EAORC BULLETIN 1,069 – 10 December 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.

ACADEMIA.EDU – Archaic and Modem Humans in the Levantine Mousterian

American Anthropologist 96:2, 300-332 (1994).

DANIEL LIEBERMAN & JOHN SHEA – Behavioral Differences between Archaic and Modem Humans in the Levantine Mousterian

Early modern and archaic humans are associated 7uith similar lithic industries in he Middle Paleolithic of the southern Levant, but new data suggest that they used the environment indifferent ways. Evidence from analyses of seasonally deposited increments of the teeth of the animals they hunted suggests that modern humans primarily practiced a strategy of circulating seasonal mobility, while archaic humans in the same region 30,000 years later were more residentially mobile. Analyses of their lithic hunting technology further suggest that archaic humans hunted more frequently than did modern humans. We argue that this greater hunting intensity may have been a strategy for coping with the consequences of resource biodepletion resulting from long-term, multiseasonal occupation of sites. These behavioral contrasts may be related to some of the morphological differences between early modern and archaic humans.

https://www.academia.edu/2619386/Daniel_E_Lieberman_and_John_J_Shea_1994_Behavioral_Differences_Between_Archaic_and_Modern_Humans_in_the_Levantine_Mousterian_American_Anthropologist_96_2_300_332

ACADEMIA.EDU – Darwinism, traditional linguistics and the new Palaeolithic Continuity Theory

In Nathalie Gontier, Jean Paul Bendegem & Diederik Aerts (eds.), Evolutionary Epistemology, Language and Culture: A Non-Adaptationist, Systems Theoretical Approach. Springer, 121-147 (2005).

MARIO ALINEI – Darwinism, traditional linguistics and the new Palaeolithic Continuity Theory of language evolution.

As the author has shown in previous work, although linguistics as a science was born in Darwin's century, Darwinism's influence on it was superficial and produced the mystifying, but still current, view that language is a living organism, and language change an organic law. Language is, instead, a social artefact with an interface with nature, which is governed by the law of conservation and changes only exceptionally. Since language is innate—as claimed by Chomsky and now demonstrated by natural sciences—and Homo was thus born loquens, the evolution of language—and all world languages, including Indo-European (IE)—must be mapped onto the entire course of human cultural evolution, in the new framework provided by the Palaeolithic Continuity Theory (PCT).

https://www.academia.edu/21757249/Darwinism_traditional_linguistics_and_the_new_Palaeolithic_Continuity_Theory_of_language_evolution

OTHER PUBLICATIONS – The two Chomskys

AEON, 8 December 2023

CHRIS KNIGHT – The two Chomskys

Noam Chomsky rose to fame in the 1960s and even now, in the 21st century, he is still considered one of the greatest intellectuals of all time. His prominence as a political analyst on the one hand, and theoretical linguist on the other, simply has no parallel. What remains unclear is quite how the two sides of the great thinker's work connect up.

https://aeon.co/essays/an-anthropologist-studies-the-warring-ideas-of-noam-chomsky

NEWS

GUARDIAN SCIENCE – Singing to babies is vital to help them learn language, say scientists

According to scientists from the University of Cambridge, there's more to the earworm than infuriating parents across the English-speaking world – they have found that singsong speech is crucial to helping babies learn language. The study concluded that infants learn languages from rhythmic information – the rise and fall of tone – as seen in nursery rhymes or songs, such as the ubiquitous alphabet song.

https://www.theguardian.com/science/2023/dec/01/singing-to-babies-is-vital-to-help-them-understand-language-say-scientists

NATURE BRIEFING – Scientists race to save ancient cave paintings

Some of the oldest pictures in the world were drawn more than 45,000 years ago in caves on the southwestern peninsula of Sulawesi in Indonesia. Despite having lasted so long, they're now disappearing as the surface of the cave walls is peeling off from the white limestone underneath. No one knows exactly why, but researchers point to pollution, climate change, human exhalations and the dust and vibrations produced by mining as possible causes. Scientists are scrambling to solve the mystery before the paintings are lost for good.

https://www.nature.com/immersive/d41586-023-03818-5/index.html

SAPIENS – What Klingon and Other Constructed Languages Reveal

Meet Christine Schreyer, a linguistic anthropologist who created the Kryptonian language for a Superman movie and researches the people who invent new tongues and seek to sustain ancient ones.
https://www.sapiens.org/language/christine-schreyer-language/

SCIENCEADVISER – What's really going on inside the minds of farm animals?

