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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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### EAORC NEWS – Replacing the Membership Page on the Website

The membership list is rather meaningless, and I have been thinking of what could replace it. I've settled on a recommendations page instead. So if any of you have a few kind words to say about EAORC and are happy to see those words on the website, drop me a line and I'll start setting up the new resource.

Many thanks in anticipation.

Martin

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### ACADEMIA.EDU – New fossil remains of *Homo naledi* from the Lesedi Chamber, South Africa

*eLife* 6:e24232 (2017)

**JOHN HAWKS et al with LEE R BERGER – New fossil remains of *Homo naledi* from the Lesedi Chamber, South Africa**

The Rising Star cave system has produced abundant fossil hominin remains within the Dinaledi Chamber, representing a minimum of 15 individuals attributed to *Homo naledi*. Further exploration led to the discovery of hominin material, now comprising 131 hominin specimens, within a second chamber, the Lesedi Chamber. The Lesedi Chamber is far separated from the Dinaledi Chamber within the Rising Star cave system, and represents a second depositional context for hominin remains. In each of three collection areas within the Lesedi Chamber, diagnostic skeletal material allows a clear attribution to *H. naledi*. Both adult and immature material is present. The hominin remains represent at least three individuals based upon duplication of elements, but more individuals are likely present based upon the spatial context. The most significant specimen is the near-complete cranium of a large individual, designated LES1, with an endocranial volume of approximately 610 ml and associated postcranial remains. The Lesedi Chamber skeletal sample extends our knowledge of the morphology and variation of *H. naledi*, and evidence of *H. naledi* from both recovery localities shows a consistent pattern of differentiation from other hominin species.

[https://www.academia.edu/32958455/New\\_fossil\\_remains\\_of\\_Homo\\_naledi\\_from\\_the\\_Lesedi\\_Chamber\\_South\\_Africa](https://www.academia.edu/32958455/New_fossil_remains_of_Homo_naledi_from_the_Lesedi_Chamber_South_Africa)

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### ACADEMIA.EDU – The Echo of Creation: Parallels between Old Norse Cosmogony and Eschatology

*Temenos* 57:1, 103-26 (2021)

**JAN A. KOZÁK – The Echo of Creation: Parallels between Old Norse Cosmogony and Eschatology**

The article explores the idea of an echo, both literal and structural, that connects Old Norse cosmogony and eschatology. The motif of a bellowing sound or cry appears in cosmogony in the figure of Ymir, 'Crier', who is killed by the Æsir, and from his body the world is created. During the eschatological events the booming sound recurs when Heimdallr blows his horn shortly before the Æsir themselves are killed by their adversaries. A cry is also emitted by Óðinn when he sacrifices himself on the Cosmic Tree. The booming bellow is thus associated with death, especially in the context of implicit or explicit sacrifice. The structural resonance between cosmogony and eschatology is composed of a series of five motifs that reappear in the same sequence at both liminal moments. The eschatology seems to be structurally a repetition of the cosmogony, but with inverted roles: the victims are the gods, and the sacrificers are the giants, which is the inverse of the situation during the cosmogony. The present analysis sheds light on the sacrificial pattern hidden behind the two events, and helps contextualize the motif of the mighty sound that reappears at both moments in cosmic history.

<https://www.academia.edu/s/7205b94c9c>

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### ACADEMIA.EDU – The Origins of Bipedal Locomotion

*Handbook of Paleoanthropology*, Winfried Henke & Ian Tattersall (eds.), Springer-Verlag, III:5, 1919-1959 (2015)

**WILLIAM E. H. HARCOURT-SMITH – The Origins of Bipedal Locomotion**

Bipedalism is a highly specialized and unusual form of primate locomotion that is found today only in modern humans. The majority of extinct taxa within the Hominini were bipedal, but the degree to which they were bipedal remains the subject of considerable debate. The significant discoveries of fossil hominin that remains in the last 40 years have resulted in this debate becoming increasingly focused on how bipedal certain fossil taxa were, rather than on the overall process. Although the early hominin fossil record remains poor, evidence points to at least two distinct adaptive shifts. First, there was a shift to habitual bipedalism, as typified by certain members of *Australopithecus*, but possibly including earlier genera such as *Ardipithecus* and *Orrorin*. Such taxa were bipedal, but also retained a number of significant adaptations to arboreal climbing. The second shift was to fully obligate bipedalism and coincides with the emergence of the genus *Homo*. By the Early Pleistocene, certain members of *Homo* had acquired a postcranial skeleton indicating fully humanlike striding bipedalism. The final part of this chapter reviews why bipedalism was selected for. There have been many theoretical explanations, and

the most robust remain those linked to the emergence of more varied habitats. Such an environmental shift would have involved strong selection for new behavioral strategies most likely linked to the efficient procurement of food.

[https://www.academia.edu/10487720/The\\_Origins\\_of\\_Bipedal\\_Locomotion\\_2nd\\_Edn](https://www.academia.edu/10487720/The_Origins_of_Bipedal_Locomotion_2nd_Edn)

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### RESEARCHGATE – Reconstructing a source cosmology for African hunter-gatherers

*Human Origins: Contributions from Social Anthropology. Camilla Power, Morna Finnegan & Hilary Callan (eds.), Berghahn Books, ch7 (2016)*

#### **CAMILLA POWER – Reconstructing a source cosmology for African hunter-gatherers**

In this chapter I explore the possibility of reconstructing a source cosmology for African hunter-gatherers. Given what we now know about the deep history and relationships among populations including Bushman groups, Western and Eastern Central African forest hunters and East African groups such as the Hadza, what are the implications for a comparative project on magico-religious beliefs? The idea that these groups are remnants of a formerly widespread proto-Khoisan-Pygmy aboriginal population, argued in respect of the Bushmen by Tobias (1964), has been challenged (e.g. Morris 2003; Schepartz 1988). But population genetics currently validates two key points:

(i) these populations all share ancestry with distinctive deep-time phylogenetic clades;

(ii) the time-depth of separation among the populations reaches back into the Middle Stone Age (MSA) to dates equal to or greater than the movement of modern humans outside Africa, that is in the order of 50–100,000 years ago.

