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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.

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### ACADEMIA.EDU – Operating systems in units B and E of the Notarchirico

*In Quaternary International 411, 284-300 (2016).*

#### **CARMEN SANTAGATA – Operating systems in units B and E of the Notarchirico (Basilicata, Italy) ancient Acheulean open-air site and the role of raw materials**

The succession of archaeological units at Notarchirico offers technical and environmental arguments aimed at the characterization of the variability of the European Ancient Palaeolithic. Analysis shows the presence of distinctive features within the Acheulean assemblage besides the presence of handaxes. Hominins used flint and limestone on the site: a lithological analysis shows a predominance of the same raw materials in every unit and a partial selective exploitation. In unit B, traditionally associated with so-called “Mode 2”, the knapper principally intended to produce a sharp or convergence of the sharps (choppers or bifacial tools). In the E/E1 units, flaking prevails on the sporadic shaping: the presence of cores with polyhedral forms and the extreme dimensional reduction of objects are other main technical features associated with this core and flake assemblage. The presence or absence of handaxes is not the only element of variability: the presence of micro-tools and other technical elements represent technological innovations in the Lower Pleistocene assemblages common to many Italian sites during the so-called “Mode 1-2” transition. The traditional idea of Acheulean as an uniform entity characterized by the presence of handaxes does not seem to be valid.

[https://www.academia.edu/33983197/Operating\\_systems\\_in\\_units\\_B\\_and\\_E\\_of\\_the\\_Notarchirico\\_Basilicata\\_Italy\\_ancient\\_Acheulean\\_open\\_air\\_site\\_and\\_the\\_role\\_of\\_raw\\_materials](https://www.academia.edu/33983197/Operating_systems_in_units_B_and_E_of_the_Notarchirico_Basilicata_Italy_ancient_Acheulean_open_air_site_and_the_role_of_raw_materials)

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## NEWS

### BREAKING SCIENCE – Neanderthals Transformed Landscapes 125,000 Years Ago

According to an analysis of paleoenvironmental and archaeological data from the 125,000-year-old Neanderthal site of Neumark-Nord in Germany, our closest ancient human relatives created and maintained a certain vegetation openness at the site; their activities included hunting and game processing, lighting fires, collecting flint and other rocks for their stone technology, and gathering wood for fuel and for making tools like spears and digging sticks, and possibly for building structures; repetitive lighting of campfires around the lakes as well as other small-scale burning activities and the hunting of game animals may, over time, have reshaped vegetation structure and ecological communities, in ways that, over multiple generations, increased the food resources available.

[http://www.sci-news.com/archaeology/neanderthal-landscapes-10386.html?utm\\_source=feedburner&utm\\_medium=email](http://www.sci-news.com/archaeology/neanderthal-landscapes-10386.html?utm_source=feedburner&utm_medium=email)

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### BREAKING SCIENCE – New Caledonian Crows Prefer Hooked Sticks, Storing Them Underfoot or in Holes

According to a new study, New Caledonian crows (*Corvus moneduloides*) strongly prefer hooked stick tools made from stems of the ground tamarind (*Desmanthus virgatus*) over non-hooked stick tools; importantly, this preference is also reflected in subsequent tool-handling behavior, with the birds keeping hooked stick tools safe more often than non-hooked stick tools sourced from leaf litter.

[http://www.sci-news.com/biology/new-caledonian-crows-tool-storage-10393.html?utm\\_source=feedburner&utm\\_medium=email](http://www.sci-news.com/biology/new-caledonian-crows-tool-storage-10393.html?utm_source=feedburner&utm_medium=email)

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### SCIENCE DAILY – 1,500 endangered languages at high risk of being lost this century

A new study warns 1,500 endangered languages could no longer be spoken by the end of this century.

<https://www.sciencedaily.com/releases/2021/12/211216145917.htm>

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### SCIENCE DAILY – Ostrich eggshell beads reveal 50,000-year-old social network across Africa

New archeological study shows ancient connection between populations 3,000 km apart, and provides first direct link between climate change and ancient human social behavior.

<https://www.sciencedaily.com/releases/2021/12/211220120634.htm>

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### SCIENCE DAILY – One algorithm to rule decision-making

Researchers uncover a single rule for how animals make spatial decisions while on the move.

<https://www.sciencedaily.com/releases/2021/12/211217102746.htm>

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### SCIENCE DAILY – Limited brain capacity in humans and birds

Birds and humans have very different networks of neurons in their brains. Nevertheless, their working memory is limited by similar mechanisms.

<https://www.sciencedaily.com/releases/2021/12/211217102743.htm>

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### SCIENCE DAILY – Ancient DNA reveals the world's oldest family tree

Analysis of ancient DNA from one of the best-preserved Neolithic tombs in Britain has revealed that most of the people buried there were from five continuous generations of a single extended family. By analysing DNA extracted from the bones and teeth of 35 individuals entombed at Hazleton North long cairn in the Cotswolds-Severn region, the research team was able to detect that 27 of them were close biological relatives. The group lived approximately 5700 years ago.

<https://www.sciencedaily.com/releases/2021/12/211222153113.htm>

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### SCIENCE DAILY – New research on ancient Britain contains insights on language, ancestry, kinship, milk

New research revealing a major migration to the island of Great Britain offers fresh insights into the languages spoken at the time, the ancestry of present-day England and Wales, and even ancient habits of dairy consumption.

<https://www.sciencedaily.com/releases/2021/12/211222153107.htm>

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### SCIENCE DAILY – Key neural mechanism believed to support advanced cognitive abilities discovered

Scientists have discovered a neural mechanism that is believed to support advanced cognitive abilities such as planning and problem-solving.

<https://www.sciencedaily.com/releases/2021/12/211221162718.htm>

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### SCIENCE NEWS – Early migration from France may have brought Celtic languages to Britain

About 2900 years ago, an elderly woman was carefully buried with two lambs in her lap and a piece of chalk in her hand at a site now called Cliff 's End Farm, about 30 kilometers north of Dover, U.K. She had been killed by sword blows to her skull, likely in a sacrificial rite. Nearby lay the bodies of a teenager, two children, and a man whose bones had been bundled along with a copper-tipped cow bone. Two of the dead had been born in Europe, according to the isotopes in their teeth. Now, a study adds new insight into their origins: They may have been part of a wave of early Celtic speakers to reach Britain.

<https://www.science.org/content/article/early-migration-france-may-have-brought-celtic-languages-britain>

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### SOCIETY FOR SCIENCE – An Indigenous people in the Philippines have the most Denisovan DNA

Genetic comparisons crown the Indigenous Ayta Magbukon people as having the most DNA, 5 percent, from the mysterious ancient hominids.

