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**EAORC BULLETIN 798 – 30 September 2018**
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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.

SCIENCE NEWS – Neanderthals used their hands like tailors and painters
Despite their brutish reputation, Neanderthals used their hands more like tailors than construction workers, new research suggests.

SCIENCE DAILY – Sensitive babies become altruistic toddlers
Our responsiveness to seeing others in distress accounts for variability in helping behavior from early in development, according to a new study.

SCIENCE DAILY – Violence in pre-Columbian Panama exaggerated, new study shows
An oft-cited publication said a pre-Columbian archaeological site in Panama showed signs of extreme violence. A new review of the evidence strongly suggests that the interpretation was wrong.

SCIENCE DAILY – Children found capable of using the 'wisdom of crowds'
Children, like adults, can improve their response to difficult tasks by the power of group work, new research has found.

SCIENCE DAILY – The warm glow of kindness is real, even when there's nothing in it for you
We feel the benefit of kind acts regardless of whether they are altruistic or strategically motivated.

SCIENCE DAILY – Silver fox study reveals genetic clues to social behavior
After more than 50 generations of selective breeding, a new study compares gene expression of tame and aggressive silver foxes in two areas of the brain, shedding light on genes responsible for social behavior.

SCIENCE DAILY – Unlocking the secret of how the brain encodes speech
People like the late Stephen Hawking are unable to speak because their muscles are paralyzed. Scientists want to help these individuals communicate by developing a brain machine interface to decode the commands the brain is sending to the tongue, palate, lips and larynx. New research has moved science closer by unlocking new information about how the brain encodes speech. They discovered the brain controls speech in a similar way to how it controls arm movements.
FRONTIERS NEWS – Primate study offers clues to evolution of speech
The study suggests primates are incapable of producing speech because they lack the brain mechanisms needed to control and coordinate vocal production.

THE CONVERSATION – Neanderthals were no brutes – they may have been precision workers
Nimble-fingered Neanderthals went about their daily business in a similar way to modern humans.
https://theconversationuk.cmail19.com/t/r-l-ijhlplk-khhilahh-b/

PUBLICATIONS
American Journal of Human Genetics
PAPERS
MICHAEL DANNEMANN & JANET KELSO – The Contribution of Neanderthals to Phenotypic Variation in Modern Humans
Assessing the genetic contribution of Neanderthals to non-disease phenotypes in modern humans has been difficult because of the absence of large cohorts for which common phenotype information is available. Using baseline phenotypes collected for 112,000 individuals by the UK Biobank, we can now elaborate on previous findings that identified associations between signatures of positive selection on Neanderthal DNA and various modern human traits but not any specific phenotypic consequences. Here, we show that Neanderthal DNA affects skin tone and hair color, height, sleeping patterns, mood, and smoking status in present-day Europeans. Interestingly, multiple Neanderthal alleles at different loci contribute to skin and hair color in present-day Europeans, and these Neanderthal alleles contribute to both lighter and darker skin tones and hair color, suggesting that Neanderthals themselves were most likely variable in these traits.

American Journal of Physical Anthropology
PAPERS
VANESSA VILLALBA et al – Reconstruction of human subsistence and husbandry strategies from the Iberian Early Neolithic: A stable isotope approach
The Early Neolithic involved an important social and economic shift that can be tested not only with the material culture, but also through biomolecular approaches. The Iberian Peninsula presents few Early Neolithic sites where fauna and humans can be analyzed together from an isotopic perspective. Here we present an isotopic study on the site of Cueva de Chaves as an example for understanding the dietary and economical changes that took place during Early Neolithic in Iberia. Faunal isotope values show no significant differences between wild and domestic herbivores, although the latter have more homogeneous values. Domestic pigs, potentially considered omnivorous, also show signatures of a herbivore diet. Human isotopic results show a diet mainly based on terrestrial C3 resources and possibly high meat consumption. The only individual found buried with a special funerary treatment presents a slightly different protein intake, when taking into account the long contemporaneous baseline analyzed.
Similar values between wild and domestic species could be the result of common feeding resources and/or grazing on the same parts of the landscape. The herbivore diet seen amongst domestic pigs rules out feeding on household leftovers. High meat consumption by humans would support the hypothesis of the existence of a specialized animal husbandry management community in which agriculture was not intensively developed. Our results suggest that the development of agricultural practices and animal husbandry were not necessarily associated together in the early stages of the Western Mediterranean Neolithic.

