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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.

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

The new membership page is now live. If you wish to add a comment, just send me a few kind words about EAORC and I’ll include them.

You can add a comment no matter how you receive the bulletin – first-hand by email every Sunday, by copied email, by ResearchGate notification, or any way you access the bulletin.

Many thanks in anticipation, and especial thanks to those who have already responded.

Martin

### ACADEMIA.EDU – Locomotor anatomy and biomechanics of the Dmanisi hominins

*In Journal of Human Evolution 58, 492-504 (2010)*

#### **HERMAN PONTZER et al with DAVID LORDKIPANIDZE – Locomotor anatomy and biomechanics of the Dmanisi hominins**

The Dmanisi hominins inhabited a northern temperate habitat in the southern Caucasus, approximately 1.8 million years ago. This is the oldest population of hominins known outside of Africa. Understanding the set of anatomical and behavioral traits that equipped this population to exploit their seasonal habitat successfully may shed light on the selection pressures shaping early members of the genus Homo and the ecological strategies that permitted the expansion of their range outside of the African subtropics. The abundant stone tools at the site, as well as taphonomic evidence for butchery, suggest that the Dmanisi hominins were active hunters or scavengers. In this study, we examine the locomotor mechanics of the Dmanisi hind limb to test the hypothesis that the inclusion of meat in the diet is associated with an increase in walking and running economy and endurance. Using comparative data from modern humans, chimpanzees, and gorillas, as well as other fossil hominins, we show that the Dmanisi hind limb was functionally similar to modern humans, with a longitudinal plantar arch, increased limb length, and human-like ankle morphology. Other aspects of the foot, specifically metatarsal morphology and tibial torsion, are less derived and similar to earlier hominins. These results are consistent with hypotheses linking hunting and scavenging to improved walking and running performance in early Homo. Primitive retentions in the Dmanisi foot suggest that locomotor evolution continued through the early Pleistocene.

[https://www.academia.edu/5242435/Locomotor\\_anatomy\\_and\\_biomechanics\\_of\\_the\\_Dmanisi\\_hominins](https://www.academia.edu/5242435/Locomotor_anatomy_and_biomechanics_of_the_Dmanisi_hominins)

### RESEARCHGATE – Cross-cultural study of pantomimic re-enactments of transitive events

*In Language & Communication 80:1, 191-203 (2021)*

#### **PRZEMYSŁAW ŻYWICZYŃSKI et al with SLAWOMIR WACEWICZ – Evolution of conventional communication. A cross-cultural study of pantomimic re-enactments of transitive events**

This study addresses the postulate of non-conventionality of pantomime, inherent in pantomimic scenarios of language origin. Since lack of semiotic conventions does not preclude micro-conventions resulting from cultural differences, pantomimes should be easier to interpret when the actor and recipient share the same culture than between two different cultures. In the study, Italian and Polish amateur “actors” re-enacted transitive events from a matrix of cartoon-like drawings. Randomly selected clips were matched by Polish and Italian participants to the corresponding drawings. We found no difference in the number of correct guesses when the actors and matchers were from the same versus from different cultures. We discuss this result in the context of the core assumptions of pantomimic scenarios of language origin.

[https://www.researchgate.net/publication/353631618\\_Evolution\\_of\\_conventional\\_communication\\_A\\_cross-cultural\\_study\\_of\\_pantomimic\\_re-enactments\\_of\\_transitive\\_events](https://www.researchgate.net/publication/353631618_Evolution_of_conventional_communication_A_cross-cultural_study_of_pantomimic_re-enactments_of_transitive_events)

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## CALL FOR PAPERS ALERT – The Evolution and Consequences of Animal Personality

### **PEERJ 2021 Call for Papers in The Evolution and Consequences of Animal Personality**

“We hope that by launching this special issue, we will encourage research on two neglected topics within the realm of animal personality, namely the evolution and consequences of personality.” Special Issue Editor Dr. Ann Hedrick.

Animal personality, or consistent individual differences in behavior among animals within a population or species, has been increasingly studied over the past two decades by behavioral ecologists. The study of animal personality represents a shift from the classic perspective in earlier research that focused on population- or species-wide norms of behavior. To date, papers have documented the existence of animal personalities in taxa as diverse as primates and insects, with individual differences in behavioral traits such as aggressiveness, boldness towards predators, foraging patterns, and sociability. A growing body of literature exists on ancillary topics such as the development of personality, but the evolution and consequences of personality remain relatively unexplored.

