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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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## NEWS

### BREAKING SCIENCE – Human Brains Decreased in Size 3,000 Years Ago, New Study Says

Human brain size nearly quadrupled in 6 million years since Homo last shared a common ancestor with chimpanzees, but human brains are thought to have decreased in volume since the end of the latest Ice Age; the timing and reason for this decrease is enigmatic.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/PLkmSSrJ9jg/human-brain-size-10198.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/PLkmSSrJ9jg/human-brain-size-10198.html?utm_source=feedburner&utm_medium=email)

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### BREAKING SCIENCE – Indri Lemur Songs Have Categorical Rhythm, New Study Shows

A lemur species called Indri indri displays, in its coordinated songs, the isochronous and 1:2 rhythm categories seen in human music, showing that such categories are not, among mammals, unique to our species, according to new research led by scientists from the Max Planck Institute for Psycholinguistics.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/CG3kmRGals8/indri-lemur-songs-categorical-rhythm-10207.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/CG3kmRGals8/indri-lemur-songs-categorical-rhythm-10207.html?utm_source=feedburner&utm_medium=email)

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### BREAKING SCIENCE – Meet Homo bodoensis, New Species of Human Ancestor

Homo bodoensis lived in Africa during the early Middle Pleistocene, around 500,000 years ago, and was the direct ancestor of the Homo sapiens lineage; however, this species was not the most recent common ancestor of Eurasian (Neanderthals and Denisovans) and African (Homo sapiens) hominins.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/sPee6v6Ar4U/homo-bodoensis-10217.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/sPee6v6Ar4U/homo-bodoensis-10217.html?utm_source=feedburner&utm_medium=email)

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## SCIENCE DAILY – That primate’s got rhythm!

What are the origins of musical rhythm? Are humans the only mammals that have rhythm? Researchers have studied indris, the 'singing primates' from Madagascar to learn more. Indri songs recorded in the wild have rhythmic categories similar to those found in human music. Finding common musical traits across species may shed light on the biology and evolution of rhythm and music.

<https://www.sciencedaily.com/releases/2021/10/211025113730.htm>

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## SCIENCE DAILY – New species of human ancestor named: Homo bodoensis

Palaeoanthropologists have announced the naming of a new species of human ancestor, Homo bodoensis. This species lived in Africa during the Middle Pleistocene, around half a million years ago, and was the direct ancestor of modern humans.

<https://www.sciencedaily.com/releases/2021/10/211028143648.htm>

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## SCIENCE NEWS – We got the beat: Lemurs show vocal musical rhythm, a rarity in animal kingdom

Rhythm, the saying goes—you either have it, or you don't. Humans and songbirds do, but until now, the ability to vocalize to a beat hasn't been observed elsewhere in the animal kingdom. Scientists now say they have discovered one of the hallmarks of the skill in the fluffy, black-and-white indri lemur, a species distantly related to humans and only found in Madagascar. The study opens the door to discovering musical traits in other species, experts say, and to understanding how our own rhythmic abilities evolved.

<https://www.science.org/content/article/we-got-beat-lemurs-show-vocal-musical-rhythm-rarity-animal-kingdom>

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## PUBLICATIONS

### Current Biology

#### ARTICLES

#### **RACHAEL C. SHAW – Animal tool use: Many tools make light work for wild parrots**

Tool set use is rare in the animal kingdom. Previously, only primates were known to use multiple tools with different functions to achieve a single goal. New research now reveals the convergent evolution of tool set use in wild parrots.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)01140-4](https://www.cell.com/current-biology/fulltext/S0960-9822(21)01140-4)