[https://www.researchgate.net/publication/307107960\\_Reconstructing\\_a\\_source\\_cosmology\\_for\\_African\\_hunter-gatherers](https://www.researchgate.net/publication/307107960_Reconstructing_a_source_cosmology_for_African_hunter-gatherers)

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### RESEARCHGATE – Cooperation and the evolution of hunter-gatherer storytelling

*Nature Communications 8:1853 (2017)*

#### **DANIEL SMITH et al – Cooperation and the evolution of hunter-gatherer storytelling**

Storytelling is a human universal. From gathering around the camp-fire telling tales of ancestors to watching the latest television box-set, humans are inveterate producers and consumers of stories. Despite its ubiquity, little attention has been given to understanding the function and evolution of storytelling. Here we explore the impact of storytelling on hunter-gatherer cooperative behaviour and the individual-level fitness benefits to being a skilled storyteller. Stories told by the Agta, a Filipino hunter-gatherer population, convey messages relevant to coordinating behaviour in a foraging ecology, such as cooperation, sex equality and egalitarianism. These themes are present in narratives from other foraging societies. We also show that the presence of good storytellers is associated with increased cooperation. In return, skilled storytellers are preferred social partners and have greater reproductive success, providing a pathway by which group-beneficial behaviours, such as storytelling, can evolve via individual-level selection. We conclude that one of the adaptive functions of storytelling among hunter gatherers may be to organise cooperation.

[https://www.researchgate.net/publication/321437210\\_Cooperation\\_and\\_the\\_evolution\\_of\\_hunter-gatherer\\_storytelling](https://www.researchgate.net/publication/321437210_Cooperation_and_the_evolution_of_hunter-gatherer_storytelling)

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### SCIENCEDIRECT – The origin and variability of *Homo heidelbergensis*

*Quaternary International 411:B, 254-261 (2016)*

#### **GIORGIO MANZI – Humans of the Middle Pleistocene: The controversial calvarium from Ceprano (Italy) and its significance for the origin and variability of *Homo heidelbergensis***

The Ceprano calvarium was found 20 years ago (March 1994) in southern Latium, Italy. At that time, a compiled regional stratigraphy suggested an age for the layer where the cranium was found close to 800–900 ka. Thus, for more than a decade, the Italian specimen concurred to the denial of the so-called “short-chronology” for the earliest Europeans. In addition, the archaic features of the calvarium were put in relationship with Mode 1 techno-complexes discovered in sites scattered across the Ceprano basin, albeit Acheulean assemblages are also well known in the same area. In 2001 we approached the field with a multidisciplinary project, aimed to validate the previous geo-chronological model and improve the available paleontological and archaeological records. However, the results we obtained consistently showed that the human calvarium is more recent than previously believed, pointing to a time range close to the beginning of MIS 11, between 430 and 385 ka. Therefore, Ceprano has to be considered among the European fossil record of the Middle Pleistocene, although its peculiar morphology – a unique combination of archaic and derived features – suggests a somewhat puzzling scenario of human evolution in Europe, which could involve the occurrence of a considerable phenetic diversity during part of the Middle Pleistocene. This argument points to the time window between 1.0 and 0.5 Ma, when it is probable that a new kind of humanity emerged and diffused across Africa and Eurasia. Although controversial when viewed as a single species, this humanity may be referred to the polymorphic and widespread taxon *Homo heidelbergensis*. Nevertheless, in the course of the Middle Pleistocene, different lineages of archaic humans possibly belonging to *Homo heidelbergensis* are recognised, suggesting the identification of geographic varieties or subspecies (i.e., potential incipient species). Given such a scenario, Ceprano represents the best candidate available at present (but also the cranial remains from Gombore II, in the Melka Kunture area, Ethiopia, ca. 850 ka, should be taken into account) to describe the cranial morphology of the still largely unknown ancestral variety of the species: i.e., *Homo heidelbergensis heidelbergensis*.

<https://www.sciencedirect.com/science/article/abs/pii/S104061821501441X>

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## SCIEDIRECT – The early Homo calvaria KNM-ER 42700

*Journal of Human Evolution* 121, 25-39 (2018)

### **SIMON NEUBAUER et al with MEAVE LEAKEY & JEAN-JACQUES HUBLIN – Reconstruction, endocranial form and taxonomic affinity of the early Homo calvaria KNM-ER 42700**

When first described, the small calvaria KNM-ER 42700 from Ileret, Kenya, was considered a late juvenile or young adult and assigned to *Homo erectus*. However, this species attribution has subsequently been challenged because the specimen's neurocranial shape differs substantially from that of *H. erectus* adults. Here, (1) we describe the post mortem damage and deformation that could have influenced previous shape analyses, (2) present digital reconstructions based on computed tomographic scans correcting for these taphonomic defects, and (3) analyze the reconstructed endocranial shape and form, considering both static allometry among adults and ontogenetic allometry. To this end, we use geometric morphometrics to analyze the shape of digital endocasts based on landmarks and semi-landmarks. Corroborating previous studies of the external surface, we find that the endocranial shape of KNM-ER 42700 falls outside the known adult variation of *H. erectus*. With an endocranial volume estimate between 721 and 744 ml, size cannot explain its atypical endocranial shape when static allometry within *H. erectus* is considered. However, the analysis of ontogenetic allometry suggests that it may be a *H. erectus* individual that is younger than previously thought and had not yet reached adult endocranial shape. Future work should therefore comprehensively review all cranial indicators of its developmental age, including closure of the spheno-occipital synchondrosis. An alternative hypothesis is that KNM-ER 42700 represents an as yet unidentified species of early *Homo*. Importantly, KNM-ER 42700 should not be included in the adult hypodigm of *H. erectus*.

<https://www.sciencedirect.com/science/article/abs/pii/S004724841730489X>

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## SCIEDIRECT – Language and cooperation in hominin scavenging

*Evolution and Human Behavior* 38:3, 376-396 (2017)

### **BART J. WILSON & SAMUEL R. HARRIS – Language and cooperation in hominin scavenging**

Bickerton (2009, 2014) hypothesizes that language emerged as the solution to a scavenging problem faced by proto-humans. We design a virtual world to explore how people use words to persuade others to work together for a common end. By gradually reducing the vocabularies that the participants can use, we trace the process of solving the hominin scavenging problem. Our experiment changes the way we think about social dilemmas. Instead of asking how does a group overcome the self-interest of its constituents, the question becomes, how do constituents persuade one another to work together for a common end that yields a common benefit?