<https://peerj.com/blog/post/115284884612/call-for-papers-the-evolution-and-consequences-of-animal-personality/>

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## NEWS

### **BREAKING SCIENCE – New Study Examines Chewing Biomechanics of Homo floresiensis**

The feeding biomechanics of *Homo floresiensis*, a small-bodied hominin lived until about 50,000 years ago on Flores, Indonesia, closely resembled the patterns observed in modern humans, according to new research led by Duke University's Dr. Justin Ledogar.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/pbWUd8aRKuA/chewing-biomechanics-homo-floresiensis-09997.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/pbWUd8aRKuA/chewing-biomechanics-homo-floresiensis-09997.html?utm_source=feedburner&utm_medium=email)

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### **NATURE BRIEFING – Clues to evolution of homosexuality**

The genetic patterns associated with homosexual behaviour might help people who have only heterosexual sex to find more partners. Researchers looked at data collected from hundreds of thousands of people, mostly in the United States and United Kingdom, and found that people who'd had at least one same-sex partner tended to share patterns of small genetic differences scattered throughout the genome. Among people who'd had only heterosexual sex, those with numerous partners tended to share some of those same genetic markers. The findings might help solve the evolutionary mystery of how same-sex attraction — which seems to be at least partly genetic — remains widespread despite possibly reducing a person's number of offspring. But there are plenty of caveats. For instance, participants didn't define their sexual orientation, just their sexual behaviour — some of which they might have chosen to keep private.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=49c208dc0f&e=1db4b9a19b>

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### **NATURE BRIEFING – Fossil DNA hints at mysterious Toaleans**

The 7,000-year-old skeleton of a teenage hunter-gatherer from Sulawesi in Indonesia might be the first remains found from a mysterious, ancient culture known as the Toaleans. Sulawesi has some of the world's oldest cave art, but ancient human remains have been scarce on the island. The largely complete fossil of a roughly 18-year-old Stone Age woman was found in 2015, buried in the fetal position in a limestone cave. DNA extracted from the skull suggests that she shared ancestry with New Guineans and Aboriginal Australians, as well with the extinct Denisovan species of ancient human. The Toalean people, known only from scant archaeological evidence, such as distinctively notched stone tools, were thought to have lived in Sulawesi at around the same time.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=c242c33785&e=1db4b9a19b>

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### **SCIENCE DAILY – To understand future habitat needs for chimpanzees, look to the past**

A new study provides insight into where chimpanzees (*Pan troglodytes*) avoided climate instability during glacial and interglacial periods in Africa over the past 120,000 years.

<https://www.sciencedaily.com/releases/2021/08/210823143623.htm>

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### **SCIENCE DAILY – Central European prehistory was highly dynamic**

Recent archaeogenetic studies have shown that human movements like migrations and expansions played a major role in driving the spread of cultures and genes in ancient Europe. However, it is only now with detailed regional studies and dense sampling that researchers start to better understand the magnitude, rate and social implications of these changes.

<https://www.sciencedaily.com/releases/2021/08/210825143018.htm>

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### **SCIENCE DAILY – Oldest genome from Wallacea shows previously unknown ancient human relations**

The oldest genome of a modern human from the Wallacea region -- the islands between western Indonesia and Papua New Guinea -- indicates a previously undescribed ancient human relationship. Researchers were able to isolate sufficient genetic material from the skull of an individual buried more than 7,000 years ago on the Indonesian island of Sulawesi. It belonged to

a hunter-gatherer society and was interred at the site now called Leang Panninge ('Bat Cave'). A large part of the genetic code matched that of today's Papua New Guineans and Aboriginal Australians. Yet portions of the genome did not match these groups. This brings new surprises about the evolution of modern humans.

<https://www.sciencedaily.com/releases/2021/08/210825113624.htm>

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### SCIENCE NEWS – Fraudulent data raise questions about superstar honesty researcher

Dan Ariely is a behavioral science superstar. His research on honesty, cheating, and irrationality is “extremely clever and extremely intuitive,” says behavioral scientist Eugen Dimant of the University of Pennsylvania—and it has had a huge impact on both the field and government policies. Ariely, who founded the Center for Advanced Hindsight at Duke University, has also written three New York Times bestsellers and is a TED Talks regular. But some researchers are calling Ariely's large body of work into question after a 17 August blog post revealed that fabricated data underlie part of a high-profile 2012 paper about dishonesty that he co-wrote. None of the five study authors disputes that fabrication occurred, but Ariely's colleagues have washed their hands of responsibility for it. Ariely acknowledges that only he had handled the earliest known version of the data file, which contained the fabrications.

<https://www.sciencemag.org/news/2021/08/fraudulent-data-set-raise-questions-about-superstar-honesty-researcher>

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### SOCIETY FOR SCIENCE – These baby greater sac-winged bats babble to learn their mating songs

Greater sac-winged bat pups babble their way through learning their rich vocal repertoire, similar to how human infants babble before speaking.

<http://click.societyforscience->

[email.com/?qs=53c27ccb1440b085c3fb2372180290d328ecfcd6e0d46a4655321d2960b327a108f47b337901c0547b8bc30c05be4a1da2a97675d8d1a](mailto:email.com/?qs=53c27ccb1440b085c3fb2372180290d328ecfcd6e0d46a4655321d2960b327a108f47b337901c0547b8bc30c05be4a1da2a97675d8d1a)

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### SOCIETY FOR SCIENCE – Everyone maps numbers in space. But why don't we all use the same directions?

