts of syntactic processing.
https://www.frontiersin.org/articles/10.3389/flang.2023.1176233/full

Frontiers in Psychology

PAPERS

YANG LIU et al – Exploring the neurobiology of Merge at a basic level: insights from a novel artificial grammar paradigm

Human language allows us to generate an infinite number of linguistic expressions. It's proposed that this competence is based on a binary syntactic operation, Merge, combining two elements to form a new constituent. An increasing number of recent studies have shifted from complex syntactic structures to two-word constructions to investigate the neural representation of this operation at the most basic level.
This fMRI study aimed to develop a highly flexible artificial grammar paradigm for testing the neurobiology of human syntax at a basic level. During scanning, participants had to apply abstract syntactic rules to assess whether a given two-word artificial phrase could be further merged with a third word. To control for lower-level template-matching and working memory strategies, an additional non-mergeable word-list task was set up.
Behavioral data indicated that participants complied with the experiment. Whole brain and region of interest (ROI) analyses were performed under the contrast of "structure > word-list." Whole brain analysis confirmed significant involvement of the posterior inferior frontal gyrus [pIFG, corresponding to Brodmann area (BA) 44]. Furthermore, both the signal intensity in Broca's area and the behavioral performance showed significant correlations with natural language performance in the same participants. ROI analysis within the language atlas and anatomically defined Broca's area revealed that only the pIFG was reliably activated.
Taken together, these results support the notion that Broca's area, particularly BA 44, works as a combinatorial engine where words are merged together according to syntactic information. Furthermore, this study suggests that the present artificial grammar may serve as promising material for investigating the neurobiological basis of syntax, fostering future cross-species studies.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1151518/full

NORAH E. DUNBAR et al – Detecting ulterior motives from verbal cues in group deliberations

Forensic interviewing entails practitioners interviewing suspects to secure valid information and elicit confessions. Such interviews are often conducted in police stations but may also occur in field settings such as border crossings, security checkpoints, bus terminals, and sports venues. Because these real-world interviews often lack experimental control and ground truth, this investigation explored whether results of non-forensic interviews generalize to forensic ones.
Organizational espionage was simulated to determine (1) what verbal signals distinguish truth from deception, (2) whether deception in groups aligns with deception in dyads, and (3) whether non-forensic venues can be generalized to forensic ones. Engaging in a mock hiring deliberation, participants (4–5 strangers) reviewed and discussed resumes of potential candidates. Surreptitiously, two group members assigned the role of "organizational spies" attempted to persuade the group to hire an inferior candidate. Each group member presented notes from an interview of "their" candidate, followed by a discussion of all candidates. Spies were to use any means possible, including deception, to persuade others to select their candidate. A financial incentive was offered for having one's candidate chosen. The interview reports and discussions were transcribed and analyzed with SPLICE, an automated text analysis program.
Deceivers were perceived as less trustworthy than truth-tellers, especially when the naïve players won but overall, deceivers were difficult for non-spies to detect even though they were seen as less trustworthy than the naïve participants. Deceivers' language was more complex and exhibited an "echoing" strategy of repeating others' opinions. This collusion evolved naturally, without pre-planning. No other verbal differences were evident, which suggests that the difference between spies and non-spies was subtle and difficult for truth-tellers to spot.
Whether deception can be successfully detected hinges on a variety of factors including the deceiver's skill to disguise and the detector's ability to sense and process information. Furthermore, the group dynamics and communication context subtly moderate how deception manifests and influence the accuracy of detecting ulterior motives. Our future investigations could encompass non-verbal communication channels and verbal patterns rooted in content, thereby providing a more comprehensive understanding of deception detection.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1166225/full

CHU YI YU et al – Perceived rhythmic regularity is greater for song than speech: examining acoustic correlates of rhythmic regularity in speech and song