If you've ever seen a cow staring vacantly across a field, or a pig rolling around in its own filth, you might not think there's a lot going on in their head. You wouldn't be alone. People haven't given much credence to the intelligence of farm animals, and neither have scientists. But that's starting to change.
https://www.science.org/content/article/not-dumb-creatures-livestock-surprise-scientists-their-complex-emotional-minds

SCIENCE.ORG NEWS – Livestock surprise scientists with their complex, emotional minds

A growing field of research is challenging long-held assumptions about goats, pigs, and other farm animals.
https://www.science.org/content/article/not-dumb-creatures-livestock-surprise-scientists-their-complex-emotional-minds

THE CONVERSATION – Sapolsky says science shows free will doesn't exist. Here's why he's mistaken

Sapolsky summarises the latest scientific research relevant to determinism: the idea that we're causally 'determined' to act as we do and couldn't possibly act any other way.
https://theconversation.com/a-stanford-professor-says-science-shows-free-will-doesnt-exist-heres-why-hes-mistaken-218525

THE CONVERSATION – Noam Chomsky turns 95: the social justice advocate paved the way for AI

Could Chomsky have foreseen where his contributions would lead us?
{Shackell seems to miss an important point, although he emphasises its importance: Chomsky's model of language is not the model of language used in AI applications. Neural networks are primarily not generative, they apply brute force to find structure and meaning through association. For Chomsky, both structure and meaning are the product of pre-existing innate faculties. It is difficult to see how a Chomskyan approach to language could ever be of practical use in AI. It is more likely, as Knight (above) discusses, that Chomsky deliberately designed his approach to language structure to exclude its application to AI.}
https://theconversation.com/noam-chomsky-turns-95-the-social-justice-advocate-paved-the-way-for-ai-does-it-keep-him-up-at-night-218034

PUBLICATIONS

Biolinguistics

PAPERS

DAIKI MATSUMOTO- Social Evolution and Commitment: Bridging the Gap Between Formal Linguistic Theories and Language Evolution Research

This article argues based on some concrete empirical evidence that what is called "(social) commitment" is grammaticalized in human language at the latest stage in the evolution of syntax. It is further argued that as a result of this grammaticalization process, our ancestors acquired a way of making their linguistic communication sufficiently trustable/reliable, by encoding the signaler's liability to the truthfulness of what is communicated. That is, the presence of commitment as a concrete grammatical element provided our species with a way of (indirectly) solving the problem of dishonesty of linguistic signals. The proposal is made in such a way that its validity can be tested by experimental means, and hence it is hoped that the model presented in this article facilitates important collaborative works among theoretical linguists, (evolutionary) biologists, and other experimentalists. Overall, the idea laid out here aims to bridge the gap between formal linguistics and language evolution studies.
https://bioling.psychopen.eu/index.php/bioling/article/view/12787

Current Biology

ARTICLES

DAVID PITCHER – Visual neuroscience: A specialised neural pathway for social perception

Humans are an intensely social species. Our daily lives depend on understanding the behaviour and intentions of the people around us. A new study identifies a neural pathway specialised for interpreting the physical actions that we use to understand others.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)01378-7

PAPERS

EMALIE MCMAHON, MICHAEL F. BONNER & LEYLA ISIK – Hierarchical organization of social action features along the lateral visual pathway

Recent theoretical work has argued that in addition to the classical ventral (what) and dorsal (where/how) visual streams, there is a third visual stream on the lateral surface of the brain specialized for processing social information. Like visual representations in the ventral and dorsal streams, representations in the lateral stream are thought to be hierarchically organized. However, no prior studies have comprehensively investigated the organization of naturalistic, social visual content in the lateral stream. To address this question, we curated a naturalistic stimulus set of 250 3-s videos of two people engaged in everyday actions. Each clip was richly annotated for its low-level visual features, mid-level scene and object properties, visual social primitives (including the distance between people and the extent to which they were facing), and high-level information about social interactions and affective content. Using a condition-rich fMRI experiment and a within-subject encoding model approach, we found that low-level visual features are represented in early visual cortex (EVC) and middle temporal (MT) area, mid-level visual social features in extrastriate body area (EBA) and lateral occipital complex (LOC), and high-level social interaction information along the superior temporal sulcus (STS). Communicative interactions, in particular, explained unique variance in regions of the STS after accounting for variance explained by all other labeled features. Taken together, these results provide support for representation of increasingly abstract social visual content—consistent with hierarchical organization—along the lateral visual stream and suggest that recognizing communicative actions may be a key computational goal of the lateral visual pathway.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)01373-8

JAMES P. TUMULTY et al – Evidence for a selective link between cooperation and individual recognition