#### PAPERS

#### **JAN M. ENGELMANN et al – Chimpanzees consider alternative possibilities**

Humans reason not only about actual events (what is), but also about possible events (what could be). Many key operations of human cognition involve the representation of possibilities, including moral judgment, future planning, and causal understanding. But little is known about the evolutionary roots of this kind of thought. Humans' closest relatives, chimpanzees, possess several cognitive abilities that are closely related to reasoning about alternatives: they plan for the future, evaluate other's actions, and reason causally. However, in the first direct test of the ability to consider alternatives, Redshaw and Suddendorf claim that chimpanzees are not able to represent alternative possibilities. Here, using a novel method, we challenge this conclusion: our results suggest that, like human cognition, chimpanzee thought is not limited to what is, but also involves reasoning about what could be the case.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)01252-5](https://www.cell.com/current-biology/fulltext/S0960-9822(21)01252-5)

#### **CHIARA DE GREGORIO et al – Categorical rhythms in a singing primate**

What are the origins of musical rhythm? One approach to the biology and evolution of music consists in finding common musical traits across species. These similarities allow biomusicologists to infer when and how musical traits appeared in our species. A parallel approach to the biology and evolution of music focuses on finding statistical universals in human music. These include rhythmic features that appear above chance across musical cultures. One such universal is the production of categorical rhythms, defined as those where temporal intervals between note onsets are distributed categorically rather than uniformly. Prominent rhythm categories include those with intervals related by small integer ratios, such as 1:1 (isochrony) and 1:2, which translates as some notes being twice as long as their adjacent ones. In humans, universals are often defined in relation to the beat, a top-down cognitive process of inferring a temporal regularity from a complex musical scene. Without assuming the presence of the beat in other animals, one can still investigate its downstream products, namely rhythmic categories with small integer ratios detected in recorded signals. Here we combine the comparative and statistical universals approaches, testing the hypothesis that rhythmic categories and small integer ratios should appear in species showing coordinated group singing. We find that a lemur species displays, in its coordinated songs, the isochronous and 1:2 rhythm categories seen in human music, showing that such categories are not, among mammals, unique to humans.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)01272-0](https://www.cell.com/current-biology/fulltext/S0960-9822(21)01272-0)

#### **MARK O'HARA et al with ALICE M.I. AUERSPERG – Wild Goffin's cockatoos flexibly manufacture and use tool sets**

The use of different tools to achieve a single goal is considered unique to human and primate technology. To unravel the origins of such complex behaviors, it is crucial to investigate tool use that is not necessary for a species' survival. These cases

can be assumed to have emerged innovatively and be applied flexibly, thus emphasizing creativity and intelligence. However, it is intrinsically challenging to record tool innovations in natural settings that do not occur species-wide. Here, we report the discovery of two distinct tool manufacture methods and the use of tool sets in wild Goffin's cockatoos (*Cacatua goffiniana*). Up to three types of wooden tools, differing in their physical properties and each serving a different function, were manufactured and employed to extract embedded seed matter of *Cerbera manghas*. While Goffin's cockatoos do not depend on tool-obtained resources, repeated observations of two temporarily captive wild birds and indications from free-ranging individuals suggest this behavior occurs in the wild, albeit not species-wide. The use of a tool set in a non-primate implies convergent evolution of advanced tool use. Furthermore, these observations demonstrate how a species without hands can achieve dexterity in a high-precision task. The presence of flexible use and manufacture of tool sets in animals distantly related to humans significantly diversifies the phylogenetic landscape of technology and opens multiple avenues for future research.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)01111-8](https://www.cell.com/current-biology/fulltext/S0960-9822(21)01111-8)

### **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

### NEWS

#### **Are jays as smart as they seem?**

Eurasian jays were thought to use clever strategies to avoid food thieves, but new work calls old findings into question.

<https://elifesciences.org/digests/69647/are-jays-as-smart-as-they-seem>

### ARTICLES

#### **CLAUDIA ZEITRÄG & IVO JACOBS – Animal Behaviour: The elusive perspective of a food thief**

Eurasian jays fail to take into account the point of view and desire of other jays when hiding food they can eat later.

