

EAORC BULLETIN 1,018 – 18 December 2022

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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.

NEWS

GUARDIAN SCIENCE – Oldest cooked leftovers ever found suggest Neanderthals were foodies

Pancake/flatbread with a ‘nutty’ taste is first evidence of complex cooking and food culture

<https://www.theguardian.com/science/2022/nov/23/oldest-cooked-leftovers-ever-found-suggest-neanderthals-were-foodies>

NATURE BRIEFING – Neanderthal Flatbread Recipe

Last week, I told you about the oldest cooked meal ever found: a tasty-sounding seed flatbread that might have been cooked by Neanderthals 70,000 years ago. Readers, you told me that you had to see that recipe, and palaeoecologist Chris Hunt did not let us down. Here are the edited details, which I’m sharing on the understanding that you will send me your photos and reviews of your own efforts:

Neanderthal ‘flatbread’

Based on an analysis by archaeobotanist Ceren Kabukcu, Hunt and their colleagues at Shanidar Cave in the north-west Zagros Mountains. “Following this recipe, you get something quite earthy tasting from the lentils and quite toasty, too, from the ‘grass’ seeds,” says Hunt.

Ingredients:

- Two parts grass seeds — Hunt recommends wheat berries or pot barley
- One part lentils — try brown or Puy lentils

Preparation:

- Soak everything overnight and then drain.
- Grind in a pestle and mortar, or use a stick blender if you must.
- Keep going until you have a mush with most components “in the 1-2 millimetre or smaller range” — add a little water as you go if needed.
- Add more water until you have a thick paste.
- Scoop some mixture onto a flat griddle or frying pan.
- Cook gently, browning on each side. “Better for 15–20 minutes on a low heat rather than getting things really smoking!” advises Hunt, who sounds like he speaks from experience here.

Fast-forward 30,000 years and there is evidence from Shanidar that food was more diverse, including fruit from the terebinth (related to the pistachio), a wild precursor of the fava bean and mustard seeds, as well as wild grasses and wild lentils. And there is separate evidence that Neanderthals ate almonds. Add modern versions of these to your mix, and you’ll find the taste “significantly more interesting”, says Chris. Combining it with grilled goat or fish would also be “quite legitimate”, he adds. Sorry — strictly no salt.

<https://www.nature.com/articles/d41586-022-04459-w>

SAPIENS – Meat and Neanderthal Demise?

An archaeologist examines whether the carnivorous eating habits of Neanderthals contributed to their eventual extinction.

<https://sapiens.us11.list-manage.com/track/click?u=80f6cf678900daf984bf763b7&id=c3ea8d4b14&e=dc0eff6180>

THE CONVERSATION – When did humans first start to speak? How language evolved in Africa

When did humans first begin to speak, which speech sounds were uttered first, and when did language evolve from those humble beginnings? These questions have long fascinated people, especially in tracing the evolution of modern humans and what makes us different from other animals.

{We got speech 70kya, and after that we developed – sorry, apparently evolved – language. It certainly left me speechless.}

<https://theconversation.com/when-did-humans-first-start-to-speak-how-language-evolved-in-africa-194372>

THE CONVERSATION – Understanding dishonesty in children – when, how and why do kids lie?

Children get a hard time for being dishonest but it's a sign of healthy brain development.

<https://theconversationuk.cmail20.com/t/r-l-tjdlllyuk-khhililahl-s/>

PUBLICATIONS

Antiquity

PAPERS

CEREN KABUKCU et al – Cooking in caves: Palaeolithic carbonised plant food remains from Franchthi and Shanidar

Research on Palaeolithic hunter-gatherer diet has focused on the consumption of animals. Evidence for the use of plant foods is comparatively limited but is rapidly expanding. The authors present an analysis of carbonised macro-remains of processed plants from Franchthi Cave in the Aegean Basin and Shanidar Cave in the north-west Zagros Mountains. Microscopic examination of the charred food remains reveals the use of pounded pulses as a common ingredient in cooked plant foods. The results are discussed in the context of the regional archaeobotanical literature, leading the authors to argue that plants with bitter and astringent tastes were key ingredients of Palaeolithic cuisines in South-west Asia and the Eastern Mediterranean.