TRACY L. KIVELL et al with JEAN-JACQUES HUBLIN – Trabecular architecture and joint loading of the proximal humerus in extant hominoids, Ateles, and Australopithecus africanus
Several studies have investigated potential functional signals in the trabecular structure of the proximal humerus but with varied success. Here, we apply for the first time a “whole-epiphyses” approach to analysing trabecular bone in the humeral head with the aim of providing a more holistic interpretation of trabecular variation in relation to habitual locomotor or manipulative behaviors in several extant primates and Australopithecus africanus. There are important differences in the quantification of trabecular parameters using a “whole-epiphysis” versus a VOI-based approach. Variation in trabecular structure across knuckle-walking African apes, suspensory taxa, and modern humans was generally consistent with predictions of load magnitude and inferred joint posture during habitual behaviors. Higher relative trabecular bone volume and more isotropic trabeculae in StW 328 suggest A. africanus may have still used its forelimbs for arboreal locomotion.

PAPERS
Explanations for this bilingual advantage, which include bilingual togetherness, the results provide support for a beneficial effect of acquiring two languages on mental state reasoning.

There was no evidence for a bilingual advantage (Cohen's $d = 0.58$, $p < 0.001$). There was no evidence for a bilingual disadvantage in language proficiency. This secondary analysis indicated a medium $d = 0.22$, $p = 0.050$). A secondary analysis was conducted on studies that statistically adjusted the Theory of Mind scores to correct for a bilingual disadvantage in language proficiency. This secondary analysis indicated a medium-size bilingual advantage (Cohen's $d = 0.58$, $p < 0.001$). There was no evidence for publication bias in either analysis. Taken together, the results provide support for a beneficial effect of acquiring two languages on mental state reasoning.

For explanations of this bilingual advantage, which include bilingual-monolingual differences in executive functioning, metalinguistic awareness, and socio-pragmatic abilities, are discussed.
IAN MADDESON – Language Adapts to Environment: Sonority and Temperature

The phonetic patterns of human spoken languages have been claimed to be in part shaped by environmental conditions in the locales where they are spoken. This follows predictions of the Acoustic Adaptation Hypothesis, previously mainly applied to the study of bird song, which proposes that differential transmission conditions in different environments explain some of the frequency and temporal variation between and within species’ songs. Prior discussion of the relevance of the Acoustic Adaptation Hypothesis to human language has related such characteristics as the total size of the consonant inventory and the complexity of the permitted maximum syllable structure, rather than patterns in continuous speech, to environmental variables. Thus the relative frequency with which more complex structures occur is not taken into account. This study looks at brief samples of spoken material from 100 languages, dividing the speech into sonorous and obstruent time fractions. The percentage of sonorous material is the sonority score. This score correlates quite strongly with mean annual temperature in the area where the languages are spoken, with higher temperatures going together with higher sonority scores. The role of tree cover and annual precipitation, found to be important in earlier work, is not found to be significant in this data. This result may be explained if absorption and scattering are more important than reflection. Atmospheric absorption is greater at higher temperatures and peaks at higher frequencies with increasing temperature. Small-scale local perturbations (eddies) in the atmosphere created by high air temperatures also degrade the high-frequency spectral characteristics that are critical to distinguishing between obstruct consonants, leading to reduction in contrasts between them, and fewer clusters containing obstruct strings.