The debate over whether number lines are innate or learned obscures a more fundamental question: Why do we map numbers to space in the first place?

<http://click.societyforscience->

[email.com/?qs=0bd2f79e783874977705bd505f4178ecae987d9614a4962c38c564bf854b80c0c1db7814d4ceadcb00bd73717d09571b145492d66f68a8beaf625a1842a8ea1f](mailto:email.com/?qs=0bd2f79e783874977705bd505f4178ecae987d9614a4962c38c564bf854b80c0c1db7814d4ceadcb00bd73717d09571b145492d66f68a8beaf625a1842a8ea1f)

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### SOCIETY FOR SCIENCE – Ancient DNA shows peopling of Southeast Asian islands was surprisingly complex

Ancient DNA from a hunter-gatherer skeleton points to earlier-than-expected human arrivals on Southeast Asian islands known as Wallacea.

<http://click.societyforscience->

[email.com/?qs=5da8647f246a762acdd1fc06bf2524ee3228c4acb97bbebd37b4b5c3fda55675ff7e153266a4de7084275fb385626f06c6c32a0efcde39e18afbda5cdd8a8e9f](mailto:email.com/?qs=5da8647f246a762acdd1fc06bf2524ee3228c4acb97bbebd37b4b5c3fda55675ff7e153266a4de7084275fb385626f06c6c32a0efcde39e18afbda5cdd8a8e9f)

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## PUBLICATIONS

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### Animal Behaviour

#### PAPERS

#### ELIZABETH A. TIBBETTS & EMILIE C. SNELL-ROOD – Reciprocal plasticity and the diversification of communication systems

The origin of novel communication systems has long been an evolutionary puzzle because communication requires interdependent signals and responses. Either component is not useful in isolation. Previous work has shown that novel communication systems may arise when pre-existing traits are co-opted for a novel function. However, research on developmental plasticity suggests we may benefit from considering how plasticity facilitates the origin and diversification of communication systems. In particular, plasticity can stabilize novel traits that are the first step towards signals or receiver responses (precursors) because plasticity allows individuals to rapidly adjust their phenotype based on their partner's phenotype, termed 'reciprocal plasticity'. For example, exposure to a new sender precursor (e.g. new song) can produce a rapid, reciprocal change in receiver responses (e.g. preference for the new song). Reciprocal plasticity may facilitate the origin of new communication systems because precursors that influence conspecifics are more likely to become established signalling systems than precursors that are ignored by conspecifics. We review evidence that plasticity is important in the development and expression of a range of signals and preferences, the implications for divergence in signalling systems and its potential impacts on speciation and diversification. We outline areas of exciting future research, from incorporating more developmental realism into evolutionary models of signalling systems to using experimental evolution and novel anthropogenic environments to study genetic assimilation of plastic signals and preferences.

<https://www.sciencedirect.com/science/article/abs/pii/S0003347221002426>

### **MAËL LEROUX et al with KLAUS ZUBERBÜHLER & SIMON W. TOWNSEND – Chimpanzees combine pant hoots with food calls into larger structures**

A growing body of observational and experimental data in nonhuman primates has highlighted the presence of rudimentary call combinations within the vocal communication system of monkeys. Such evidence suggests the ability to combine meaning-bearing units into larger structures, a key feature of language also known as syntax, could have its origins rooted within the primate lineage. However, the evolutionary progression of this trait remains ambiguous as evidence for similar combinations in great apes, our closest-living relatives, is sparse and incomplete. In this study, we aimed to bridge this gap by analysing the combinatorial properties of the pant hoot–food call combination in our closest-living relative, the chimpanzee, *Pan troglodytes*. To systematically investigate the syntactic-like potential of this structure, we adopted three levels of analysis. First, we applied collocation analyses, methods traditionally used in language sciences, to confirm the combination of pant hoots with food calls was not a random co-occurrence, but instead a consistently produced structure. Second, using acoustic analyses, we confirmed pant hoots and food calls comprising the combination were acoustically indistinguishable from the same calls produced in isolation, indicating the pant hoot–food call combination is composed of individually occurring meaning-bearing units, a key criterion of linguistic syntax. Finally, we investigated the context-specific nature of this structure, demonstrating that the call combination was more likely to be produced when feeding on larger patches and when a high-ranking individual joined the feeding party. Together our results converge to provide support for the systematic combination of calls in chimpanzees. We highlight that playback experiments are vital to robustly disentangle both the function this combination might serve and the similarities with combinations of meaning-bearing units (i.e. syntax) in language.

