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NOTICES

PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, do please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.

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

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

SOCIETY FOR SCIENCE – A game based on Simon shows how people mentally rehearse new information

Signs of learning echo through people’s resting brains.

<http://click.societyforscience->

[email.com/?qs=18a6fb8f3c933e5ade132b4a95a1424db1432c285c3043aeb0f62b441d38e7aa649c5ed3178fe1bdcbfc338f76e744f8a71bac76302d8d5](http://click.societyforscience-email.com/?qs=18a6fb8f3c933e5ade132b4a95a1424db1432c285c3043aeb0f62b441d38e7aa649c5ed3178fe1bdcbfc338f76e744f8a71bac76302d8d5)

SCIENCE DAILY – Neanderthals were choosy about making bone tools

Evidence continues to mount that the Neanderthals, who lived in Europe and Asia until about 40,000 years ago, were more sophisticated people than once thought. A new study shows that Neanderthals chose to use bones from specific animals to make a tool for specific purpose: working hides into leather.

<https://www.sciencedaily.com/releases/2020/05/200508112856.htm>

NATURE BRIEFING – When conservation goes wrong

In some areas, conservationists have contributed to dislodging people who have lived sustainably for generations.

Anthropologist Jerome Lewis saw this happen to the BaYaka Pygmies, who had lived in the forests of Central Africa’s Congo Basin for some 55,000 years. “The formerly active, well-fed and lively BaYaka are now often malnourished, depressed and alcoholic casual laborers dwelling on the edges of their former territories, terrorized by so-called eco-guards and subjected to commercial and sexual exploitation by outsiders.” In various parts of the world, new programmes are now attempting a better approach.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=3a038d599b&e=1db4b9a19b>

PUBLICATIONS

Current Biology

ARTICLES

MICHAEL GROSS – Digging deeper into human evolution

In the decade since the publication of the draft genome of Neanderthals, analyses of ancient DNA have revolutionised the study of human evolution in the late Pleistocene. The challenge for the next decade is to extend molecular studies deeper into evolutionary time.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(20\)30542-X?dgcid=raven_jbs_etoc_email](https://www.cell.com/current-biology/fulltext/S0960-9822(20)30542-X?dgcid=raven_jbs_etoc_email)

JENNIFER K. BIZLEY – Auditory Neuroscience: Unravelling How the Brain Gives Sound Meaning

The brain must be able to assign sounds in the world to behaviourally meaningful categories. A new study has revealed that sensory pathways represent category information, but that selectivity for sound classes emerges first in the frontal cortex.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(20\)30411-5?dgcid=raven_jbs_etoc_email](https://www.cell.com/current-biology/fulltext/S0960-9822(20)30411-5?dgcid=raven_jbs_etoc_email)

BRADFORD Z. MAHON – Brain Mapping: Understanding the Ins and Outs of Brain Regions

A recent study in which primary motor cortex activity was imaged with sub-laminar resolution has found that, while overt motor actions led to activity in both superficial and deep cortical layers, motor imagery engaged only superficial layers.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(20\)30431-0?dgcid=raven_jbs_etoc_email](https://www.cell.com/current-biology/fulltext/S0960-9822(20)30431-0?dgcid=raven_jbs_etoc_email)

Evolutionary Anthropology

PAPERS

HOLLY M. DUNSWORTH – Expanding the evolutionary explanations for sex differences in the human skeleton

While the anatomy and physiology of human reproduction differ between the sexes, the effects of hormones on skeletal growth do not. Human bone growth depends on estrogen. Greater estrogen produced by ovaries causes bones in female bodies to fuse before males' resulting in sex differences in adult height and mass. Female pelvises expand more than males' due to estrogen and relaxin produced and employed by the tissues of the pelvic region and potentially also due to greater internal space occupied by female gonads and genitals. Evolutionary explanations for skeletal sex differences (aka sexual dimorphism) that focus too narrowly on big competitive men and broad birthing women must account for the adaptive biology of skeletal growth and its dependence on the developmental physiology of reproduction. In this case, dichotomizing

evolution into proximate-ultimate categories may be impeding the progress of human evolutionary science, as well as enabling the popular misunderstanding and abuse of it.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21834?campaign=wolearlyview>