Frontiers in Neuroscience

PAPERS

SIYUN ZHANG et al – The Association Between Genetic Variation In FOXP2 and Sensorimotor Control of Speech Production

Significant advances have been made in understanding the role of auditory feedback in sensorimotor integration for speech production. The neurogenetic basis of this feedback-based control process, however, remains largely unknown. Mutations of FOXP2 gene in humans are associated with severe deficits in speech motor behavior. The present study examined the associations between a FOXP2 common variant, rs6980093 (A/G), and the behavioral and event-related potential (ERP) responses to -50 and -200 cents pitch perturbations during vocal production in a sample of 133 Chinese adults. Behaviorally, the GG genotype was associated with significantly smaller vocal compensations for -200 cents perturbations relative to the AA and AG genotypes. Furthermore, both the AA and AG genotypes exhibited significant positive correlations between the degree of vocal compensation for -50 and -200 cents perturbations and the variability of normal voice fundamental frequency, whereas no such correlation existed for the GG genotype. At the cortical level, significantly larger P2 responses to -200 cents perturbations were associated with the GG genotype as compared to the AA and AG genotypes due to increased left-lateralized activity in the superior, middle, and inferior frontal gyrus, precentral gyrus, anterior cingulate cortex, middle temporal gyrus, and insula. The neurobehavioral responses to -50 cents perturbations, however, did not vary as a function of genotype. These findings present the first neurobehavioral evidence for an association between FOXP2 genetic variant and auditory-motor integration for vocal pitch regulation. The differential effects of FOXP2 genotypes at rs6980093 may reflect their influences on the weighting of feedback and feedforward control of speech production.


COMMENTARIES

RIE ASANO & UWE SEIFERT – Commentary: The Evolution of Musicality: What Can Be Learned from Language Evolution Research?


Nature Scientific Reports

PAPERS

SAMUEL NOORMAN, DAVID A. NEVILLE & IRINA SIMANOVA – Words affect visual perception by activating object shape representations

Linguistic labels are known to facilitate object recognition, yet the mechanism of this facilitation is not well understood. Previous psychophysical studies have suggested that words guide visual perception by activating information about visual object shape. Here we aimed to test this hypothesis at the neural level, and to tease apart the visual and semantic contribution of words to visual object recognition. We created a set of object pictures from two semantic categories with varying shapes, and obtained subjective ratings of their shape and category similarity. We then conducted a word-picture matching experiment, while recording participants’ EEG, and tested if the shape or the category similarity between the word’s referent and target picture explained the spatiotemporal pattern of the picture-evoked responses. The results show
that hearing a word activates representations of its referent's shape, which interacts with the visual processing of a subsequent picture within 100 ms from its onset. Furthermore, non-visual categorical information, carried by the word, affects the visual processing at later stages. These findings advance our understanding of the interaction between language and visual perception and provide insights into how the meanings of words are represented in the brain.

https://www.nature.com/articles/s41598-018-32483-2

New Scientist
NEWS
The 7 non-human mammals where females rule the roost
In the wild, males often dominate leadership roles, but not in seven species of mammals ranging from orcas and African elephants to spotted hyenas.


ARTICLES
DANIEL COSSINS – How to read Inca
A lost language encoded in intricate cords is finally revealing its secrets – and it could upend what we know about Incan history and culture.

http://click.e.newscientist.com/?qs=70d082f5c621ecfc9667e236a8af442e5670eda0ae552f287067c1ad67faa4908be8d4fd5b53d2b87c52a5bbda2b0ca094973a702113cf7

TIMOTHY REVELL – Mind-reading tech
We can now decode dreams and recreate images of faces people have seen, and everyone from Facebook to Elon Musk wants a piece of this mind reading reality.

http://click.e.newscientist.com/?qs=924c35f073a558654748d355d3b22db51b64761d7ebbb2b527153eabcd93f66f461a0ab6f3c72b2ece29ca5cf2161b769db86c2fa393ed