<https://www.cambridge.org/core/journals/antiquity/article/cooking-in-caves-palaeolithic-carbonised-plant-food-remains-from-franchthi-and-shanidar/0CB510C9E528CD7AD923469D78E14E42>

Frontiers in Psychology

PAPERS

MARIA ALEKSEEVA, ANDRIY MYACHYKOV & YURY SHYROV – Inflectional zero morphology – Linguistic myth or neurocognitive reality?

Knowledge of language, its structure and grammar are an essential part of our education and daily activities. Despite the importance of language in our lives, linguistic theories that explain how the language system operates are often disconnected from our knowledge of the brain's neurocognitive mechanisms underpinning the linguistic function. This is reflected, for example, in the inclusion of abstract and often controversial elements into theories of language. Here, we discuss the case of the so-called null constituent and its smallest and the most controversial variant – the zero morpheme, a hypothetical morphosyntactic device that has no overt physical (phonological or orthographic) expression. Focusing on the putative inflectional zero morpheme, we discuss the theoretical origins and pitfalls of this approach and advocate the important role for neurobiological research that could try to elucidate the neurocognitive reality of such constructs in linguistic communication.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2022.1015435/full>

Human Nature

PAPERS

C. GRANITO et al with T. C. SCOTT-PHILLIPS – Does Group Contact Shape Styles of Pictorial Representation? A Case Study of Australian Rock Art

Image-making is a nearly universal human behavior, yet the visual strategies and conventions to represent things in pictures vary greatly over time and space. In particular, pictorial styles can differ in their degree of figurativeness, varying from intersubjectively recognizable representations of things to very stylized and abstract forms. Are there any patterns to this variability, and what might its ecological causes be? Experimental studies have shown that demography and the structure of interaction of cultural groups can play a key role: the greater the degree of contact with other groups, the more recognizable and less abstract are the representations. Here we test this hypothesis on a real-world dataset for the first time. We constructed a balanced database of Indigenous Australian rock art motifs from both isolated and contact Aboriginal groups

(those often in contact with other groups). We then ran a survey asking participants to judge the recognizability of the motifs and to provide interpretations. Results show that motifs from contact Aboriginal groups were more likely to be judged as inter-subjectively recognizable and also elicited more convergent descriptions than motifs from isolated groups. This is consistent with the idea that intergroup contact is likely to be an important factor in the cultural evolution of pictorial representation. We discuss the implications of these findings for the archaeology and anthropology of art, and the parallels with language evolution.

<https://link.springer.com/article/10.1007/s12110-022-09430-2>

ANNE C. PISOR & CODY T. ROSS – Distinguishing Intergroup and Long-Distance Relationships

Intergroup and long-distance relationships are both central features of human social life, but because intergroup relationships are emphasized in the literature, long-distance relationships are often overlooked. Here, we make the case that intergroup and long-distance relationships should be studied as distinct, albeit related, features of human sociality. First, we review the functions of both kinds of relationship: while both can be conduits for difficult-to-access resources, intergroup relationships can reduce intergroup conflict whereas long-distance relationships are especially effective at buffering widespread resource shortfalls. Second, to illustrate the importance of distinguishing the two relationship types, we present a case study from rural Bolivia. Combining ethnography and two different experimental techniques, we find that the importance of intergroup relationships—and the salience of group membership itself—varies across populations and across methods. Although ethnography revealed that participants often rely on long-distance relationships for resource access, we were unable to capture participant preferences for these relationships with a forced-choice technique. Taken together, our review and empirical data highlight that (1) intergroup and long-distance relationships can have different functions and can be more or less important in different contexts and (2) validating experimental field data with ethnography is crucial for work on human sociality. We close by outlining future directions for research on long-distance relationships in humans.