Frontiers in Psychology

PAPERS

TILL NIKOLAUS VON HEISELER – The Social Origin of the Concept of Truth – How Statements Are Built on Disagreements

This paper proposes a social account for the origin of the truth value and the emergence of the first declarative sentence. Such a proposal is based on two assumptions. The first is known as the social intelligence hypothesis: that the cognitive evolution of humans is first and foremost an adaptation to social demands. The second is the function-first approach to explaining the evolution of traits: before a prototype of a new trait develops and the adaptation process begins, something already existing is used for a new purpose. Applied to the emergence of declarative sentences, this suggests something already existing—natural signs (which have a logical or causal relation to what they denote)—were used for the declarative function and thereby integrated (in the form of indexical objects implying a past action) into communication. I show that the display of an indexical object (such as the display of hunting trophies) can imply a conceptual structure similar to that informing the syntax of sentences. The view developed in this paper is broadly consistent with the argumentative theory of Mercier and Sperber, which suggests that reasoning is less adapted to decision making than to social purposes such as winning disputes or justifying one's actions. In this paper I extend this view to the origin of the concept of truth. According to my proposal, the first declarative sentence (articulated in a simple sign language) emerged as a negation of a negation of an implicit statement expressed by the display of an indexical object referring to a past action. Thereby, I suggest that the binary structure of the truth value underlying any declarative sentence is founded on disagreements based on conflicts of interest. Thus, I deny that the concept of truth could have evolved for instrumental reasons such as solving problems, or through self-questioning about what one ought to believe.

https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00733/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1322592_69_Psycho_20200507_arts_A

BYURAKN ISHKHANYAN et al – Anterior and Posterior Left Inferior Frontal Gyrus Contribute to the Implementation of Grammatical Determiners During Language Production

The left inferior frontal gyrus (IFG) is a key region for language comprehension and production. Previous studies point to a preferential involvement of left anterior IFG (aIFG) in lexical and semantic processes, while the posterior IFG (pIFG) has been implicated in supporting syntactic and phonological processes. Here we used focal neuronavigated transcranial magnetic stimulation (TMS) to probe the functional involvement of left IFG in lexical and grammatical processing at the sentence level. We applied 10 Hz TMS effective or sham bursts to left aIFG and pIFG, while healthy volunteers performed an adjective-noun production task contrasting grammatical and lexical determiners. For each trial, we measured the time from the stimulus onset to the moment of articulation (response time) and the time from articulation onset to the end of articulation (duration). Focal TMS of IFG generally delayed response times. The TMS-induced delay in response times was relatively stronger for the grammatical condition compared to the lexical condition, when TMS targeted aIFG. Articulation of the determiner was generally shorter in trials presenting grammatical determiners relative to lexical determiners. The shorter articulation time for grammar determiners was facilitated by effective TMS to pIFG. Together, the effects of TMS on task performance provide novel evidence for a joint involvement of anterior and posterior parts of left IFG in implementing grammatical determiners during language production, suggesting an involvement of aIFG in the initiation and pIFG in the production of grammatically appropriate verbal responses at the sentence level.

https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00685/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1322592_69_Psycho_20200507_arts_A

Mind & Language

PAPERS

LARS DÄNZER – The explanatory project of Gricean pragmatics

The Gricean paradigm in pragmatics has recently been attacked for its alleged lack of explanatory import, based on the claim that it does not seek accounts of how utterance interpretation actually works, but merely of how it might work. This article rebuts this line of attack by offering a clear and detailed account of the explanatory project of Gricean pragmatics according to which the latter aims for rationalizing explanations of utterance interpretation. It is shown that, on this view, Gricean pragmatics seeks psychological explanations of utterance interpretation that are “cognitively real” in a perfectly clear and robust sense.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12295?campaign=wolearlyview>

NATALIA WAIGHTS HICKMAN – (Implicit) Knowledge, reasons, and semantic understanding

This paper exploits recent work on the normative and constitutive roles of knowledge in practical rationality, to put pressure on the idea that speakers could communicate without exploiting linguistic knowledge. I defend cognitivism about meaning,

the view that speakers have rationally accessible (i.e., implicit rather than tacit) knowledge of semantic facts and principles, and that this knowledge is constitutive of their linguistic competence.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12286?campaign=wolearlyview>

Nature Ecology & Evolution

PAPERS

NICHOLAS J. CONARD et al – A 300,000-year-old throwing stick from Schöningen, northern Germany, documents the evolution of human hunting

The poor preservation of Palaeolithic sites rarely allows the recovery of wooden artefacts, which served as key tools in the arsenals of early hunters. Here, we report the discovery of a wooden throwing stick from the Middle Pleistocene open-air site of Schöningen that expands the range of Palaeolithic weaponry and establishes that late Lower Palaeolithic hominins in Northern Europe were highly effective hunters with a wide array of wooden weapons that are rarely preserved in the archaeological record.

