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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, 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, let me know.

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

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## ACADEMIA.EDU – Evidence for the Consumption of Arboreal, Diurnal Primates by Bonobos

*In American Journal of Primatology 71, 171–174 (2009).*

### MARTIN SURBECK et al with ANDREW FOWLER – Evidence for the Consumption of Arboreal, Diurnal Primates by Bonobos (*Pan paniscus*)

We present evidence for the consumption of a diurnal, arboreal, group living primate by bonobos. The digit of an immature black mangabey (*Lophocebus aterrimus*) was found in the fresh feces of a bonobo (*Pan paniscus*) at the Lui Kotale study site, Democratic Republic of Congo. In close proximity to the fecal sample containing the remains of the digit, we also found a large part of the pelt of a black mangabey. Evidence suggests that the Lui Kotale bonobos consume more meat than other bonobo populations and have greater variation in the mammalian species exploited than previously thought [Hohmann & Fruth, *Folia primatologica* 79:103–110]. The current finding supports Stanford's argument [Current Anthropology 39:399–420] that some differences in the diet and behavior between chimpanzees (*P. troglodytes*) and bonobos are an artefact of the limited number of bonobo study populations. If bonobos did obtain the monkey by active hunting, this would challenge current evolutionary models relating the intra-specific aggression and violence seen in chimpanzees and humans to hunting and meat consumption [Wrangham, *Yearbook of Physical Anthropology* 42:1–30].

[https://www.academia.edu/88442671/Evidence\\_for\\_the\\_consumption\\_of\\_arboreal\\_diurnal\\_primates\\_by\\_bonobos\\_Pan\\_paniscus](https://www.academia.edu/88442671/Evidence_for_the_consumption_of_arboreal_diurnal_primates_by_bonobos_Pan_paniscus)

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## SERVICES – How to spread the word about your research

Your research deserves to be seen! Our PLoS guide to article promotion will empower you to do the things that you need to do from the beginning of the writing process in order to make sure that your work achieves its full potential and finds its readership.

Download the guide here

<https://click.e.plos.org/?qs=21a9ac5a4964ca5fb6b1f70f59b148a193129b4479594b4b2c1edc7529d5af6b8c93eee85f6cd1ea1acb9bf39e29a445601723c8c59445bc>

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## NEWS

### NATURE BRIEFING – A Neanderthal nuclear family

For the first time, researchers have identified a set of closely related Neanderthals: a father, his teenage daughter and two other more distant relatives. The discovery of the family and seven more individuals in Chagyrskaya Cave in southern Siberia, along with two more from a nearby site, nearly doubles the number of known Neanderthal genomes. Genetic clues found in the individuals' DNA hint that the population of breeding adults was low, and that there was more diversity in maternally inherited mitochondrial genomes — suggesting that mothers left their communities to build new families.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=4c33ab7c6a&e=1db4b9a19b>

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### SAPIENS – When Kinship Is Traced Through Women, Their Health Follows

A study finds that there may be health benefits when family ties are linked through mothers and women head households.

<https://www.sapiens.org/culture/matrilineal-kinship-womens-health/>

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### SOCIETY FOR SCIENCE – Ancient DNA unveils Siberian Neandertals' small-scale social lives

Females often moved into their mate's communities, which totaled about 20 individuals, researchers say.

<http://click.societyforscience->

[email.com/?qs=508ea276798eb09e6bb8f5bf93086be339281c1e46ab247195c62d8d5d5b94cb41c67a9f3ce380f366dffa2a60e801753dcf15ca1050688853c919c853b985d](mailto:email.com/?qs=508ea276798eb09e6bb8f5bf93086be339281c1e46ab247195c62d8d5d5b94cb41c67a9f3ce380f366dffa2a60e801753dcf15ca1050688853c919c853b985d)

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### SOCIETY FOR SCIENCE – Honeybees order numbers from left to right, a study claims

In experiments, bees tend to go to smaller numbers on the left, larger ones on the right. But the idea of a mental number line in animals has critics.

<http://click.societyforscience->

[email.com/?qs=508ea276798eb09e26a15229a2998e2db9bbd4d58f4fc6430e3509d23a65bdc6497a001a2bf7572a735fd49c49c5043197d9d8330b115bc74f62555f0f527d8f](mailto:email.com/?qs=508ea276798eb09e26a15229a2998e2db9bbd4d58f4fc6430e3509d23a65bdc6497a001a2bf7572a735fd49c49c5043197d9d8330b115bc74f62555f0f527d8f)

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### THE CONVERSATION – How bumblebees can help us understand the evolution of human memories

We take it for granted that we can compare multiple memories when faced with a tough choice. But not every animal's mind works that way.

<https://theconversationuk.cmail20.com/t/r-l-tjyhidhy-khhiliah-g/>

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### THE CONVERSATION – Kenya's Samburu warriors still practise a rock art tradition that tells their stories

Instead of displaying myths, Samburu rock art reveals real-life stories and is made as a leisure activity.

*{So it wasn't the rock artists who made the myths, they were only giving the news. It was the later folk who turned yesterday's news into today's mythology. 'Twas ever so.}*

<https://theconversationuk.cmail19.com/t/r-l-tjuhkit-khhiliah-yd/>

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## PUBLICATIONS

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### American Journal of Biological Anthropology

#### PAPERS

##### **BRUNO F. MOSCARDI et al – Diet composition and prey choice in prehistoric human individuals from Northwest Patagonia: An application of species distribution and isotope mixing models**

Ancient hunter-gatherer diets were heterogeneous, varying substantially across time and space, and frequently showing considerable intrapopulation variation. The diet composition of these human groups depended primarily on resource availability, but also on the active selection of certain prey due to different bio-cultural factors. In this context, we explore resource availability, diet composition, and prey choice in the human populations of the Middle-Late Holocene from Northwest Patagonia.