<http://click.societyforscience->

[email.com/?qs=78d09484f56591631aaefa7d3d5d493f4b372b03b03823ddc19d782a8b88127aa2ea2f47b99b652114e62f1911d847d219107a7da0da932d](mailto:?qs=78d09484f56591631aaefa7d3d5d493f4b372b03b03823ddc19d782a8b88127aa2ea2f47b99b652114e62f1911d847d219107a7da0da932d)

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### SOCIETY FOR SCIENCE – 'The Dawn of Everything' rewrites 40,000 years of human history

A new book recasts human social evolution as multiple experiments with freedom and domination that started in the Stone Age.

<http://click.societyforscience->

[email.com/?qs=78d09484f5659163f5cd07f05930d5152addb48f8bc051d62474e69bf68c628e322b672c9f45383f680d1fe1e0a4b89f1e19a35643073466](mailto:?qs=78d09484f5659163f5cd07f05930d5152addb48f8bc051d62474e69bf68c628e322b672c9f45383f680d1fe1e0a4b89f1e19a35643073466)

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### THE CONVERSATION – 'Please continue'

Did this simple two-word phrase lead normal people to 'torture' strangers? I looked at the infamous Milgram experiment and seem to have made a shocking new discovery.

<https://theconversationuk.cmail20.com/t/r-l-trhykhjl-khhllilahn-g/>

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### THE CONVERSATION – Seagulls, songbirds and parrots: new research on their cognitive ability

Corvids and parrots might be the superstars of the bird world - but other species like gulls, geese and even chicken have shown some impressive skills too.

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## PUBLICATIONS

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### American Journal of Biological Anthropology

#### PAPERS

#### **HIDEKI AMANO et al – Morphological invariant of the midsagittal deep brain anatomy between humans and African great apes**

Efforts have been made to mathematically reconstruct the brain morphology from human fossil crania to clarify the evolutionary changes in the brain that are associated with the emergence of human cognitive ability. However, because conventional reconstruction methods are based solely on the endocranial shape, deep brain structures cannot be estimated with sufficient accuracy. Our study aims to investigate the possible morphological correspondence between the cranial and deep brain morphologies based on humans and African great apes, with the goal of a more precise reconstruction of fossil brains.

Midsagittal endocranial and deep brain landmarks were obtained from magnetic resonance images of humans and three species of African great apes. The average midsagittal endocranial profile of all four species was calculated after Procrustes registration. The spatial deformation function from each of the endocranial profiles to the average endocranial profile was defined, and the brain landmarks enclosed in the endocranium were transformed using the deformation function to evaluate the interspecific variabilities of the positions of the brain landmarks on the average endocranial profile.

The interspecific differences in the shape-normalized positions of the corpus callosum, anterior commissure, thalamus center, and brainstem were approximately within the range of 2% of the human cranial length, indicating that the interspecific variabilities of the positions of these deep brain structures were relatively small among the four species.

Such an invariant relationship of the deep brain structure and the endocranium that encloses the brain can potentially be utilized to reconstruct the brains of fossil hominins.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24414>

#### **MELANIA IOANNIDOU et al with KATERINA HARVATI – 3D geometric morphometrics analysis of mandibular fragments of *Ouranopithecus macedoniensis* from the late Miocene deposits of Central Macedonia, Greece**

To explore mandibular shape differences between *Ouranopithecus macedoniensis* and a comparative sample of extant great apes using three-dimensional (3D) geometrics morphometrics. Other objectives are to assess mandibular shape variation and homogeneity within *Ouranopithecus*, explore the effects of size on mandibular shape, and explore the degree of mandibular sexual size dimorphism in *Ouranopithecus*.

The comparative sample comprises digitized mandibles from adult extant great apes. The 3D analysis includes three datasets: one with landmarks registered on the mandibular corpus and symphysis of mandibles preserving both sides, one on hemimandibles only, and one focused on the ramus and gonial area. Multivariate statistical analyses were conducted, such as ordination analyses (PCA), intra-specific Procrustes distances pairs, pairwise male–female centroid size differences, and correlation analyses.

The male and female specimens of *Ouranopithecus* have mandibular shapes that are quite similar, although differences exist. The Procrustes distances results suggest more shape variation in *Ouranopithecus* than in the extant great apes.

*Ouranopithecus* shows some similarities in mandibular shape to the larger great apes, Gorilla and Pongo. Moreover, the degree of sexual dimorphism in the small *Ouranopithecus* sample is greater than any of the great apes. Based on our correlation analyses of principal components (PC) with size, some PCs are significantly correlated with size, with correlation varying from moderate to substantial.

This study attempted to understand better the variation within the mandibles of *O. macedoniensis* and the expression of sexual dimorphism in this taxon in more detail than has been done previously. The overall mandibular morphology of *Ouranopithecus* shows some similarities to those of the larger great apes, which likely reflects similarities in size. Compared to Gorilla and Pongo, *O. macedoniensis* shows an elevated degree of morphological variation, although limitations relating to sample size apply. Sexual dimorphism in the mandibles of *O. macedoniensis* appears to be relatively high, seemingly greater than in Gorilla and high even in comparison to Pongo, but this again is possibly in part an artifact of a small sample size.

<https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.24420>

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## Current Biology

#### ARTICLES

#### **SIMON W. TOWNSEND & ALEXIS HERVAIS-ADELMAN – Speech segmentation: New dogs, old tricks?**

A new study using electroencephalography and functional magnetic resonance imaging suggests that dogs and humans may segment speech in similar ways.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)01465-2](https://www.cell.com/current-biology/fulltext/S0960-9822(21)01465-2)

## PAPERS

### **MARIANNA BOROS et al – Neural processes underlying statistical learning for speech segmentation in dogs**

To learn words, humans extract statistical regularities from speech. Multiple species use statistical learning also to process speech, but the neural underpinnings of speech segmentation in non-humans remain largely unknown. Here, we investigated computational and neural markers of speech segmentation in dogs, a phylogenetically distant mammal that efficiently navigates humans' social and linguistic environment. Using electroencephalography (EEG), we compared event-related responses (ERPs) for artificial words previously presented in a continuous speech stream with different distributional statistics. Results revealed an early effect (220–470 ms) of transitional probability and a late component (590–790 ms) modulated by both word frequency and transitional probability. Using fMRI, we searched for brain regions sensitive to statistical regularities in speech. Structured speech elicited lower activity in the basal ganglia, a region involved in sequence learning, and repetition enhancement in the auditory cortex. Speech segmentation in dogs, similar to that of humans, involves complex computations, engaging both domain-general and modality-specific brain areas.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)01406-8](https://www.cell.com/current-biology/fulltext/S0960-9822(21)01406-8)