<https://www.nature.com/articles/s41559-020-1139-0>

Nature Scientific Reports

PAPERS

FIorenzo ARTONI et al – High gamma response tracks different syntactic structures in homophonous phrases

Syntax is a species-specific component of human language combining a finite set of words in a potentially infinite number of sentences. Since words are by definition expressed by sound, factoring out syntactic information is normally impossible. Here, we circumvented this problem in a novel way by designing phrases with exactly the same acoustic content but different syntactic structures depending on the other words they occur with. In particular, we used phrases merging an article with a noun yielding a Noun Phrase (NP) or a clitic with a verb yielding a Verb Phrase (VP). We performed stereo-electroencephalographic (SEEG) recordings in epileptic patients. We measured a different electrophysiological correlates of verb phrases vs. noun phrases in multiple cortical areas in both hemispheres, including language areas and their homologous in the non-dominant hemisphere. The high gamma band activity (150-300 Hz frequency), which plays a crucial role in inter-regional cortical communications, showed a significant difference during the presentation of the homophonous phrases, depending on whether the phrase was a verb phrase or a noun phrase. Our findings contribute to the ultimate goal of a complete neural decoding of linguistic structures from the brain.

<https://www.nature.com/articles/s41598-020-64375-9>

RAPHAËLLE MALASSIS, STANISLAS DEHAENE & JOËL FAGOT – Baboons (*Papio papio*) Process a Context-Free but Not a Context-Sensitive Grammar

Language processing involves the ability to master supra-regular grammars, that go beyond the level of complexity of regular grammars. This ability has been hypothesized to be a uniquely human capacity. Our study probed baboons' capacity to learn two supra-regular grammars of different levels of complexity: a context-free grammar generating sequences following a mirror structure (e.g., AB | BA, ABC | CBA) and a context-sensitive grammar generating sequences following a repeat structure (e.g., AB | AB, ABC | ABC), the latter requiring greater computational power to be processed. Fourteen baboons were tested in a prediction task, requiring them to track a moving target on a touchscreen. In distinct experiments, sequences of target locations followed one of the above two grammars, with rare violations. Baboons showed slower response times when violations occurred in mirror sequences, but did not react to violations in repeat sequences, suggesting that they learned the context-free (mirror) but not the context-sensitive (repeat) grammar. By contrast, humans tested with the same task learned both grammars. These data suggest a difference in sensitivity in baboons between a context-free and a context-sensitive grammar.

<https://www.nature.com/articles/s41598-020-64244-5>

WILLIAM D. HOPKINS et al – The role of early social rearing, neurological, and genetic factors on individual differences in mutual eye gaze among captive chimpanzees

Mutual eye gaze plays an important role in primate social development and communication. In the current study, we examined the underlying experiential, genetic, and neuroanatomical basis of mutual eye gaze variation in adult captive chimpanzees. A multivariate analysis of variance revealed a significant rearing effect on bout length, with human-reared chimpanzees engaging in longer bouts of mutual gaze compared to mother-reared and wild-born individuals. Next, we utilized source-based morphometry (SBM) to examine gray matter covariation in magnetic resonance imaging scans and determine the relationship between the resulting gray matter covariation components and mutual eye gaze. One SBM component was negatively correlated with gaze duration (nucleus accumbens and anterior insular cortex), while two components were positively correlated with bout length (posterior cingulate cortex, inferior occipital cortex, middle temporal cortex, hippocampus, and the precentral sulcus). Finally, heritability analyses revealed mutual eye gaze to be modestly heritable and significant genetic correlations between bout length and two gray matter covariation components. This study reveals that non-genetic factors, and to a lesser extent, genetic factors appear to influence mutual eye gaze in adult chimpanzees, and is the first to report neuroanatomical correlates of mutual eye gaze variation in chimpanzees.