We employ species distribution models using current and zooarchaeological data to estimate species availability throughout Northwest Patagonia, and we use Bayesian stable isotope mixing models on a large number of samples to analyze human diet composition at the individual level during the Middle-Late Holocene. Finally, we calculate a prey selectivity index to address the different dietary choices of human individuals in the region.

Our results show large differences in species available for consumption throughout the region, as well as a high dietary variation between human individuals, which is mainly related to their spatial location. Some species, such as guanaco, were widely distributed and consumed in the region. Notably, species of small mammals were actively selected in several areas, indicating greater importance in human diets than previously appreciated.

Species availability does not appear as the only factor driving human diets in the region, since prey choice seems to have been a recurring phenomenon among these populations. The novel approach used in this study overcomes several limitations of previous studies employing isotopic analysis in prehistoric human diets, allowing new insights into the bioarchaeology of the region.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24626>

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### Animal Behaviour

#### PAPERS

##### **CHARLÈNE DUDOUIT et al – Vocal performance during spontaneous song is equal in male and female European robins**

The song of male birds is implicated in mate attraction and territory defence and assumed to evolve through sexual selection. Song production is hypothesized to represent a biomechanical challenge under physical, respiratory and neural limitation, leading to trade-offs. Although both sexes sing in numerous species, vocal performance has been little studied in females.

European robins, *Erithacus rubecula*, of both sexes sing in autumn and winter to defend exclusive individual territories. We recorded robins singing spontaneously, that is, when not engaged in overt territorial interactions. We identified a trade-off between two acoustic parameters: (1) the frequency ratio between successive song elements and (2) the duration of gaps between these elements. This trade-off might represent a vocal production limit. To compare vocal performance between the sexes we used two measures: vocal gap deviation (the difference between how the bird sings and the theoretical performance maximum according to the putative vocal production limit we had identified) and sound density (the proportion of the song over which sound is present). Males and females did not differ in these two measures of vocal performance suggesting that the territory defence function of the song is used in social competition with members of either sex. In both sexes, vocal performance was not correlated with morphometric measures and repeatability coefficients were very small. Thus, vocal performance probably does not convey information about the signaller's body size or body condition, at least in spontaneous song of robins. These results inform the debate on selection forces driving female song.

<https://www.sciencedirect.com/science/article/abs/pii/S0003347222002354>

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##### **TOMMASO SACCA' et al – Reducing the bias due to unknown relationships in measuring the steepness of a dominance hierarchy**

Measuring the steepness of a dominance hierarchy is important for classifying a social system in a continuum between egalitarian and despotic. For this, often the steepness-slope from de Vries et al. (*Animal Behaviour*, 2006, 71, 585–592) is often used. It compares the cardinal and ordinal dominance rank of each individual using the slope of the linear regression. The disadvantage of this measure is that the slope becomes lower the higher the proportion of unknown relationships (dyads without interactions). In the present paper, we investigate what causes this bias, and propose a solution. (1) We show that the bias is due to the treatment of unknown relationships by the dominance index currently used in this methodology, the David's score (namely by assuming, among other things, an equal number of wins and losses for both members of the pair). (2) Instead, using the Average Dominance Index (the average proportion of wins by each individual from all its opponents) reduces the bias due to unknown relationships, because it excludes these relationships, and (3) the standard error of the steepness-slope based on the Average Dominance Index is smaller. (4) The two indices (David's score and Average Dominance Index) result in similar steepness-slopes when all relationships are known. To compare the two indices we use

empirical data (from four group-years of wild vervet monkeys, *Chlorocebus pygerythrus*) and data from a computational model on dominance interactions in a group (DomWorld). We conclude that the Average Dominance Index (compared to the David's score) is preferable for measuring the steepness-slope.

<https://www.sciencedirect.com/science/article/abs/pii/S0003347222002421>

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## Current Biology

### PAPERS

#### **MANON K. SCHWEINFURTH et al with JOSEP CALL – Inter-individual coordination in walking chimpanzees**

Humans, like many other animals, live in groups and coordinate actions with others in social settings. Such interpersonal coordination may emerge unconsciously and when the goal is not the coordination of movements, as when falling into the same rhythm when walking together. Although one of our closest living relatives, the chimpanzee (*Pan troglodytes*), shows the ability to succeed in complex joint action tasks where coordination is the goal, little is known about simpler forms of joint action. Here, we examine whether chimpanzees spontaneously synchronize their actions with conspecifics while walking together. We collected data on individual walking behavior of two groups of chimpanzees under semi-natural conditions. In addition, we assessed social relationships to investigate potential effects on the strength of coordination. When walking with a conspecific, individuals walked faster than when alone. The relative phase was symmetrically distributed around 0° with the highest frequencies around 0, indicating a tendency to coordinate actions. Further, coordination was stronger when walking with a partner compared with two individuals walking independently. Although the inter-limb entrainment was more pronounced between individuals of similar age as a proxy for height, it was not affected by the kinship or bonding status of the walkers or the behaviors they engaged in immediately after the walk. We conclude that chimpanzees adapt their individual behavior to temporally coordinate actions with others, which might provide a basis for engaging in other more complex forms of joint action. This spontaneous form of inter-individual coordination, often called entrainment, is thus shared with humans.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(22\)01601-3](https://www.cell.com/current-biology/fulltext/S0960-9822(22)01601-3)

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## Evolutionary Anthropology

### ARTICLES

#### **EMILY HALLINAN et al with ERELLA HOVERS – The nature of Nubian: Developing current global perspectives on Nubian Levallois technology and the Nubian complex**

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21958>

Summary & text available.