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## eLife

## PAPERS

### **BARBARA C. KLUMP & JAMES J.H. ST CLAIR – New Caledonian crows keep 'valuable' hooked tools safer than basic non-hooked tools**

The temporary storage and re-use of tools can significantly enhance foraging efficiency. New Caledonian crows in one of our study populations use two types of stick tools – hooked and non-hooked – which differ in raw material, manufacture costs, and foraging performance. Using a large sample of wild-caught, temporarily captive New Caledonian crows, we investigated experimentally whether individuals prefer one tool type over the other when given a choice and whether they take better care of their preferred tools between successive episodes of use, safely storing them underfoot or in nearby holes. Crows strongly preferred hooked stick tools made from *Desmanthus virgatus* stems over non-hooked stick tools. Importantly, this preference was also reflected in subsequent tool-handling behaviour, with subjects keeping hooked stick tools safe more often than non-hooked stick tools sourced from leaf litter. These results suggest that crows 'value' hooked stick tools, which are both costlier to procure and more efficient to use, more than non-hooked stick tools. Results from a series of control treatments suggested that crows altered their tool 'safekeeping' behaviour in response to a combination of factors, including tool type and raw material. To our knowledge, our study is the first to use safekeeping behaviour as a proxy for assessing how non-human animals value different tool types, establishing a novel paradigm for productive cross-taxonomic comparisons.

<https://elifesciences.org/articles/64829>

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## Frontiers in Communication

## PAPERS

### **SAMANTHA GORDON DANNER, JELENA KRIVOKAPIĆ & DANI BYRD – Co-Speech Movement in Conversational Turn-Taking**

This study investigates co-speech movements as a function of the conversational turn exchange type, the type of speech material at a turn exchange, and the interlocutor's role as speaker or listener. A novel interactive protocol that mixes conversation and (non-read) nursery rhymes works to elicit many speech turns and co-speech movements within dyadic speech interaction. To evaluate a large amount of data, we use the density of co-speech movement as a quantitative measure. Results indicate that both turn exchange type and participant role are associated with variation in movement density for head and brow co-speech movement. Brow and head movement becomes denser as speakers approach overlapping speech exchanges, indicating that speakers increase their movement density as an interruptive exchange is approached. Similarly, head movement generally increases after such overlapping exchanges. Lastly, listeners display a higher rate of co-speech movement than speakers, both at speech turns and remote from them. Brow and head movements generally behave similarly across speech material types, conversational roles, and turn exchange types. On the whole, the study demonstrates that the quantitative co-speech movement density measure advanced here is useful in the study of co-speech movement and turn-taking.

<https://www.frontiersin.org/articles/10.3389/fcomm.2021.779814/full>

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### **KAREN EMMOREY – New Perspectives on the Neurobiology of Sign Languages**

The first 40 years of research on the neurobiology of sign languages (1960–2000) established that the same key left hemisphere brain regions support both signed and spoken languages, based primarily on evidence from signers with brain injury and at the end of the 20th century, based on evidence from emerging functional neuroimaging technologies (positron emission tomography and fMRI). Building on this earlier work, this review focuses on what we have learned about the neurobiology of sign languages in the last 15–20 years, what controversies remain unresolved, and directions for future research. Production and comprehension processes are addressed separately in order to capture whether and how output and input differences between sign and speech impact the neural substrates supporting language. In addition, the review includes aspects of language that are unique to sign languages, such as pervasive lexical iconicity, fingerspelling, linguistic

facial expressions, and depictive classifier constructions. Summary sketches of the neural networks supporting sign language production and comprehension are provided with the hope that these will inspire future research as we begin to develop a more complete neurobiological model of sign language processing.

<https://www.frontiersin.org/articles/10.3389/fcomm.2021.748430/full>

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## Frontiers in Ecology and Evolution

### PAPERS

#### **MATTHEW COBB – A Brief History of Wires in the Brain**

Metaphors have formed a significant part of the development of neuroscience, often linked with technology. A metaphor that has been widely used for the past two centuries is that of the nervous system being like wires, either as a telegraph system or telephone exchange, or, more recently, in the more abstract metaphor of a wiring diagram. The entry of these terms into scientific writing is traced, together with the insights provided by these metaphors, in particular in relation to recent developments in the study of connectomes. Finally, the place of the wiring diagram as a modern version of Leibniz's "mill" argument is described, as a way of exploring the limits of what insight the metaphor can provide.

<https://www.frontiersin.org/articles/10.3389/fevo.2021.760269/full>

#### **MARK E. LAIDRE – The Architecture of Cooperation Among Non-kin: Coalitions to Move Up in Nature's Housing Market**

The evolution of cooperation among non-kin poses a major theoretical puzzle: why should natural selection favor individuals who help unrelated conspecifics at a cost to themselves? The relevance of architecture to this question has rarely been considered. Here I report cooperation among non-kin in social hermit crabs (*Coenobita compressus*), where unrelated conspecifics work together to evict larger individuals from a housing market of architecturally remodeled shells. I present (1) the first detailed description of natural coalitions in the wild and (2) a theoretical framework, which examines the evolutionary benefits to each coalition member and predicts when forming a coalition will be successful. In the wild, important ecological and social constraints exist, which are built into the model. Based on these constraints, I show that coalitions can be a successful strategy if several key criteria hold: the coalition is necessary, effective, stable dyadically, and stable polyadically. Notably, the "splitting the spoils" problem—which often undermines non-kin cooperation—is eliminated via architecture: a small individual (C) who helps a medium individual (B) to evict a large individual (A) will ultimately benefit, since C will get B's left behind shell after B moves into A's shell. Coalitions, however, can break down due to added layers of social complexity involving third-party "free riders" and "cheaters," which strategically butt in the architectural queue and thereby steal incentives from the smaller coalition member. Overall, therefore, substantial scope exists for both cooperation and conflict within nature's housing market of architecture. Experiments are now needed to directly test the impact on coalitions of architecture, from the interior of homes up to whole housing markets.