Rhythm is a key feature of music and language, but the way rhythm unfolds within each domain differs. Music induces perception of a beat, a regular repeating pulse spaced by roughly equal durations, whereas speech does not have the same isochronous framework. Although rhythmic regularity is a defining feature of music and language, it is difficult to derive acoustic indices of the differences in rhythmic regularity between domains. The current study examined whether participants could provide subjective ratings of rhythmic regularity for acoustically matched (syllable-, tempo-, and contour-matched) and

acoustically unmatched (varying in tempo, syllable number, semantics, and contour) exemplars of speech and song. We used subjective ratings to index the presence or absence of an underlying beat and correlated ratings with stimulus features to identify acoustic metrics of regularity. Experiment 1 highlighted that ratings based on the term "rhythmic regularity" did not result in consistent definitions of regularity across participants, with opposite ratings for participants who adopted a beat-based definition (song greater than speech), a normal-prosody definition (speech greater than song), or an unclear definition (no difference). Experiment 2 defined rhythmic regularity as how easy it would be to tap or clap to the utterances. Participants rated song as easier to clap or tap to than speech for both acoustically matched and unmatched datasets. Subjective regularity ratings from Experiment 2 illustrated that stimuli with longer syllable durations and with less spectral flux were rated as more rhythmically regular across domains. Our findings demonstrate that rhythmic regularity distinguishes speech from song and several key acoustic features can be used to predict listeners' perception of rhythmic regularity within and across domains as well.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1167003/full

iScience

PAPERS

STUART K. WATSON et al with SIMON W. TOWNSEND – Cognitive constraints on vocal combinatoriality in a social bird
A critical component of language is the ability to recombine sounds into larger structures. Although animals also reuse sound elements across call combinations to generate meaning, examples are generally limited to pairs of distinct elements, even when repertoires contain sufficient sounds to generate hundreds of combinations. This combinatoriality might be constrained by the perceptual-cognitive demands of disambiguating between complex sound sequences that share elements. We test this hypothesis by probing the capacity of chestnut-crowned babblers to process combinations of two versus three distinct acoustic elements. We found babblers responded quicker and for longer towards playbacks of recombined versus familiar bi-element sequences, but no evidence of differential responses towards playbacks of recombined versus familiar tri-element sequences, suggesting a cognitively prohibitive jump in processing demands. We propose that overcoming constraints in the ability to process increasingly complex combinatorial signals was necessary for the productive combinatoriality that is characteristic of language to emerge.
https://www.cell.com/iscience/fulltext/S2589-0042(23)01054-4

Linguistic Anthropology

PAPERS

JAN DAVID HAUCK – Language otherwise: Linguistic natures and the ontological challenge
Linguistic anthropology has remained largely unaffected by debates about ontology in other subfields. In turn, the concept of language has been conspicuously absent from ontological debates. The past few years, however, have seen attempts at articulating the two, interrogating what language is from ethnographic perspectives and extending the analytic focus to ontologies of language or linguistic natures. This article discusses such efforts and compares them to previous critical engagements with the concept of language. Calling into question the ontological equivalence of language within and across cultures, communities, and regions, it explores understandings of what language is that go against the grain of existing theoretical models.
https://anthrosource.onlinelibrary.wiley.com/doi/full/10.1111/jola.12384

Nature

ARTICLES

ENI MUSTAFARAJ – People, not search-engine algorithms, choose unreliable or partisan news
Analysis of people's web searches and visited websites suggests that it is more likely that they are choosing to engage with partisan or unreliable news than that they are being unduly exposed to it by search-engine algorithms.
https://www.nature.com/articles/d41586-023-01634-5

Nature Communications Biology

PAPERS

PATRICK J. TKACZYNSKI et al with KLAUS ZUBERBUEHLER & CATHERINE CROCKFORD – Shared community effects and the non-genetic maternal environment shape cortisol levels in wild chimpanzees
Mechanisms of inheritance remain poorly defined for many fitness-mediating traits, especially in long-lived animals with protracted development. Using 6,123 urinary samples from 170 wild chimpanzees, we examined the contributions of genetics, non-genetic maternal effects, and shared community effects on variation in cortisol levels, an established predictor of survival in long-lived primates. Despite evidence for consistent individual variation in cortisol levels across years, between-group effects were more influential and made an overwhelming contribution to variation in this trait. Focusing on within-group variation, non-genetic maternal effects accounted for 8% of the individual differences in average cortisol levels, significantly more than that attributable to genetic factors, which was indistinguishable from zero. These maternal effects are

consistent with a primary role of a shared environment in shaping physiology. For chimpanzees, and perhaps other species with long life histories, community and maternal effects appear more relevant than genetic inheritance in shaping key physiological traits.
https://www.nature.com/articles/s42003-023-04909-9