<https://elifesciences.org/articles/74048>

### PAPERS

#### **PIERO AMODIO et al – Little evidence that Eurasian jays protect their caches by responding to cues about a conspecific's desire and visual perspective**

Eurasian jays have been reported to protect their caches by responding to cues about either the visual perspective or current desire of an observing conspecific, similarly to other corvids. Here, we used established paradigms to test whether these birds can – like humans – integrate multiple cues about different mental states and perform an optimal response accordingly. Across five experiments, which also include replications of previous work, we found little evidence that our jays adjusted their caching behaviour in line with the visual perspective and current desire of another agent, neither by integrating these social cues nor by responding to only one type of cue independently. These results raise questions about the reliability of the previously reported effects and highlight several key issues affecting reliability in comparative cognition research.

<https://elifesciences.org/articles/69647>

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## Evolutionary Anthropology

### PAPERS

#### **MIRJANA ROKSANDIC et al – Resolving the “muddle in the middle”: The case for *Homo bodoensis* sp. nov.**

Recent developments in the field of palaeoanthropology necessitate the suppression of two hominin taxa and the introduction of a new species of hominins to help resolve the current nebulous state of Middle Pleistocene (Chibanian) hominin taxonomy. In particular, the poorly defined and variably understood hominin taxa *Homo heidelbergensis* (both sensu stricto and sensu lato) and *Homo rhodesiensis* need to be abandoned as they fail to reflect the full range of hominin variability in the Middle Pleistocene. Instead, we propose: (1) introduction of a new taxon, *Homo bodoensis* sp. nov., as an early Middle Pleistocene ancestor of the *Homo sapiens* lineage, with a pan-African distribution that extends into the eastern Mediterranean (Southeast Europe and the Levant); (2) that many of the fossils from Western Europe (e.g. Sima de los Huesos) currently assigned to *H. heidelbergensis* s.s. be reassigned to *Homo neanderthalensis* to reflect the early appearance

of Neanderthal derived traits in the Middle Pleistocene in the region; and (3) that the Middle Pleistocene Asian fossils, particularly from China, likely represent a different lineage altogether.

<https://onlinelibrary.wiley.com/doi/10.1002/evan.21929>

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## Frontiers in Ecology and Evolution

### PAPERS

#### **ROBIN I. M. DUNBAR & SUSANNE SHULTZ – The Infertility Trap: The Fertility Costs of Group-Living in Mammalian Social Evolution**

Mammal social groups vary considerably in size from single individuals to very large herds. In some taxa, these groups are extremely stable, with at least some individuals being members of the same group throughout their lives; in other taxa, groups are unstable, with membership changing by the day. We argue that this variability in grouping patterns reflects a tradeoff between group size as a solution to environmental demands and the costs created by stress-induced infertility (creating an infertility trap). These costs are so steep that, all else equal, they will limit group size in mammals to ~15 individuals. A species will only be able to live in larger groups if it evolves strategies that mitigate these costs. We suggest that mammals have opted for one of two solutions. One option (fission-fusion herding) is low cost but high risk; the other (bonded social groups) is risk-averse, but costly in terms of cognitive requirements.

<https://www.frontiersin.org/articles/10.3389/fevo.2021.634664/full>

#### **JEREMY M. DESILVA et al – When and Why Did Human Brains Decrease in Size? A New Change-Point Analysis and Insights From Brain Evolution in Ants**

Human brain size nearly quadrupled in the six million years since Homo last shared a common ancestor with chimpanzees, but human brains are thought to have decreased in volume since the end of the last Ice Age. The timing and reason for this decrease is enigmatic. Here we use change-point analysis to estimate the timing of changes in the rate of hominin brain evolution. We find that hominin brains experienced positive rate changes at 2.1 and 1.5 million years ago, coincident with the early evolution of Homo and technological innovations evident in the archeological record. But we also find that human brain size reduction was surprisingly recent, occurring in the last 3,000 years. Our dating does not support hypotheses concerning brain size reduction as a by-product of body size reduction, a result of a shift to an agricultural diet, or a consequence of self-domestication. We suggest our analysis supports the hypothesis that the recent decrease in brain size may instead result from the externalization of knowledge and advantages of group-level decision-making due in part to the advent of social systems of distributed cognition and the storage and sharing of information. Humans live in social groups in which multiple brains contribute to the emergence of collective intelligence. Although difficult to study in the deep history of Homo, the impacts of group size, social organization, collective intelligence and other potential selective forces on brain evolution can be elucidated using ants as models. The remarkable ecological diversity of ants and their species richness encompasses forms convergent in aspects of human sociality, including large group size, agrarian life histories, division of labor, and collective cognition. Ants provide a wide range of social systems to generate and test hypotheses concerning brain size enlargement or reduction and aid in interpreting patterns of brain evolution identified in humans. Although humans and ants represent very different routes in social and cognitive evolution, the insights ants offer can broadly inform us of the selective forces that influence brain size.