<https://www.frontiersin.org/articles/10.3389/fevo.2021.766342/full>

#### **MARION PETRIE – Evolution by Sexual Selection**

Charles Darwin published his second book "Sexual selection and the descent of man" in 1871 150 years ago, to try to explain, amongst other things, the evolution of the peacock's train, something that he famously thought was problematic for his theory of evolution by natural selection. He proposed that the peacock's train had evolved because females preferred to mate with males with more elaborate trains. This idea was very controversial at the time and it wasn't until 1991 that a manuscript testing Darwin's hypothesis was published. The idea that a character could arise as a result of a female preference is still controversial. Some argue that there is no need to distinguish sexual from natural selection and that natural selection can adequately explain the evolution of extravagant characteristics that are characteristic of sexually selected species. Here, I outline the reasons why I think that this is not the case and that Darwin was right to distinguish sexual selection as a distinct process. I present a simple verbal and mathematical model to expound the view that sexual selection is profoundly different from natural selection because, uniquely, it can simultaneously promote and maintain the genetic variation which fuels evolutionary change. Viewed in this way, sexual selection can help resolve other evolutionary conundrums, such as the evolution of sexual reproduction, that are characterised by having impossibly large costs and no obvious immediate benefits and which have baffled evolutionary biologists for a very long time. If sexual selection does indeed facilitate rapid adaptation to a changing environment as I have outlined, then it is very important that we understand the fundamentals of adaptive mate choice and guard against any disruption to this natural process.

<https://www.frontiersin.org/articles/10.3389/fevo.2021.786868/full>

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## Frontiers in Psychology

### PAPERS

#### **JAMES W. MOORE – "They Were Noble Automatons Who Knew Not What They Did:" Volition in Jaynes' The Origin of Consciousness in the Breakdown of the Bicameral Mind**

An important question in consciousness research concerns its origins. In Julian Jaynes' book, *The Origin of Consciousness in the Breakdown of the Bicameral Mind*, he suggests that consciousness arose rather recently in human history, sometime between the composition of *The Iliad* and *The Odyssey*. Although Jaynes' work as a theory of consciousness has achieved a great deal of attention (and indeed criticism), what has not been widely noted is the prominent role of volition in his theory.

In this article I hope to draw attention to these overlooked aspects of his theory, in particular the fact that volition is central to Jaynes' definition of consciousness and that it is changes in the nature of volitional experience that mark, for Jaynes, the emergence of consciousness.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.811295/full>

### **KENGO MIYAZONO & KIICHI INARIMORI – Empathy, Altruism, and Group Identification**

This paper investigates the role of group identification in empathic emotion and its behavioral consequences. Our central idea is that group identification is the key to understanding the process in which empathic emotion causes helping behavior. Empathic emotion causes helping behavior because it involves group identification, which motivates helping behavior toward other members. This paper focuses on a hypothesis, which we call “self-other merging hypothesis (SMH),” according to which empathy-induced helping behavior is due to the “merging” between the helping agent and the helped agent. We argue that SMH should be interpreted in terms of group identification. The group identification interpretation of SMH is both behaviorally adequate (i.e., successfully predicts and explains the helping behavior in the experimental settings) and psychologically plausible (i.e., does not posit psychologically unrealistic beliefs, desires, etc.). Empathy-induced helping behavior, according to the group identification interpretation of the SMH, does not fit comfortably into the traditional egoism/altruism dichotomy. We thus propose a new taxonomy according to which empathy-induced helping behavior is both altruistic at the individual level and egoistic at the group level.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.749315/full>

### **VERENA BUREN et al – What Makes Babies Musical? Conceptions of Musicality in Infants and Toddlers**

Despite major advances in research on musical ability in infants, relatively little attention has been paid to individual differences in general musicality in infants. A fundamental problem has been the lack of a clear definition of what constitutes “general musicality” or “musical ability” in infants and toddlers, resulting in a wide range of test procedures that rely on different models of musicality. However, musicality can be seen as a social construct that can take on different meanings across cultures, sub-groups, and individuals, and may be subject to change over time. Therefore, one way to get a clearer picture of infant musicality is to assess conceptions of musicality in the general population. Using this approach, we surveyed 174 German adults, asking about their view and conceptions regarding behaviors that characterize a musical child under 3 years. Based on previous studies on adult and child musicality, we designed a survey containing 41 statements describing musical behaviors in children. Participants were asked to rate how indicative these behaviors were of musicality in infants and toddlers. PCA analysis revealed 4 components of musical abilities and behaviors in under-3-year-olds: Musical Communication, Enthusiasm and Motivation, Adaptive Expressiveness, and Musical Abilities as traditionally defined. Professional background and musical expertise of the respondents did not significantly influence participants' conceptions. Our results suggest that, in order to capture musicality in young children, a wider range of skills and observable behaviors should be taken into account than those assessed by traditional musical ability tests for young children.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.736833/full>

### **IVAN A. KHVATOV et al – Hooded Crows (*Corvus cornix*) May Be Aware of Their Own Body Size**

Body-awareness is one of the manifestations of self-awareness, expressed in the ability of people and animals to represent their own body physical properties. Relatively little work has been devoted to this phenomenon in comparison with the studies of the ability of self-recognition in the mirror, and most studies have been conducted on mammals and human infants. Crows are known to be “clever” birds, so we investigated whether hooded crows (*Corvus cornix*) may be aware of their own body size. We set up an experimental design in which the crows had to pass through one of three openings to reach the bait. In the first experiment, we studied whether crows prefer a larger hole if all the three are suitable for passage, and what other predictors influence their choice. In the second experiment, we assessed the ability of the crows to select a single passable hole out of three on the first attempt, even though the area of the former was smaller than that of the other two. The results of the first experiment suggest that when choosing among three passable holes, crows prefer those holes that require less effort from them, e.g., they do not need to crouch or make other additional movements. In the second experiment, three of the five crows reliably more often chose a single passable hole on the first try, despite its smaller size. We believe that these results suggest that hooded crows may be aware of their own body size.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.769397/full>

### **JULIEN MEYER & DENNY MOORE – A Flute, Musical Bows and Bamboo Clarinets that “Speak” in the Amazon Rainforest; Speech and Music in the Gavião Language of Rondônia**