<https://www.sciencedirect.com/science/article/abs/pii/S1090513816303695>

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## OTHER PUBLICATIONS – Hunter-gatherers' dual distribution systems in Africa

*Towards a Broader View of Hunter-Gatherer Sharing. Noa Lavi & David E. Friesem (eds.), McDonald Institute Conversations ch7. (2019)*

### **JEROME LEWIS – Sharing pleasures to share rare things: Hunter-gatherers' dual distribution systems in Africa**

Most research on the economic institutions of what James Woodburn defined as 'immediate-return' egalitarian hunter-gatherers has focused on demand sharing as the primary mode for ensuring the distribution of food and goods amongst group members. Although Woodburn mentioned the importance of parallel systems for distributing non-local goods – such as gambling among Hadza and xaro exchange among the San – in his seminal article 'Egalitarian Societies' (1982), no work has examined these systems cross culturally. Based on recently published research into a system shared by Western Pygmies in Central Africa that circulates things, including non-local goods, through ritual initiations (Lewis 2015), this chapter seeks to make some preliminary observations of similarities and differences between these systems for sharing non-local products across three African groups: the BaYaka (represented by the Mbendjele), the San (represented by the !Kung) and the Hadza. In contrast to similarities in demand sharing, each of these parallel systems for circulating non-local products has a different model: ritual performances (massana) among BaYaka, gift-giving (xaro) among San, and gambling (lukuchuko) among Hadza. Despite structural differences, each system is primarily driven by culturally determined pleasure-seeking and produces a sense of group that extends far beyond those with whom each is daily present in camp.

<https://www.repository.cam.ac.uk/handle/1810/300130>

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## NEWS

### **BREAKING SCIENCE – Ancient DNA Analysis Sheds New Light on Occupational History of Denisova Cave**

In a new study published this week in the journal *Nature*, an international team of researchers analyzed DNA from more than 700 sediment samples that were collected from the Pleistocene layers of Denisova Cave in Siberia and detected ancient hominin and mammalian mitochondrial DNA (mtDNA) in 685 and 175 samples, respectively; the earliest evidence for hominin mtDNA is of Denisovans, and is associated with the stone tools that were deposited approximately 250,000 to 170,000 years ago; Neanderthal mtDNA first appears towards the end of this period; the authors also detected a turnover in the mtDNA of Denisovans that coincides with changes in the composition of faunal mtDNA, and evidence that Denisovans and Neanderthals occupied the site repeatedly – possibly until, or after, the onset of the Initial Upper Paleolithic at least 45,000 years ago, when modern human mtDNA is first recorded in the sediments.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/CoMqbwA6hMQ/denisova-cave-occupational-history-09795.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/CoMqbwA6hMQ/denisova-cave-occupational-history-09795.html?utm_source=feedburner&utm_medium=email)

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### **BREAKING SCIENCE – Neshar Ramla Hominin: Previously Unknown Type of Homo Discovered**

The Neshar Ramla hominins lived between 420,000 and 120,000 years ago in the Middle East and had a distinctive combination of Neanderthal (especially the teeth and jaws) and archaic Homo (specifically the skull) features; they had fully mastered technology that until only recently was linked to either Homo sapiens or Neanderthals; they were efficient hunters of large and small game, used wood for fuel, cooked or roasted meat, and maintained fires.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/PquPxaodXBU/neshar-ramla-hominin-09799.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/PquPxaodXBU/neshar-ramla-hominin-09799.html?utm_source=feedburner&utm_medium=email)

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### **GUARDIAN SCIENCE – Massive human head in Chinese well forces scientists to rethink evolution**

'Dragon man' skull reveals new branch of family tree more closely related to modern humans than Neanderthals.

<https://www.theguardian.com/science/2021/jun/25/massive-human-head-in-chinese-well-forces-scientists-to-rethink-evolution>

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### **NATURE BRIEFING – How humans learnt to love carbs**

The people who built the ancient monumental structures at Turkey's Göbekli Tepe were fuelled by vat-fuls of starchy porridge and stew, not just meaty feasts. Archaeologists are uncovering evidence that ancient people were grinding grains for hearty, starchy dishes long before we domesticated crops. These discoveries shred the long-standing idea that early people subsisted mainly on meat.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=437cdeea06&e=1db4b9a19b>

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### **NATURE BRIEFING – Iconic cave sheltered several human species**

In the past decade, a mere eight human fossils unearthed in the Denisova Cave in southern Siberia have rewritten the human story, from the tiny finger bone that revealed the extinct human Denisovans, to the discovery of a first-generation Neanderthal-Denisovan hybrid. Now a study of DNA in the cave's soil reveals the complex history of human and animal habitation there. Hundreds of soil samples show a cycle of inhabitants, starting with Denisovans about 300,000 years ago. Different groups of Denisovans and Neanderthals left their marks on the cave, and modern humans appeared about 45,000 years ago. "I cannot think of another site where three human species lived through time," says archaeological scientist Katerina Douka.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=938e179667&e=1db4b9a19b>

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### **SCIENCE DAILY – A new type of Homo unknown to science**

The bones of an early human, unknown to science, who lived in the Levant at least until 130,000 years ago, were discovered in excavations at the Neshar Ramla site, near the city of Ramla. Recognizing similarity to other archaic Homo specimens from 400,000 years ago, found in Israel and Eurasia, the researchers reached the conclusion that the Neshar Ramla fossils represent a unique Middle Pleistocene population, now identified for the first time.

<https://www.sciencedaily.com/releases/2021/06/210624141540.htm>

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### **SCIENCE DAILY – Comet strike may have sparked key shift in human civilization**

A cluster of comet fragments believed to have hit Earth nearly 13,000 years ago may have shaped the origins of human civilization, research suggests.

<https://www.sciencedaily.com/releases/2021/06/210624114509.htm>

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### **SCIENCE DAILY – Being Anglo-Saxon was a matter of language and culture, not genetics**

Archaeologists have provided important new evidence to answer the question 'who exactly were the Anglo-Saxons?' New findings based on studying skeletal remains clearly indicates the Anglo-Saxons were a melting pot of people from both migrant and local cultural groups and not one homogenous group from Western Europe.