<https://link.springer.com/article/10.1007/s12110-022-09431-1>

EDWARD H. HAGEN – The Biological Roots of Music and Dance

After they diverged from panins, hominins evolved an increasingly committed terrestrial lifestyle in open habitats that exposed them to increased predation pressure from Africa's formidable predator guild. In the Pleistocene, Homo transitioned to a more carnivorous lifestyle that would have further increased predation pressure. An effective defense against predators would have required a high degree of cooperation by the smaller and slower hominins. It is in the interest of predator and potential prey to avoid encounters that will be costly for both. A wide variety of species, including carnivores and apes and other primates, have therefore evolved visual and auditory signals that deter predators by credibly signaling detection and/or the ability to effectively defend themselves. In some cooperative species, these predator deterrent signals involve highly synchronized visual and auditory displays among group members. Hagen and Bryant (*Human Nature*, 14(1), 21–51, 2003) proposed that synchronized visual and auditory displays credibly signal coalition quality. Here, this hypothesis is extended to include credible signals to predators that they have been detected and would be met with a highly coordinated defensive response, thereby deterring an attack. Within-group signaling functions are also proposed. The evolved cognitive abilities underlying these behaviors were foundations for the evolution of fully human music and dance.

<https://link.springer.com/article/10.1007/s12110-022-09429-9>

Mind & Language

PAPERS

LEDA BERIO & KRISTINA MUSHOLT – How language shapes our minds: On the relationship between generics, stereotypes and social norms

In this article, we discuss the role of labels and generics referring to social kinds in mindshaping practices, arguing that they promote generalizations that foster essentialist thinking and carry a normative force. We propose that their cognitive function consists in both contributing to the formation and reinforcement of schemata and scripts for social interaction and in activating these schemata in specific social situations. Moreover, we suggest that failure to meet the expectations engendered by these schemata and scripts leads to the activation of “reactive attitudes” embedded in feedback loops of reactive exchange that are constitutive of our mindshaping practices.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12449>

Nature Human Behaviour

PAPERS

ALLISON C. MORGAN et al – Socioeconomic roots of academic faculty

Despite the special role of tenure-track faculty in society, training future researchers and producing scholarship that drives scientific and technological innovation, the sociodemographic characteristics of the professoriate have never been representative of the general population. Here we systematically investigate the indicators of faculty childhood socioeconomic status and consider how they may limit efforts to diversify the professoriate. Combining national-level data on education, income and university rankings with a 2017–2020 survey of 7,204 US-based tenure-track faculty across eight

disciplines in STEM, social science and the humanities, we show that faculty are up to 25 times more likely to have a parent with a Ph.D. Moreover, this rate nearly doubles at prestigious universities and is stable across the past 50 years. Our results suggest that the professoriate is, and has remained, accessible disproportionately to the socioeconomically privileged, which is likely to deeply shape their scholarship and their reproduction.

<https://www.nature.com/articles/s41562-022-01425-4>

SÖNKE EHRET et al – Group identities can undermine social tipping after intervention

Social tipping can accelerate behaviour change consistent with policy objectives in diverse domains from social justice to climate change. Hypothetically, however, group identities might undermine tipping in ways that policymakers do not anticipate. To examine this, we implemented an experiment around the 2020 US federal elections. The participants faced consistent incentives to coordinate their choices. Once the participants had established a coordination norm, an intervention created pressure to tip to a new norm. Our control treatment used neutral labels for choices. Our identity treatment used partisan political images. This simple pay-off-irrelevant relabelling generated extreme differences. The control groups developed norms slowly before intervention but transitioned to new norms rapidly after intervention. The identity groups developed norms rapidly before intervention but persisted in a state of costly disagreement after intervention. Tipping was powerful but unreliable. It supported striking cultural changes when choice and identity were unlinked, but even a trivial link destroyed tipping entirely.