The ability to recognize others is a frequent assumption of models of the evolution of cooperation. At the same time, cooperative behavior has been proposed as a selective agent favoring the evolution of individual recognition abilities. Although theory predicts that recognition and cooperation may co-evolve, data linking recognition abilities and cooperative behavior with evidence of selection are elusive. Here, we provide evidence of a selective link between individual recognition and cooperation in the paper wasp Polistes fuscatus through a combination of clinal, common garden, and population genomics analyses. We identified latitudinal clines in both rates of cooperative nesting and color pattern diversity, consistent with a selective link between recognition and cooperation. In behavioral experiments, we replicated previous results demonstrating individual recognition in cooperative and phenotypically diverse P. fuscatus from New York. In contrast, wasps from a less cooperative and phenotypically uniform Louisiana population showed no evidence of individual recognition. In a common garden experiment, groups of wasps from northern populations formed more stable and individually biased associations, indicating that recognition facilitates group stability. The strength of recent positive selection on cognition-associated loci likely to mediate individual recognition is substantially greater in northern compared with southern P. fuscatus populations. Collectively, these data suggest that individual recognition and cooperative nesting behavior have co-evolved in P. fuscatus because recognition helps stabilize social groups. This work provides evidence of a specific cognitive phenotype under selection because of social interactions, supporting the idea that social behavior can be a key driver of cognitive evolution.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)01582-8

ZHILEI ZHAO et al – Anterior forebrain pathway in parrots is necessary for producing learned vocalizations with individual signatures

Parrots have enormous vocal imitation capacities and produce individually unique vocal signatures. Like songbirds, parrots have a nucleated neural song system with distinct anterior (AFP) and posterior forebrain pathways (PFP). To test if song systems of parrots and songbirds, which diverged over 50 million years ago, have a similar functional organization, we first established a neuroscience-compatible call-and-response behavioral paradigm to elicit learned contact calls in budgerigars (Melopsittacus undulatus). Using variational autoencoder-based machine learning methods, we show that contact calls within affiliated groups converge but that individuals maintain unique acoustic features, or vocal signatures, even after call convergence. Next, we transiently inactivated the outputs of AFP to test if learned vocalizations can be produced by the PFP alone. As in songbirds, AFP inactivation had an immediate effect on vocalizations, consistent with a premotor role. But in contrast to songbirds, where the isolated PFP is sufficient to produce stereotyped and acoustically normal vocalizations, isolation of the budgerigar PFP caused a degradation of call acoustic structure, stereotypy, and individual uniqueness. Thus, the contribution of AFP and the capacity of isolated PFP to produce learned vocalizations have diverged substantially between songbirds and parrots, likely driven by their distinct behavioral ecology and neural connectivity.
https://www.cell.com/current-biology/fulltext/S0960-9822(23)01528-2

Frontiers in Communication

PAPERS

DAG HAUG & NILO PEDRAZZINI – The semantic map of when and its typological parallels

In this paper, we explore the semantic map of the English temporal connective when and its parallels in more than 1,000 languages drawn from a parallel corpus of New Testament translations. We show that there is robust evidence for a cross-

linguistic distinction between universal and existential WHEN. We also see tentative evidence that innovation in this area involves recruiting new items for universal WHEN which gradually can take over the existential usage. Another possible distinction that we see is between serialized events, which tend to be expressed with non-lexified constructions and framing/backgrounding constructions, which favor an explicit subordinator.
https://www.frontiersin.org/articles/10.3389/fcomm.2023.1163431/full

Frontiers in Human Neuroscience

PAPERS

GABRIELA DZIĘGIEL-FIVET, JOANNA BECK & KATARZYNA JEDNORÓG – The role of the left ventral occipitotemporal cortex in speech processing—The influence of visual deprivation

The role of the left ventral occipitotemporal cortex (vOT) in reading is well-established in both sighted and blind readers. Its role in speech processing remains only partially understood. Here, we test the involvement of the left vOT in phonological processing of spoken language in the blind (N = 50, age: 6.76–60.32) and in the sighted (N = 54, age: 6.79–59.83) by means of whole-brain and region-of-interest (including individually identified) fMRI analyses. We confirm that the left vOT is sensitive to phonological processing (shows greater involvement in rhyming compared to control spoken language task) in both blind and sighted participants. However, in the sighted, the activation was observed only during the rhyming task and in the speech-specific region of the left vOT, pointing to task and modality specificity. In contrast, in the blind group, the left vOT was active during speech processing irrespective of task and in both speech and reading-specific vOT regions. Only in the blind, the left vOT presented a higher degree of sensitivity to phonological processing than other language nodes in the left inferior frontal and superior temporal cortex. Our results suggest a changed development of the left vOT sensitivity to spoken language, resulting from visual deprivation.
https://www.frontiersin.org/articles/10.3389/fnhum.2023.1228808/full

Frontiers in Mammal Science

PAPERS

ZDRAVKO PETANJEK et al – Von Economo neurons as a specialized neuron class of the human cerebral cortex