<https://www.sciencedaily.com/releases/2021/06/210623144901.htm>

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### **SCIENCE DAILY – 'Dragon man' fossil may replace Neanderthals as our closest relative**

A near-perfectly preserved ancient human fossil known as the Harbin cranium sits in the Geoscience Museum in Hebei GEO University. The largest of Homo skulls, scientists now say this skull represents a newly discovered human species named Homo longi or 'Dragon Man.' Their findings suggest that the Homo longi lineage may be our closest relatives -- and may reshape our understanding of human evolution.

<https://www.sciencedaily.com/releases/2021/06/210625120419.htm>

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## SCIENCE NEWS – Mongoose mothers help their colonies thrive—by forgetting which pups are theirs

Pregnant mongooses in a colony all give birth on the same night, a phenomenon that makes it harder for mothers to know which pups are their own. But that confusion works in their favor—and may even lead to a fairer distribution of scarce resources—researchers report today in Nature Communications.

<https://www.sciencemag.org/news/2021/06/mongoose-mothers-help-their-colonies-thrive-forgetting-which-pups-are-theirs>

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## SCIENCE NEWS – Siberian cave hosted Neanderthals, Denisovans, and modern humans—simultaneously?

A decade ago, anthropologists shocked the world when they discovered a fossil pinkie bone from a then-unknown group of extinct humans in Siberia's Denisova Cave. The group was named "Denisovans" in its honor. Now, an extensive analysis of DNA in the cave's soils reveals it also hosted modern humans—who arrived early enough that they may have once lived there alongside Denisovans and Neanderthals.

<https://www.sciencemag.org/news/2021/06/ancient-siberian-cave-hosted-neanderthals-denisovans-and-modern-humans-possibly-same>

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## SCIENCE NEWS – New fossils reveal a strange-looking Neanderthal in Israel

Some of the earliest bands of modern humans who ventured out of Africa and into the Middle East 120,000 to 140,000 years ago might have met a strange-looking character with the look of a primitive Neanderthal, but a stone toolkit as modern as their own. New fossils of this individual, found over the past decade in Israel, are stirring intense debate among paleoanthropologists: Was it the earliest known Neanderthal in the Middle East, or a late remnant of a previously unknown Neanderthal ancestor?

<https://www.sciencemag.org/news/2021/06/new-fossils-reveal-strange-looking-neanderthal-israel>

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## THE CONVERSATION – IQ tests can't measure it, but 'cognitive flexibility' is key to learning and creativity

Are you good at changing perspectives? If so, it may benefit you in more ways than you imagine.

<https://theconversationuk.cmail20.com/t/r-l-tlhtluyk-khhililahl-k/>

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## THE CONVERSATION – Why we dispute 'Dunbar's number' – can humans only maintain 150 friendships?

New research calls into question the validity of 'Dunbar's number'.

<https://theconversationuk.cmail20.com/t/r-l-tlhtluyk-khhililahl-o/>

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## THE CONVERSATION – Homo longi: extinct human species – our closest relatives? – found in China

A new analysis of a 'lost' skull rewrites the recent family tree of the human species, showing our closest relatives lived in China.

<https://theconversationuk.cmail19.com/t/r-l-tlhiza-khhililahl-v/>

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## PUBLICATIONS

### American Journal of Physical Anthropology

#### PAPERS

#### **ANDREW K. YEGIAN et al with DANIEL E. LIEBERMAN – Shorter distal forelimbs benefit bipedal walking and running mechanics: Implications for hominin forelimb evolution**

Brachial index is a skeletal ratio that describes the relative length of the distal forelimb. Over the course of hominin evolution, a shift toward smaller brachial indices occurred. First, Pleistocene australopiths yield values between extant chimpanzees and humans, with further evolution in Pliocene Homo to the modern human range. We hypothesized that shorter distal forelimbs benefit walking and running performance, notably elbow and shoulder joint torques, and predicted that the benefit would be greater in running compared to walking.

We found longer distal forelimbs and the added mass increased elbow muscle torque by 98% while walking and 70% in running, confirming our hypothesis that shorter distal forelimbs benefit walking and running performance. Shoulder muscle torque similarly increased in both gaits with the addition of hand weights due to elongation of the effective forelimb length. Normalized elbow torque, which accounted for the effect on shoulder torque caused by the experimental manipulation, increased by 16% while walking but 52% while running, indicating that shorter distal forelimbs provide a greater benefit for running by approximately three-fold.

Selection for economical bipedal walking in Australopithecus and endurance running in Homo likely contributed to the shift toward relatively smaller distal forelimbs across hominin evolution, with modern human proportions attained in Pleistocene Homo erectus and retained in later species.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24274>

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## Current Biology

### ARTICLES

#### **RICHARD HUSKEY – Gossip: More than just trash talk**

Think gossip is just trash talk? Think again. A new study shows that gossip influences behavior, fosters cooperation, and increases group affiliation.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00595-9](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00595-9)

#### **ROBERT R. HAMPTON – Animal consciousness: Should a new behavioral correlate in monkeys persuade agnostics?**

After human subjects learn to look away from visible cues, their attention can still be captured by cues so brief that they cause no conscious perception. A new study has found evidence that this behavior also occurs in monkeys. Is this further evidence for consciousness in a nonhuman animal?

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00679-5](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00679-5)

### PAPERS

#### **ESHIN JOLLY & LUKE J. CHANG – Gossip drives vicarious learning and facilitates social connection**

Complex language and communication is one of the unique hallmarks that distinguishes humans from most other animals. Interestingly, the overwhelming majority of our communication consists of social topics involving self-disclosure and discussions about others, broadly construed as gossip. Yet the precise social function of gossip remains poorly understood as research has been heavily influenced by folk intuitions narrowly casting gossip as baseless trash talk. Using a novel empirical paradigm that involves real interactions between a large sample of participants, we provide evidence that gossip is a rich, multifaceted construct, that plays a critical role in vicarious learning and social bonding. We demonstrate how the visibility or lack thereof of others' behavior shifts conversational content between self-disclosure and discussions about others. Social information acquired through gossip aids in vicarious learning, directly influencing future behavior and impression formation. At the same time, conversation partners come to influence each other, form more similar impressions, and build robust social bonds. Consistent with prior work, gossip also helps promote cooperation in groups without a need for formal sanctioning mechanisms. Altogether these findings demonstrate the rich and diverse social functions and effects of this ubiquitous human behavior and lay the groundwork for future investigations.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00463-2](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00463-2)