The Gavião, a native Amazonian group in Rondônia, Brazil, use three different traditional musical instruments that they identify as “speaking” ones and that are characterized by a very tight music-lyric relation through similar pitch patterns: a flute (called kotiráp), a pair of mouth bows (iridináp), and three large bamboo clarinets (totoráp), played by three different players, each one playing a single-note clarinet. They show in different ways the relation of acoustic iconicity which exists between the words of the songs' lyrics and the music played on such instruments to “sing” the songs. Linguistic analysis makes it possible to understand the phonetic and phonological nature of the iconicity. The sung speech form, being intermediate between the spoken and the instrumental forms, is useful for both learning and explaining the musical notes. In a language with distinctive tone and length, such as Gavião of Rondônia, the first question about speech that is played by

musical instruments is the relation between the melodies and the supersegmental phonology of the corresponding words in sung speech and in modal spoken speech. It is influenced by the phonological possibilities of the spoken form and by the musical possibilities of the instrumental form. The description and analysis of Gavião instrumental speech and song practices are found to be a noteworthy contribution to the typology of instrumental language surrogates associated with a tone language, one that calls for a reexamination of hypotheses about which aspects of the phonological/phonetic structure can be transposed in instrumental speech and how this can be done. The role of this kind of instrumental sung speech is artistic and also practical as it contributes to maintain the oral heritage. Such practice represents a little-studied and threatened cultural heritage of the traditional substratum of the cultures of Amazonia.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.674289/full>

### **LINDA ROMANOVSKA & MILENE BONTE – How Learning to Read Changes the Listening Brain**

Reading acquisition reorganizes existing brain networks for speech and visual processing to form novel audio-visual language representations. This requires substantial cortical plasticity that is reflected in changes in brain activation and functional as well as structural connectivity between brain areas. The extent to which a child's brain can accommodate these changes may underlie the high variability in reading outcome in both typical and dyslexic readers. In this review, we focus on reading-induced functional changes of the dorsal speech network in particular and discuss how its reciprocal interactions with the ventral reading network contributes to reading outcome. We discuss how the dynamic and intertwined development of both reading networks may be best captured by approaching reading from a skill learning perspective, using audio-visual learning paradigms and longitudinal designs to follow neuro-behavioral changes while children's reading skills unfold.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.726882/full>

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## Language

### REVIEWS

#### **NATALIA LEVSHINA – The grammar network**

Review of 'The grammar network: How linguistic structure is shaped by language use' by Holger Diessel. Cambridge: Cambridge University Press (2019).

<https://muse.jhu.edu/article/840958>

#### **PETER W. CULICOVER – Grammatical theory**

Review of 'Grammatical theory: From transformational grammar to constraint-based approaches', 4th revised and extended edn' by Stefan Müller. Berlin: Language Science (2020).

<https://muse.jhu.edu/article/840959>

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## Nature

### ARTICLES

#### **BENJAMIN R. COLLINS & AMY HATTON – Beads reveal long-distance connections in early Africa**

Beads made from ostrich eggshells, produced by people over the past 50,000 years, provide evidence for a long period of social connection between eastern and southern Africa, followed by isolation and then reconnection.

<https://www.nature.com/articles/d41586-021-03681-2>

#### **DANIEL G. BRADLEY – Bronze Age genomes reveal migration to Britain**

The genomes of hundreds of individuals who lived in Great Britain and in continental Europe during the Bronze Age provide evidence for a migration of people from the continent to southern Britain between 1000 and 875 BC.

<https://www.nature.com/articles/d41586-021-03770-2>

### PAPERS

#### **CHRIS FOWLER et al with DAVID REICH – A high-resolution picture of kinship practices in an Early Neolithic tomb**

To explore kinship practices at chambered tombs in Early Neolithic Britain, here we combined archaeological and genetic analyses of 35 individuals who lived about 5,700 years ago and were entombed at Hazleton North long cairn<sup>1</sup>. Twenty-seven individuals are part of the first extended pedigree reconstructed from ancient DNA, a five-generation family whose many interrelationships provide statistical power to document kinship practices that were invisible without direct genetic data. Patrilineal descent was key in determining who was buried in the tomb, as all 15 intergenerational transmissions were through men. The presence of women who had reproduced with lineage men and the absence of adult lineage daughters suggest virilocal burial and female exogamy. We demonstrate that one male progenitor reproduced with four women: the descendants of two of those women were buried in the same half of the tomb over all generations. This suggests that maternal sub-lineages were grouped into branches whose distinctiveness was recognized during the construction of the tomb. Four men descended from non-lineage fathers and mothers who also reproduced with lineage male individuals, suggesting that some men adopted the children of their reproductive partners by other men into their patriline. Eight individuals were not close biological relatives of the main lineage, raising the possibility that kinship also encompassed social bonds independent of biological relatedness.

<https://www.nature.com/articles/s41586-021-04241-4>

### **JENNIFER M. MILLER & YIMING V. WANG – Ostrich eggshell beads reveal 50,000-year-old social network in Africa**

Humans evolved in a patchwork of semi-connected populations across Africa<sup>1,2</sup>; understanding when and how these groups connected is critical to interpreting our present-day biological and cultural diversity. Genetic analyses reveal that eastern and southern African lineages diverged sometime in the Pleistocene epoch, approximately 350–70 thousand years ago (ka)<sup>3,4</sup>; however, little is known about the exact timing of these interactions, the cultural context of these exchanges or the mechanisms that drove their separation. Here we compare ostrich eggshell bead variations between eastern and southern Africa to explore population dynamics over the past 50,000 years. We found that ostrich eggshell bead technology probably originated in eastern Africa and spread southward approximately 50–33 ka via a regional network. This connection breaks down approximately 33 ka, with populations remaining isolated until herders entered southern Africa after 2 ka. The timing of this disconnection broadly corresponds with the southward shift of the Intertropical Convergence Zone, which caused periodic flooding of the Zambezi River catchment (an area that connects eastern and southern Africa). This suggests that climate exerted some influence in shaping human social contact. Our study implies a later regional divergence than predicted by genetic analyses, identifies an approximately 3,000-kilometre stylistic connection and offers important new insights into the social dimension of ancient interactions.

<https://www.nature.com/articles/s41586-021-04227-2>

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## Nature Aging

### PAPERS

#### **STEVE HORVATH et al – DNA methylation clocks tick in naked mole rats but queens age more slowly than nonbreeders**

Naked mole rats (NMRs) live an exceptionally long life, appear not to exhibit age-related decline in physiological capacity and are resistant to age-related diseases. However, it has been unknown whether NMRs also evade aging according to a primary hallmark of aging: epigenetic changes. To address this question, we profiled  $n = 385$  samples from 11 tissue types at loci that are highly conserved between mammalian species using a custom array (HorvathMammalMethylChip40). We observed strong epigenetic aging effects and developed seven highly accurate epigenetic clocks for several tissues (pan-tissue, blood, kidney, liver, skin clocks) and two dual-species (human–NMR) clocks. The skin clock correctly estimated induced pluripotent stem cells derived from NMR fibroblasts to be of prenatal age. The NMR epigenetic clocks revealed that breeding NMR queens age more slowly than nonbreeders, a feature that is also observed in some eusocial insects. Our results show that despite a phenotype of negligible senescence, the NMR ages epigenetically.

