# EAORC BULLETIN 938 – 6 June 2021

## 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, 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.

## ACADEMIA.EDU – The evolutionary history of the human face

***Nature Ecology & Evolution 3, 726-736 (2019)***

**MARC R. MEYER & MARTIN HAEUSLER – Spinal cord evolution in early Homo**

The discovery at Nariokotome of the Homo erectus skeleton KNM-WT 15000, with a narrow spinal canal, seemed to show that this relatively large-brained hominin retained the primitive spinal cord size of African apes and that brain size expansion preceded postcranial neurological evolution. Here we compare the size and shape of the KNM-WT 15000 spinal canal with modern and fossil taxa including H. erectus from Dmanisi, Homo antecessor, the European middle Pleistocene hominins from Sima de los Huesos, and Pan troglodytes. In terms of shape and absolute and relative size of the spinal canal, we find all of the Dmanisi and most of the vertebrae of KNM-WT 15000 are within the human range of variation except for the C7, T2, and T3 of KNM-WT 15000, which are constricted, suggesting spinal stenosis. While additional fossils might definitively indicate whether H. erectus had evolved a human-like enlarged spinal canal, the evidence from the Dmanisi spinal canal and the unaffected levels of KNM-WT 15000 show that unlike Australopithecus, H. erectus had a spinal canal size and shape equivalent to that of modern humans. Subadult status is unlikely to affect our results, as spinal canal growth is complete in both individuals. We contest the notion that vertebrae yield information about respiratory control or language evolution, but suggest that, like H. antecessor and European middle Pleistocene hominins from Sima de los Huesos, early Homo possessed a postcranial neurological endowment roughly commensurate to modern humans, with implications for neurological, structural, and vascular improvements over Pan and Australopithecus.
https://www.academia.edu/17378768/Spinal_Cord_Evolution_in_Early_Homo

## SCIENCEDIRECT – The speech-like properties of nonhuman primate vocalizations

***Animal Behaviour 151, 229-237 (2019)***

**THORE J.BERGMAN et al – The speech-like properties of nonhuman primate vocalizations**

The origins of speech, the most complex form of animal communication, remain a puzzle. Human speech and nonhuman primate vocalizations have traditionally been viewed dichotomously, with several aspects of speech having no clear

analogues in the calls of our primate relatives. The putative unique aspects of speech include a diverse array of learned sounds that are rapidly produced in rhythmic strings and continuously recombined in new sequences. However, recent research challenges the idea that these features are indeed unique to humans and suggests more continuity between nonhuman and human primates than was previously appreciated. Here we review recent findings in four areas of this emerging continuity. In light of these studies, we argue that the evolution of human speech abilities most likely originated in a primate ancestor capable of (1) producing a 'speech-ready' range of vowel-like sounds, (2) vocalizing with simultaneous rhythmic mouth movements, (3) combining long strings of varied and structured sounds and (4) exercising some volitional control over calls that were modified based on experience. Taken together, these results suggest that the considerable latent vocal ability that we observe in nonhuman primates is consistent with the hypothesis that a key step towards human speech was the evolution of greater cognitive control of the vocal apparatus (and not the evolution of speech-specific anatomical adaptations). By shifting research emphasis away from the mechanics of how speech is produced to the conditions that favoured more diverse, open-ended and imitative vocal systems, we hope to encourage new avenues for future comparative research.
https://www.sciencedirect.com/science/article/abs/pii/S0003347219300685

## SCIENCEDIRECT – Dual neural network model of speech and language evolution

***Current Opinion in Behavioral Sciences 21, 80-87 (2018)***

**STEFFEN R. HAGE – Dual neural network model of speech and language evolution: new insights on flexibility of vocal production systems and involvement of frontal cortex**