<https://www.sciencedirect.com/science/article/pii/S0003347221002062>

### **SAKUMI IKI & NOBUYUKI KUTSUKAKE – Japanese macaques relax vigilance when surrounded by kin**

Vigilance behaviour in group-living animals helps to detect threats. Individual vigilance levels are thought to decrease as group size or the number of neighbours increases. However, the results of studies on the effects of group size or the number of neighbours are inconsistent, especially in primates. Since social vigilance (i.e. monitoring for group members) plays an essential role in group-living primates, discrepancies among studies may have been caused by differences in the quality of social relationships between group members. Using data from a provisioned group of Japanese macaques, *Macaca fuscata*, this study examined the effects of the quality of social relationships and the number of neighbours on vigilance levels. We found that the frequency of vigilance was lower when the majority of an individual's neighbours were kin than when kin were in the minority. Since Japanese macaques show strong nepotism and cope with social threats by forming coalitions between close kin, individuals may be able to reduce their vigilance levels by relying on the vigilance of potential allies. Furthermore, when the majority of neighbours were kin, the proportion of time spent on vigilance decreased as the number of neighbours increased. However, when kin were in the minority of neighbours, the number of neighbours did not affect vigilance levels. Overall, our results indicate that the quality of social relationships with neighbours and the number of neighbours interactively affect vigilance levels.

<https://www.sciencedirect.com/science/article/abs/pii/S0003347221002153>

### **JOEL BRAY, JOSEPH T. FELDBLUM & IAN C. GILBY – Social bonds predict dominance trajectories in adult male chimpanzees**

In some species, individuals form well-differentiated and affiliative social relationships that facilitate cooperation and confer adaptive benefits, but few studies of males have addressed the benefits of same-sex social bonds. Among mammals, adult male chimpanzees, *Pan troglodytes*, form some of the strongest and most stable social bonds, and several studies have found that higher-ranking males attain short- and long-term benefits. No study in chimpanzees, however, has demonstrated a link between social bonds and dominance trajectories. To fill this gap, we used 37 years of data from Gombe National Park, Tanzania, to test the hypothesis that social bonds in adult male chimpanzees predict changes in dominance strength, which were measured by annual changes in mean Elo scores. Across 24 adult males, we found that social bonds, which were identified using both association in small groups and grooming activity, showed positive relationships with changes in dominance strength. From previous studies, the most likely mechanism for the observed relationship between adult male bond strength and dominance trajectories is the formation of cooperative coalitions, by which males with stronger bonds leverage established relationships to maintain or increase their position in the dominance hierarchy. Given the fission–fusion social structure of chimpanzees, both party-level associations and grooming relationships are essential components of male social bonding, and these results, in combination with prior studies, suggest that having strong social bonds is a valuable strategy for achieving higher rank.

<https://www.sciencedirect.com/science/article/abs/pii/S0003347221002128>

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## **Biology Letters**

### **PAPERS**

#### **FELICITY MUTH – Intra-specific differences in cognition: bumblebee queens learn better than workers**

Species' cognitive traits are shaped by their ecology, and even within a species, cognition can reflect the behavioural requirements of individuals with different roles. Social insects have a number of discrete roles (castes) within a colony and thus offer a useful system to determine how ecological requirements shape cognition. Bumblebee queens are a critical point

in the lifecycle of their colony, since its future success is reliant on a single individual's ability to learn about floral stimuli while finding a suitable nest site; thus, one might expect particularly adept learning capabilities at this stage. I compared wild *Bombus vosnesenskii* queens and workers on their ability to learn a colour association and found that queens performed better than workers. In addition, queens of another species, *B. insularis*, a cuckoo species with a different lifecycle but similar requirements at this stage, performed equally well as the non-parasitic queens. To control for differences in foraging experience, I then repeated this comparison with laboratory-based *B. impatiens* and found that unmated queens performed better than workers. These results add to the body of work on how ecology shapes cognition and opens the door to further research in comparative cognition using wild bees.

<https://royalsocietypublishing.org/doi/full/10.1098/rsbl.2021.0280>

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## Evolutionary Anthropology

### PAPERS

#### **DAVID A. RAICHLIN & HERMAN PONTZER – Energetic and endurance constraints on great ape quadrupedalism and the benefits of hominin bipedalism**

Bipedal walking was one of the first key behavioral traits that defined the evolution of early hominins. While it is not possible to identify specific selection pressures underlying bipedal evolution, we can better understand how the adoption of bipedalism may have benefited our hominin ancestors. Here, we focus on how bipedalism relaxes constraints on nonhuman primate quadrupedal limb mechanics, providing key advantages during hominin evolution. Nonhuman primate quadrupedal kinematics, especially in our closest living relatives, the great apes, are dominated by highly flexed limb joints, often associated with high energy costs, and are constrained by the need to reduce loads on mobile, but less stable forelimb joints. Bipedal walking would have allowed greater hind limb joint extension, which is associated with reduced energy costs and increased endurance. We suggest that relaxing these constraints provided bipedal hominins important benefits associated with long distance foraging and mobility.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21911>