By studying human cortical cytoarchitecture, von Economo noticed large spindle-shaped-neurons within layer Vb in the anterior-cingulate and fronto-insular cortex. Those neurons had such extremely elongated stick-like or corkscrew-like soma shape that appeared to him as a pathological alteration. Eventually, he realized that this was a specialized-type of neuron which he described as distinct from the main cortical cell populations, including the commonly found spindle cells. Data from recent studies suggest that specialized-stick-corkscrew-neurons may have first developed in the fronto-insular cortex before the division of hominids and Old World monkeys, and that they have become abundant in the anterior-cingulate cortex only in the hominid line. Golgi analysis found that they have distinctive somato-dendritic morphology with a characteristic very distal position of their axon origin. Many additional studies claimed to find cells similar to the specialized cells described by von Economo in other non-primate species, even in functionally unrelated cortical regions and layers. However, these studies did not provide sufficient evidence that the cells they described are indeed distinct from common spindle-shaped-neurons, and that they truly correspond to the specialized-stick-corkscrew-cells described by von Economo. We believe that present evidence primarily supports the presence of specialized-stick-corkscrew-neurons in hominids, with a seeming increase in their number in humans compared to other primates. The functional significance of such neuronal specialization within specific areas of the human cerebral cortex remains to be elucidated.
https://www.frontiersin.org/articles/10.3389/fmamm.2023.1242289/full

Frontiers in Psychology

PAPERS

KRISTEN HAWKES – Life history impacts on infancy and the evolution of human social cognition

Greater longevity, slower maturation and shorter birth intervals are life history features that distinguish humans from the other living members of our hominid family, the great apes. Theory and evidence synthesized here suggest the evolution of those features can explain both our bigger brains and our cooperative sociality. I rely on Sarah Hrdy's hypothesis that survival challenges for ancestral infants propelled the evolution of distinctly human socioemotional appetites and Barbara Finlay and colleagues' findings that mammalian brain size is determined by developmental duration. Similar responsiveness to varying developmental contexts in chimpanzee and human one-year-olds suggests similar infant responsiveness in our nearest common ancestor. Those ancestral infants likely began to acquire solid food while still nursing and fed themselves at weaning as chimpanzees and other great apes do now. When human ancestors colonized habitats lacking foods that infants could handle, dependents' survival became contingent on subsidies. Competition to engage subsidizers selected for capacities and tendencies to enlist and maintain social connections during the early wiring of expanding infant brains with lifelong consequences that Hrdy labeled "emotionally modern" social cognition.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1197378/full

MARCOS HERRERA et al – Doing-together with words: the sequential unfolding of a moment of meeting in a psychoanalytic therapy session

Changes in psychoanalytic therapy have been traditionally attributed to self-knowledge (insight) in the client, provided by the therapist's interpretations. In recent years there has been growing realization that such changes can also be the consequence of the development of new forms of relatedness through client–therapist interaction, particularly through special intersubjective moments called moments of meeting. Drawing on the methods and findings of Conversation Analysis about the sequential organization of psychotherapeutic interaction, this single-case study examines the unfolding of a moment of meeting in the final session of a brief psychoanalytic therapy in Peru (in Spanish) with a female client victim of domestic violence. Our analysis shows that the moment of meeting, which resolves a challenge to the intersubjective relationship posed by a now moment, comes about interactionally through a sequentially accomplished shared practice of co-animation. In this sequence the client, who had previously assumed a passive role, exercises her own agency to assume an active role, which the therapist ratifies through his response. In this way, a momentary but significant transformation in the here-and-now relationship between client and therapist occurs. Thus, our analysis contributes to the understanding of how a transformation of relation—the transitory emergence of a new form of relatedness—can take place in and through sequentially organized talk and action in psychotherapy. Our study also sheds light on the role of language in moments of meeting, as the moment of meeting in our segment does not occur in parallel with the exchange of linguistic utterances between client and therapist, but through the exchange of such linguistic utterances and through the sequence of actions carried out by that exchange. In this way, the sequential doing-together with words leads to a moment of meeting, bringing about change, at least momentarily, in the implicit ways-of-being-with-others of the client.
https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1205500/full

iScience

PAPERS

MAYTE MARTÍNEZ et al with SARAH F. BROSNAN – Some dogs can find the payoff-dominant outcome in the Assurance game

Studies on coordination often present animals with the choice of either cooperating or remaining inactive, however in nature, animals may also choose to act alone. This can be modelled with the Assurance game, an economic game that has recently been used to explore decision-making in primates. We investigated whether dyads of pet dogs coordinate in the Assurance game. Pairs were presented with two alternatives: they could individually solve an apparatus baited with a low-value reward (Hare) or they could coordinate to solve a cooperative apparatus baited with a high-value reward for each dog (Stag). All individuals matched their partner´s choices, but after controlling for side-bias, only four out of eleven dyads consistently coordinated on the payoff-dominant strategy (Stag-Stag). Thus, some dogs are capable of finding coordinated outcomes, as do primates, at least when their partner´s actions are visible and coordination results in the biggest payoff for both individuals.
https://www.cell.com/iscience/fulltext/S2589-0042(23)02775-X