[https://www.researchgate.net/publication/363274863\\_The\\_nature\\_of\\_Nubian\\_Developing\\_current\\_global\\_perspectives\\_on\\_Nubian\\_Levallois\\_technology\\_and\\_the\\_Nubian\\_complex](https://www.researchgate.net/publication/363274863_The_nature_of_Nubian_Developing_current_global_perspectives_on_Nubian_Levallois_technology_and_the_Nubian_complex)

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### PAPERS

#### **STACY ROSENBAUM & JOAN B. SILK – Pathways to paternal care in primates**

Natural selection will favor male care when males have limited alternative mating opportunities, can invest in their own offspring, and when care enhances males' fitness. These conditions are easiest to fulfill in pair-bonded species, but neither male care nor stable "breeding bonds" that facilitate it are limited to pair-bonded species. We review evidence of paternal care and extended breeding bonds in owl monkeys, baboons, Assamese macaques, mountain gorillas, and chimpanzees. The data, which span social/mating systems and ecologies, suggest that there are multiple pathways by which conditions conducive to male care can arise. This diversity highlights the difficulty of making inferences about the emergence of male care in early hominins based on single traits visible in the fossil record. We discuss what types of data are most needed and the questions yet to be answered about the evolution of male care and extended breeding bonds in the primate order.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21942>

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### COMMENTARIES

#### **ERIC DELSON & CHRIS STRINGER – The naming of *Homo bodoensis* by Roksandic and colleagues does not resolve issues surrounding Middle Pleistocene human evolution**

Roksandic et al. (2022) proposed the new species name *Homo bodoensis* as a replacement name for *Homo rhodesiensis* Woodward, 1921, because they felt it was poorly and variably defined and was linked to sociopolitical baggage. However, the International Code of Zoological Nomenclature includes regulations on how and when such name changes are allowed, and Roksandic et al.'s arguments meet none of these requirements. It is not permitted to change a name solely because of variable (or erroneous) later use once it has been originally defined correctly, nor can a name be modified because it is offensive to one or more authors or to be politically expedient. We discuss past usage of *H. rhodesiensis* and the relevant nomenclatural procedures, the proposed evolutionary position of *H. bodoensis*, and issues raised about decolonizing paleoanthropology. We reject *H. bodoensis* as a junior synonym, with no value from its inception.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21950>

### **ESTEBAN E. SARMIENTO & MARTIN PICKFORD – Muddying the muddle in the middle even more**

In an Evolutionary Anthropology article Roksandic et al. (2022) propose a new middle Pleistocene hominin species *H. bodoensis* to replace a “poorly defined” *Homo heidelbergensis*. *Homo bodoensis* extends from the African Middle Pleistocene through the Levant to South-eastern Europe with all currently classified *H. heidelbergensis* fossils from western Europe subsumed into *Homo neanderthalensis*. The authors claim their new species will be more clearly defined than *H. heidelbergensis* and will better describe hominin variation and evolution in the middle Pleistocene. Roksandic et al. are unable to account for some European fossils (i.e., Petralona and Arago) and provide no evidence as to how their new species meets their objectives. Fatally, they overlook the priority rule and fail to realize that *H. bodoensis* is both a junior synonym of *Homo rhodesiensis* and *Homo saldanensis*. Roksandic et al. conflate taxonomy with phylogeny, present hypotheses as facts, and harbor many systematic and evolutionary misconceptions.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21952>

### **MIRJANA ROKSANDIC et al – Homo bodoensis and why it matters**

In our original paper, we proposed a new species, *Homo bodoensis*, to replace the problematical taxa *Homo heidelbergensis* and *Homo rhodesiensis*, with the goal of streamlining communication about human evolution in the Chibanian. We received two independent responses. Given their substantial overlap, we provide one combined reply. In this response: (1) we are encouraged that the primary proposal in our paper, to discontinue the use of *H. heidelbergensis* (as a junior synonym to *Homo neanderthalensis*) due to its' nomenclatural problems, is acknowledged. (2) we provide additional clarification about the rules governing taxonomic nomenclature as outlined by the International Code of Zoological Nomenclature and join the growing calls for a revision to these rules. (3) we discuss further why *H. rhodesiensis* should be abandoned, particularly in light of the current sensitivity to using culturally inappropriate names. We conclude that *H. bodoensis* is a better solution than the proposed alternatives.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21954>

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## Mind & Language

### PAPERS

#### **FABRIZIO CALZAVARINI – The empirical status of semantic perceptualism**

Semantic perceptualism is the thesis that meaning experiences are forms of perceptual experiences. According to its defenders, this view is motivated not only by philosophical considerations, but also by empirical evidence. In the present article, I shall provide the first comprehensive and critical review of the empirical evidence in support of semantic perceptualism, including a detailed analysis of the relevant neuroanatomical data. The conclusions of my analysis are largely pessimistic. I believe that the relevant behavioral, cognitive, and patient data are suggestive but hardly conclusive. Moreover, neuroanatomical data speak strongly against semantic perceptualism.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12444>

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## Nature

### NEWS

#### **First known Neanderthal family discovered in Siberian cave**

Ancient DNA from closely related individuals offers fresh insight into Neanderthals' lives and social structures.