#### **CARA OCOBOCK, SARAH LACY & ALEXANDRA NICLOU – Between a rock and a cold place: Neanderthal biocultural cold adaptations**

A large body of work focuses on the unique aspects of Neanderthal anatomy, inferred physiology, and behavior to test the assumption that Neanderthals were hyper-adapted to living in cold environments. This research has expanded over the years to include previously unexplored and potentially adaptive features such as brown adipose tissue and fire-usage. Here we review the current state of knowledge of Neanderthal cold adaptations along morphological, physiological, and behavioral lines. While highlighting foundational as well as recent work, we also emphasize key areas for future research. Despite thriving in a variety of climates, it is well-accepted that Neanderthals appear to be the most cold-adapted of known fossil hominin groups; however, there are still many unknowns. There is a great deal yet to be uncovered about the nature and manifestation of Neanderthal adaptation and how the synergy of biology and culture helped buffer them against extreme and variable environments.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21894>

#### **SIMON T. POWERS, CAREL P. VAN SCHAİK & LAURENT LEHMANN – Cooperation in large-scale human societies—What, if anything, makes it unique, and how did it evolve?**

To resolve the major controversy about why prosocial behaviors persist in large-scale human societies, we propose that two questions need to be answered. First, how do social interactions in small-scale and large-scale societies differ? By reviewing the exchange and collective-action dilemmas in both small-scale and large-scale societies, we show they are not different. Second, are individual decision-making mechanisms driven by self-interest? We extract from the literature three types of individual decision-making mechanism, which differ in their social influence and sensitivity to self-interest, to conclude that humans interacting with non-relatives are largely driven by self-interest. We then ask: what was the key mechanism that allowed prosocial behaviors to continue as societies grew? We show the key role played by new social interaction mechanisms—change in the rules of exchange and collective-action dilemmas—devised by the interacting individuals, which allow for self-interested individuals to remain prosocial as societies grow.

<https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21909>

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## Frontiers in Communication

### PAPERS

#### **BARBARA FOX & TRINE HEINEMANN – Grammar and Hands: Manual Turn-Taking and Its Relationships to Verbal Turn-Taking in the Transfer of Objects**

When customers bring a material item to a shop for repair, they must make the item and its troubles inspectable to the staff at the shop. This typically requires physical manipulation of the object by the customer. For their part, the staff person may then need to take the item into their own hands to further inspect it. A physical transfer of the object from customer to staff person may thus need to be accomplished. A practical problem that can arise in such transfers is this: who has the rights and responsibilities to touch and hold the object at any given time? In our data from a shoe repair shop, this practical problem is one of turn-taking of the participants' hands, and the participants exhibit a clear normative orientation to "one person

touches at a time”, with gaps and overlaps being common but brief. The parallels to verbal turn-taking are explored, as are the different affordances of each semiotic resource. The data are in American English.

<https://www.frontiersin.org/articles/10.3389/fcomm.2021.661721/full>

### **LUCAS JAMES – Systems of Communication: Aspects of Culture and Structure in Speech Surrogates**

The practice of speech surrogacy is used for communication across many cultures. Previous work has historically engaged with the study of speech surrogates as part of anthropological or ethnomusicological inquiry; more recently, scholars have explored aspects of the formal relationship between spoken and surrogate linguistic structures. How speech surrogates function as systems of communication is not yet well understood. Based on evidence from an interdisciplinary corpus of documentation, characteristics of culture and discourse, as well as features of linguistic structure, are shown to play a role in fostering communicability in speech surrogates. Cultural constraints are linked to the development of a speech surrogate-mediated discourse within a community of practice, facilitating comprehension of the surrogate system. Moreover, specific structures including formulas, enphrasing, and framing devices are identified as common to various speech surrogate traditions, suggesting a common function as aids to communication. This analysis points to the need to investigate speech surrogates as linguistic systems within a discursive context.

<https://www.frontiersin.org/articles/10.3389/fcomm.2021.653268/full>

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## Frontiers in Psychology

### PAPERS

### **LUCIA L.-A. BOILEAU, DAVID J. GRÜNING & HERBERT BLESS – Too Good to be Liked? When and How Prosocial Others are Disliked**

Outstandingly prosocial individuals may not always be valued and admired, but sometimes depreciated and rejected. While prior research has mainly focused on devaluation of highly competent or successful individuals, comparable research in the domain of prosociality is scarce. The present research suggests two mechanisms why devaluation of extreme prosocial individuals may occur: they may (a) constitute very high comparison standards for observers, and may (b) be perceived as communal narcissists. Two experiments test these assumptions. We confronted participants with an extreme prosocial or an ordinary control target and manipulated comparative aspects of the situation (salient vs. non-salient comparison, Experiment 1), and narcissistic aspects of the target (showing off vs. being modest, Experiment 2). Consistent with our assumptions, the extreme prosocial target was liked less than the control target, and even more so when the comparison situation was salient (Experiment 1), and when the target showed off with her good deeds (Experiment 2). Implications that prosociality does not always breed more liking are discussed.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.701689/full>