#### **KAUÉ MACHADO COSTA, AYESHA SENGUPTA & GEOFFREY SCHOENBAUM – The orbitofrontal cortex is necessary for learning to ignore**

Animals learn not only what is potentially useful but also what is meaningless and should be disregarded. How this is accomplished is a key but seldom explored question in psychology and neuroscience. Learning to ignore irrelevant cues is evident in latent inhibition—the ubiquitous phenomenon where presenting a cue several times without consequences leads to retardation of subsequent conditioning to that cue. 1,2 Does learning to ignore these cues, because they predict nothing, involve the same neural circuits that are critical to learning to make predictions about other “real world” impending events? If so, the orbitofrontal cortex (OFC), as a key node in such networks, should be important. 3 Specifically, the OFC has been hypothesized to participate in the recognition of hidden task states, which are not directly signaled by explicit outcomes. 4 Evaluating its involvement in pre-exposure learning during latent inhibition would be an acid test for this hypothesis. Here, we report that selective chemogenetic inactivation of rat orbitofrontal cortex principal neurons during stimulus pre-exposure markedly reduces latent inhibition in subsequent conditioning. Inactivation only during pre-exposure ensured that the observed effects were due to an impact on the acquisition of information prior to its use in any sort of behavior, i.e., during latent learning. Further behavioral tests confirmed this, showing that the impact of OFC inactivation during pre-exposure was limited to the latent inhibition effect. These results demonstrate that the OFC is important for latent learning and the formation of associations even in the absence of explicit outcomes.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00384-5](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00384-5)

#### **CHI T. NGO et al – Contingency of semantic generalization on episodic specificity varies across development**

Semantic memory—general knowledge of ideas and concepts—includes generalization processes that support inference. Episodic memory, on the other hand, preserves the specificity of individual events by binding together unique combinations of elements from an episode and relies on pattern separation to distinguish similar experiences. These two memory systems play complementary roles, supporting different mnemonic goals, but the nature and extent of their interdependence is unclear. Some models suggest that new information is encoded initially as hippocampus-dependent episodic memory and then, either through repetition or gist extraction, becomes semantic over time. These models also posit a neocortical route to semantic memory acquisition exists that can bypass the hippocampus. 3 Both proposed routes are slow learning mechanisms, yet generalization can occur rapidly. Recent models suggest that fast generalization relies, in part, on the retrieval of individual but related episodes. Such episodic memory gating mechanisms render fast generalization contingent on the memory specificity of instances, a pattern that has been observed in adults. None of these models take into account the observation that generalization and episodic specificity have asynchronous developmental profiles, with generalization emerging years before episodic memory. We ask two questions about generalized and specific memory during early childhood: first, is rapid generalization contingent on remembering specific past memories? And second, does the strength or

nature of this contingency differ across development? We found that the interdependence of generalization and episodic memory varies across development: generalization success in adults, but not in children, was contingent on context binding. [https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00461-9](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00461-9)

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## eLife

### PAPERS

#### **CÉDRIC GIRARD-BUTTOZ et al with ROMAN M WITTIG & CATHERINE CROCKFORD – Early maternal loss leads to short-but not long-term effects on diurnal cortisol slopes in wild chimpanzees**

The biological embedding model (BEM) suggests that fitness costs of maternal loss arise when early-life experience embeds long-term alterations to hypothalamic-pituitary-adrenal (HPA) axis activity. Alternatively, the adaptive calibration model (ACM) regards physiological changes during ontogeny as short-term adaptations. Both models have been tested in humans but rarely in wild, long-lived animals. We assessed whether, as in humans, maternal loss had short- and long-term impacts on orphan wild chimpanzee urinary cortisol levels and diurnal urinary cortisol slopes, both indicative of HPA axis functioning. Immature chimpanzees recently orphaned and/or orphaned early in life had diurnal cortisol slopes reflecting heightened activation of the HPA axis. However, these effects appeared short-term, with no consistent differences between orphan and non-orphan cortisol profiles in mature males, suggesting stronger support for the ACM than the BEM in wild chimpanzees. Compensatory mechanisms, such as adoption, may buffer against certain physiological effects of maternal loss in this species. <https://elifesciences.org/articles/64134>

#### **MIKKEL MALLING BECK et al – Cortical signatures of precision grip force control in children, adolescents, and adults**

Human dexterous motor control improves from childhood to adulthood, but little is known about the changes in cortico-cortical communication that support such ontogenetic refinement of motor skills. To investigate age-related differences in connectivity between cortical regions involved in dexterous control, we analyzed electroencephalographic data from 88 individuals (range 8-30 years) performing a visually guided precision grip task using dynamic causal modelling and parametric empirical Bayes. Our results demonstrate that bidirectional coupling in a canonical 'grasping network' is associated with precision grip performance across age groups. We further demonstrate greater backward coupling from higher-order to lower-order sensorimotor regions from late adolescence in addition to differential associations between connectivity strength in a premotor-prefrontal network and motor performance for different age groups. We interpret these findings as reflecting greater use of top-down and executive control processes with development. These results expand our understanding of the cortical mechanisms that support dexterous abilities through development. <https://elifesciences.org/articles/61018>

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## Evolutionary Anthropology

### PAPERS

#### **FOTIOS ALEXANDROS KARAKOSTIS & KATERINA HARVATI – New horizons in reconstructing past human behavior: Introducing the “Tübingen University Validated Entheses-based Reconstruction of Activity” method**

An accurate reconstruction of habitual activities in past populations and extinct hominin species is a paramount goal of paleoanthropological research, as it can elucidate the evolution of human behavior and the relationship between culture and biology. Variation in muscle attachment (enthesal) morphology has been considered an indicator of habitual activity, and many attempts have been made to use it for this purpose. However, its interpretation remains equivocal due to methodological shortcomings and a paucity of supportive experimental data. Through a series of studies, we have introduced a novel and precise methodology that focuses on reconstructing muscle synergies based on three-dimensional and multivariate analyses among entheses. This approach was validated using uniquely documented anthropological samples, experimental animal studies, histological observations, and geometric morphometrics. Here, we detail, synthesize, and critically discuss the findings of these studies, which overall point to the great potential of entheses in elucidating aspects of past human behavior. <https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21892>