Human speech vastly outperforms primate vocal behavior in scope and flexibility making the elucidation of speech evolution one of biology's biggest challenges. A proposed dual-network model including a volitional articulatory motor network originating in the prefrontal cortex that is capable of cognitively controlling vocal output of a phylogenetically conserved primary vocal motor network attempts to bridge this gap. By comparing neuronal networks in human and non-human brains, crucial biological preadaptations are found in monkeys for the emergence of a speech system in humans. This model can explain behavioral evidence for vocal flexibility in cognitive tasks as well as during vocal development in monkeys as intermediate steps in the continuous evolution of speech in the primate lineage.
https://www.sciencedirect.com/science/article/pii/S2352154617301596

# NEWS

## BREAKING SCIENCE – Humans Arrived in North America More Than 30,000 Years Ago?

Archaeologists have obtained radiocarbon dates for the faunal bones excavated from Coxcatlan Cave, a dry rock shelter located within the southern portion of the Tehuacan Valley, southern Puebla, Mexico. The dates for the bone samples from the early depositional levels of the cave ranged from 33,448 to 28,279 years old.
http://feedproxy.google.com/~r/BreakingScienceNews/~3/48BKqc9dgKM/coxcatlan-cave-humans-09721.html?utm_source=feedburner&utm_medium=email

## BREAKING SCIENCE – Scientists Decode Complex Song of Northern Mockingbird

In a new study published in May 2021 in the journal Frontiers in Psychology, an interdisciplinary team of researchers made an attempt to describe the specific compositional rules behind the song of the northern mockingbird (Mimus polyglottos), focusing on the way the bird transitions from one syllable type to the next.
http://feedproxy.google.com/~r/BreakingScienceNews/~3/02Hne_azEmw/northern-mockingbird-song-09731.html?utm_source=feedburner&utm_medium=email

## BREAKING SCIENCE – Dogs' Skills for Cooperating with Humans are Biologically Prepared, Study Says

A new study, published in the journal Current Biology, suggests that dogs' social skills emerge early in development and are under strong genetic control.
http://feedproxy.google.com/~r/BreakingScienceNews/~3/0MOX8fbYzBs/dogs-biologically-prepared-social-skills-09729.html?utm_source=feedburner&utm_medium=email

## NATURE BRIEFING – Slime moulds remember their meals

The slime mould Physarum polycephalum has no brain or nervous system — yet it somehow 'remembers' the location of food that it ate. Slime molds are simple organisms made up of interlacing tubes — but previous research has shown they can solve complex problems, such as finding the shortest path through a maze. Scientists found that when parts of P. polycephalum come into contact with a food source, they release a substance that softens the gel-like walls of its tubes, making them widen. The slime mould moves by expanding along wider tubes and pruning narrower ones, so the enlarged tubes effectively record past food sites.
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=7f6f840fac&e=1db4b9a19b

## NATURE BRIEFING – How did Neanderthals learn to count?

Archaeological finds suggest that people developed numbers tens of thousands of years ago. Scholars are now exploring the first detailed hypotheses about this life-changing invention. “Numbers are just so fundamental to everything we do,” says evolutionary biologist Russell Gray. “It’s hard to conceive of human life without them.” Nevertheless, there remains a slew of open questions about exactly when and how humans first started using numbers.
https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=feecac6ea3&e=1db4b9a19b

## SCIENCE DAILY – Newly discovered African 'climate seesaw' drove human evolution

A scientific consortium has found that ancient El Niño-like weather patterns were the primary drivers of environmental change in sub-Saharan Africa over the last 620 thousand years - the critical time-frame for the evolution of our species. The group found that these ancient weather patterns had more profound impacts in sub-Saharan Africa than glacial-interglacial cycles more commonly linked to human evolution.
https://www.sciencedaily.com/releases/2021/05/210531153205.htm

## SCIENCE DAILY – New evidence may change timeline for when people first arrived in North America

An unexpected discovery suggests that the first humans may have arrived in North America more than 30,000 years ago - nearly 20,000 years earlier than originally thought.
https://www.sciencedaily.com/releases/2021/06/210601165038.htm

## SCIENCE DAILY – Trust among corvids

Corvids use social information to protect themselves against deception by conspecifics from neighboring territories.
https://www.sciencedaily.com/releases/2021/06/210601135719.htm