<https://www.nature.com/articles/d41586-022-03339-7>

### ARTICLES

#### **LARA M. CASSIDY – The first genomic portrait of a Neanderthal family**

Ancient genomic data have been retrieved for 13 Neanderthals from 2 caves in Siberia. The genomes provide unprecedented insights into the social organization of Neanderthal communities.

<https://www.nature.com/articles/d41586-022-03005-y>

### PAPERS

#### **LAURITS SKOV et al with JANET KELSO & SVANTE PÄÄBO – Genetic insights into the social organization of Neanderthals**

Genomic analyses of Neanderthals have previously provided insights into their population history and relationship to modern humans, but the social organization of Neanderthal communities remains poorly understood. Here we present genetic data for 13 Neanderthals from two Middle Palaeolithic sites in the Altai Mountains of southern Siberia: 11 from Chagyrskaya Cave and 2 from Okladnikov Cave—making this one of the largest genetic studies of a Neanderthal population to date. We used hybridization capture to obtain genome-wide nuclear data, as well as mitochondrial and Y-chromosome sequences. Some Chagyrskaya individuals were closely related, including a father–daughter pair and a pair of second-degree relatives, indicating that at least some of the individuals lived at the same time. Up to one-third of these individuals' genomes had long segments of homozygosity, suggesting that the Chagyrskaya Neanderthals were part of a small community. In addition, the Y-chromosome diversity is an order of magnitude lower than the mitochondrial diversity, a pattern that we found is best explained by female migration between communities. Thus, the genetic data presented here provide a detailed

documentation of the social organization of an isolated Neanderthal community at the easternmost extent of their known range.

<https://www.nature.com/articles/s41586-022-05283-y>

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## Nature Communications

### PAPERS

#### **WENYI ZHANG, YANG XIE & TIANMING YANG – Reward salience but not spatial attention dominates the value representation in the orbitofrontal cortex**

The orbitofrontal cortex (OFC) encodes value and plays a key role in value-based decision-making. However, the attentional modulation of the OFC's value encoding is poorly understood. We trained two monkeys to detect a luminance change at a cued location between a pair of visual stimuli, which were over-trained pictures associated with different amounts of juice reward and, thus, different reward salience. Both the monkeys' behavior and the dorsolateral prefrontal cortex neuronal activities indicated that the monkeys actively directed their spatial attention toward the cued stimulus during the task. However, the OFC's neuronal responses were dominated by the stimulus with higher reward salience and encoded its value. The value of the less salient stimulus was only weakly represented regardless of spatial attention. The results demonstrate that reward and spatial attention are distinctly represented in the prefrontal cortex and the OFC maintains a stable representation of reward salience minimally affected by attention.

<https://www.nature.com/articles/s41467-022-34084-0>

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## Nature Genetics

### PAPERS

#### **CATHERINE DOUST et al with 23ANDME RESEARCH TEAM & QUANTITATIVE TRAIT WORKING GROUP OF THE GENLANG CONSORTIUM – Discovery of 42 genome-wide significant loci associated with dyslexia**

Reading and writing are crucial life skills but roughly one in ten children are affected by dyslexia, which can persist into adulthood. Family studies of dyslexia suggest heritability up to 70%, yet few convincing genetic markers have been found. Here we performed a genome-wide association study of 51,800 adults self-reporting a dyslexia diagnosis and 1,087,070 controls and identified 42 independent genome-wide significant loci: 15 in genes linked to cognitive ability/educational attainment, and 27 new and potentially more specific to dyslexia. We validated 23 loci (13 new) in independent cohorts of Chinese and European ancestry. Genetic etiology of dyslexia was similar between sexes, and genetic covariance with many traits was found, including ambidexterity, but not neuroanatomical measures of language-related circuitry. Dyslexia polygenic scores explained up to 6% of variance in reading traits, and might in future contribute to earlier identification and remediation of dyslexia.

<https://www.nature.com/articles/s41588-022-01192-y>

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## Nature Reviews Psychology

### PAPERS

#### **ANDREW B. BARRON – How animal minds can help reveal the human mind**

The field of animal cognition does far more than simply extend cognition into zoology. Studying animal cognition helps researchers to comprehend the human mind.

<https://www.nature.com/articles/s44159-022-00122-3>

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## Nature Scientific Reports

### PAPERS

#### **ELISA DEMURU et al – Female bonobos show social swelling by synchronizing their maximum swelling and increasing bonding**

Different Old World primates show conspicuous anogenital swelling, with the Maximum Swelling Phase (MSP) signaling the ovulatory phase. MSP synchronization between females has been linked to social dynamics. In bonobos, characterized by female dominance, MSP is not a fully reliable signal of fertility because it may cover anovulatory periods. We investigated whether bonobo females synchronized their MSP and whether this phenomenon was modulated by social factors. Data were collected at La Vallée des Singes (France). In the period 2009–2022, swelling cycles data were collected daily on bonobo females (N = 9). In the period 2018–2022, ethological data (aggression/affiliation/socio-sexual behaviors) were also collected. We found that: (i) females synchronized their MSP and most likely experienced MSP onset following the MSP onset in other females; (ii) synchronization increased as the years spent together by females increased; (iii) synchronization preferentially occurred between females that affiliated less; (iv) synchronization on the MSP was linked to increased female-female socio-sexual contacts, which probably favored MSP synchronization maintenance. Hence, in bonobos MSP can be modulated by social factors and its synchronization, possibly underlying autonomic contagion, might have been positively selected during evolution in relation to the benefits females obtain in terms of intra-group cohesion.