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## Frontiers in Communication

### PAPERS

#### **STEFAN HINTERWIMMER, UMESH PATIL & CORNELIA EBERT – On the Interaction of Gestural and Linguistic Perspective Taking**

In this paper, we investigate the question of whether and how perspective taking at the linguistic level interacts with perspective taking at the level of co-speech gestures. In an experimental rating study, we compared test items clearly expressing the perspective of an individual participating in the event described by the sentence with test items which clearly express the speaker's or narrator's perspective. Each test item was videotaped in two different versions: In one version, the speaker performed a co-speech gesture in which she enacted the event described by the sentence from a participant's point of view (i.e. with a character viewpoint gesture). In the other version, she performed a co-speech gesture depicting the event described by the sentence as if it was observed from a distance (i.e. with an observer viewpoint gesture). Both versions of each test item were shown to participants who then had to decide which of the two versions they find more natural. Based

on the experimental results we argue that there is no general need for perspective taking on the linguistic level to be aligned with perspective taking on the gestural level. Rather, there is clear preference for the more informative gesture.

<https://www.frontiersin.org/articles/10.3389/fcomm.2021.625757/full>

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## Frontiers in Psychology

### PAPERS

#### **FRANCESCO MANCINI & AMELIA GANGEMI – Deontological and Altruistic Guilt Feelings: A Dualistic Thesis**

In this paper we argue in favor of the existence of two different guilt feelings: altruistic guilt (AG) and deontological guilt (DG). AG arises from having harmed, through one's own action or omission, an innocent victim, while DG arises from the transgression of an internalized norm. In most daily experiences of guilt feelings both types are present, but we argue that they are not traceable to each other and that each can be present without the other. We show that the two guilt feelings can be distinguished with reference to behavioral, cognitive, and neurophysiological aspects. Moreover, we demonstrate that they are differently related to other processes and emotions. AG is connected with pain, empathy and ToM. DG is strongly related to disgust. We briefly illustrate some implications for moral psychology and clinical psychology.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.651937/full>

#### **HIROFUMI HASHIMOTO – Cross-Generational Differences in Independence and Interdependence: Discrepancies Between Their Actual and Ideal Selves in the Japanese Cultural Context**

The current study examined cross-generational differences in both independent and interdependent self-construal. Two studies using samples from across Japan that included a wide age range demonstrated that, with increasing age, Japanese respondents scored higher on independence, which was measured by a self-expression scale, and lower on interdependence, as measured by a rejection avoidance scale. Furthermore, these cross-over effects were not observed with regard to participants' preferences (i.e., the ideal state of the self), but were only observed in their actual selves (i.e., the actual state of the self). These results suggest that the Japanese, especially younger generations, cannot help but behave in an interdependent way despite being eager to be independent.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.676526/full>

#### **HANS BUFFART & HAIKE JACOBS – A Gestalt Theory Approach to Structure in Language**

The fact that human language is highly structured and that, moreover, the way it is structured shows striking similarities in the world's languages has been addressed from two different perspectives. The first, and more traditional, generative hypothesis is that the similarities are due to an innate language faculty. There is an inborn 'grammar' with universal principles that manifest themselves in each language and cross-linguistic variation arises due to a different parameter setting of universal principles. A second perspective is that there is no inborn, innate language faculty, but that instead structure emerges from language usage. This paper purports to develop and illustrate a third perspective, according to which the structural similarities in human languages are the result of the way the cognitive system works in perception. The essential claim is that structural properties follow from the limitations of human cognition in focus.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.649384/full>

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## Nature

### ARTICLES

#### **ANDREW CURRY – How ancient people fell in love with bread, beer and other carbs**

Well before people domesticated crops, they were grinding grains for hearty stews and other starchy dishes.

<https://www.nature.com/articles/d41586-021-01681-w>

#### **NICOLA JONES – Mysterious skull fossils expand human family tree — but questions remain**

Fossilized bones found in Israel and China, including a specimen named 'Dragon Man', could belong to new types of ancient human. But the findings have sparked debate.

<https://www.nature.com/articles/d41586-021-01738-w>

### PAPERS

#### **ELENA I. ZAVALA et al with JANET KELSO & SVANTE PÄÄBO – Pleistocene sediment DNA reveals hominin and faunal turnovers at Denisova Cave**

Denisova Cave in southern Siberia is the type locality of the Denisovans, an archaic hominin group who were related to Neanderthals. The dozen hominin remains recovered from the deposits also include Neanderthals and the child of a Neanderthal and a Denisovan, which suggests that Denisova Cave was a contact zone between these archaic hominins. However, uncertainties persist about the order in which these groups appeared at the site, the timing and environmental context of hominin occupation, and the association of particular hominin groups with archaeological assemblages. Here we report the analysis of DNA from 728 sediment samples that were collected in a grid-like manner from layers dating to the Pleistocene epoch. We retrieved ancient faunal and hominin mitochondrial (mt)DNA from 685 and 175 samples, respectively. The earliest evidence for hominin mtDNA is of Denisovans, and is associated with early Middle Palaeolithic stone tools that

were deposited approximately 250,000 to 170,000 years ago; Neanderthal mtDNA first appears towards the end of this period. We detect a turnover in the mtDNA of Denisovans that coincides with changes in the composition of faunal mtDNA, and evidence that Denisovans and Neanderthals occupied the site repeatedly—possibly until, or after, the onset of the Initial Upper Palaeolithic at least 45,000 years ago, when modern human mtDNA is first recorded in the sediments.

<https://www.nature.com/articles/s41586-021-03675-0>

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## Nature Humanities & Social Sciences Communications

### PAPERS

#### **CSILLA DALLOS – Is there more to human social learning than enhanced facilitation? Prolonged learning and its impact on culture**

Recent scholarship has sought to understand culture by studying attributes of social learning. While celebrating the role of pedagogy and other forms of facilitated learning in human cultural uniqueness, these studies have neglected instances of restricted and prolonged knowledge and skill acquisition. This article analyses illustrative cases of such learning in the ethnographic literature to assess their implications for cultural processes and products. Combined evidence from formal apprenticeship and the informal learning of hunter-gatherers indicates that though enhanced facilitation of learning is undeniable, an exclusive focus on it has resulted in a flawed concept of human culture and its social context. The cases cited suggest that mechanisms to extend learning constitute a vital source of cultural creativity and innovation that should be considered in social learning and culture discussions.