Linguistic Anthropology

PAPERS

CHARLES H. P. ZUCKERMAN & N. J. ENFIELD – The limits of thematization

A fundamental capacity of language is its reflexivity. But not every aspect of language is equally accessible to being reflected upon. Michael Silverstein's 1981 paper, the "Limits of Awareness," set the terms of this discussion in linguistic anthropology with his study of speakers' "awareness" of pragmatic forms and their corresponding capacity to talk about them. His notion of differential "awareness" of aspects of language has since been foundational to linguistic-anthropological understandings of language ideologies. Here we consider Silverstein's argument with reference to our research in Laos, exploring the limits of metalinguistic discourse. We argue that the apparent constraints on our capacity to talk about aspects of language do not evidence limits of awareness of elements of language, but rather constraints on our ability to thematize those elements, that is, to bring them into joint attention. The central issue is thematization, and the relation of interest is a relation of joint attention between speakers. Metalanguage is thus constrained not (only) by psychological limits but by the social and semiotic limits on what people can bring into mutual focus within interactions. To present our framing of the issue and show what it helps us see, we distinguish two kinds of thematization and describe their subtypes, affordances, and constraints. We then demonstrate how social conventions—broadly understood—can circumvent these constraints, allowing people to thematize otherwise difficult to thematize forms.
https://anthrosource.onlinelibrary.wiley.com/doi/abs/10.1111/jola.12399

ALESSANDRO DURANTI – If it is language that speaks, what do speakers do? Confronting Heidegger's language ontology

Many of Heidegger's statements about language should sound familiar to linguistic anthropologists, starting with the pragmatic-indexical functions of speaking (in Sein und Zeit) and continuing, in later years, with something resembling linguistic relativity. But a comparison of Heidegger's ideas with those of some of his contemporaries who wrote about similar themes reveals that he had different goals, first among them "the destruction of western metaphysics," which he pursued by

means of a new philosophical metalanguage, full of unorthodox etymologies, ambiguous metaphors, and linguistic constructions that gave agency to non-human entities (e.g., "the world worlds," "language speaks"). While offering himself as the prophet of innovative thinking and speaking, Heidegger also endorsed a conservative language ideology whereby some languages and some writers were said to be better equipped than others to capture the truth about the human condition. His decentering of the human subject ultimately turned into an antihumanist and elitist stance whereby most speakers are inauthentic "sounding boxes." Drawing from concepts and analytic tools familiar to linguistic anthropologists I offer ways to counter Heidegger's apocalyptic language ontology, explain the reasons of his success, and reflect on our own language ontology.
https://anthrosource.onlinelibrary.wiley.com/doi/full/10.1111/jola.12404

Nature

ARTICLES

DYANI LEWIS – Humanity's oldest art is flaking away. Can scientists save it?
Ancient humans painted scenes in Indonesian caves more than 45,000 years ago, but their art is disappearing rapidly. Researchers are trying to discover what's causing the damage and how to stop it — before the murals are gone forever.
https://www.nature.com/immersive/d41586-023-03818-5/index.html

Nature Communications Biology

PAPERS

GAYANE GHAZARYAN et al – Cortical time-course of evidence accumulation during semantic processing
Our understanding of the surrounding world and communication with other people are tied to mental representations of concepts. In order for the brain to recognize an object, it must determine which concept to access based on information available from sensory inputs. In this study, we combine magnetoencephalography and machine learning to investigate how concepts are represented and accessed in the brain over time. Using brain responses from a silent picture naming task, we track the dynamics of visual and semantic information processing, and show that the brain gradually accumulates information on different levels before eventually reaching a plateau. The timing of this plateau point varies across individuals and feature models, indicating notable temporal variation in visual object recognition and semantic processing.
https://www.nature.com/articles/s42003-023-05611-6

Nature Ecology & Evolution

ARTICLES

AIDA GÓMEZ-ROBLES – Human altriciality is driven by postnatal brain growth
Humans are considered to be altricial (strongly underdeveloped at birth) with respect to other primates, but this observation is driven by the strong postnatal enlargement of human brains. We inferred that the developmental stage of human brains at birth does not differ substantially from that of other fossil hominins.
https://www.nature.com/articles/s41559-023-02262-y