<https://www.nature.com/articles/s41562-022-01440-5>

Nature Scientific Reports

PAPERS

JULIA STEINBERG & HAIM SOMPOLINSKY – Associative memory of structured knowledge

A long standing challenge in biological and artificial intelligence is to understand how new knowledge can be constructed from known building blocks in a way that is amenable for computation by neuronal circuits. Here we focus on the task of storage and recall of structured knowledge in long-term memory. Specifically, we ask how recurrent neuronal networks can store and retrieve multiple knowledge structures. We model each structure as a set of binary relations between events and attributes (attributes may represent e.g., temporal order, spatial location, role in semantic structure), and map each structure to a distributed neuronal activity pattern using a vector symbolic architecture scheme. We then use associative memory plasticity rules to store the binarized patterns as fixed points in a recurrent network. By a combination of signal-to-noise analysis and numerical simulations, we demonstrate that our model allows for efficient storage of these knowledge structures, such that the memorized structures as well as their individual building blocks (e.g., events and attributes) can be subsequently retrieved from partial retrieving cues. We show that long-term memory of structured knowledge relies on a new principle of computation beyond the memory basins. Finally, we show that our model can be extended to store sequences of memories as single attractors.

<https://www.nature.com/articles/s41598-022-25708-y>

VALENTINA PACELLA et al – Temporal judgments of actions following unilateral brain damage

Sense of time is a complex construct, and its neural correlates remain to date in most part unknown. To complicate the frame, physical attributes of the stimulus, such as its intensity or movement, influence temporal perception. Although previous studies have shown that time perception can be compromised after a brain lesion, the evidence on the role of the left and right hemispheres are meager. In two experiments, the study explores the ability of temporal estimation of multi-second actions and non-biological movements in 33 patients suffering from unilateral brain lesion. Furthermore, the modulatory role of induced embodiment processes is investigated. The results reveal a joint contribution of the two hemispheres depending not only on different durations but also on the presence of actions. Indeed, the left hemisphere damaged patients find it difficult to estimate 4500 ms or longer durations, while the right hemisphere damaged patients fail in 3000 ms durations. Furthermore, the former fail when a biological action is shown, while the latter fail in non-biological movement. Embodiment processes have a modulatory effect only after right hemisphere lesions. Among neuropsychological variables, only spatial neglect influences estimation of non-biological movement.

<https://www.nature.com/articles/s41598-022-26070-9>

ALBERTO ACERBI, WILLIAM DANIEL SNYDER & CLAUDIO TENNIE – The method of exclusion (still) cannot identify specific mechanisms of cultural inheritance

The method of exclusion identifies patterns of distributions of behaviours and/or artefact forms among different groups, where these patterns are deemed unlikely to arise from purely genetic and/or ecological factors. The presence of such patterns is often used to establish whether a species is cultural or not—i.e. whether a species uses social learning or not. Researchers using or describing this method have often pointed out that the method cannot pinpoint which specific type(s) of social learning resulted in the observed patterns. However, the literature continues to contain such inferences. In a new attempt to warn against these logically unwarranted conclusions, we illustrate this error using a novel approach. We use an individual-based model, focused on wild ape cultural patterns—as these patterns are the best-known cases of animal culture and as they also contain the most frequent usage of the unwarranted inference for specific social learning mechanisms. We

built a model that contained agents unable to copy specifics of behavioural or artefact forms beyond their individual reach (which we define as “copying”). We did so, as some of the previous inference claims related to social learning mechanisms revolve around copying defined in this way. The results of our model however show that non-copying social learning can already reproduce the defining—even iconic—features of observed ape cultural patterns detected by the method of exclusion. This shows, using a novel model approach, that copying processes are not necessary to produce the cultural patterns that are sometimes still used in an attempt to identify copying processes. Additionally, our model could fully control for both environmental and genetic factors (impossible in real life) and thus offers a new validity check for the method of exclusion as related to general cultural claims—a check that the method passed. Our model also led to new and additional findings, which we likewise discuss.