## SCIENCE DAILY – Stone Age raves to the beat of elk tooth rattles?

In the Stone Age, some 8,000 years ago, people danced often and in a psychedelic way. This is a conclusion drawn from elk teeth discovered in the Yuzhniy Oleniy Ostrov burial site in the Republic of Karelia, Russia, whose wear marks and location in the graves indicate that the objects were used as rattlers.
https://www.sciencedaily.com/releases/2021/06/210603171333.htm

## SCIENCE DAILY – Puppies are wired to communicate with people

Dogs may have earned the title 'man's best friend' because of how good they are at interacting with people. Those social skills may be present shortly after birth rather than learned, a new study suggests.
https://www.sciencedaily.com/releases/2021/06/210603111935.htm

## SOCIETY FOR SCIENCE – Hunter-gatherers first launched violent raids at least 13,400 years ago

Skeletons from an ancient African cemetery bear the oldest known signs of small-scale warfare.
http://click.societyforscience-email.com/?qs=be8a3326ddbf528444d7cfaabf102035f7bf96805213dab88b4f151383ebe1b2fa4825590d431275bf90f9e843f7e1be7cf1570ef013d067

## THE CONVERSATION – Is it time to give up on consciousness as ‘the ghost in the machine’?

Consciousness is sometimes referred to as 'the ghost' in the machinery of our brain. Is it time we gave up the ghost to focus on the machine?
https://theconversationuk.cmail20.com/t/r-l-tldjjkhy-khhlilahh-f/

# PUBLICATIONS

## American Journal of Physical Anthropology

### REVIEWS

**JOHN C. MITANI – Chimpanzee culture wars**

Review of ‘Chimpanzee culture wars’ by Nicolas Langlitz, Princeton University Press, 2020.
https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24331

**EMŐKE J. E. SZATHMÁRY – A companion to anthropological genetics**

Review of ‘A companion to anthropological genetics’ by Dennis H. O'Rourke, John Wiley & Sons, 2019.
https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24337

## Current Biology

### ARTICLES

**NESKUTS IZAGIRRE & SANTOS ALONSO – Evolution: On the origin of Basques**

As the only speakers of a non-Indo-European language lacking connections to any other language, the origin and evolution of the Basque population have been topics of interest. A new genomic analysis of Basques shows that they are not a relict Paleolithic population as once thought.

https://www.cell.com/current-biology/fulltext/S0960-9822(21)00448-6

### PAPERS

**ANDRÉ FLORES-BELLO et al – Genetic origins, singularity, and heterogeneity of Basques**

Basques have historically lived along the Western Pyrenees, in the Franco-Cantabrian region, straddling the current Spanish and French territories. Over the last decades, they have been the focus of intense research due to their singular cultural and biological traits that, with high controversy, placed them as a heterogeneous, isolated, and unique population. Their non-Indo-European language, Euskara, is thought to be a major factor shaping the genetic landscape of the Basques. Yet there is still a lively debate about their history and assumed singularity due to the limitations of previous studies. Here, we analyze genome-wide data of Basque and surrounding groups that do not speak Euskara at a micro-geographical level. A total of ~629,000 genome-wide variants were analyzed in 1,970 modern and ancient samples, including 190 new individuals from 18 sampling locations in the Basque area. For the first time, local- and wide-scale analyses from genome-wide data have been performed covering the whole Franco-Cantabrian region, combining allele frequency and haplotype-based methods. Our results show a clear differentiation of Basques from the surrounding populations, with the non-Euskara-speaking Franco-Cantabrians located in an intermediate position. Moreover, a sharp genetic heterogeneity within Basques is observed with significant correlation with geography. Finally, the detected Basque differentiation cannot be attributed to an external origin compared to other Iberian and surrounding populations. Instead, we show that such differentiation results from genetic continuity since the Iron Age, characterized by periods of isolation and lack of recent gene flow that might have been reinforced by the language barrier.