Nature Human Behaviour

ARTICLES

MATTHEW I. BILLET & ARA NORENZAYAN – Global supernatural beliefs
Supernatural beliefs shape how people understand the world, but there is debate regarding how these beliefs relate to the natural or social world. Jackson and colleagues quantitatively analysed the ethnographic record and found evidence that supernatural explanations are more commonly used for natural than for social phenomena.
https://www.nature.com/articles/s41562-023-01568-y

MARC-LLUÍS VIVES & ORIEL FELDMANHALL – People who are averse to uncertainty exhibit expanded semantic representations
Semantic representations enable humans to identify stimuli. We illustrate that the organization of semantic representations is in part shaped by psychological needs: people who are averse to uncertainty have more-differentiated and separable semantic representations than individuals who are tolerant of uncertainty, and this separation predicts improved discrimination but poorer generalization.
https://www.nature.com/articles/s41562-023-01566-0

PAPERS

JOSHUA CONRAD JACKSON et al – Supernatural explanations across 114 societies are more common for natural than social phenomena
Humans across the globe use supernatural beliefs to explain the world around them. This article explores whether cultural groups invoke the supernatural more to explain natural phenomena (for example, storms, disease outbreaks) or social phenomena (for example, murder, warfare). Quantitative analysis of ethnographic text across 114 geographically and culturally diverse societies found that supernatural explanations are more prevalent for natural than for social phenomena, consistent with theories that ground the origin of religious belief in a human tendency to perceive intent and agency in the natural world. Despite the dominance of supernatural explanations of natural phenomena, supernatural explanations of social phenomena were especially prevalent in urbanized societies with more socially complex and anonymous groups. Our results show how people use supernatural beliefs as explanatory tools in non-industrial societies, and how these applications vary across small-scale communities versus large and urbanized groups.
https://www.nature.com/articles/s41562-023-01558-0

MARC-LLUÍS VIVES et al – Uncertainty aversion predicts the neural expansion of semantic representations
Correctly identifying the meaning of a stimulus requires activating the appropriate semantic representation among many alternatives. One way to reduce this uncertainty is to differentiate semantic representations from each other, thereby expanding the semantic space. Here, in four experiments, we test this semantic-expansion hypothesis, finding that uncertainty-averse individuals exhibit increasingly differentiated and separated semantic representations. This effect is mirrored at the neural level, where uncertainty aversion predicts greater distances between activity patterns in the left inferior frontal gyrus when reading words, and enhanced sensitivity to the semantic ambiguity of these words in the ventromedial prefrontal cortex. Two direct tests of the behavioural consequences of semantic expansion further reveal that uncertainty-averse individuals exhibit reduced semantic interference and poorer generalization. Together, these findings show that the internal structure of our semantic representations acts as an organizing principle to make the world more identifiable.
https://www.nature.com/articles/s41562-023-01561-5

BRUNO VERSCHUERE et al – The use-the-best heuristic facilitates deception detection
Decades of research have shown that people are poor at detecting deception. Understandably, people struggle with integrating the many putative cues to deception into an accurate veracity judgement. Heuristics simplify difficult decisions by ignoring most of the information and relying instead only on the most diagnostic cues. Here we conducted nine studies in which people evaluated honest and deceptive handwritten statements, video transcripts, videotaped interviews or live interviews. Participants performed at the chance level when they made intuitive judgements, free to use any possible cue. But when instructed to rely only on the best available cue (detailedness), they were consistently able to discriminate lies from truths. Our findings challenge the notion that people lack the potential to detect deception. The simplicity and accuracy of the use-the-best heuristic provides a promising new avenue for deception research.
https://www.nature.com/articles/s41562-023-01556-2