<https://www.frontiersin.org/articles/10.3389/fevo.2021.742639/full>

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## Mind & Language

### PAPERS

#### **JOSHUA MAY – Moral rationalism on the brain**

I draw on neurobiological evidence to defend the rationalist thesis that moral judgments are essentially dependent on reasoning, not emotions (conceived as distinct from inference). The neuroscience reveals that moral cognition arises from domain-general capacities in the brain for inferring, in particular, the consequences of an agent's action, the agent's intent, and the rules or norms relevant to the context. Although these capacities entangle inference and affect, blurring the reason/emotion dichotomy does not preferentially support sentimentalism. The argument requires careful consideration of the empirical evidence (from neuroimaging to psychopathology) and philosophical analysis of the commitments of rationalism versus sentimentalism in ethics.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12394>

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## Nature

### PAPERS

#### **RAUNAK BASU et al – The orbitofrontal cortex maps future navigational goals**

Accurate navigation to a desired goal requires consecutive estimates of spatial relationships between the current position and future destination throughout the journey. Although neurons in the hippocampal formation can represent the position of an animal as well as its nearby trajectories, their role in determining the destination of the animal has been questioned. It is, thus, unclear whether the brain can possess a precise estimate of target location during active environmental exploration. Here we describe neurons in the rat orbitofrontal cortex (OFC) that form spatial representations persistently pointing to the

subsequent goal destination of an animal throughout navigation. This destination coding emerges before the onset of navigation, without direct sensory access to a distal goal, and even predicts the incorrect destination of an animal at the beginning of an error trial. Goal representations in the OFC are maintained by destination-specific neural ensemble dynamics, and their brief perturbation at the onset of a journey led to a navigational error. These findings suggest that the OFC is part of the internal goal map of the brain, enabling animals to navigate precisely to a chosen destination that is beyond the range of sensory perception.

<https://www.nature.com/articles/s41586-021-04042-9>

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## Nature Communications

### PAPERS

#### **KAI YUAN et al – Refining models of archaic admixture in Eurasia with ArchaicSeeker 2.0**

We developed a method, ArchaicSeeker 2.0, to identify introgressed hominin sequences and model multiple-wave admixture. The new method enabled us to discern two waves of introgression from both Denisovan-like and Neanderthal-like hominins in present-day Eurasian populations and an ancient Siberian individual. We estimated that an early Denisovan-like introgression occurred in Eurasia around 118.8–94.0 thousand years ago (kya). In contrast, we detected only one single episode of Denisovan-like admixture in indigenous peoples eastern to the Wallace-Line. Modeling ancient admixtures suggested an early dispersal of modern humans throughout Asia before the Toba volcanic super-eruption 74 kya, predating the initial peopling of Asia as proposed by the traditional Out-of-Africa model. Survived archaic sequences are involved in various phenotypes including immune and body mass (e.g., ZNF169), cardiovascular and lung function (e.g., HHAT), UV response and carbohydrate metabolism (e.g., HYAL1/HYAL2/HYAL3), while “archaic deserts” are enriched with genes associated with skin development and keratinization.