https://www.cell.com/current-biology/fulltext/S0960-9822(21)00349-3

**EMILY E. BRAY et al – Early-emerging and highly heritable sensitivity to human communication in dogs**

Human cognition is believed to be unique in part because of early-emerging social skills for cooperative communication. Comparative studies show that at 2.5 years old, children reason about the physical world similarly to other great apes, yet already possess cognitive skills for cooperative communication far exceeding those in our closest primate relatives. A growing body of research indicates that domestic dogs exhibit functional similarities to human children in their sensitivity to cooperative-communicative acts. From early in development, dogs flexibly respond to diverse forms of cooperative gestures. Like human children, dogs are sensitive to ostensive signals marking gestures as communicative, as well as contextual factors needed for inferences about these communicative acts. However, key questions about potential biological bases for these abilities remain untested. To investigate their developmental and genetic origins, we tested 375 8-week-old dog puppies on a battery of social-cognitive measures. We hypothesized that if dogs' skills for cooperating with humans are biologically prepared, then they should emerge robustly in early development, not require extensive socialization or learning, and exhibit heritable variation. Puppies were highly skillful at using diverse human gestures, and we found no evidence that their performance required learning. Critically, over 40% of the variation in dogs' point-following abilities and attention to human faces was attributable to genetic factors. Our results suggest that these social skills in dogs emerge early in development and are under strong genetic control.

https://www.cell.com/current-biology/fulltext/S0960-9822(21)00602-3

## Frontiers in Psychology

### PAPERS

**ANNA CIAUNICA et al – Whatever Next and Close to My Self—The Transparent Senses and the "Second Skin": Implications for the Case of Depersonalization**

In his paper "Whatever next? Predictive brains, situated agents, and the future of cognitive science," Andy Clark seminally proposed that the brain's job is to predict whatever information is coming "next" on the basis of prior inputs and experiences. Perception fundamentally subserves survival and self-preservation in biological agents, such as humans. Survival however crucially depends on rapid and accurate information processing of what is happening in the here and now. Hence, the term "next" in Clark's seminal formulation must include not only the temporal dimension (i.e., what is perceived now) but also the spatial dimension (i.e., what is perceived here or next-to-my-body). In this paper, we propose to focus on perceptual experiences that happen "next," i.e., close-to-my-body. This is because perceptual processing of proximal sensory inputs has a key impact on the organism's survival. Specifically, we focus on tactile experiences mediated by the skin and what we will call the "extended skin" or "second skin," that is, immediate objects/materials that envelop closely to our skin, namely, clothes. We propose that the skin and tactile experiences are not a mere border separating the self and world. Rather, they simultaneously and inherently distinguish and connect the bodily self to its environment. Hence, these proximal and pervasive tactile experiences can be viewed as a "transparent bridge" intrinsically relating and facilitating exchanges

between the self and the physical and social world. We conclude with potential implications of this observation for the case of Depersonalization Disorder, a condition that makes people feel estranged and detached from their self, body, and the world.
https://www.frontiersin.org/articles/10.3389/fpsyg.2021.613587/full

**ANITA PACHOLIK-ŻUROMSKA – How Proprioception Gives Rise to Self-Others-Knowledge**
The already rich professional literature broadly informs about the role of the body in establishing the self-others distinction (Jeannerod, 2006; Iacoboni, 2009; Kyselo, 2015; Maister et al., 2015; Noel et al., 2017; Palmer and Tsakiris, 2018). The internal sense of ownership and sense of agency are the fundamentals of self-identification (Jeannerod, 2004; Blanke et al., 2015; Tsakiris, 2016; Braun et al., 2018). The lack of these two fundamentals (natural or artificially induced) also conveys important information, specifically that the action was executed by someone else (Iacoboni, 2009; Tsakiris, 2010). In my opinion, owing to its neural fundamentals, bodily self-consciousness (BSC) not only allows us to differentiate between self and others but also leads to the propositional knowledge of the subject and influences the social functioning of the subject (the self-others-knowledge—SOK). Assigning the important role of the body and multisensory integration in the self-others distinction is not new (Keromnes et al., 2019). However, what I add to this opinion is the recognition of the role of proprioception in shaping propositional SOK, i.e., shaping a specific type of metacognition.
https://www.frontiersin.org/articles/10.3389/fpsyg.2021.575945/full