PAPERS

AIDA GÓMEZ-ROBLES et al with CHET C. SHERWOOD – The evolution of human altriciality and brain development in comparative context
Human newborns are considered altricial compared with other primates because they are relatively underdeveloped at birth. However, in a broader comparative context, other mammals are more altricial than humans. It has been proposed that altricial development evolved secondarily in humans due to obstetrical or metabolic constraints, and in association with increased brain plasticity. To explore this association, we used comparative data from 140 placental mammals to measure how altriciality evolved in humans and other species. We also estimated how changes in brain size and gestation length influenced the timing of neurodevelopment during hominin evolution. Based on our data, humans show the highest evolutionary rate to become more altricial (measured as the proportion of adult brain size at birth) across all placental mammals, but this results primarily from the pronounced postnatal enlargement of brain size rather than neonatal changes. In addition, we show that only a small number of neurodevelopmental events were shifted to the postnatal period during hominin evolution, and that they were primarily related to the myelination of certain brain pathways. These results indicate that the perception of human altriciality is mostly driven by postnatal changes, and they point to a possible association between the timing of myelination and human neuroplasticity.
https://www.nature.com/articles/s41559-023-02253-z

Nature Italy

NEWS

Mother tongue shapes the brain before birth
The melody and rhythm of language heard in the womb prepares the brain to quickly acquire the same language, according to a study on the neural activity of newborns.
https://www.nature.com/articles/d43978-023-00181-x

Nature Scientific Reports

PAPERS

KATHLEEN B. MATHER et al – Social groups and polarization of aesthetic values from symmetry and complexity
When deciding what images we prefer, our brain must weigh many aesthetic variables, such as symmetry and complexity. To date, aesthetic research has mainly focused on investigating one variable at a time. In this article, we use symmetry and complexity to study the problem of multi aesthetic-variable interactions. For symmetry and complexity, there are two simple interaction hypotheses. The independence hypothesis proposes that the evaluation of aesthetic variables is mutually independent. Meanwhile, Birkhoff's aesthetic-measure hypothesis predicts that people prefer images high in symmetry and low in complexity, and dislike the opposite. To test these hypotheses, we generated images that systematically varied in levels of symmetry and complexity. We then compared the subjects' preference maps to identify regions of likes and dislikes. Unlike the predictions from these hypotheses, we found that most, but not all subjects, formed two distinct natural clusters, termed "islands," in terms of likes and dislikes. We also found that people with more art exposure were less likely to belong to an island. If someone did belong to an island, their gender influenced which cluster they belonged to. We discuss alternate hypotheses, possible mechanisms for the occurrence of islands, and their possible social implications.
https://www.nature.com/articles/s41598-023-47835-w

JAMES H. LIU et al – Behavioral evidence for global consciousness transcending national parochialism
While national parochialism is commonplace, individual differences explain more variance in it than cross-national differences. Global consciousness (GC), a multi-dimensional concept that includes identification with all humanity, cosmopolitan orientation, and global orientation, transcends national parochialism. Across six societies (N = 11,163), most notably the USA and China, individuals high in GC were more generous allocating funds to the other in a dictator game, cooperated more in a one-shot prisoner's dilemma, and differentiated less between the ingroup and outgroup on these actions. They gave more to the world and kept less for the self in a multi-level public goods dilemma. GC profiles showed 80% test–retest stability over 8 months. Implications of GC for cultural evolution in the face of trans-border problems are discussed.
https://www.nature.com/articles/s41598-023-47333-z

G. BIRARDA et al – Morpho-chemical characterization of individual ancient starches retrieved on ground stone tools from Palaeolithic sites in the Pontic steppe
Despite the extensive literature on the retrieval of digestible starches from archaeological contexts, there are still significant concerns regarding their genuine origin and durability. Here, we propose a multi-analytical strategy to identify the authenticity of ancient starches retrieved from macrolithic tools excavated at Upper Paleolithic sites in the Pontic steppe. This strategy integrates the morphological discrimination of starches through optical microscopy and scanning electron microscopy with single starch chemo-profiling using Fourier transform infrared imaging and microscopy. We obtained evidence of aging and biomineralization in the use-related starches from Palaeolithic sites, providing a methodology to establish their ancient origin, assess their preservation status, and attempt their identification. The pivotal application of this multidisciplinar approach demonstrates that the macrolithic tools, from which starches were dislodged, were used for food-processing across the Pontic Steppe around 40,000 years ago during the earliest colonization of Eurasia by Homo sapiens.
https://www.nature.com/articles/s41598-023-46970-8

VAHID NEJATI et al – The role of prefrontal cortex and temporoparietal junction in interpersonal comfort and emotional approach
Our perception of physical distance to individuals and stimuli is influenced by our mental distance and relatedness. The present study aimed to investigate the role of the dorsolateral prefrontal cortex (dlPFC), ventromedial prefrontal cortex (vmPFC), and right temporoparietal junction (rTPJ) in interpersonal comfortable distance and approach behaviors towards emotional stimuli. Twenty healthy volunteers received brain stimulation in four separate sessions with a one-week interval, including anodal left dlPFC, anodal right vmPFC, anodal rTPJ, and sham condition, with an extracranial return electrode. Our results revealed an increase in interpersonal distance during anodal rTPJ stimulation and a decrease in distance to positive pictures during anodal vmPFC stimulation. These findings suggest that the rTPJ plays a role in the perceptual component of self-other distancing, while the vmPFC is involved in approaching positive emotions.
https://www.nature.com/articles/s41598-023-48099-0