<https://www.nature.com/articles/s41599-021-00829-3>

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## Nature Neuroscience

### PAPERS

#### **L. T. HUNT et al – Formalizing planning and information search in naturalistic decision-making**

Decisions made by mammals and birds are often temporally extended. They require planning and sampling of decision-relevant information. Our understanding of such decision-making remains in its infancy compared with simpler, forced-choice paradigms. However, recent advances in algorithms supporting planning and information search provide a lens through which we can explain neural and behavioral data in these tasks. We review these advances to obtain a clearer understanding for why planning and curiosity originated in certain species but not others; how activity in the medial temporal lobe, prefrontal and cingulate cortices may support these behaviors; and how planning and information search may complement each other as means to improve future action selection.

<https://www.nature.com/articles/s41593-021-00866-w>

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## Nature Reviews

### PAPERS

#### **VLADIMIR B. SEPLYARSKIY & SHAMIL SUNYAEV – The origin of human mutation in light of genomic data**

Despite years of active research into the role of DNA repair and replication in mutagenesis, surprisingly little is known about the origin of spontaneous human mutation in the germ line. With the advent of high-throughput sequencing, genome-scale data have revealed statistical properties of mutagenesis in humans. These properties include variation of the mutation rate and spectrum along the genome at different scales in relation to epigenomic features and dependency on parental age. Moreover, mutations originated in mothers are less frequent than mutations originated in fathers and have a distinct genomic distribution. Statistical analyses that interpret these patterns in the context of known biochemistry can provide mechanistic models of mutagenesis in humans.

<https://www.nature.com/articles/s41576-021-00376-2>

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## Nature Scientific Reports

### PAPERS

#### **KAI R. CASPAR et al – Ocular pigmentation in humans, great apes, and gibbons is not suggestive of communicative functions**

Pigmentation patterns of the visible part of the eyeball, encompassing the iris and portions of the sclera, have been discussed to be linked to social cognition in primates. The cooperative eye hypothesis suggests the white sclera of humans to be a derived adaptive trait that enhances eye-mediated communication. Here, we provide a comparative analysis of ocular pigmentation patterns in 15 species of hominoids (humans, great apes & gibbons) that show marked differences in social cognition and quantify scleral exposure at the genus level. Our data reveals a continuum of eye pigmentation traits in hominoids which does not align with the complexity of gaze-mediated communication in the studied taxa. Gibbons display darker eyes than great apes and expose less sclera. Iridoscleral contrasts in orangutans and gorillas approach the human condition but differ between congeneric species. Contrary to recent discussions, we found chimpanzee eyes to exhibit a cryptic coloration scheme that resembles gibbons more than other apes. We reevaluate the evidence for links between social cognition and eye pigmentation in primates, concluding that the cooperative eye hypothesis cannot explain the patterns observed. Differences in scleral pigmentation between great apes and humans are gradual and might have arisen via genetic drift and sexual selection.

## PLoS Biology

### PAPERS

#### **SATOSHI NISHIDA et al – Behavioral correlates of cortical semantic representations modeled by word vectors**

*This is an uncorrected proof.*

The quantitative modeling of semantic representations in the brain plays a key role in understanding the neural basis of semantic processing. Previous studies have demonstrated that word vectors, which were originally developed for use in the field of natural language processing, provide a powerful tool for such quantitative modeling. However, whether semantic representations in the brain revealed by the word vector-based models actually capture our perception of semantic information remains unclear, as there has been no study explicitly examining the behavioral correlates of the modeled brain semantic representations. To address this issue, we compared the semantic structure of nouns and adjectives in the brain estimated from word vector-based brain models with that evaluated from human behavior. The brain models were constructed using voxelwise modeling to predict the functional magnetic resonance imaging (fMRI) response to natural movies from semantic contents in each movie scene through a word vector space. The semantic dissimilarity of brain word representations was then evaluated using the brain models. Meanwhile, data on human behavior reflecting the perception of semantic dissimilarity between words were collected in psychological experiments. We found a significant correlation between brain model- and behavior-derived semantic dissimilarities of words. This finding suggests that semantic representations in the brain modeled via word vectors appropriately capture our perception of word meanings.

<https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1009138>

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## PLoS One

### PAPERS

#### **TALES ALEXANDRE AVERSI-FERREIRA et al – Gross anatomy of the longitudinal fascicle of Sapajus sp.**

Opposing genetic and cultural-social explanations for the origin of language are currently the focus of much discussion. One of the functions linked to the longitudinal fascicle is language, which links Wernicke's area and Broca's area in the brain, and its size should indicate the brain increase in the evolution. Sapajus is a New World primate genus with high cognition and advanced tool use similar to that of chimpanzees. A study of the gross anatomy of the longitudinal fascicle of Sapajus using Kingler's method found it to differ from other studied primates, such as macaques and chimpanzees, mainly because its fibers join the cingulate fascicle. As in other non-human primates, the longitudinal fascicle of Sapajus does not reach the temporal lobe, which could indicate a way of separating these fascicles to increase white matter in relation to individual function. The study of anatomical structures seems very promising for understanding the basis of the origin of language. Indeed, socio-historical-cultural philosophy affirms the socio-cultural origin of speech, although considering the anatomical structures behind it working as a functional system.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0252178>

#### **PAUL J. ZAK et al – Alcohol unleashes homo economicus by inhibiting cooperation**

Human behavior lies somewhere between purely self-interested homo economicus and socially-motivated homo reciprocans. The factors that cause people to choose self-interest over costly cooperation can provide insights into human nature and are essential when designing institutions and policies that are meant to influence behavior. Alcohol consumption can shed light on the inflection point between selfish and selfless because it is commonly consumed and has global effects on the brain. The present study administered alcohol or placebo (N = 128), titrated to sex and weight, to examine its effect on cooperation in a standard task in experimental economics, the public goods game (PGG). Alcohol, compared to placebo, doubled the number of free-riders who contributed nothing to the public good and reduced average PGG contributions by 32% (p = .005). This generated 64% higher average profits in the PGG for those who consumed alcohol. The degree of intoxication, measured by blood alcohol concentration, linearly reduced PGG contributions (r = -0.18, p = .05). The reduction in cooperation was traced to a deterioration in mood and an increase in physiologic stress as measured by adrenocorticotrophic hormone. Our findings indicate that moderate alcohol consumption inhibits the motivation to cooperate and that homo economicus is stressed and unhappy.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0253296>