<https://www.nature.com/articles/s41598-020-64051-y>

ANTONIO RODRÍGUEZ-HIDALGO et al – Taphonomic criteria for identifying Iberian lynx dens in quaternary deposits

For decades, taphonomists have dedicated their efforts to assessing the nature of the massive leporid accumulations recovered at archaeological sites in the northwestern Mediterranean region. Their interest lying in the fact that the European rabbit constituted a critical part of human subsistence during the late Pleistocene and early Holocene. However, rabbits are also a key prey in the food webs of Mediterranean ecosystems and the base of the diet for several specialist predators, including the Iberian lynx (*Lynx pardinus*). For this reason, the origin of rabbit accumulations in northwestern Mediterranean sites has proved a veritable conundrum. Here, we present the zooarchaeological and taphonomic study of more than 3000 faunal and 140 coprolite remains recovered in layer IIIa of Cova del Gegant (Catalonia, Spain). Our analysis indicates that this layer served primarily as a den for the Iberian lynx. The lynxes modified and accumulated rabbit remains and also died at the site creating an accumulation dominated by the two taxa. However, other agents and processes, including human, intervened in the final configuration of the assemblage. Our study contributes to characterizing the Iberian lynx fossil accumulation differentiating between the faunal assemblages accumulated by lynxes and hominins.

<https://www.nature.com/articles/s41598-020-63908-6>

PLoS One

PAPERS

P. A. HANCOCK & WILLIAM G. VOLANTE – Quantifying the qualities of language

We here quantify the qualities of language. Specifically, we derive numerical values, and associated variability scores for statements of general probability as well as for anchor terms commonly expressed on Likert-type scales. Our results show significant inter-responder variability in the understanding of such terms. We also demonstrate scale compression such that average estimates are poorly aligned to the a priori expectations of equal response spacing in commonly used verbal response instruments. Terms further show intriguing propensities such that people agree more about statements of agreement, but manifestly disagree more about statements of disagreement. The valence of these terms is thus systematically related to their degree of common understanding. The accuracy of language, especially when used in conjunction with modern advanced technologies, proves vital for effective communication. Our work demonstrates that the tool of language still remains a fairly blunt one, but one that can be sharpened by systematic quantitative evaluation, as we demonstrate here.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0232198>

VINCENT AUBANEL & NOËL NGUYEN – Speaking to a common tune: Between-speaker convergence in voice fundamental frequency in a joint speech production task

Recent research on speech communication has revealed a tendency for speakers to imitate at least some of the characteristics of their interlocutor's speech sound shape. This phenomenon, referred to as phonetic convergence, entails a moment-to-moment adaptation of the speaker's speech targets to the perceived interlocutor's speech. It is thought to contribute to setting up a conversational common ground between speakers and to facilitate mutual understanding. However, it remains uncertain to what extent phonetic convergence occurs in voice fundamental frequency (F0), in spite of the major role played by pitch, F0's perceptual correlate, as a conveyor of both linguistic information and communicative cues associated with the speaker's social/individual identity and emotional state. In the present work, we investigated to what extent two speakers converge towards each other with respect to variations in F0 in a scripted dialogue. Pairs of speakers jointly performed a speech production task, in which they were asked to alternately read aloud a written story divided into a sequence of short reading turns. We devised an experimental set-up that allowed us to manipulate the speakers' F0 in real time across turns. We found that speakers tended to imitate each other's changes in F0 across turns that were both limited in amplitude and spread over large temporal intervals. This shows that, at the perceptual level, speakers monitor slow-varying movements in their partner's F0 with high accuracy and, at the production level, that speakers exert a very fine-tuned control on their laryngeal vibrator in order to imitate these F0 variations. Remarkably, F0 convergence across turns was found to occur in spite of the large melodic variations typically associated with reading turns. Our study sheds new light on speakers' perceptual tracking of F0 in speech processing, and the impact of this perceptual tracking on speech production.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0232209>

PNAS

PAPERS

KATHERINE M. GRILLO et al with AUDAX Z. P. MABULLA – Molecular and isotopic evidence for milk, meat, and plants in prehistoric eastern African herder food systems