MENOUA KESHISHIAN et al – Joint, distributed and hierarchically organized encoding of linguistic features in the human auditory cortex

The precise role of the human auditory cortex in representing speech sounds and transforming them to meaning is not yet fully understood. Here we used intracranial recordings from the auditory cortex of neurosurgical patients as they listened to natural speech. We found an explicit, temporally ordered and anatomically distributed neural encoding of multiple linguistic features, including phonetic, prelexical phonotactics, word frequency, and lexical–phonological and lexical–semantic information. Grouping neural sites on the basis of their encoded linguistic features revealed a hierarchical pattern, with distinct representations of prelexical and postlexical features distributed across various auditory areas. While sites with longer response latencies and greater distance from the primary auditory cortex encoded higher-level linguistic features, the encoding of lower-level features was preserved and not discarded. Our study reveals a cumulative mapping of sound to meaning and provides empirical evidence for validating neurolinguistic and psycholinguistic models of spoken word recognition that preserve the acoustic variations in speech.
https://www.nature.com/articles/s41562-023-01520-0

Nature Reviews Psychology

PAPERS

SOTARO KITA & KAREN EMMOREY – Gesture links language and cognition for spoken and signed languages

Human communication combines language with gesture. Gesture contributes to the uniquely human ability to communicate about an infinite number of ideas in an efficient way and to generate representations that are useful for thinking. Gesture and language can be distinguished by distinct underlying modes of thinking and by gradations of conventionalization and the transparency of form–meaning relations. However, it is not always possible or useful to draw a sharp line between gesture and language. In this Review, we first describe how speakers and signers produce facial, manual, and body gestures. Then, we describe how representational gesture encodes information, considering the constraints from properties of languages, and how speakers and signers orchestrate language and gesture. Next, we review how gesture production shapes thinking for both signers and speakers, and consider gesture comprehension and how the meaning of gestures is integrated with language. We conclude with suggestions for further exploration of gesture as a critical expression of the human mind.
https://www.nature.com/articles/s44159-023-00186-9

Nature Scientific Reports

PAPERS

DYLAN FALTINE-GONZALEZ, JAMIE HAVRILAK & MICHAEL J. LAYDEN – The brain regulatory program predates central nervous system evolution

Understanding how brains evolved is critical to determine the origin(s) of centralized nervous systems. Brains are patterned along their anteroposterior axis by stripes of gene expression that appear to be conserved, suggesting brains are homologous. However, the striped expression is also part of the deeply conserved anteroposterior axial program. An emerging hypothesis is that similarities in brain patterning are convergent, arising through the repeated co-option of axial programs. To resolve whether shared brain neuronal programs likely reflect convergence or homology, we investigated the evolution of axial programs in neurogenesis. We show that the bilaterian anteroposterior program patterns the nerve net of the cnidarian Nematostella along the oral-aboral axis arguing that anteroposterior programs regionalized developing nervous systems in the cnidarian–bilaterian common ancestor prior to the emergence of brains. This finding rejects shared patterning as sufficient evidence to support brain homology and provides functional support for the plausibility that axial programs could be co-opted if nervous systems centralized in multiple lineages.
https://www.nature.com/articles/s41598-023-35721-4

New Scientist

NEWS

Stone Age blueprints are the oldest architectural plans ever found

Plans etched into stone tablets depict vast hunting traps called desert kites built 9000 years ago, showing a mastery of geometry long before the invention of writing.
https://www.newscientist.com/article/2373937-stone-age-blueprints-are-the-oldest-architectural-plans-ever-found/

Octopuses may have nightmares about predators attacking them

An octopus in an aquarium has been filmed going from deep sleep to thrashing and releasing ink - an anti-predator response that suggests it was dreaming about being attacked.
https://www.newscientist.com/article/2373884-octopuses-may-have-nightmares-about-predators-attacking-them/

PLoS One

PAPERS

JINHWAN KWON & HIROMI KOTANI – Head motion synchrony in unidirectional and bidirectional verbal communication