### **PERRINE BRUSINI et al – The Acquisition of Noun and Verb Categories by Bootstrapping From a Few Known Words: A Computational Model**

While many studies have shown that toddlers are able to detect syntactic regularities in speech, the learning mechanism allowing them to do this is still largely unclear. In this article, we use computational modeling to assess the plausibility of a context-based learning mechanism for the acquisition of nouns and verbs. We hypothesize that infants can assign basic semantic features, such as “is-an-object” and/or “is-an-action,” to the very first words they learn, then use these words, the semantic seed, to ground proto-categories of nouns and verbs. The contexts in which these words occur, would then be exploited to bootstrap the noun and verb categories: unknown words are attributed to the class that has been observed most frequently in the corresponding context. To test our hypothesis, we designed a series of computational experiments which used French corpora of child-directed speech and different sizes of semantic seed. We partitioned these corpora in training and test sets: the model extracted the two-word contexts of the seed from the training sets, then used them to predict the syntactic category of content words from the test sets. This very simple algorithm demonstrated to be highly efficient in a categorization task: even the smallest semantic seed (only 8 nouns and 1 verb known) yields a very high precision (~90% of new nouns; ~80% of new verbs). Recall, in contrast, was low for small seeds, and increased with the seed size. Interestingly, we observed that the contexts used most often by the model featured function words, which is in line with what we know about infants' language development. Crucially, for the learning method we evaluated here, all initialization hypotheses are plausible and fit the developmental literature (semantic seed and ability to analyse contexts). While this experiment cannot prove that this learning mechanism is indeed used by infants, it demonstrates the feasibility of a realistic learning hypothesis, by using an algorithm that relies on very little computational and memory resources. Altogether, this supports the idea that a probabilistic, context-based mechanism can be very efficient for the acquisition of syntactic categories in infants.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.661479/full>



PAPERS

**PETER RANACHER et al with BALTHASAR BICKEL – Contact-tracing in cultural evolution: a Bayesian mixture model to detect geographic areas of language contact**

When speakers of different languages interact, they are likely to influence each other: contact leaves traces in the linguistic record, which in turn can reveal geographical areas of past human interaction and migration. However, other factors may contribute to similarities between languages. Inheritance from a shared ancestral language and universal preference for a linguistic property may both overshadow contact signals. How can we find geographical contact areas in language data, while accounting for the confounding effects of inheritance and universal preference? We present sBayes, an algorithm for Bayesian clustering in the presence of confounding effects. The algorithm learns which similarities are better explained by confounders, and which are due to contact effects. Contact areas are free to take any shape or size, but an explicit geographical prior ensures their spatial coherence. We test sBayes on simulated data and apply it in two case studies to reveal language contact in South America and the Balkans. Our results are supported by findings from previous studies. While we focus on detecting language contact, the method can also be used to uncover other traces of shared history in cultural evolution, and more generally, to reveal latent spatial clusters in the presence of confounders.

<https://royalsocietypublishing.org/doi/full/10.1098/rsif.2020.1031>

**LAUREN BLOOMFIELD et al – Perceiving and remembering speech depend on multifractal nonlinearity in movements producing and exploring speech**

Speech perception and memory for speech require active engagement. Gestural theories have emphasized mainly the effect of speaker's movements on speech perception. They fail to address the effects of listener movement, focusing on communication as a boundary condition constraining movement among interlocutors. The present work attempts to break new ground by using multifractal geometry of physical movement as a common currency for supporting both sides of the speaker–listener dyads. Participants self-paced their listening to a narrative, after which they completed a test of memory querying their narrative comprehension and their ability to recognize words from the story. The multifractal evidence of nonlinear interactions across timescales predicted the fluency of speech perception. Self-pacing movements that enabled listeners to control the presentation of speech sounds constituted a rich exploratory process. The multifractal nonlinearity of this exploration supported several aspects of memory for the perceived spoken language. These findings extend the role of multifractal geometry in the speaker's movements to the narrative case of speech perception. In addition to posing novel basic research questions, these findings make a compelling case for calibrating multifractal structure in text-to-speech synthesizers for better perception and memory of speech.

<https://royalsocietypublishing.org/doi/abs/10.1098/rsif.2021.0272>

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Nature

NEWS

**First ancient human DNA found from key Asian migration route**

Sulawesi has some of the world's oldest cave art, but ancient human remains have been scarce — now a fossil with DNA hints at a mysterious lineage of people.