### REVIEWS

**YANG YAO & QIUJUN SU – The Routledge Handbook of Cognitive Linguistics (1st Edition)**
Review of 'The Routledge Handbook of Cognitive Linguistics (1st Edition)' by Xu Wen & John R. Taylor (Routledge), 2021.
https://www.frontiersin.org/articles/10.3389/fpsyg.2021.697145/full

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## Nature

### ARTICLES

**COLIN BARRAS – How did Neanderthals and other ancient humans learn to count?**
Archaeological finds suggest that people developed numbers tens of thousands of years ago. Scholars are now exploring the first detailed hypotheses about this life-changing invention.
https://www.nature.com/articles/d41586-021-01429-6

**NICK PETRIĆ HOWE & BENJAMIN THOMPSON – On the origin of numbers**
The cross-discipline effort to work out how ancient humans learned to count.
https://www.nature.com/articles/d41586-021-01491-0

### PAPERS

**YAFEI MAO et mul – A high-quality bonobo genome refines the analysis of hominid evolution**
The divergence of chimpanzee and bonobo provides one of the few examples of recent hominid speciation. Here we describe a fully annotated, high-quality bonobo genome assembly, which was constructed without guidance from reference genomes by applying a multiplatform genomics approach. We generate a bonobo genome assembly in which more than 98% of genes are completely annotated and 99% of the gaps are closed, including the resolution of about half of the segmental duplications and almost all of the full-length mobile elements. We compare the bonobo genome to those of other great apes and identify more than 5,569 fixed structural variants that specifically distinguish the bonobo and chimpanzee lineages. We focus on genes that have been lost, changed in structure or expanded in the last few million years of bonobo evolution. We produce a high-resolution map of incomplete lineage sorting and estimate that around 5.1% of the human genome is genetically closer to chimpanzee or bonobo and that more than 36.5% of the genome shows incomplete lineage sorting if we consider a deeper phylogeny including gorilla and orangutan. We also show that 26% of the segments of incomplete lineage sorting between human and chimpanzee or human and bonobo are non-randomly distributed and that genes within these clustered segments show significant excess of amino acid replacement compared to the rest of the genome.
https://www.nature.com/articles/s41586-021-03519-x

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## Nature Scientific Reports

### PAPERS

**A. R. LUÍS et al – Vocal universals and geographic variations in the acoustic repertoire of the common bottlenose dolphin**
Acoustical geographic variation is common in widely distributed species and it is already described for several taxa, at various scales. In cetaceans, intraspecific variation in acoustic repertoires has been linked to ecological factors, geographical barriers, and social processes. For the common bottlenose dolphin (Tursiops truncatus), studies on acoustic variability are scarce, focus on a single signal type—whistles and on the influence of environmental variables. Here, we analyze the acoustic emissions of nine bottlenose dolphin populations across the Atlantic Ocean and the Mediterranean Sea, and identify common signal types and acoustic variants to assess repertoires' (dis)similarity. Overall, these dolphins present a rich

acoustic repertoire, with 24 distinct signal sub-types including: whistles, burst-pulsed sounds, brays and bangs. Acoustic divergence was observed only in social signals, suggesting the relevance of cultural transmission in geographic variation. The repertoire dissimilarity values were remarkably low (from 0.08 to 0.4) and do not reflect the geographic distances among populations. Our findings suggest that acoustic ecology may play an important role in the occurrence of intraspecific variability, as proposed by the 'environmental adaptation hypothesis'. Further work may clarify the boundaries between neighboring populations, and shed light into vocal learning and cultural transmission in bottlenose dolphin societies.
https://www.nature.com/articles/s41598-021-90710-9