<https://www.nature.com/articles/s41467-021-26503-5>

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## Nature Humanities & Social Sciences Communications

### CORRECTIONS

#### **ALASTAIR J. M. KEY, IVAN JARIĆ & DAVID L. ROBERTS – Author Correction: Modelling the end of the Acheulean at global and continental levels suggests widespread persistence into the Middle Palaeolithic**

The original paper did not include sites assigned to transitional Acheulean cultures, except for the Fauresmith in Africa. To ensure the analyses are correct, the authors have now removed Qesem Cave from the ‘North Africa and Near East’ and ‘Global 1b’ OLE models. While the earliest occupation at Qesem predates the Acheulo-Yabrudian (Barkai et al., 2003), the levels with dates young enough to be included in the models come from this transitional complex. The authors re-ran the ‘North Africa and Near East’ and ‘Global 1b’ OLE models with Qesem Cave removed. Its removal resulted in only minor changes to the inferred extinction dates for the two models. The Methods, Results and Conclusions remain entirely unchanged.

<https://www.nature.com/articles/s41599-021-00932-5>

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## Nature Neuroscience

### PAPERS

#### **SARA F. POPHAM et al – Visual and linguistic semantic representations are aligned at the border of human visual cortex**

Semantic information in the human brain is organized into multiple networks, but the fine-grain relationships between them are poorly understood. In this study, we compared semantic maps obtained from two functional magnetic resonance imaging experiments in the same participants: one that used silent movies as stimuli and another that used narrative stories. Movies evoked activity from a network of modality-specific, semantically selective areas in visual cortex. Stories evoked activity from another network of semantically selective areas immediately anterior to visual cortex. Remarkably, the pattern of semantic selectivity in these two distinct networks corresponded along the boundary of visual cortex: for visual categories represented posterior to the boundary, the same categories were represented linguistically on the anterior side. These results suggest that these two networks are smoothly joined to form one contiguous map.

<https://www.nature.com/articles/s41593-021-00921-6>

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## Nature Scientific Reports

### PAPERS

#### **ANNE-MARIE BACON et al with JEAN-JACQUES HUBLIN – A multi-proxy approach to exploring Homo sapiens’ arrival, environments and adaptations in Southeast Asia**

The capability of Pleistocene hominins to successfully adapt to different types of tropical forested environments has long been debated. In order to investigate environmental changes in Southeast Asia during a critical period for the turnover of hominin species, we analysed palaeoenvironmental proxies from five late Middle to Late Pleistocene faunas. Human teeth discoveries have been reported at Duoi U’Oi, Vietnam (70–60 ka) and Nam Lot, Laos (86–72 ka). However, the use of palaeoproteomics allowed us to discard the latter, and, to date, no human remains older than ~ 70 ka are documented in the area. Our findings indicate that tropical rainforests were highly sensitive to climatic changes over that period, with significant

fluctuations of the canopy forests. Locally, large-bodied faunas were resilient to these fluctuations until the cooling period of the Marine Isotope Stage 4 (MIS 4; 74–59 ka) that transformed the overall biotope. Then, under strong selective pressures, populations with new phenotypic characteristics emerged while some other species disappeared. We argue that this climate-driven shift offered new foraging opportunities for hominins in a novel rainforest environment and was most likely a key factor in the settlement and dispersal of our species during MIS 4 in SE Asia.

<https://www.nature.com/articles/s41598-021-99931-4>

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## PLoS One

### PAPERS

#### **JOÃO ZILHÃO et al with FRANCESCO D'ERRICO – Revisiting the Middle and Upper Palaeolithic archaeology of Gruta do Caldeirão (Tomar, Portugal)**