<https://www.nature.com/articles/s41598-022-22325-7>

### **CATERINA VILLANI et al – Abstract and concrete concepts in conversation**

Concepts allow us to make sense of the world. Most evidence on their acquisition and representation comes from studies of single decontextualized words and focuses on the opposition between concrete and abstract concepts (e.g., “bottle” vs. “truth”). A significant step forward in research on concepts consists in investigating them in online interaction during their use. Our study examines linguistic exchanges analyzing the differences between sub-kinds of concepts. Participants were submitted to an online task in which they had to simulate a conversational exchange by responding to sentences involving sub-kinds of concrete (tools, animals, food) and abstract concepts (PS, philosophical-spiritual; EMSS, emotional-social, PSTQ, physical-spatio-temporal-quantitative). We found differences in content: foods evoked interoception; tools and animals elicited materials, spatial, auditory features, confirming their sensorimotor grounding. PS and EMSS yielded inner experiences (e.g., emotions, cognitive states, introspections) and opposed PSTQ, tied to visual properties and concrete agency. More crucially, the various concepts elicited different interactional dynamics: more abstract concepts generated higher uncertainty and more interactive exchanges than concrete ones. Investigating concepts in situated interactions opens new possibilities for studying conceptual knowledge and its pragmatic and social aspects.

<https://www.nature.com/articles/s41598-022-20785-5>

### **ROCCO MENNELLA et al – Spontaneous instrumental avoidance learning in social contexts**

Adaptation to our social environment requires learning how to avoid potentially harmful situations, such as encounters with aggressive individuals. Threatening facial expressions can evoke automatic stimulus-driven reactions, but whether their aversive motivational value suffices to drive instrumental active avoidance remains unclear. When asked to freely choose between different action alternatives, participants spontaneously—without instruction or monetary reward—developed a preference for choices that maximized the probability of avoiding angry individuals (sitting away from them in a waiting room). Most participants showed clear behavioral signs of instrumental learning, even in the absence of an explicit avoidance strategy. Inter-individual variability in learning depended on participants’ subjective evaluations and sensitivity to threat approach feedback. Counterfactual learning best accounted for avoidance behaviors, especially in participants who developed an explicit avoidance strategy. Our results demonstrate that implicit defensive behaviors in social contexts are likely the product of several learning processes, including instrumental learning.

<https://www.nature.com/articles/s41598-022-22334-6>

### **BRICE BROSSETTE et al – On the relations between letter, word, and sentence-level processing during reading**

Much prior research on reading has focused on a specific level of processing, with this often being letters, words, or sentences. Here, for the first time in adult readers, we provide a combined investigation of these three key component processes of reading comprehension. We did so by testing the same group of participants in three tasks thought to reflect processing at each of these levels: alphabetic decision, lexical decision, and grammatical decision. Participants also performed a non-reading classification task, with an aim to partial-out common binary decision processes from the correlations across the three main tasks. We examined the pairwise partial correlations for response times (RTs) in the three reading tasks. The results revealed strong significant correlations across adjacent levels of processing (i.e., letter-word; word-sentence) and a non-significant correlation between non-adjacent levels (letter-sentence). The results provide an important new benchmark for evaluating computational models that describe how letters, words, and sentences contribute to reading comprehension.

<https://www.nature.com/articles/s41598-022-22587-1>

### **SAIMA MALIK-MORALEDA, MANUEL ROCA & EDWARD GIBSON – Color naming in Tsimane’–Spanish bilinguals indicates that differential experience with content domains affects lexical access**

A standard assumption in the bilingual language processing literature is that the ease of access of a word in a language is determined by the speaker’s overall proficiency in the language. Alternatively, it could be that proficiency varies across semantic categories of the bilingual’s two languages. Here, we investigated lexical access in color terms in Tsimane’–Spanish bilinguals. Given that color terms are generally more frequent in Spanish than Tsimane’, participants may have better lexical access for color words in Spanish despite being overall more proficient in Tsimane’. Twenty-two Tsimane’–Spanish bilinguals took part in a picture naming task where participants labeled colors and animals. Participants were equally fast and accurate at naming animals in Tsimane’ and Spanish. However, participants were faster and more accurate at naming colors in Spanish than Tsimane’ except for the three color words that are most frequent (jaibes ~ white, tsincus ~ black, jaines ~ red) in Tsimane’, for which they were equally fast in both Tsimane’ and Spanish. These results suggest that category-specific proficiency is a better predictor for lexical access than overall proficiency.

<https://www.nature.com/articles/s41598-022-18461-9>

### **EDUARDO MAYORAL et al – New dating of the Matalascañas footprints provides new evidence of the Middle Pleistocene (MIS 9-8) hominin paleoecology in southern Europe**

Hominin footprints were recently discovered at Matalascañas (Huelva; South of Iberian Peninsula). They were dated thanks to a previous study in deposits of the Asperillo cliff to  $106 \pm 19$  ka, Upper Pleistocene, making Neandertals the most likely track-makers. In this paper, we report new Optically Stimulated Luminescence dating that places the hominin footprints surface in the range of  $295.8 \pm 17$  ka (MIS 9-MIS 8 transition, Middle Pleistocene). This new age implies that the possible



track-makers are individuals more likely from the Neandertal evolutionary lineage. Regardless of the taxon attributed to the Matalascañas footprints, they supplement the existing partial fossil record for the European Middle Pleistocene Hominins being notably the first palaeoanthropological evidence (hominin skeleton or footprints) from the MIS 9 and MIS 8 transition discovered in the Iberian Peninsula, a moment of climatic evolution from warm to cool. Thus, the Matalascañas footprints represent a crucial record for understanding human occupations in Europe in the Pleistocene.