New Scientist

ARTICLES

EDD GENT – The roboticist who wants to bring AI into contact with the real world
Artificial intelligence may never reach its full potential without a body to interact with the physical world. Roboticist Josh Bongard says that the push for "embodied AI" is suggesting a rethink of what it means to design intelligent robots.
https://www.newscientist.com/article/2406229-the-roboticist-who-wants-to-bring-ai-into-contact-with-the-real-world/

NPJ Science of Learning

PAPERS

STACEE SANTOS et al – Language experience matters for the emergence of early numerical concepts
Research has shown a link between the acquisition of numerical concepts and language, but exactly how linguistic input matters for numerical development remains unclear. Here, we examine both symbolic (number word knowledge) and non-symbolic (numerical discrimination) numerical abilities in a population in which access to language is limited early in development—oral deaf and hard of hearing (DHH) preschoolers born to hearing parents who do not know a sign language. The oral DHH children demonstrated lower numerical discrimination skills, verbal number knowledge, conceptual understanding of the word "more", and vocabulary relative to their hearing peers. Importantly, however, analyses revealed that group differences in the numerical tasks, but not vocabulary, disappeared when differences in the amount of time children had had auditory access to spoken language input via hearing technology were taken into account. Results offer insights regarding the role language plays in emerging number concepts.
https://www.nature.com/articles/s41539-023-00202-w

NURIT VIESEL-NORDMEYER & JÉRÔME PRADO – Arithmetic skills are associated with left fronto-temporal gray matter volume in 536 children and adolescents
There are large individual differences in arithmetic skills. Although a number of brain-wide association studies have attempted to identify the neural correlates of these individual differences, studies have focused on relatively small sample sizes and have yielded inconsistent results. In the current voxel-based morphometry study, we merged six structural imaging datasets of children and adolescents (from 7.5 to 15 years) whose levels of arithmetic skills were assessed, leading to a combined sample of n = 536. Controlling for individual differences in age, gender, as well as language, and intelligence, we found a unique positive relation between arithmetic skill and gray matter volume in the left inferior frontal gyrus (IFG) and middle temporal gyrus (MTG). Our results suggest that individual differences in arithmetic skills are associated with structural differences in left fronto-temporal areas, rather than in regions of the parietal cortex and hippocampus that are often associated with arithmetic processing.
https://www.nature.com/articles/s41539-023-00201-x

Patterns

PAPERS

OLIVER Y. CHÉN et al – The roles, challenges, and merits of the p value
Since the 18th century, the p value has been an important part of hypothesis-based scientific investigation. As statistical and data science engines accelerate, questions emerge: to what extent are scientific discoveries based on p values reliable and reproducible? Should one adjust the significance level or find alternatives for the p value? Inspired by these questions and everlasting attempts to address them, here, we provide a systematic examination of the p value from its roles and merits to its misuses and misinterpretations. For the latter, we summarize modest recommendations to handle them. In parallel, we present the Bayesian alternatives for seeking evidence and discuss the pooling of p values from multiple studies and datasets. Overall, we argue that the p value and hypothesis testing form a useful probabilistic decision-making mechanism, facilitating causal inference, feature selection, and predictive modeling, but that the interpretation of the p value must be contextual, considering the scientific question, experimental design, and statistical principles.
https://www.cell.com/patterns/fulltext/S2666-3899(23)00270-2

PLoS One

PAPERS

RACHAEL MILLER et al – Social influences on delayed gratification in New Caledonian crows and Eurasian jays
Self-control underlies goal-directed behaviour in humans and other animals. Delayed gratification - a measure of self-control - requires the ability to tolerate delays and/or invest more effort to obtain a reward of higher value over one of lower value, such as food or mates. Social context, in particular, the presence of competitors, may influence delayed gratification. We adapted the 'rotating-tray' paradigm, where subjects need to forgo an immediate, lower-quality (i.e. less preferred) reward for a delayed, higher-quality (i.e. more preferred) one, to test social influences on delayed gratification in two corvid species: New Caledonian crows and Eurasian jays. We compared choices for immediate vs. delayed rewards while alone, in the presence of a competitive conspecific and in the presence of a non-competitive conspecific. We predicted that, given the

increased risk of losing a reward with a competitor present, both species would similarly, flexibly alter their choices in the presence of a conspecific compared to when alone. We found that species differed: jays were more likely to select the immediate, less preferred reward than the crows. We also found that jays were more likely to select the immediate, less preferred reward when a competitor or non-competitor was present than when alone, or when a competitor was present compared to a non-competitor, while the crows selected the delayed, highly preferred reward irrespective of social presence. We discuss our findings in relation to species differences in socio-ecological factors related to adult sociality and food-caching (storing). New Caledonian crows are more socially tolerant and moderate cachers, while Eurasian jays are highly territorial and intense cachers that may have evolved under the social context of cache pilfering and cache protection strategies. Therefore, flexibility (or inflexibility) in delay of gratification under different social contexts may relate to the species' social tolerance and related risk of competition.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0289197