Interpersonal communication includes verbal and nonverbal communication. Verbal communication comprises one-way (e.g., a speech or lecture) and interactive verbal communication (e.g., daily conversations or meetings), which we frequently encounter. Nonverbal communication has considerable influence on interpersonal communication, and body motion synchrony is known to be an important factor for successful communication and social interaction. However, most research on body motion synchrony has been elucidated by either the setting of one-way verbal transmission or the verbal interaction setting, and it remains unclear whether verbal directionality and interactivity affect body motion synchrony. One-way and two-way (interactive) verbal communication is implicated in designed or undesigned leader–follower relationships, and also in the complexity and diversity of interpersonal interactions, where two-way verbal communication is more complex and diverse than in the one-way condition. In this study, we tested head motion synchrony between the one-way verbal communication condition (in which the roles of the speaker and listener are fixed) and the two-way verbal communication condition (where the speaker and listener can freely engage in a conversation). Therefore, although no statistically significant difference in synchrony activity (relative frequency) was found, a statistically significant difference was observed in synchrony direction (temporal lead-lag structure as mimicry) and intensity. Specifically, the synchrony direction in two-way verbal communication was close to zero, but this in one-way verbal communication was synchronized with the listener's movement predominantly delayed. Furthermore, synchrony intensity, in terms of the degree of variation in the phase difference distribution, was significantly higher in the one-way verbal communication than in the two-way condition, with bigger time-shifts being observed in the latter. This result suggests that verbal interaction does not affect the overall frequency of head motion synchrony but does affect the temporal lead-lag structure and coherence.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0286098

CAROLINE KAERCHER KRAMER & CRISTIANE BAUERMANN LEITAO – Laughter as medicine: A systematic review and meta-analysis of interventional studies evaluating the impact of spontaneous laughter on cortisol levels

Laughter as an expression of humor has been recognized as good medicine for centuries. The health benefits of humor-induced well-being remain unclear and thus we conducted a systematic review and meta-analysis of interventional studies to evaluate the impact of spontaneous laughter on stress response as measured by cortisol levels.
Eight studies (315 participants; mean age 38.6) met our inclusion criteria; four were randomized placebo-controlled trials (RCTs) and four were quasi-experiment studies. Five studies evaluated the impact of watching a humor/comedy video, two studies evaluating laughter sessions administered by a trained laughter therapist, and one study evaluating a self-administered laughter program. Pooling these data showed a significant reduction in cortisol levels by 31.9% (95%CI -47.7% to -16.3%) induced by laughter intervention compared to control group with no evidence of publication bias (P = 0.66). Sensitivity analyses demonstrated that even a single laughter session induced a significant reduction of 36.7% in cortisol (95%CI -52.5% to -20.8%). In addition, analyses including the four RCTs reinforced these results by demonstrating a significant reduction in cortisol levels promoted by laughter as compared to the placebo arm [-37.2% (95%CI -56.3% to -18.1%)]. Current evidence demonstrates that spontaneous laughter is associated with greater reduction in cortisol levels as compared with usual activities, suggesting laughter as a potential adjunctive medical therapy to improve well-being.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0286260

Royal Society Open Science

PAPERS

DOUGLAS BROWN & STEVEN WRATHMALL – Geographical modelling of language decline

Competition between languages affects the lives of people all over the globe, and a huge number of languages are at risk of extinction. In this work, statistical physics is applied to modelling the decline of one language in competition with another. A model from the literature is used and adapted to model the interactions among speakers in a population distribution over time, and is applied to historical data for Cornish and Welsh. Visual, geographical models show the simulated decline of the real languages studied, and a number of qualitative and quantitative features from the historical data are captured by the model. The applicability of the model to further real situations is discussed, as well as adaptations that would be needed to better take account of migration and population dynamics.
https://royalsocietypublishing.org/doi/10.1098/rsos.221045

LILY JOHNSON-ULRICH et al with MARTA B. MANSER – Directional speakers as a tool for animal vocal communication studies