<https://www.nature.com/articles/s41598-022-22524-2>

### **IGOR DJAKOVIC, ALASTAIR KEY & MARIE SORESSI – Optimal linear estimation models predict 1400–2900 years of overlap between Homo sapiens and Neandertals prior to their disappearance from France and northern Spain**

Recent fossil discoveries suggest that Neandertals and Homo sapiens may have co-existed in Europe for as long as 5 to 6000 years. Yet, evidence for their contemporaneity at any regional scale remains highly elusive. In France and northern Spain, a region which features some of the latest directly-dated Neandertals in Europe, Protoaurignacian assemblages attributed to Homo sapiens appear to 'replace' Neandertal-associated Châtelperronian assemblages. Using the earliest and latest known occurrences as starting points, Bayesian modelling has provided indication that these occupations may in fact have been partly contemporaneous. The reality, however, is that we are unlikely to ever identify the 'first' or 'last' appearance of a species or cultural tradition in the archaeological and fossil record. Here, we use optimal linear estimation modelling to estimate the first appearance date of Homo sapiens and the extinction date of Neandertals in France and northern Spain by statistically inferring these 'missing' portions of the Protoaurignacian and Châtelperronian archaeological records. Additionally, we estimate the extinction date of Neandertals in this region using a dataset of directly-dated Neandertal fossil remains. Our total dataset consists of sixty-six modernly produced radiocarbon determinations which we recalibrated using the newest calibration curve (IntCal20) to produce updated age ranges. The results suggest that the onset of the Homo sapiens occupation of this region likely preceded the extinction of Neandertals and the Châtelperronian by up to 1400–2900 years. This reaffirms the Bayesian-derived duration of co-existence between these groups during the initial Upper Palaeolithic of this region using a novel independent method, and indicates that our understanding of the timing of these occupations may not be suffering from substantial gaps in the record. Whether or not this co-existence featured some form of direct interaction, however, remains to be resolved.

<https://www.nature.com/articles/s41598-022-19162-z>

### **E. V. DORONICHEVA et al – Functional characterization of Mousterian tools from the Caucasus using comprehensive use-wear and residue analysis**

The authors discuss functional characterization of Mousterian tools on the basis of their use-wear and residue analysis of five lithic tools from Mezmaiskaya cave and Saradj-Chuko grotto in the North Caucasus. The results represent the first comprehensive use-wear and residue analysis carried out on Mousterian stone artefacts in the Caucasus. This study unequivocally confirms the use of bitumen for hafting stone tools in two different Middle Paleolithic cultural contexts defined in the Caucasus, Eastern Micoquian and Zagros Mousterian.

<https://www.nature.com/articles/s41598-022-20612-x>

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## New Scientist

### NEWS

#### **Neanderthal family life revealed by ancient DNA from Siberian cave**

DNA from 11 individuals who lived in Chagyrskaya cave around 51,000 years ago suggests women moved between groups and also shows a high level of inbreeding.

<https://www.newscientist.com/article/2342731-neanderthal-family-life-revealed-by-ancient-dna-from-siberian-cave/>

#### **Menstrual cycle lengths vary between people of different ethnicities**

Cycles may be 1.6 days longer in people who identify as Asian compared with their white non-Hispanic counterparts.

<https://www.newscientist.com/article/2342719-menstrual-cycle-lengths-vary-between-people-of-different-ethnicities/>

#### **Scientists finally realised female robins sing just as well as males**

An analysis of the songs of male and female European robins adds to growing evidence that both sexes of songbirds are talented singers.

<https://www.newscientist.com/article/2341846-scientists-finally-realised-female-robins-sing-just-as-well-as-males/>

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## PeerJ

### PAPERS

#### **LUCÍA COBO-SÁNCHEZ et al with AUDAX MABULLA – Computer vision supports primary access to meat by early Homo 1.84 million years ago**

Human carnivory is atypical among primates. Unlike chimpanzees and bonobos, who are known to hunt smaller monkeys and eat them immediately, human foragers often cooperate to kill large animals and transport them to a safe location to be shared. While it is known that meat became an important part of the hominin diet around 2.6–2 Mya, whether intense

cooperation and food sharing developed in conjunction with the regular intake of meat remains unresolved. A widespread assumption is that early hominins acquired animal protein through klepto-parasitism at felid kills. This should be testable by detecting felid-specific bone modifications and tooth marks on carcasses consumed by hominins. Here, deep learning (DL) computer vision was used to identify agency through the analysis of tooth pits and scores on bones recovered from the Early Pleistocene site of DS (Bed I, Olduvai Gorge). We present the first objective evidence of primary access to meat by hominins 1.8 Mya by showing that the most common securely detectable bone-modifying fissipeds at the site were hyenas. The absence of felid modifications in most of the carcasses analyzed indicates that hominins were the primary consumers of most animals accumulated at the site, with hyenas intervening at the post-depositional stage. This underscores the role of hominins as a prominent part of the early Pleistocene African carnivore guild. It also stresses the major (and potentially regular) role that meat played in the diet that configured the emergence of early Homo.