<https://www.nature.com/articles/d41586-021-02319-7>

PAPERS

**SELINA CARLHOFF et al with KAY PRÜFER & JOHANNES KRAUSE – Genome of a middle Holocene hunter-gatherer from Wallacea**

Much remains unknown about the population history of early modern humans in southeast Asia, where the archaeological record is sparse and the tropical climate is inimical to the preservation of ancient human DNA. So far, only two low-coverage pre-Neolithic human genomes have been sequenced from this region. Both are from mainland Hòabınhian hunter-gatherer sites: Pha Faen in Laos, dated to 7939–7751 calibrated years before present (yr cal BP; present taken as AD 1950), and Gua Cha in Malaysia (4.4–4.2 kyr cal BP). Here we report, to our knowledge, the first ancient human genome from Wallacea, the oceanic island zone between the Sunda Shelf (comprising mainland southeast Asia and the continental islands of western Indonesia) and Pleistocene Sahul (Australia–New Guinea). We extracted DNA from the petrous bone of a young female hunter-gatherer buried 7.3–7.2 kyr cal BP at the limestone cave of Leang Panninge in South Sulawesi, Indonesia. Genetic analyses show that this pre-Neolithic forager, who is associated with the 'Toalean' technocomplex, shares most genetic drift and morphological similarities with present-day Papuan and Indigenous Australian groups, yet represents a previously unknown divergent human lineage that branched off around the time of the split between these populations approximately 37,000 years ago. We also describe Denisovan and deep Asian-related ancestries in the Leang Panninge genome, and infer their large-scale displacement from the region today.

<https://www.nature.com/articles/s41586-021-03823-6>

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## Nature Communications

### PAPERS

#### **ROBERT M. BEYER et al – Climatic windows for human migration out of Africa in the past 300,000 years**

subject of heated debate, due to the scarcity of fossils and the lack of suitably old ancient DNA. Here, we use high-resolution palaeoclimate reconstructions to estimate how difficult it would have been for humans in terms of rainfall availability to leave the African continent in the past 300k years. We then combine these results with an anthropologically and ecologically motivated estimate of the minimum level of rainfall required by hunter-gatherers to survive, allowing us to reconstruct when, and along which geographic paths, expansions out of Africa would have been climatically feasible. The estimated timings and routes of potential contact with Eurasia are compatible with archaeological and genetic evidence of human expansions out of Africa, highlighting the key role of palaeoclimate variability for modern human dispersals.

<https://www.nature.com/articles/s41467-021-24779-1>

#### **PINGHSUN HSIEH et al – Evidence for opposing selective forces operating on human-specific duplicated TCAF genes in Neanderthals and humans**

TRP channel-associated factor 1/2 (TCAF1/TCAF2) proteins antagonistically regulate the cold-sensor protein TRPM8 in multiple human tissues. Understanding their significance has been complicated given the locus spans a gap-ridden region with complex segmental duplications in GRCh38. Using long-read sequencing, we sequence-resolve the locus, annotate full-length TCAF models in primate genomes, and show substantial human-specific TCAF copy number variation. We identify two human super haplogroups, H4 and H5, and establish that TCAF duplications originated ~1.7 million years ago but diversified only in *Homo sapiens* by recurrent structural mutations. Conversely, in all archaic-hominin samples the fixation for a specific H4 haplotype without duplication is likely due to positive selection. Here, our results of TCAF copy number expansion, selection signals in hominins, and differential TCAF2 expression between haplogroups and high TCAF2 and TRPM8 expression in liver and prostate in modern-day humans imply TCAF diversification among hominins potentially in response to cold or dietary adaptations.

<https://www.nature.com/articles/s41467-021-25435-4>

#### **WILLA I. VOORHIES et al – Cognitive insights from tertiary sulci in prefrontal cortex**

The lateral prefrontal cortex (LPFC) is disproportionately expanded in humans compared to non-human primates, although the relationship between LPFC brain structures and uniquely human cognitive skills is largely unknown. Here, we test the relationship between variability in LPFC tertiary sulcal morphology and reasoning scores in a cohort of children and adolescents. Using a data-driven approach in independent discovery and replication samples, we show that the depth of specific LPFC tertiary sulci is associated with individual differences in reasoning scores beyond age. To expedite discoveries in future neuroanatomical-behavioral studies, we share tertiary sulcal definitions with the field. These findings support a classic but largely untested theory linking the protracted development of tertiary sulci to late-developing cognitive processes.

<https://www.nature.com/articles/s41467-021-25162-w>

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## Nature Human Behaviour

### PAPERS

#### **KARA WEISMAN et al – Similarities and differences in concepts of mental life among adults and children in five cultures**

How do concepts of mental life vary across cultures? By asking simple questions about humans, animals and other entities – for example, ‘Do beetles get hungry? Remember things? Feel love?’ – we reconstructed concepts of mental life from the bottom up among adults (N = 711) and children (ages 6–12 years, N = 693) in the USA, Ghana, Thailand, China and Vanuatu. This revealed a cross-cultural and developmental continuity: in all sites, among both adults and children, cognitive abilities travelled separately from bodily sensations, suggesting that a mind–body distinction is common across diverse cultures and present by middle childhood. Yet there were substantial cultural and developmental differences in the status of social–emotional abilities – as part of the body, part of the mind or a third category unto themselves. Such differences may have far-reaching social consequences, whereas the similarities identify aspects of human understanding that may be universal.