<https://www.nature.com/articles/s41598-022-25646-9>

FLAVIA VENDITTI et al with NICHOLAS J. CONARD – Using microartifacts to infer Middle Pleistocene lifeways at Schöningen, Germany

While archeologists usually favor the study of large and diagnostic lithic artifacts, this study illustrates the invaluable contribution of lithic microartifacts for interpreting hominin lifeways. Across a 64 m² area of the Middle Pleistocene lakeshore site of Schöningen 13 II-3 in Northern Germany, we recovered a total of 57 small and micro flint artifacts, four small debris pieces, three natural fragments and three bone retouchers in close association with the skeleton of an extinct Eurasian straight-tusked elephant (*Palaeoloxodon antiquus*). This area lacks the type of formal knapped stone tools that would normally constitute the focus of archeological interpretations. By adopting a holistic approach, including morpho-technical analysis, experimental archeology, and use-wear and residue analyses, we demonstrate that these small and microartifacts are resharpening flakes that tell the story of the site. Fifteen resharpening flakes preserve microwear traces of processing wood. Microscopic residues of wood adhered to the former working edges of the tools corroborate this observation. Additionally, hominins used a sharp-edged, natural fragment of flint to process fresh animal tissue, which likely originates from the butchery of the elephant. These results provide unique, 300,000-year-old evidence for the functionally interconnected use of lithic, osseous and wood technologies. Furthermore, we document in-situ transformations of stone tools and the presence of both curational and expedient behaviors, thereby demonstrating the temporal depth of hominin activities at the lakeshore where the elephant died, and in the broader landscape as a whole.

<https://www.nature.com/articles/s41598-022-24769-3>

HELENA FORNWAGNER et al – On the robustness of gender differences in economic behavior

Because of the importance of economic decisions, researchers have looked into what factors influence them. Gender has received a lot of attention for explaining differences in behavior. But how much can be associated with gender, and how much with an individual’s biological sex? We run an experimental online study with cis- and transgender participants that (1) looks into correlational differences between gender and sex for competitiveness, risk-taking, and altruism by comparing decisions across these different subject groups. (2) we prime participants with either a masculine or feminine gender identity to examine causal gender effects on behavior. We hypothesize that if gender is indeed a primary factor for decision-making, (i) individuals of the same gender (but different sex) make similar decisions, and (ii) gender priming changes behavior. Based on 780 observations, we conclude that the role of gender (and sex) is not as decisive for economic behavior as originally thought.

<https://www.nature.com/articles/s41598-022-25141-1>

MICHAEL K. GAGAN et al – The historical impact of anthropogenic air-borne sulphur on the Pleistocene rock art of Sulawesi

The Maros-Pangkep karst in southwest Sulawesi, Indonesia, contains some of the world’s oldest rock art. However, the Pleistocene images survive only as weathered patches of pigment on exfoliated limestone surfaces. Salt efflorescence underneath the case-hardened limestone substrate causes spall-flaking, and it has been proposed that the loss of artwork has accelerated over recent decades. Here, we utilise historical photographs and superposition constraints to show that the bulk of the damage was present before 1950 CE, and describe the role of anthropogenic sulphur emissions in promoting gypsum-salt efflorescence and rock art decay. The rock art shelters have been exposed to domestic fire-use and intensive rice cultivation with post-harvest burning of straw for hundreds (if not thousands) of years, both of which release chemically reactive sulphur oxides for gypsum formation, with cumulative effects. Analysis of time-lapse photography indicates that the rate of rock art loss may be on the decline, consistent with the history of fire-use in southwest Sulawesi. At present, vandalism and sulphur emissions from diesel-powered traffic and cement-based infrastructure development constitute localised threats. Our findings indicate that there are grounds for being cautiously optimistic that targeted conservation measures will ensure the longevity of some of our oldest artistic treasures.