<https://peerj.com/articles/14148/>

### **LENA M. BLOTT et al – Learning about the meanings of ambiguous words: evidence from a word-meaning priming paradigm with short narratives**

Fluent language comprehension requires people to rapidly activate and integrate context-appropriate word meanings. This process is challenging for meanings of ambiguous words that are comparatively lower in frequency (e.g., the “bird” meaning of “crane”). Priming experiments have shown that recent experience makes such subordinate (less frequent) word meanings more readily available at the next encounter. These experiments used lists of unconnected sentences in which each ambiguity was disambiguated locally by neighbouring words. In natural language, however, disambiguation may occur via more distant contextual cues, embedded in longer, connected communicative contexts. In the present experiment, participants (N = 51) listened to 3-sentence narratives that ended in an ambiguous prime. Cues to disambiguation were relatively distant from the prime; the first sentence of each narrative established a situational context congruent with the subordinate meaning of the prime, but the remainder of the narrative did not provide disambiguating information. Following a short delay, primed subordinate meanings were more readily available (compared with an unprimed control), as assessed by responses in a word association task related to the primed meaning. This work confirms that listeners reliably disambiguate spoken ambiguous words on the basis of cues from wider narrative contexts, and that they retain information about the outcome of these disambiguation processes to inform subsequent encounters of the same word form.

<https://peerj.com/articles/14070/>

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## **PLoS One**

### **PAPERS**

### **EMMA M. FINESTONE et al with MICHAEL PETRAGLIA – Paleolithic occupation of arid Central Asia in the Middle Pleistocene**

Central Asia is positioned at a crossroads linking several zones important to hominin dispersal during the Middle Pleistocene. However, the scarcity of stratified and dated archaeological material and paleoclimate records makes it difficult to understand dispersal and occupation dynamics during this time period, especially in arid zones. Here we compile and analyze paleoclimatic and archaeological data from Pleistocene Central Asia, including examination of a new layer-counted speleothem-based multiproxy record of hydrological changes in southern Uzbekistan at the end of MIS 11. Our findings indicate that Lower Palaeolithic sites in the steppe, semi-arid, and desert zones of Central Asia may have served as key areas for the dispersal of hominins into Eurasia during the Middle Pleistocene. In agreement with previous studies, we find that bifaces occur across these zones at higher latitudes and in lower altitudes relative to the other Paleolithic assemblages. We argue that arid Central Asia would have been intermittently habitable during the Middle Pleistocene when long warm interglacial phases coincided with periods when the Caspian Sea was experiencing consistently high water levels, resulting in greater moisture availability and more temperate conditions in otherwise arid regions. During periodic intervals in the Middle Pleistocene, the local environment of arid Central Asia was likely a favorable habitat for paleolithic hominins and was frequented by Lower Paleolithic toolmakers producing bifaces.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0273984>

### **ALICE RODRIGUEZ et al – The effect of worked material hardness on stone tool wear**

The identification of ancient worked materials is one of the fundamental goals of lithic use wear analysis and one of the most important parts of understanding how stone tools were used in the past. Given the documented overlaps in wear patterns generated by different materials, it is imperative to understand how individual materials' mechanical properties might influence wear formation. Because isolating physical parameters and measuring their change is necessary for such an endeavor, controlled (rather than replicative) experiments combined with objective measurements of surface topography are necessary to better grasp how surface modifications formed on stone tools. Therefore, we used a tribometer to wear natural flint surfaces against five materials (bone, antler, beech wood, spruce wood, and ivory) under the same force, and speed, over one, three, and five hours. The study aimed to test if there is a correlation between surface modifications and the hardness of the worked material. We measured each raw material's hardness using a nano-indentation test, and we compared the surface texture of the flint bits using a 3D optical profilometer. The interfacial detritus powder was analyzed with a scanning electron microscope to look for abraded flint particles. We demonstrate that, contrary to expectation, softer materials, such as wood, create a smoother surface than hard ones, such as ivory.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0276166>

### **ANDREW M. ROBBINS et al – Population dynamics of western gorillas at Mbeli Bai**

Long-term studies of population dynamics can provide insights into life history theory, population ecology, socioecology, conservation biology and wildlife management. Here we examine 25 years of population dynamics of western gorillas at Mbeli Bai, a swampy forest clearing in Nouabalé-Ndoki National Park, the Republic of Congo. The Mbeli population more than doubled from 101 to 226 gorillas during the study. After adjusting for a net influx of gorillas into the study population, the increase represents an inherent growth rate of 0.7% per year, with 95% confidence limits between -0.7% and 2.6%. The influx of gorillas mainly involved immigration of individuals into existing study groups (social dispersal), but it also included the appearance of a few previously unknown groups (locational dispersal). The average group size did not change significantly during the study, which is consistent with the possibility that western gorillas face socioecological constraints on group size, even when the population is increasing. We found no significant evidence of density dependence on female reproductive success or male mating competition. The distribution of gorillas among age/sex categories also did not change significantly, which suggests that the population had a stable age structure. Our results provide evidence of population stability or growth for some western gorillas (albeit within a small area). The results highlight the value of law enforcement, long-term monitoring, and protected areas; but they do not diminish the importance of improving conservation for this critically endangered species.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0275635>

### **ARYAN YAZDANPANA, ABDOL-HOSSEIN VAHABIE & MAJID NILI AHMADABADI – Do you share your personally useless information if others may benefit from it?**