PLoS Biology
PAPERS
TOBIAS GROSSMANN, MANUELA MISSANA & KATHLEEN M. KROL – The neurodevelopmental precursors of altruistic behavior in infancy
Altruistic behavior is considered a key feature of the human cooperative makeup, with deep ontogenetic roots. The tendency to engage in altruistic behavior varies between individuals and has been linked to differences in responding to fearful faces. The current study tests the hypothesis that this link exists from early in human ontogeny. Using eye tracking, we examined whether attentional responses to fear in others at 7 months of age predict altruistic behavior at 14 months of age. Our analysis revealed that altruistic behavior in toddlerhood was predicted by infants’ attention to fearful faces but not happy or angry faces. Specifically, infants who showed heightened initial attention to (i.e., prolonged first look) followed by greater disengagement (i.e., reduced attentional bias over 15 seconds) from fearful faces at 7 months displayed greater prosocial behavior at 14 months of age. Our data further show that infants’ attentional bias to fearful faces and their altruistic behavior was predicted by brain responses in the dorsolateral prefrontal cortex (dlPFC), measured through functional near-infrared spectroscopy (fNIRS). This suggests that, from early in ontogeny, variability in altruistic helping behavior is linked to our responsiveness to seeing others in distress and brain processes implicated in attentional control. These findings critically advance our understanding of the emergence of altruism in humans by identifying responsiveness to fear in others as an early precursor contributing to variability in prosocial behavior.

https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.2005281

JOHAN J. BOLHUIS et al with ROBERT C. BERWICK & MARTIN B. H. EVERAERT – The slings and arrows of comparative linguistics
There are intriguing avian parallels to human speech acquisition absent in our closest relatives, the great apes. Although unbounded hierarchical syntactic structure is thought to be unique to human language, there is no a priori reason why the computational mechanisms used to build such structure could not have evolved in other animal species. So far, however, there is no evidence to support such a claim. Only extensive and thorough comparative work can provide insights into which features of the language faculty are uniquely human and which ones are shared with other animals. We therefore welcome the contributions of Suzuki and colleagues and Engesser and colleagues, as well as their responses to our essay. Our critical evaluations of their claims on compositionality in birds are not in any way linked to the value of a comparative biological approach. Nor do we think that such an approach would be rendered obsolete, even if a single computational operation of recursive combination turns out to underlie all human syntax, a position held by Townsend and colleagues. In fact, these authors go to great lengths arguing against something that we are actually not discussing—whether or not the Minimalist Program is an appropriate theoretical linguistics framework. Such questions are better addressed elsewhere.

https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000019
MATTHEW BALDWIN AND THOMAS MUSSWEILER – The culture of social comparison
Social comparison is one of the most ubiquitous features of human social life. This fundamental human tendency to look to others for information about how to think, feel, and behave has provided us with the ability to thrive in a highly complex and interconnected modern social world. Despite its prominent role, however, a detailed understanding of the cultural foundations of social comparison is lacking. The current research aims to fill this gap by showing that two prominent cultural dimensions, tightness–looseness and individualism–collectivism, uniquely explain variation in social-comparison proclivity across individuals, situations, and cultures. We first demonstrate the yet-undocumented link between cultural tightness and comparison proclivity across individuals, and further show that perceptions of ambient tightness and interdependence are uniquely associated with stronger social-comparison tendencies. Next, we show that these associations arise across social settings and can be attributed to properties of the settings themselves, not solely to individual differences. Finally, we show that both tight and collectivistic US states show a propensity to engage in Google searches related to specific social-comparison emotions, but that the tightness–comparison link arises from a unique psychological mechanism. Altogether, these findings show that social comparison—a fundamental aspect of human cognition—is linked to cultural practices based both in prevalence and strength of social norms as well as the tendency to construe the self in relation to others.