METTE BANGSBORG THUESEN et al – Nascent craft specialization in the Pre-Pottery Neolithic A? Bead making at Shubayqa 6 (northeast Jordan)
The emergence of craft specialisation is a key area of interest for archaeologists investigating the socio-economic history and development of past societies. In southwest Asia, as elsewhere, the origins of craft specialisation have been associated with the emergence of surplus food production, households and social stratification. We present evidence for nascent skilled production of green stone beads at the Pre-Pottery Neolithic A (PPNA) site Shubayqa 6, northeast Jordan. Thousands of pieces of debitage, roughouts and finished beads exhibit signs of standardised production that was probably geared towards exchange. This hints towards incipient skilled craft production that was likely part-time and seasonal. We therefore argue that the appearance of specialist artisans in this autonomous and non-hierarchical society has no correlation with surplus food production, households, or social stratification.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0292954

Proceedings of the Royal Society B

PAPERS

SHUMA TSURUMI, SO KANAZAWA & MASAMI K. YAMAGUCHI – Infants' visual perception without feature-binding
We reveal a unique visual perception before feature-integration of colour and motion in infants. Visual perception is established by the integration of multiple features, such as colour and motion direction. The mechanism of feature integration benefits from the ongoing interplay between feedforward and feedback loops, yet our comprehension of this causal connection remains incomplete. Researchers have explored the role of recurrent processing in feature integration by studying a visual illusion called 'misbinding', wherein visual characteristics are erroneously merged, resulting in a perception distinct from the originally presented stimuli. Anatomical investigations have revealed that the neural pathways responsible for recurrent connections are underdeveloped in early infants. Therefore, there is a possibility that younger infants could potentially perceive the physically presented visual information that adults miss due to misbinding. Here, we demonstrate that infants less than half a year old showed no misbinding; thus, they perceived the physically presented visual information, while infants more than half a year old perceived incorrectly integrated visual information, showing misbinding. Our findings indicate that recurrent processing barely functions in infants younger than six months of age and that visual information that should have been originally integrated is perceived as it is without being integrated.
https://royalsocietypublishing.org/doi/abs/10.1098/rspb.2023.2134

Royal Society Open Science

PAPERS

MORITZ REIS et al – Creative thinking does not promote dishonesty
We assessed the relation of creativity and unethical behaviour by manipulating the thinking style of participants (N = 450 adults) and measuring the impact of this manipulation on the prevalence of dishonest behaviour. Participants performed one of three inducer tasks: the alternative uses task to promote divergent thinking, the remote associates task to promote convergent thinking, or a simple classification task for rule-based thinking. Before and after this manipulation, participants conducted the mind game as a straightforward measure of dishonesty. Dishonest behaviour increased from before to after the intervention, but we found no credible evidence that this increase differed between induced mindsets. Exploratory analyses did not support any relation of trait creativity and dishonesty either. We conclude that the influence of creative thinking on unethical behaviour seems to be more ambiguous than assumed in earlier research or might be restricted to specific populations or contexts.
https://royalsocietypublishing.org/doi/abs/10.1098/rsos.230879

Science

ARTICLES

DAVID GRIMM – What are farm animals thinking?
New research is revealing surprising complexity in the minds of goats, pigs, and other livestock.

https://www.science.org/content/article/not-dumb-creatures-livestock-surprise-scientists-their-complex-emotional-minds

WILLIAM A. SEARCY & STEPHEN NOWICKI – Human–wild bird cooperation
Honeyguides learn distinct signals made by honey hunters from different cultures.
https://www.science.org/doi/10.1126/science.adl5923

PAPERS

CLAIRE N. SPOTTISWOODE & BRIAN M. WOOD – Culturally determined interspecies communication between humans and honeyguides
Species interactions that vary across environments can create geographical mosaics of genetic coevolution. However, traits mediating species interactions are sometimes culturally inherited. Here we show that traditions of interspecies communication between people and wild birds vary in a culturally determined geographical mosaic. Honey hunters in different parts of Africa use different calls to communicate with greater honeyguides (Indicator indicator) that lead them to bees' nests. We show experimentally that honeyguides in Tanzania and Mozambique discriminate among honey hunters' calls, responding more readily to local than to foreign calls. This was not explained by variation in sound transmission and instead suggests that honeyguides learn local human signals. We discuss the forces stabilizing and diversifying interspecies communication traditions, and the potential for cultural coevolution between species.
https://www.science.org/doi/10.1126/science.adh4129

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