**JAMES BLINKHORN et al with MICHAEL D. PETRAGLIA – Directional changes in Levallois core technologies between Eastern Africa, Arabia, and the Levant during MIS 5**
Marine Isotope Stage (MIS) 5, ~ 130 to 71 thousand years ago, was a key period for the geographic expansion of Homo sapiens, including engagement with new landscapes within Africa and dispersal into Asia. Occupation of the Levant by Homo sapiens in MIS 5 is well established, while recent research has documented complementary evidence in Arabia. Here, we undertake the first detailed comparison of Levallois core technology from eastern Africa, Arabia, and the Levant during MIS 5, including multiple sites associated with Homo sapiens fossils. We employ quantitative comparisons of individual artefacts that provides a detailed appraisal of Levallois reduction activity in MIS 5, thereby enabling assessment of intra- and inter-assemblage variability for the first time. Our results demonstrate a pattern of geographically structured variability embedded within a shared focus on centripetal Levallois reduction schemes and overlapping core morphologies. We reveal directional changes in core shaping and flake production from eastern Africa to Arabia and the Levant that are independent of differences in geographic or environmental parameters. These results are consistent with a common cultural inheritance between these regions, potentially stemming from a shared late Middle Pleistocene source in eastern Africa.
https://www.nature.com/articles/s41598-021-90744-z

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## New Scientist

### NEWS

**Monkeys can change their accent to communicate with another species**
Have you ever adopted a local accent so people can understand you better? Some tamarin monkeys in the Amazon rainforest do something similar if they share living space with a closely related species.
https://www.newscientist.com/article/2278562-monkeys-can-change-their-accent-to-communicate-with-another-species/#ixzz6wkcor7kx

### REVIEWS

**VIJAYSREE VENKATRAMAN – Could alcohol-induced creativity be key to civilisation?**
Review of 'Drunk: How we sipped, danced, and stumbled our way to civilization' by Edward Slingerland.
https://www.newscientist.com/article/mg25033372-300-drunk-review-could-alcohol-induced-creativity-be-key-to-civilisation/#ixzz6wkdIjlRK

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## PLoS Biology

### PAPERS

**BEATRICE EHMANN et al with CAREL P. VAN SCHAIK – Immature wild orangutans acquire relevant ecological knowledge through sex-specific attentional biases during social learning**
As a part of growing up, immature orangutans must acquire vast repertoires of skills and knowledge, a process that takes several years of observational social learning and subsequent practice. Adult female and male orangutans show behavioral differences including sex-specific foraging patterns and male-biased dispersal. We investigated how these differing life trajectories affect social interest and emerging ecological knowledge in immatures. We analyzed 15 years of detailed observational data on social learning, associations, and diet repertoires of 50 immatures (16 females and 34 males), from 2 orangutan populations. Specific to the feeding context, we found sex differences in the development of social interest: Throughout the dependency period, immature females direct most of their social attention at their mothers, whereas immature males show an increasing attentional preference for individuals other than their mothers. When attending to non-mother individuals, males show a significant bias toward immigrant individuals and a trend for a bias toward adult males. In contrast, females preferentially attend to neighboring residents. Accordingly, by the end of the dependency period, immature females show a larger dietary overlap with their mothers than do immature males. These results suggest that immature orangutans show attentional biases through which they learn from individuals with the most relevant ecological knowledge. Diversifying their skills and knowledge likely helps males when they move to a new area. In sum, our findings underline the importance of fine-grained social inputs for the acquisition of ecological knowledge and skills in orangutans and likely in other apes as well.
https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001173

**ALFRED KIK et al – Language and ethnobiological skills decline precipitously in Papua New Guinea, the world's most linguistically diverse nation**

Papua New Guinea is home to >10% of the world's languages and rich and varied biocultural knowledge, but the future of this diversity remains unclear. We measured language skills of 6,190 students speaking 392 languages (5.5% of the global total) and modeled their future trends using individual-level variables characterizing family language use, socioeconomic conditions, students' skills, and language traits. This approach showed that only 58% of the students, compared to 91% of their parents, were fluent in indigenous languages, while the trends in key drivers of language skills (language use at home, proportion of mixed-language families, urbanization, students' traditional skills) predicted accelerating decline of fluency to an estimated 26% in the next generation of students. Ethnobiological knowledge declined in close parallel with language skills. Varied medicinal plant uses known to the students speaking indigenous languages are replaced by a few, mostly nonnative species for the students speaking English or Tok Pisin, the national lingua franca. Most (88%) students want to teach indigenous language to their children. While crucial for keeping languages alive, this intention faces powerful external pressures as key factors (education, cash economy, road networks, and urbanization) associated with language attrition are valued in contemporary society.