<https://www.nature.com/articles/s43587-021-00152-1>

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## Nature Humanities & Social Sciences Communications

### PAPERS

#### **MARC ALLASSONNIÈRE-TANG et al – Expansion by migration and diffusion by contact is a source to the global diversity of linguistic nominal categorization systems**

Languages of diverse structures and different families tend to share common patterns if they are spoken in geographic proximity. This convergence is often explained by horizontal diffusibility, which is typically ascribed to language contact. In such a scenario, speakers of two or more languages interact and influence each other's languages, and in this interaction, more grammaticalized features tend to be more resistant to diffusion compared to features of more lexical content. An alternative explanation is vertical heritability: languages in proximity often share genealogical descent. Here, we suggest that the geographic distribution of features globally can be explained by two major pathways, which are generally not distinguished within quantitative typological models: feature diffusion and language expansion. The first pathway corresponds to the contact scenario described above, while the second occurs when speakers of genetically related languages migrate. We take the worldwide distribution of nominal classification systems (grammatical gender, noun class, and classifier) as a case study to show that more grammaticalized systems, such as gender, and less grammaticalized systems, such as classifiers, are almost equally widespread, but the former spread more by language expansion historically, whereas the latter spread more by feature diffusion. Our results indicate that quantitative models measuring the areal diffusibility and stability of linguistic features are likely to be affected by language expansion that occurs by historical coincidence. We anticipate that our findings will support studies of language diversity in a more sophisticated way, with relevance to other parts of language, such as phonology.

<https://www.nature.com/articles/s41599-021-01003-5>

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## Nature Neuroscience

### PAPERS

#### **ELIZABETH J. JUN et al – Causal role for the primate superior colliculus in the computation of evidence for perceptual decisions**

Trained monkeys performed a two-choice perceptual decision-making task in which they reported the perceived orientation of a dynamic Glass pattern, before and after unilateral, reversible, inactivation of a brainstem area—the superior colliculus (SC)—involved in preparing eye movements. We found that unilateral SC inactivation produced significant decision biases

and changes in reaction times consistent with a causal role for the primate SC in perceptual decision-making. Fitting signal detection theory and sequential sampling models to the data showed that SC inactivation produced a decrease in the relative evidence for contralateral decisions, as if adding a constant offset to a time-varying evidence signal for the ipsilateral choice. The results provide causal evidence for an embodied cognition model of perceptual decision-making and provide compelling evidence that the SC of primates (a brainstem structure) plays a causal role in how evidence is computed for decisions—a process usually attributed to the forebrain.

*{Many thanks to Jermaine Horton for finding this one.}*

<https://www.nature.com/articles/s41593-021-00878-6>

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## Nature Reviews Neuroscience

### PAPERS

#### **ITZHAK FRIED – Neurons as will and representation**

Memory recollections and voluntary actions are often perceived as spontaneously generated irrespective of external stimuli. Although products of our neurons, they are only rarely accessible in humans at the neuronal level. Here I review insights gleaned from unique neurosurgical opportunities to record and stimulate single-neuron activity in people who can declare their thoughts, memories and wishes. I discuss evidence that the subjective experience of human recollection and that of voluntary action arise from the activity of two internal neuronal generators, the former from medial temporal lobe reactivation and the latter from frontoparietal preactivation. I characterize properties of these generators and their interaction, enabling flexible recruitment of memory-based choices for action as well as recruitment of action-based plans for the representation of conceptual knowledge in memories. Both internal generators operate on surprisingly explicit but different neuronal codes, which appear to arise with distinct single-neuron activity, often observed before participants' reports of conscious awareness. I discuss prediction of behaviour based on these codes, and the potential for their modulation. The prospects of editing human memories and volitions by enhancement, inception or deletion of specific, selected content raise therapeutic possibilities and ethical concerns.

<https://www.nature.com/articles/s41583-021-00543-8>

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## PLoS One

### PAPERS

#### **HELEN REBECCA CHAMBERS, SANDRA ANDREA HELDSTAB & SEAN J. O'HARA – Why big brains? A comparison of models for both primate and carnivore brain size evolution**

Despite decades of research, much uncertainty remains regarding the selection pressures responsible for brain size variation. Whilst the influential social brain hypothesis once garnered extensive support, more recent studies have failed to find support for a link between brain size and sociality. Instead, it appears there is now substantial evidence suggesting ecology better predicts brain size in both primates and carnivores. Here, different models of brain evolution were tested, and the relative importance of social, ecological, and life-history traits were assessed on both overall encephalisation and specific brain regions. In primates, evidence is found for consistent associations between brain size and ecological factors, particularly diet; however, evidence was also found advocating sociality as a selection pressure driving brain size. In carnivores, evidence suggests ecological variables, most notably home range size, are influencing brain size; whereas, no support is found for the social brain hypothesis, perhaps reflecting the fact sociality appears to be limited to a select few taxa. Life-history associations reveal complex selection mechanisms to be counterbalancing the costs associated with expensive brain tissue through extended developmental periods, reduced fertility, and extended maximum lifespan. Future studies should give careful consideration of the methods chosen for measuring brain size, investigate both whole brain and specific brain regions where possible, and look to integrate multiple variables, thus fully capturing all of the potential factors influencing brain size.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0261185>

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## PNAS

### PAPERS

#### **MARTEN SCHEFFER et al – The rise and fall of rationality in language**

The surge of post-truth political argumentation suggests that we are living in a special historical period when it comes to the balance between emotion and reasoning. To explore if this is indeed the case, we analyze language in millions of books covering the period from 1850 to 2019 represented in Google nGram data. We show that the use of words associated with rationality, such as “determine” and “conclusion,” rose systematically after 1850, while words related to human experience such as “feel” and “believe” declined. This pattern reversed over the past decades, paralleled by a shift from a collectivistic to an individualistic focus as reflected, among other things, by the ratio of singular to plural pronouns such as “I”/“we” and “he”/“they.” Interpreting this synchronous sea change in book language remains challenging. However, as we show, the nature of this reversal occurs in fiction as well as nonfiction. Moreover, the pattern of change in the ratio between sentiment and rationality flag words since 1850 also occurs in New York Times articles, suggesting that it is not an artifact of the book corpora we analyzed. Finally, we show that word trends in books parallel trends in corresponding Google search terms, supporting the idea that changes in book language do in part reflect changes in interest. All in all, our results suggest that

over the past decades, there has been a marked shift in public interest from the collective to the individual, and from rationality toward emotion.