Information is personally useless if its beholder cannot individually benefit from it further unless she shares it with those who can exploit that information to increase their mutual outcome. We study sharing such information anonymously in a non-strategic and non-competitive setting, where selfish and cooperative motives align. Although sharing information was cost-free and resulted in expected mutual payoff, almost all subjects showed some levels of hesitancy toward sharing information, and it was more severe in the introverts. According to our mechanistic model, this irrationality could arise because of the excessive subjective value of personally useless information and low other-regarding motives, that necessitated over-attainable personal benefit to drive sharing. Interestingly, other-regarding element correlated with the subjects' belief about how others are cooperative in general. In addition, sensitivity to the value of information correlated with their extraversion level. The results open a new window towards understanding inefficient motives that deprive people of collective benefit.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0276062>

### **KATHERINE MCAULIFFE, NATALIE BENJAMIN & FELIX WARNEKEN – Reward type influences adults' rejections of inequality in a task designed for children**

In the context of economic games, adults sacrifice money to avoid unequal outcomes, showing so-called inequity aversion. Child-friendly adaptations of these games have shown that children, too, show inequity aversion. Moreover, inequity aversion shows a clear developmental trajectory, with young children rejecting only disadvantageously unequal distributions and older children rejecting both disadvantageously and advantageously unequal distributions. However, based on existing work, it is difficult to compare adult and child responses to inequity because (1) adapting economic games to make them child-friendly may importantly alter the dynamics of the fairness interaction and (2) adult work typically uses abstract rewards such as money while work with children typically uses more concrete rewards like candy, stickers or toys. Here we adapted the Inequity Game—a paradigm designed to study children's responses to inequality in isolation from other concerns—to test inequity aversion in adults (N = 104 pairs). We manipulated whether participants made decisions about concrete rewards (candy) or abstract rewards (tokens that could be traded in for money). We found that, like children, adults rejected unequal payoffs in this task. Additionally, we found that reward type mattered: adults rejected disadvantageous—but not advantageous—monetary distributions, yet rejected both disadvantageous and advantageous candy distributions. These findings allow us to draw clearer comparisons across child and adult responses to unfairness and help paint a fuller picture of inequity aversion in humans.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0272710>

### **ANDY I. R. HERRIES et al – A marine isotope stage 11 coastal Acheulian workshop with associated wood at Amanzi Springs Area 1, South Africa**

Amanzi Springs is a series of inactive thermal springs located near Kariega in the Eastern Cape of South Africa. Excavations in the 1960s exposed rare, stratified Acheulian-bearing deposits that were not further investigated over the next 50 years. Reanalysis of the site and its legacy collection has led to a redefined stratigraphic context for the archaeology, a confirmed direct association between Acheulian artefacts and wood, as well as the first reliable age estimates for the site. Thermally transferred optically stimulated luminescence and post-infrared infrared stimulated luminescence dating indicates that the Acheulian deposits from the Amanzi Springs Area 1 spring eye formed during Marine Isotope Stage (MIS) 11 at ~ 404–390 ka. At this time, higher sea levels of ~13–14m would have placed Amanzi Springs around 7 km from a ria that would have formed along what is today the Swartkops River, and which likely led to spring reactivation. This makes the Amanzi Springs Area 1 assemblage an unusual occurrence of a verified late occurring, seaward, open-air Acheulian occupation. The Acheulian levels

do not contain any Middle Stone Age (MSA) elements such as blades and points that have been documented in the interior of South Africa at this time. However, a small number of stone tools from the upper layers of the artefact zone, and originally thought of as intrusive, have been dated to ~190 ka, at the transition between MIS 7 to 6, and represent the first potential MSA identified at the site.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0273714>

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## Science Advances

### PAPERS

#### **ANTOINE BALZEAU et al with LEE BERGER, JOSÉ MARÍA BERMÚDEZ DE CASTRO, KATERINA HARVATI, JEAN-JACQUES HUBLIN, DAVID LORDKIPANIDZE, CHRIS STRINGER & JOÃO ZILHÃO – Frontal sinuses and human evolution**

The frontal sinuses are cavities inside the frontal bone located at the junction between the face and the cranial vault and close to the brain. Despite a long history of study, understanding of their origin and variation through evolution is limited. This work compares most hominin species' holotypes and other key individuals with extant hominids. It provides a unique and valuable perspective of the variation in sinuses position, shape, and dimensions based on a simple and reproducible methodology. We also observed a covariation between the size and shape of the sinuses and the underlying frontal lobes in hominin species from at least the appearance of *Homo erectus*. Our results additionally undermine hypotheses stating that hominin frontal sinuses were directly affected by biomechanical constraints resulting from either chewing or adaptation to climate. Last, we demonstrate their substantial potential for discussions of the evolutionary relationships between hominin species.

<https://www.science.org/doi/full/10.1126/sciadv.abp9767>

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## Trends in Cognitive Sciences

### PAPERS

#### **LINDA B. SMITH & HADAR KARMAZYN-RAZ – Episodes of experience and generative intelligence**

How do humans, including toddlers, take knowledge from past experiences and apply this knowledge in new ways? Current approaches to human and artificial intelligence (AI) fail to offer satisfactory explanations. We suggest the explanation will be found in the coherence statistics of the individual time-extended episodes of human experience and the cognitive processes those statistics engage.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00233-9](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00233-9)

#### **SUPARNA RAJARAM – Collective memory and the individual mind**

How does social transmission of information shape individual and collective memory? Taking a cognitive-experimental perspective, I propose three critical research themes to tackle in the next 25 years: the dynamic reciprocity of influence between the individual and the collective; changes in the individual and collective memory structures; and the impact of culture.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(22\)00235-2](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(22)00235-2)

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