https://www.pnas.org/content/118/22/e2100096118.abstract?etoc

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## PLoS One

### PAPERS

**JOSÉ RAMÓN URIARTE & STEFAN SPERLICH – A behavioural model of minority language shift: Theory and empirical evidence**

Natural languages with their speech communities tend to compete for speakers, very much like firms compete for market shares. As a result, some languages suffer a shifting pressure which might lead them to their extinction. This work studies the dynamics of language shift in the context of modern bilingual societies like the Basque Country, Ireland and Wales. They all have two official languages, linguistically distant: A, spoken by all, and B, spoken by a bilingual minority. They also have a bilingual education system that ensures a steady flow of new bilinguals. However, a decay in the use of B is observed, signalling that shift processes are at work. To investigate this apparent paradox, we use a novel approach in the literature of language competition. We build a behavioural game model with which bilinguals choose either language A or B for each interaction. Thus, they play repeatedly the game. We present a theorem predicting that under reasonable assumptions, any given population of bilinguals will converge into a linguistic convention, namely into an evolutionary stable equilibrium of the game, that always embeds a proportion of bilinguals shifting to A. We validate this result by means of an empirical version of the model, showing that the predictions fit well the observed data of street use of Basque and daily use of Irish and Welsh.

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0252453

**RYAN M. CAMPBELL, GABRIEL VINAS & MACIEJ HENNEBERG – Towards the restoration of ancient hominid craniofacial anatomy: Chimpanzee morphology reveals covariation between craniometrics and facial soft tissue thickness**

In modern humans, facial soft tissue thicknesses have been shown to covary with craniometric dimensions. However, to date it has not been confirmed whether these relationships are shared with non-human apes. In this study, we analyze these relationships in chimpanzees (Pan troglodytes) with the aim of producing regression models for approximating facial soft tissue thicknesses in Plio-Pleistocene hominids. Using CT scans of 19 subjects, 637 soft tissue, and 349 craniometric measurements, statistically significant multiple regression models were established for 26 points on the face and head. Examination of regression model validity resulted in minimal differences between observed and predicted soft tissue thickness values. Assessment of interspecies compatibility using a bonobo (Pan paniscus) and modern human subject resulted in minimal differences for the bonobo but large differences for the modern human. These results clearly show that (1) soft tissue thicknesses covary with craniometric dimensions in P. troglodytes, (2) confirms that such covariation is uniformly present in both extant Homo and Pan species, and (3) suggests that chimp-derived regression models have interspecies compatibility with hominids who have similar craniometric dimensions to P. troglodytes. As the craniometric dimensions of early hominids, such as South African australopithecines, are more similar to P. troglodytes than those of H. sapiens, chimpanzee-derived regression models may be used for approximating their craniofacial anatomy. It is hoped that the results of the present study and the reference dataset for facial soft tissue thicknesses of chimpanzees it provides will encourage further research into this topic.

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0245760

**RICHARD A. BLYTHE & WILLIAM CROFT – How individuals change language**

Languages emerge and change over time at the population level though interactions between individual speakers. It is, however, hard to directly observe how a single speaker's linguistic innovation precipitates a population-wide change in the language, and many theoretical proposals exist. We introduce a very general mathematical model that encompasses a wide variety of individual-level linguistic behaviours and provides statistical predictions for the population-level changes that result from them. This model allows us to compare the likelihood of empirically-attested changes in definite and indefinite articles in multiple languages under different assumptions on the way in which individuals learn and use language. We find that accounts of language change that appeal primarily to errors in childhood language acquisition are very weakly supported by

the historical data, whereas those that allow speakers to change incrementally across the lifespan are more plausible, particularly when combined with social network effects.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0252582