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## PNAS

### PAPERS

#### **ELISABETTA BOARETTO et al with JEAN-JACQUES HUBLIN – The absolute chronology of Boker Tachtit (Israel) and implications for the Middle to Upper Paleolithic transition in the Levant**

The Initial Upper Paleolithic (IUP) is a crucial lithic assemblage type in the archaeology of southwest Asia because it marks a dramatic shift in hominin populations accompanied by technological changes in material culture. This phase is conventionally divided into two chronocultural phases based on the Boker Tachtit site, central Negev, Israel. While lithic technologies at Boker Tachtit are well defined, showing continuity from one phase to another, the absolute chronology is poorly resolved because the radiocarbon method used had a large uncertainty. Nevertheless, Boker Tachtit is considered to be the origin of

the succeeding Early Upper Paleolithic Ahmarian tradition that dates in the Negev to ~42,000 y ago (42 ka). Here, we provide 14C and optically stimulated luminescence dates obtained from a recent excavation of Boker Tachtit. The new dates show that the early phase at Boker Tachtit, the Emirian, dates to 50 through 49 ka, while the late phase dates to 47.3 ka and ends by 44.3 ka. These results show that the IUP started in the Levant during the final stages of the Late Middle Paleolithic some 50,000 y ago. The later IUP phase in the Negev chronologically overlaps with the Early Upper Paleolithic Ahmarian of the Mediterranean woodland region between 47 and 44 ka. We conclude that Boker Tachtit is the earliest manifestation of the IUP in Eurasia. The study shows that distinguishing the chronology of the IUP from the Late Middle Paleolithic, as well as from the Early Upper Paleolithic, is much more complex than previously thought.

<https://www.pnas.org/content/118/25/e2014657118.abstract>

#### **ANDREW I. WILTERSON et al with MICHAEL S. A. GRAZIANO – Attention, awareness, and the right temporoparietal junction**

The attention schema theory posits a specific relationship between subjective awareness and attention, in which awareness is the control model that the brain uses to aid in the endogenous control of attention. In previous experiments, we developed a behavioral paradigm in human subjects to manipulate awareness and attention. The paradigm involved a visual cue that could be used to guide attention to a target stimulus. In task 1, subjects were aware of the cue, but not aware that it provided information about the target. The cue measurably drew exogenous attention to itself. In addition, implicitly, the subjects' endogenous attention mechanism used the cue to help shift attention to the target. In task 2, subjects were no longer aware of the cue. The cue still measurably drew exogenous attention to itself, yet without awareness of the cue, the subjects' endogenous control mechanism was no longer able to use the cue to control attention. Thus, the control of attention depended on awareness. Here, we tested the two tasks while scanning brain activity in human volunteers. We predicted that the right temporoparietal junction (TPJ) would be active in relation to the process in which awareness helps control attention. This prediction was confirmed. The right TPJ was active in relation to the effect of the cue on attention in task 1; it was not measurably active in task 2. The difference was significant. In our interpretation, the right TPJ is involved in an interaction in which awareness permits the control of attention.

<https://www.pnas.org/content/118/25/e2026099118.abstract>

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## Science

### ARTICLES

#### **MARTA MIRAZÓN LAHR – The complex landscape of recent human evolution**

New genomic studies, new fossils, and new dates of existing ones suggest that our African origin has a deeper history—one that took place in the context of high population and lineage diversity and which was intermeshed by periods of contact with Eurasian hominins using the Middle East as a geographical bridge. On pages 1424 and 1429 of this issue, Herskovitz et al. and Zaidner et al., respectively, report new archaic Homo fossils and stone tools in Neshar Ramla, Israel, that date to about 126 thousand years (ka) ago. This discovery, at the crossroads of Africa and Eurasia, adds substantial complexity to our reconstruction of those potential interactions, raising questions about the co-existence of different hominin populations in this region and complex population dynamics in the Late Pleistocene.

<https://science.sciencemag.org/content/372/6549/1395>

### PAPERS

#### **ISRAEL HERSHKOVITZ et al with JOSÉ MARÍA BERMÚDEZ DE CASTRO – A Middle Pleistocene Homo from Neshar Ramla, Israel**

It has long been believed that Neanderthals originated and flourished on the European continent. However, recent morphological and genetic studies have suggested that they may have received a genetic contribution from a yet unknown non-European group. Here we report on the recent discovery of archaic Homo fossils from the site of Neshar Ramla, Israel, which we dated to 140,000 to 120,000 years ago. Comprehensive qualitative and quantitative analyses of the parietal bones, mandible, and lower second molar revealed that this Homo group presents a distinctive combination of Neanderthal and archaic features. We suggest that these specimens represent the late survivors of a Levantine Middle Pleistocene paleodeme that was most likely involved in the evolution of the Middle Pleistocene Homo in Europe and East Asia.

<https://science.sciencemag.org/content/372/6549/1424>

#### **YOSSI Z Aidner et al – Middle Pleistocene Homo behavior and culture at 140,000 to 120,000 years ago and interactions with Homo sapiens**

Fossils of a Middle Pleistocene (MP) Homo within a well-defined archaeological context at the open-air site of Neshar Ramla, Israel, shed light on MP Homo culture and behavior. Radiometric ages, along with cultural and stratigraphic considerations, suggest that the fossils are 140,000 to 120,000 years old, chronologically overlapping with H. sapiens in western Asia. Lithic analysis reveals that MP Homo mastered stone-tool production technologies, previously known only among H. sapiens and Neanderthals. The Levallois knapping methods they used are indistinguishable from that of concurrent H. sapiens in western Asia. The most parsimonious explanation for such a close similarity is the cultural interactions between these two populations. These findings constitute evidence of contacts and interactions between H. sapiens and MP Homo.

<https://science.sciencemag.org/content/372/6549/1429>

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