http://www.pnas.org/content/115/39/E9067?etoc=

STEFAN A. FRANK – Measurement Invariance explains the universal law of generalization for psychological perception
The universal law of generalization describes how animals discriminate between alternative sensory stimuli. On an appropriate perceptual scale, the probability that an organism perceives two stimuli as similar typically declines exponentially with the difference on the perceptual scale. Exceptions often follow a Gaussian probability pattern rather than an exponential pattern. Previous explanations have been based on underlying theoretical frameworks such as information theory, Kolmogorov complexity, or empirical multidimensional scaling. This article shows that the few inevitable invariances that must apply to any reasonable perceptual scale provide a sufficient explanation for the universal exponential law of generalization. In particular, reasonable measurement scales of perception must be invariant to shift by a constant value, which by itself leads to the exponential form. Similarly, reasonable measurement scales of perception must be invariant to multiplication, or stretch, by a constant value, which leads to the conservation of the slope of discrimination with perceptual difference. In some cases, an additional assumption about exchangeability or rotation of underlying perceptual dimensions leads to a Gaussian pattern of discrimination, which can be understood as a special case of the more general exponential form. The three measurement invariances of shift, stretch, and rotation provide a sufficient explanation for the universally observed patterns of perceptual generalization. All of the additional assumptions and language associated with information, complexity, and empirical scaling are superfluous with regard to the broad patterns of perception.

http://www.pnas.org/content/115/39/9803?etoc=

Proceedings of the Royal Society B

JONATHAN N. PRUITT et al – Social tipping points in animal societies
Animal social groups are complex systems that are likely to exhibit tipping points—which are defined as drastic shifts in the dynamics of systems that arise from small changes in environmental conditions—yet this concept has not been carefully applied to these systems. Here, we summarize the concepts behind tipping points and describe instances in which they are likely to occur in animal societies. We also offer ways in which the study of social tipping points can open up new lines of inquiry in behavioural ecology and generate novel questions, methods, and approaches in animal behaviour and other fields, including community and ecosystem ecology. While some behaviours of living systems are hard to predict, we argue that probing tipping points across animal societies and across tiers of biological organization—populations, communities, ecosystems—may help to reveal principles that transcend traditional disciplinary boundaries.

http://rspb.royalsocietypublishing.org/content/285/1887/20181282?etoc=

KELLY JAASKOLA et al with STEPHANIE L. KING – Bottlenose dolphins can understand their partner's role in a cooperative task
In recent decades, a number of studies have examined whether various non-human animals understand their partner's role in cooperative situations. Yet the relatively tolerant timing requirements of these tasks make it theoretically possible for animals to succeed by using simple behavioural strategies rather than by jointly intended coordination. Here we investigated whether bottlenose dolphins could understand a cooperative partner's role by testing whether they could learn a button-pressing task requiring precise behavioural synchronization. Specifically, members of cooperative dyads were required to swim across a lagoon and each press their own underwater button simultaneously (within a 1 s time window), whether sent together or with a delay between partners of 1–20 s. We found that dolphins were able to work together with extreme precision even when they had to wait for their partner, and that their coordination improved over the course of the study, with the time between button presses in the latter trials averaging 370 ms. These findings show that bottlenose dolphins can learn to understand their partner's role in a cooperative situation, and suggest that the behavioural synchronization evident
in wild dolphins' synchronous movement and coordinated alliance displays may be a generalized cognitive ability that can also be used to solve novel cooperative tasks.

http://rspb.royalsocietypublishing.org/content/285/1887/20180948?etoc

Science Advances

PAPERS

FOTIOS ALEXANDROS KARAKOSTIS et al – Evidence for Precision Grasping in Neandertal Daily Activities
Neandertal manual activities, as previously reconstructed from their robust hand skeletons, are thought to involve systematic power grasping rather than precise hand movements. However, this interpretation is at odds with increasing archeological evidence for sophisticated cultural behavior. We reevaluate the manipulative behaviors of Neandertals and early modern humans using a historical reference sample with extensive genealogical and lifelong occupational documentation, in combination with a new and precise three-dimensional multivariate analysis of hand muscle attachments. Results show that Neandertal muscle marking patterns overlap exclusively with documented lifelong precision workers, reflecting systematic precision grasping consistent with the use of their associated cultural remains. Our findings challenge the established interpretation of Neandertal behavior and establish a solid link between biological and cultural remains in the fossil record.

http://advances.sciencemag.org/content/4/9/eaat2369?utm_campaign=toc_advances_2018-09-28&et_rid=17774313&et_cid=2397960

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