**ETHAN E. COCHRANE, TIMOTHY M. RIETH & DARBY FILIMOEHALA – The first quantitative assessment of radiocarbon chronologies for initial pottery in Island Southeast Asia supports multi-directional Neolithic dispersal**
Neolithization, or the Holocene demographic expansion of farming populations, accounts for significant changes in human and animal biology, artifacts, languages, and cultures across the earth. For Island Southeast Asia, the orthodox Out of Taiwan hypothesis proposes that Neolithic expansion originated from Taiwan with populations moving south into Island Southeast Asia, while the Western Route Migration hypothesis suggests the earliest farming populations entered from Mainland Southeast Asia in the west. These hypotheses are also linked to competing explanations of the Austronesian expansion, one of the most significant population dispersals in the ancient world that influenced human and environmental diversity from Madagascar to Easter Island and Hawai'i to New Zealand. The fundamental archaeological test of the Out of Taiwan and Western Route Migration hypotheses is the geographic and chronological distribution of initial pottery assemblages, but these data have never been quantitatively analyzed. Using radiocarbon determinations from 20 archaeological sites, we present a Bayesian chronological analysis of initial pottery deposition in Island Southeast Asia and western Near Oceania. Both site-scale and island-scale Bayesian models were produced in Oxcal using radiocarbon determinations that are most confidently associated with selected target events. Our results indicate multi-directional Neolithic dispersal in Island Southeast Asia, with the earliest pottery contemporaneously deposited in western Borneo and the northern Philippines. This work supports emerging research that identifies separate processes of biological, linguistic, and material culture change in Island Southeast Asia.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0251407

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## Science Advances

### PAPERS

**ANTONIA GODOY-LORITE & NICK S. JONES – Inference and influence of network structure using snapshot social behavior without network data**
Population behavior, like voting and vaccination, depends on the structure of social networks. This structure can differ depending on behavior type and is typically hidden. However, we do often have behavioral data, albeit only snapshots taken at one time point. We present a method jointly inferring a model for both network structure and human behavior using only snapshot population-level behavioral data. This exploits the simplicity of a few parameter model, geometric sociodemographic network model, and a spin-based model of behavior. We illustrate, for the European union referendum and two London mayoral elections, how the model offers both prediction and the interpretation of the homophilic inclinations of the population. Beyond extracting behavior-specific network structure from behavioral datasets, our approach yields a framework linking inequalities and social preferences to behavioral outcomes. We illustrate potential network-sensitive policies: how changes to income inequality, social temperature, and homophilic preferences might have reduced polarization in a recent election.
https://advances.sciencemag.org/content/7/23/eabb8762

**R. KELLY GARRETT & ROBERT M. BOND – Conservatives' susceptibility to political misperceptions**
The idea that U.S. conservatives are uniquely likely to hold misperceptions is widespread but has not been systematically assessed. Research has focused on beliefs about narrow sets of claims never intended to capture the richness of the political information environment. Furthermore, factors contributing to this performance gap remain unclear. We generated an unique longitudinal dataset combining social media engagement data and a 12-wave panel study of Americans' political knowledge about high-profile news over 6 months. Results confirm that conservatives have lower sensitivity than liberals, performing worse at distinguishing truths and falsehoods. This is partially explained by the fact that the most widely shared falsehoods tend to promote conservative positions, while corresponding truths typically favor liberals. The problem is exacerbated by liberals' tendency to experience bigger improvements in sensitivity than conservatives as the proportion of partisan news increases. These results underscore the importance of reducing the supply of right-leaning misinformation.
https://advances.sciencemag.org/content/7/23/eabf1234

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## Trends in Cognitive Sciences

### PAPERS

**CHRISTINE E. PARSONS & REBEKAH B. BAGLINI – Peer review: the case for neutral language**
Peer review is an integral part of scientific life, determining success in publishing, grant applications, and professional appointments. We argue for the importance of neutral language in peer review and provide examples of nonneutral linguistic and stylistic devices that emphasize a reviewer's personal response to the manuscript rather than their objective assessment.
***{I think this sums up all we really need to know: TO READ THIS ARTICLE IN FULL YOU WILL NEED TO MAKE A PAYMENT.}***
https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00124-8

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