Gruta do Caldeirão features a c. 6 m-thick archaeological stratification capped by Holocene layers ABC-D and Ea, which overlie layer Eb, a deposit of Magdalenian age that underwent significant disturbance, intrusion, and component mixing caused by funerary use of the cave during the Early Neolithic. Here, we provide an updated overview of the stratigraphy and archaeological content of the underlying Pleistocene succession, whose chronology we refine using radiocarbon and single-grain optically stimulated luminescence dating. We find a high degree of stratigraphic integrity. Dating anomalies exist in association with the succession's two major discontinuities: between layer Eb and Upper Solutrean layer Fa, and between Early Upper Palaeolithic layer K and Middle Palaeolithic layer L. Mostly, the anomalies consist of older-than-expected radiocarbon ages and can be explained by bioturbation and palimpsest-forming sedimentation hiatuses. Combined with palaeoenvironmental inferences derived from magnetic susceptibility analyses, the dating shows that sedimentation rates varied in tandem with the oscillations in global climate revealed by the Greenland oxygen isotope record. A steep increase in sedimentation rate is observed through the Last Glacial Maximum, resulting in a c. 1.5 m-thick accumulation containing conspicuous remains of occupation by people of the Solutrean technocomplex, whose traditional subdivision is corroborated: the index fossils appear in the expected stratigraphic order; the diagnostics of the Protosolutrean and the Lower Solutrean predate 24,000 years ago; and the constraints on the Upper Solutrean place it after Greenland Interstadial 2.2. (23,220–23,340 years ago). Human usage of the site during the Early Upper and the Middle Palaeolithic is episodic and low-intensity: stone tools are few, and the faunal remains relate to carnivore activity. The Middle Palaeolithic is found to persist beyond 39,000 years ago, at least three millennia longer than in the Franco-Cantabrian region. This conclusion is upheld by Bayesian modelling and stands even if the radiocarbon ages for the Middle Palaeolithic levels are removed from consideration (on account of observed inversions and the method's potential for underestimation when used close to its limit of applicability). A number of localities in Spain and Portugal reveal a similar persistence pattern. The key evidence comes from high-resolution fluvial contexts spared by the site formation issues that our study of Caldeirão brings to light—palimpsest formation, post-depositional disturbance, and erosion. These processes are ubiquitous in the cave and rock-shelter sites of Iberia, reflecting the impact on karst archives of the variation in climate and environments that occurred through the Upper Pleistocene, and especially at two key points in time: between 37,000 and 42,000 years ago, and after the Last Glacial Maximum. Such empirical difficulties go a long way towards explaining the controversies surrounding the associated cultural transitions: from the Middle to the Upper Palaeolithic, and from the Solutrean to the Magdalenian. Alongside potential dating error caused by incomplete decontamination, proper consideration of sample association issues is required if we are ever to fully understand what happened with the human settlement of Iberia during these critical intervals, and especially so with regards to the fate of Iberia's last Neandertal populations.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0259089>

#### **BRODIE C. DAKIN et al – Searching for meaning is associated with costly prosociality**

The study of meaning in life has largely centered on its relationship with personal well-being, while a focus on how meaning is related to enhancing the well-being of others has received less research attention. Although searching for meaning may imply lower personal well-being, we find that meaning-seekers are more motivated to perform costly prosocial actions for the sake of others' well-being, given the perceived meaningfulness of these behaviors. Studies 1–4 (N = 780) show that meaning-seeking correlates with the motivation to engage in a range of costly prosocial behaviors. Meaning-seeking is further shown to be distinct from pursuing happiness in its relationship with costly prosociality (Study 2 & 3) and to share a stronger association with high-cost than low-cost prosociality (Study 3 & 4). Study 5 (N = 370; pre-registered) further shows that the search for meaning is related to costly prosocial behavior in the recent past. While our studies are cross-sectional, the pattern of findings suggests that seeking meaning (rather than happiness) may play an important role in motivating altruistic tendencies.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0258769>

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## PNAS

### PAPERS

#### **LIYANG SAI et al – Neural mechanisms of deliberate dishonesty: Dissociating deliberation from other control processes during dishonest behaviors**

Numerous studies have sought proof of whether people are genuinely honest by testing whether cognitive control mechanisms are recruited during honest and dishonest behaviors. The underlying assumption is: Deliberate behaviors

require cognitive control to inhibit intuitive responses. However, cognitive control during honest and dishonest behaviors can be required for other reasons than deliberation. Across 58 neuroimaging studies (1,211 subjects), we investigated different forms of honest and dishonest behaviors and demonstrated that many brain regions previously implicated in dishonesty may reflect more general cognitive mechanisms. We argue that the motivational/volitional dimension is central to deliberation and provide evidence that motivated dishonest behaviors recruit the perigenual anterior cingulate cortex. This work questions the view that cognitive control is a hallmark of dishonesty.