<https://www.nature.com/articles/s41598-022-25810-1>

New Scientist**NEWS****DNA from 2 million years ago is the oldest ever recovered**

DNA bound to mineral particles in ancient sediment reveals that north Greenland once had spruce forests populated by hares, reindeer and even mastodons.

<https://www.newscientist.com/article/2350324-dna-from-2-million-years-ago-is-the-oldest-ever-recovered/>

PLoS Genetics**PAPERS****DAVIDE M. VESPASIANI et al – Denisovan introgression has shaped the immune system of present-day Papuans**

Modern humans have admixed with multiple archaic hominins. Papuans, in particular, owe up to 5% of their genome to Denisovans, a sister group to Neanderthals whose remains have only been identified in Siberia and Tibet. Unfortunately, the biological and evolutionary significance of these introgression events remain poorly understood. Here we investigate the function of both Denisovan and Neanderthal alleles characterised within a set of 56 genomes from Papuan individuals. By comparing the distribution of archaic and non-archaic variants we assess the consequences of archaic admixture across a multitude of different cell types and functional elements. We observe an enrichment of archaic alleles within cis-regulatory elements and transcribed regions of the genome, with Denisovan variants strongly affecting elements active within immune-related cells. We identify 16,048 and 10,032 high-confidence Denisovan and Neanderthal variants that fall within annotated cis-regulatory elements and with the potential to alter the affinity of multiple transcription factors to their cognate DNA motifs, highlighting a likely mechanism by which introgressed DNA can impact phenotypes. Lastly, we experimentally validate these predictions by testing the regulatory potential of five Denisovan variants segregating within Papuan individuals, and find that two are associated with a significant reduction of transcriptional activity in plasmid reporter assays. Together, these data provide support for a widespread contribution of archaic DNA in shaping the present levels of modern human genetic diversity, with different archaic ancestries potentially affecting multiple phenotypic traits within non-Africans.

<https://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1010470>

PLoS One**PAPERS****VICTOR KARPICHEV et al – Greater volumes of a callosal sub-region terminating in posterior language-related areas predict a stronger degree of language lateralization: A tractography study**

Language lateralization is the most intriguing trait of functional asymmetry for cognitive functions. Nowadays, ontogenetic determinants of this trait are largely unknown, but there are efforts to find its anatomical correlates. In particular, a white matter interhemispheric connection—the corpus callosum—has been proposed as such. In the present study, we aimed to find the association between the degree of language lateralization and metrics of the callosal sub-regions. We applied a sentence completion fMRI task to measure the degree of language lateralization in a group of healthy participants balanced for handedness. We obtained the volumes and microstructural properties of callosal sub-regions with two tractography techniques, diffusion tensor imaging (DTI) and constrained spherical deconvolution (CSD). The analysis of DTI-based metrics did not reveal any significant associations with language lateralization. In contrast, CSD-based analysis revealed that the volumes of a callosal sub-region terminating in the core posterior language-related areas predict a stronger degree of language lateralization. This finding supports the specific inhibitory model implemented through the callosal fibers projecting into the core posterior language-related areas in the degree of language lateralization, with no relevant contribution of other callosal sub-regions.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0276721>

PENELOPE LACOMBE et al with KLAUS ZUBERBÜHLER – Rationality and cognitive bias in captive gorillas' and orang-utans' economic decision-making

Human economic decision-making sometimes appears to be irrational. Partly, this is due to cognitive biases that can lead to suboptimal economic choices and context-dependent risk-preferences. A pertinent question is whether such biases are part of our evolutionary heritage or whether they are culturally acquired. To address this, we tested gorillas (*Gorilla gorilla gorilla*) and orang-utans (*Pongo abelii*) with two risk-assessment experiments that differed in how risk was presented. For both experiments, we found that subjects increased their preferences for the risky options as their expected gains increased, showing basic understanding of reward contingencies and rational decision-making. However, we also found consistent differences in risk proneness between the two experiments, as subjects were risk-neutral in one experiment and risk-prone in the other. We concluded that gorillas and orang-utans are economically rational but that their decisions can interact with pre-existing cognitive biases which modulates their risk-preference in context-dependent ways, explaining the variability of their risk-preference in previous literature.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0278150>

PNAS**PAPERS****FAYSAL BIBI – Telling time with monkeys**

No abstract or summary available.