The development of pastoralism transformed human diets and societies in grasslands worldwide. The long-term success of cattle herding in Africa has been sustained by dynamic food systems, consumption of a broad range of primary and secondary livestock products, and the evolution of lactase persistence (LP), which allows digestion of lactose into adulthood and enables the milk-based, high-protein, low-calorie diets characteristic of contemporary pastoralists. Despite the presence

of multiple alleles associated with LP in ancient and present-day eastern African populations, the contexts for selection for LP and the long-term development of pastoralist foodways in this region remain unclear. Pastoral Neolithic (c. 5000 to 1200 BP) faunas indicate that herders relied on cattle, sheep, and goats and some hunting, but direct information on milk consumption, plant use, and broader culinary patterns is rare. Combined chemical and isotopic analysis of ceramic sherds ($n = 125$) from Pastoral Neolithic archaeological contexts in Kenya and Tanzania, using compound-specific $\delta^{13}\text{C}$ and $\Delta^{13}\text{C}$ values of the major fatty acids, provides chemical evidence for milk, meat, and plant processing by ancient herding societies in eastern Africa. These data provide the earliest direct evidence for milk product consumption and reveal a history of reliance on animal products and other nutrients, likely extracted through soups or stews, and plant foods. They document a 5,000-y temporal framework for eastern Africa pastoralist cuisines and cultural contexts for selection for alleles distinctive of LP in eastern Africa.

<https://www.pnas.org/content/117/18/9793.abstract?etoc>

ALVA TANG et al – Infant behavioral inhibition predicts personality and social outcomes three decades later

Does infant temperament predict adult personality and life-course patterns? To date, there is scant evidence examining relations between child temperament and adult outcomes, and extant research has relied on limited methods for measuring temperament such as maternal report. This prospective longitudinal study followed a cohort of infants ($n = 165$) for three decades to examine whether infant behavioral inhibition, a temperament characterized by cautious and fearful behaviors to unfamiliar situations, shapes long-term personality, social relationships, vocational/education, and mental health outcomes in adulthood. At age 14 mo, behavioral inhibition was assessed using an observation paradigm. In adolescence (15 y; $n = 115$), error monitoring event-related potentials were measured in a flanker task. In adulthood (26 y; $n = 109$), personality, psychopathology, and sociodemographics were self-reported using questionnaires. We found that infants with higher levels of behavioral inhibition at 14 mo grew up to become more reserved and introverted adults ($\beta = 0.34$) with lower social functioning with friends and family ($\beta = -0.23$) at age 26. Infant behavioral inhibition was also a specific risk factor for adult internalizing (i.e., anxiety and depression, $\beta = 0.20$) psychopathology, rather than a transdiagnostic risk for general and externalizing psychopathology. We identified a neurophysiologic mechanism underlying risk and resilience for later psychopathology. Heightened error monitoring in adolescence moderated higher levels of adult internalizing psychopathology among behaviorally inhibited individuals. These findings suggest meaningful continuity between infant temperament and the development of adult personality. They provide the earliest evidence suggesting that the foundation of long-term well-being is rooted in individual differences in temperament observed in infancy.

<https://www.pnas.org/content/117/18/9800.abstract?etoc>

Science Advances

PAPERS

ALLI ASIKAINEN et al – Cumulative effects of triadic closure and homophily in social networks

Social network structure has often been attributed to two network evolution mechanisms—triadic closure and choice homophily—which are commonly considered independently or with static models. However, empirical studies suggest that their dynamic interplay generates the observed homophily of real-world social networks. By combining these mechanisms in a dynamic model, we confirm the longheld hypothesis that choice homophily and triadic closure cause induced homophily. We estimate how much observed homophily in friendship and communication networks is amplified due to triadic closure. We find that cumulative effects of homophily amplification can also lead to the widely documented core-periphery structure of networks, and to memory of homophilic constraints (equivalent to hysteresis in physics). The model shows that even small individual bias may prompt network-level changes such as segregation or core group dominance. Our results highlight that individual-level mechanisms should not be analyzed separately without considering the dynamics of society as a whole.

https://advances.sciencemag.org/content/6/19/eaax7310?utm_campaign=toc_advances_2020-05-08&et rid=17774313&et cid=3319669

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