<https://www.pnas.org/content/118/51/e2107848118.abstract>

### **JANET H. T. SONG et al – Genetic studies of human–chimpanzee divergence using stem cell fusions**

Complete genome sequencing has identified millions of DNA changes that differ between humans and chimpanzees. Although a subset of these changes likely underlies important phenotypic differences between humans and chimpanzees, it is currently difficult to distinguish causal from incidental changes and to map specific phenotypes to particular genome locations. To facilitate further genetic study of human–chimpanzee divergence, we have generated human and chimpanzee autotetraploids and allotetraploids by fusing induced pluripotent stem cells (iPSCs) of each species. The resulting tetraploid iPSCs can be stably maintained and retain the ability to differentiate along ectoderm, mesoderm, and endoderm lineages. RNA sequencing identifies thousands of genes whose expression differs between humans and chimpanzees when assessed in single-species diploid or autotetraploid iPSCs. Analysis of gene expression patterns in interspecific allotetraploid iPSCs shows that human–chimpanzee expression differences arise from substantial contributions of both cis-acting changes linked to the genes themselves and trans-acting changes elsewhere in the genome. To enable further genetic mapping of species differences, we tested chemical treatments for stimulating genome-wide mitotic recombination between human and chimpanzee chromosomes, and CRISPR methods for inducing species-specific changes on particular chromosomes in allotetraploid cells. We successfully generated derivative cells with nested deletions or interspecific recombination on the X chromosome. These studies confirm an important role for the X chromosome in trans regulation of expression differences between species and illustrate the potential of this system for more detailed cis and trans mapping of the molecular basis of human and chimpanzee evolution.

<https://www.pnas.org/content/118/51/e2117557118.abstract>

## **COMMENTARIES**

### **WILLIAM C. MCGREW – Cultural diffusion occurs in chimpanzees**

MacDonald et al. propose that Middle Pleistocene fire use signaled the onset of widespread cultural diffusion and that it was “the first clear evidence of the emergence of cultural diffusion in the evolution of humankind” and “a distinctive characteristic of the cultural behavior of Homo sapiens.” They attribute such diffusion to “tolerant intergroup encounters” that facilitate transmission. All three assertions are questionable, given extended findings by cultural primatologists studying humankind’s nearest living relative, the chimpanzee (*Pan troglodytes*).

<https://www.pnas.org/content/118/51/e2116042118>

### **KRIST VAESEN et al with WIL ROEBROEKS – Reply to McGrew: Chimpanzees do not exhibit widespread cultural diffusion**

McGrew objects to the proposal that Middle Pleistocene fire use signaled the onset of widespread cultural diffusion in our lineage. He argues that, given the commonness of cultural diffusion among chimpanzees, cultural diffusion plausibly emerged already as long ago as the Last Common Ancestor of chimpanzees and humans, which he situates at about 6 Mya to 7 Mya. Further, in light of this, he contends that cultural diffusion should not be considered a distinctive feature of the cultural behavior of *Homo sapiens*.

<https://www.pnas.org/content/118/51/e2116917118>

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## **Proceedings of the Royal Society B**

### **PAPERS**

### **MAXWELL N. BURTON-CHELLEW & VICTOIRE D'AMICO – A preference to learn from successful rather than common behaviours in human social dilemmas**

Human cooperation is often claimed to be special and requiring explanations based on gene–culture coevolution favouring a desire to copy common social behaviours. If this is true, then individuals should be motivated to both observe and copy common social behaviours. Previous economic experiments, using the public goods game, have suggested individuals' desire to sacrifice for the common good and to copy common social behaviours. However, previous experiments have often not shown examples of success. Here we test, on 489 participants, whether individuals are more motivated to learn about, and more likely to copy, either common or successful behaviours. Using the same social dilemma and standard instructions, we find that individuals were primarily motivated to learn from successful rather than common behaviours. Consequently, social learning disfavoured costly cooperation, even when individuals could observe a stable, pro-social level of cooperation. Our results call into question explanations for human cooperation based on cultural evolution and/or a desire to conform with common social behaviours. Instead, our results indicate that participants were motivated by personal gain, but initially confused, despite receiving standard instructions. When individuals could learn from success, they learned to cooperate less, suggesting that human cooperation is maybe not so special after all.

<https://royalsocietypublishing.org/doi/abs/10.1098/rspb.2021.1590>

## **CASSANDRE VIELLE et al – Evidence for a vocal signature in the rat and its reinforcing effects: a key role for the subthalamic nucleus**

Although rodents have a well-structured vocal form of communication, like humans and non-human primates, there is, to date, no evidence for a vocal signature in the well-known 50- and 22-kHz ultrasonic vocalizations (USVs) emitted by rats. Here, we show that rats can recognize the identity of the USV emitter since they choose to preferentially self-administer playback of 50-kHz USVs emitted by a stranger rat over those of their cagemate. In a second experiment, we show that only stranger, but not familiar, 50-kHz USVs reduce cocaine self-administration. Finally, to study the neurobiological substrate of these processes, we have shown that subthalamic nucleus (STN)-lesioned rats did not lever press much for any USV playback, whatever their emotional valence, nor did they seem able to differentiate familiar from stranger peer. Advocating for the existence of a vocal signature in rats, these results highlight the importance of ultrasonic communication in the socio-affective influence of behaviour, such as the influence of proximal social factors on drug consumption and confirm the role of the STN on this influence.

<https://royalsocietypublishing.org/doi/abs/10.1098/rspb.2021.2260>

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## Quarterly Review of Biology

### REVIEWS

#### **MICHAEL RUSE – A Story of Us: A New Look at Human Evolution**

Review of 'A Story of Us: A New Look at Human Evolution' by Lesley Newson and Peter J. Richerson. Oxford and New York: Oxford University Press (2021).

<https://www.journals.uchicago.edu/doi/abs/10.1086/717383>

#### **CRAIG B. STANFORD – Chimpanzee Culture Wars: Rethinking Human Nature alongside Japanese, European, and American Cultural Primatologists**

Review of 'Chimpanzee Culture Wars: Rethinking Human Nature alongside Japanese, European, and American Cultural Primatologists' by Nicolas Langlitz. Princeton (New Jersey): Princeton University Press (2020).