<https://www.pnas.org/doi/abs/10.1073/pnas.2217198119>

Royal Society Open Science**PAPERS****RACHAEL C. HULME, LAURA R. SHAPIRO & J. S. H. TAYLOR – Learning new words through reading: do robust spelling–sound mappings boost learning of word forms and meanings?**

High-quality lexical representations depend on robust representations of written form (orthography), spoken form (phonology) and meaning (semantics), and strong bonds between them. Quality of lexical representations may be affected by amount of print exposure and the form of individual words. Words that are harder to decode (print-to-sound) may lead to fuzzy representations of the orthographic and phonological forms, potentially creating less stable foundations for semantic knowledge. These factors are difficult to disentangle in natural language research; in this registered report, we experimentally manipulated decoding ease and exposure at the item level. Adults read paragraphs describing invented meanings of pseudowords. Pseudowords appeared two or six times in a paragraph, and had easy (e.g. bamper) or hard (e.g. uzide) to decode spelling–sound mappings. Post-tests assessed word-form knowledge, orthography–semantic mappings and semantic–phonology mappings. Results showed that greater decoding ease improved learning of word forms and consequently also impacted on word meanings. Higher exposure frequency improved learning of word forms but not meanings. Exposure frequency also modulated the effect of decoding ease on word-form learning, with a stronger effect of decoding ease for fewer exposures. Disentangling effects of decoding ease from print exposure has important implications for understanding potential barriers to vocabulary learning.

<https://royalsocietypublishing.org/doi/10.1098/rsos.210555>

Science Advances**PAPERS****RHIANNA C. DRUMMOND-CLARKE et al with TRACY L. KIVELL – Wild chimpanzee behavior suggests that a savanna-mosaic habitat did not support the emergence of hominin terrestrial bipedalism**

Bipedalism, a defining feature of the human lineage, is thought to have evolved as forests retreated in the late Miocene-Pliocene. Chimpanzees living in analogous habitats to early hominins offer a unique opportunity to investigate the ecological drivers of bipedalism that cannot be addressed via the fossil record alone. We investigated positional behavior and terrestriality in a savanna-mosaic community of chimpanzees (*Pan troglodytes schweinfurthii*) in the Issa Valley, Tanzania as the first test in a living ape of the hypothesis that wooded, savanna habitats were a catalyst for terrestrial bipedalism. Contrary to widely accepted hypotheses of increased terrestriality selecting for habitual bipedalism, results indicate that trees remained an essential component of the hominin adaptive niche, with bipedalism evolving in an arboreal context, likely driven by foraging strategy.

<https://www.science.org/doi/full/10.1126/sciadv.add9752>

Scientific American**ARTICLES****JEREMY DESILVA – Fossils Upend Conventional Wisdom about Evolution of Human Bipedalism**

For most of human evolution, multiple species with different ways of walking upright coexisted.

<https://www.scientificamerican.com/article/fossils-upend-conventional-wisdom-about-evolution-of-human-bipedalism/>

Trends in Neurosciences**PAPERS****MATTHEW H. DAVENPORT & ERICH D. JARVIS – Birdsong neuroscience and the evolutionary substrates of learned vocalization**

Oscine songbirds have served as a model for speech and its evolution since the discovery that birds in this clade learn to produce their songs by imitating conspecifics. We discuss the initial characterization of neural substrates for song learning and highlight several avenues of neuroscientific, phylogenetic, and genomic research that have advanced our understanding of how songbirds evolved to produce this behavior.

[https://www.cell.com/trends/neurosciences/fulltext/S0166-2236\(22\)00236-3](https://www.cell.com/trends/neurosciences/fulltext/S0166-2236(22)00236-3)

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