<https://www.pnas.org/content/118/43/e2109208118.abstract>

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## Proceedings of the Royal Society B

### PAPERS

#### **URI HERTZ, VAUGHAN BELL AND NICHOLA RAIHANI – Trusting and learning from others: Immediate and long-term effects of learning from observation and advice**

Social learning underpins our species's extraordinary success. Learning through observation has been investigated in several species, but learning from advice—where information is intentionally broadcast—is less understood. We used a pre-registered, online experiment (n = 1492) combined with computational modelling to examine learning through observation and advice. Participants were more likely to immediately follow advice than to copy an observed choice, but this was dependent upon trust in the adviser: highly paranoid participants were less likely to follow advice in the short term. Reinforcement learning modelling revealed two distinct patterns regarding the long-term effects of social information: some individuals relied fully on social information, whereas others reverted to trial-and-error learning. This variation may affect the prevalence and fidelity of socially transmitted information. Our results highlight the privileged status of advice relative to observation and how the assimilation of intentionally broadcast information is affected by trust in others.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2021.1414>

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## Royal Society Open Science

### PAPERS

#### **SHANY DROR et al – Acquisition and long-term memory of object names in a sample of Gifted Word Learner dogs**

Dogs with a vocabulary of object names are rare and are considered uniquely gifted. In a few cases, these Gifted Word Learner (GWL) dogs have presented cognitive skills that are functionally similar to those of human infants. However, the acquisition rate of new object names and the ability of GWL dogs to form long-term memories of those is unknown. In this study, we examine the ability of six GWL dogs to acquire the names of new objects in a short period and to retain those in their long-term memory without post-acquisition exposures. In Experiments 1 and 2, the dogs were tested on their ability to learn, during social interactions with their owners, the names of 6 and 12 new toys respectively, in one week. In Experiments 3 and 4, the dogs' memory of these objects was tested after one and two months. GWL dogs typically learned the names of the new objects and remembered those. We suggest that dogs with knowledge of object names could be a powerful model for studying mental mechanisms related to word acquisition in a non-human species.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.210976>

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#### **SARAH GRIFFITHS et al with THE SCALES TEAM – Relationship between early language competence and cognitive emotion regulation in adolescence**

Cognitive emotion regulation improves throughout adolescence and promotes good mental health. Here, we test whether language skills at school entry predict success in emotion regulation in an experimental task at age 10–11, using longitudinal data from the Surrey Communication and Language in Education Study. We additionally compared the performance of children with and without language disorder (LD). Across the whole sample (N = 344), language skills at school entry predicted emotion regulation success in Year 6 ( $\beta = 0.23$ ), over and above the concurrent association between language and regulation success. There was no evidence that children with LD that could engage in the task were less successful regulators compared to peers with typical language. However, a quarter of children with LD were unable to complete the task. These children had more severe language difficulties, lower non-verbal IQ and more comorbid conditions. This has implications for clinicians addressing mental health needs for children with neurodevelopmental conditions that affect language, as conversations about emotions and emotion regulation are an integral part of therapy. The longitudinal relationship between language skills and the capacity to use temporal distancing for emotion regulation in early adolescence suggests that language may drive improvements in emotion regulation.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.210742>

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## Trends in Cognitive Sciences

### PAPERS

#### **SOFIA M. LANDI & ELIZABETH A. BUFFALO – Value representation in the monkey hippocampus**

The hippocampus is thought to form cognitive maps across different domains of experience, including space and time. Recent work by Knudsen and Wallis identifies a map of abstract value space in the monkey hippocampus. We consider how these abstract variables might contribute to a comprehensive hippocampal representation of ongoing experience.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(21\)00262-X](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00262-X)

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