Audio playbacks are a common experimental tool in vocal communication research. However, low directionality of sound makes it hard to control the audience exposed to the stimuli. Parametric speakers offer a solution for transmitting directional audible signals by using ultrasonic carrier waves. The targeted transmission of vocal signals offers exciting opportunities for testing the diffusion of information in animal groups and mechanisms for resolving informational ambiguities. We have field tested the quality and directionality of a commercial parametric speaker, Soundlazer SL-01. Additionally, we assessed its

usability for performing playback experiments by comparing behavioural responses of free-ranging meerkats (Suricata suricatta) with calls transmitted from conventional and parametric speakers. Our results show that the tested parametric speaker is highly directional. However, the acoustic structure of meerkat calls was strongly affected and low frequencies were not reliably reproduced by the parametric speaker. The playback trials elicited weakened behavioural responses probably due to the partial distortion of the signal but also indicating the potential importance of social facilitation for initiating mobbing events in meerkats. We conclude that parametric speakers can be useful tools for directed transmission of animals calls but after a careful assessment of signal fidelity.
https://royalsocietypublishing.org/doi/10.1098/rsos.230489

VITTORIA ROATTI et al – Social network inheritance and differentiation in wild baboons
Immatures' social development may be fundamental to understand important biological processes, such as social information transmission through groups, that can vary with age and sex. Our aim was to determine how social networks change with age and differ between sexes in wild immature baboons, group-living primates that readily learn socially. Our results show that immature baboons inherited their mothers' networks and differentiated from them as they aged, increasing their association with partners of similar age and the same sex. Males were less bonded to their matriline and became more peripheral with age compared to females. Our results may pave the way to further studies testing a new hypothetical framework: in female-philopatric societies, social information transmission may be constrained at the matrilineal level by age- and sex-driven social clustering.
https://royalsocietypublishing.org/doi/10.1098/rsos.230219

Science

ARTICLES

ELIZABETH PENNISI – Tales of the tongue
Since first evolving 350 million years ago, the tongue has taken myriad forms, unlocking new niches and boosting the diversity of life
https://www.sciencemagazinedigital.org/sciencemagazine/library/item/26_may_2023/4103866/

REVIEWS

ANGELA SAINI – The Female Turn: How Evolutionary Science Shifted Perceptions About Females [PODCAST]
Evolutionary biology has historically rendered female animals as passive recipients of sexual selection, but that view has shifted as researchers have begun to focus more on female anatomy and behavior. This week on the Science podcast, Malin Ah-King describes how new research is revealing the active sexual strategies used by females across the animal kingdom. Review of 'The Female Turn: How Evolutionary Science Shifted Perceptions About Females' by Malin Ah-King. Palgrave Macmillan, 2023.
https://www.science.org/doi/10.1126/science.adi5088

Trends in Cognitive Sciences

PAPERS

ROGER E. BEATY & YOED N. KENETT – Associative thinking at the core of creativity
Creativity has long been thought to involve associative processes in memory: connecting concepts to form ideas, inventions, and artworks. However, associative thinking has been difficult to study due to limitations in modeling memory structure and retrieval processes. Recent advances in computational models of semantic memory allow researchers to examine how people navigate a semantic space of concepts when forming associations, revealing key search strategies associated with creativity. Here, we synthesize cognitive, computational, and neuroscience research on creativity and associative thinking. This Review highlights distinctions between free- and goal-directed association, illustrates the role of associative thinking in the arts, and links associative thinking to brain systems supporting both semantic and episodic memory – offering a new perspective on a longstanding creativity theory.
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(23)00094-3

Trends in Ecology and Evolution

PAPERS

CHARLOTTE DE VRIES & JUSSI LEHTONEN – Sex-specific assumptions and their importance in models of sexual selection
Sexual selection is a field coloured by tension and contrasting views. One contested claim is the causal link from the definition of the sexes (anisogamy) to divergent selection on the sexes. Does theory truly engage with this claim? We survey the extent to which theory makes sex-specific assumptions and engages with anisogamy, and discuss these issues in a broader context. The majority of theory in sexual selection makes sex-specific assumptions and does not engage with the definition of the sexes. While this does not invalidate existing results, debates and criticisms regarding sexual selection force

us to think deeper about its logical foundations. We discuss ways to strengthen the foundations of sexual selection theory by relaxing central assumptions.
https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(23)00110-6

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