<https://www.journals.uchicago.edu/doi/abs/10.1086/717371>

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## Royal Society Open Science

### PAPERS

#### **KETIKA GARG et al – Hunter–gatherer foraging networks promote information transmission**

Central-place foraging (CPF), where foragers return to a central location (or home), is a key feature of hunter–gatherer social organization. CPF could have significantly changed hunter–gatherers' spatial use and mobility, altered social networks and increased opportunities for information-exchange. We evaluated whether CPF patterns facilitate information-transmission and considered the potential roles of environmental conditions, mobility strategies and population sizes. We built an agent-based model of CPF where agents moved according to a simple optimal foraging rule, and could encounter other agents as they moved across the environment. They either foraged close to their home within a given radius or moved the location of their home to new areas. We analysed the interaction networks arising under different conditions and found that, at intermediate levels of environmental heterogeneity and mobility, CPF increased global and local network efficiencies as well as the rate of contagion-based information-transmission. We also found that central-place mobility strategies can further improve information transmission in larger populations. Our findings suggest that the combination of foraging and movement strategies, as well as the environmental conditions that characterized early human societies, may have been a crucial precursor in our species' unique capacity to innovate, accumulate and rely on complex culture.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.211324>

#### **RAPHAELA HEESSEN et al with KLAUS ZUBERBÜHLER – Evidence of joint commitment in great apes' natural joint actions**

Human joint action seems special, as it is grounded in joint commitment—a sense of mutual obligation participants feel towards each other. Comparative research with humans and non-human great apes has typically investigated joint commitment by experimentally interrupting joint actions to study subjects' resumption strategies. However, such experimental interruptions are human-induced, and thus the question remains of how great apes naturally handle interruptions. Here, we focus on naturally occurring interruptions of joint actions, grooming and play, in bonobos and chimpanzees. Similar to humans, both species frequently resumed interrupted joint actions (and the previous behaviours, like grooming the same body part region or playing the same play type) with their previous partners and at the previous location. Yet, the probability of resumption attempts was unaffected by social bonds or rank. Our data suggest that great apes experience something akin to joint commitment, for which we discuss possible evolutionary origins.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.211121>

#### **JESSIKA LAMARRE & DAVID R. WILSON – Waterbird solves the string-pull test**

String-pulling is among the most widespread cognitive tasks used to test problem-solving skills in mammals and birds. The task requires animals to comprehend that pulling on a non-valuable string moves an otherwise inaccessible food reward to

within their reach. Although at least 90 avian species have been administered the string-pull test, all but five of them were perching birds (passeriformes) or parrots (psittaciformes). Waterbirds (Aequorlitorne) are poorly represented in the cognitive literature, yet are known to engage in complex foraging behaviours. In this study, we tested whether free-living ring-billed gulls (*Larus delawarensis*), a species known for their behavioural flexibility and foraging innovativeness, could solve a horizontal string-pull test. Here, we show that 25% (26/104) of the ring-billed gulls that attempted to solve the test at least once over a maximum of three trials were successful, and that 21% of them (22/104) succeeded during their first attempt. Ring-billed gulls are thus the first waterbird known to solve a horizontal single-string-rewarded string-pull test. Since innovation rate and problem-solving are associated with species' ability to endure environmental alterations, we suggest that testing the problem-solving skills of other species facing environmental challenges will inform us of their vulnerability in a rapidly changing world.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.211343>

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## Science

### NEWS

#### **Early migration may have spread Celtic languages**

About 2900 years ago, an elderly woman was carefully buried with two lambs in her lap and a piece of chalk in her hand at a site now called Cliff 's End Farm, about 30 kilometers north of Dover, U.K. She had been killed by sword blows to her skull, likely in a sacrificial rite. Nearby lay the bodies of a teenager, two children, and a man whose bones had been bundled along with a copper-tipped cow bone. Two of the dead had been born in Europe, according to the isotopes in their teeth. Now, a study adds new insight into their origins: They may have been part of a wave of early Celtic speakers to reach Britain.

<https://www.science.org/content/article/early-migration-france-may-have-brought-celtic-languages-britain>

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## Trends in Cognitive Sciences

### PAPERS

#### **MATTHEW R. LONGO – Distortion of mental body representations**

Our body is central to our sense of self, and distorted body representations are found in several serious medical conditions. This paper reviews evidence that distortions of body representations are also common in healthy individuals, and occur in domains including tactile spatial perception, proprioception, and the conscious body image. Across domains, there is a general tendency for body width to be overestimated compared to body length. Intriguingly, distortions in both eating disorders and chronic pain appear to be exaggerations of this baseline pattern of distortions, suggesting that these conditions may relate to dysfunction of mechanisms for body perception. Distortions of body representations provide a revealing window into basic aspects of self-perception.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(21\)00290-4](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00290-4)

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## Trends in Ecology and Evolution

### PAPERS

#### **ANTÓNIO M.M. RODRIGUES & ANDY GARDNER – Reproductive value and the evolution of altruism**

Altruism is favored by natural selection provided that it delivers sufficient benefits to relatives. An altruist's valuation of her relatives depends upon the extent to which they carry copies of her genes – relatedness – and also on the extent to which they are able to transmit their own genes to future generations – reproductive value. However, although relatedness has received a great deal of attention with regard to altruism, reproductive value has been surprisingly neglected. We review how reproductive value modulates patterns of altruism in relation to individual differences in age, sex, and general condition, and discuss how social partners may manipulate each other's reproductive value to incentivize altruism. This topic presents opportunities for tight interplay between theoretical and empirical research.

[https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(21\)00312-8](https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(21)00312-8)

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## Trends in Neurosciences

### PAPERS

#### **ROHIT MENON et al – Neurobiology of the lateral septum: regulation of social behavior**

Social interactions are essential for mammalian life and are regulated by evolutionary conserved neuronal mechanisms. An individual's internal state, experiences, and the nature of the social stimulus are critical for determining apt responses to social situations. The lateral septum (LS) – a structure of the basal forebrain – integrates abundant cortical and subcortical inputs, and projects to multiple downstream regions to generate appropriate behavioral responses. Although incoming cognitive information is indispensable for contextualizing a social stimulus, neuromodulatory information related to the internal state of the organism significantly influences the behavioral outcome as well. This review article provides an overview of the neuroanatomical properties of the LS, and examines its neurochemical (neuropeptidergic and hormonal) signaling, which provide the neuromodulatory information essential for fine-tuning social behavior across the lifespan.

[https://www.cell.com/trends/neurosciences/fulltext/S0166-2236\(21\)00210-1](https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(21)00210-1)

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