<https://www.nature.com/articles/s41562-021-01184-8>

#### **BRENDAN P. ZIETSCH et al – Genomic evidence consistent with antagonistic pleiotropy may help explain the evolutionary maintenance of same-sex sexual behaviour in humans**

Human same-sex sexual behaviour (SSB) is heritable, confers no immediately obvious direct reproductive or survival benefit and can divert mating effort from reproductive opportunities. This presents a Darwinian paradox: why has SSB been maintained despite apparent selection against it? We show that genetic effects associated with SSB may, in individuals who only engage in opposite-sex sexual behaviour (OSB individuals), confer a mating advantage. Using results from a recent genome-wide association study of SSB and a new genome-wide association study on number of opposite-sex sexual partners in 358,426 individuals, we show that, among OSB individuals, genetic effects associated with SSB are associated with having more opposite-sex sexual partners. Computer simulations suggest that such a mating advantage for alleles associated with SSB could help explain how it has been evolutionarily maintained. Caveats include the cultural specificity of our UK and US

samples, the societal regulation of sexual behaviour in these populations, the difficulty of measuring mating success and the fact that measured variants capture a minority of the total genetic variation in the traits.

<https://www.nature.com/articles/s41562-021-01168-8>

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## Nature Neuropsychopharmacology

### PAPERS

#### **ELISABETH A. MURRAY & LESLEY K. FELLOWS – Prefrontal cortex interactions with the amygdala in primates**

This review addresses functional interactions between the primate prefrontal cortex (PFC) and the amygdala, with emphasis on their contributions to behavior and cognition. The interplay between these two telencephalic structures contributes to adaptive behavior and to the evolutionary success of all primate species. In our species, dysfunction in this circuitry creates vulnerabilities to psychopathologies. Here, we describe amygdala–PFC contributions to behaviors that have direct relevance to Darwinian fitness: learned approach and avoidance, foraging, predator defense, and social signaling, which have in common the need for flexibility and sensitivity to specific and rapidly changing contexts. Examples include the prediction of positive outcomes, such as food availability, food desirability, and various social rewards, or of negative outcomes, such as threats of harm from predators or conspecifics. To promote fitness optimally, these stimulus–outcome associations need to be rapidly updated when an associative contingency changes or when the value of a predicted outcome changes. We review evidence from nonhuman primates implicating the PFC, the amygdala, and their functional interactions in these processes, with links to experimental work and clinical findings in humans where possible.

<https://www.nature.com/articles/s41386-021-01128-w>

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## Nature Scientific Reports

### PAPERS

#### **CHARLIE PILGRIM & THOMAS T HILLS – Bias in Zipf's law estimators**

The prevailing maximum likelihood estimators for inferring power law models from rank-frequency data are biased. The source of this bias is an inappropriate likelihood function. The correct likelihood function is derived and shown to be computationally intractable. A more computationally efficient method of approximate Bayesian computation (ABC) is explored. This method is shown to have less bias for data generated from idealised rank-frequency Zipfian distributions. However, the existing estimators and the ABC estimator described here assume that words are drawn from a simple probability distribution, while language is a much more complex process. We show that this false assumption leads to continued biases when applying any of these methods to natural language to estimate Zipf exponents. We recommend that researchers be aware of the bias when investigating power laws in rank-frequency data.

<https://www.nature.com/articles/s41598-021-96214-w>

#### **KSENJA SLIVAC et al with PETER HAGOORT – Linguistic labels cue biological motion perception and misperception**

Linguistic labels exert a particularly strong top-down influence on perception. The potency of this influence has been ascribed to their ability to evoke category-diagnostic features of concepts. In doing this, they facilitate the formation of a perceptual template concordant with those features, effectively biasing perceptual activation towards the labelled category. In this study, we employ a cueing paradigm with moving, point-light stimuli across three experiments, in order to examine how the number of biological motion features (form and kinematics) encoded in lexical cues modulates the efficacy of lexical top-down influence on perception. We find that the magnitude of lexical influence on biological motion perception rises as a function of the number of biological motion-relevant features carried by both cue and target. When lexical cues encode multiple biological motion features, this influence is robust enough to mislead participants into reporting erroneous percepts, even when a masking level yielding high performance is used.

<https://www.nature.com/articles/s41598-021-96649-1>

#### **CLAUDIA REPETTO et al – Visual recognition of words learned with gestures induces motor resonance in the forearm muscles**

According to theories of Embodied Cognition, memory for words is related to sensorimotor experiences collected during learning. At a neural level, words encoded with self-performed gestures are represented in distributed sensorimotor networks that resonate during word recognition. Here, we ask whether muscles involved in gesture execution also resonate during word recognition. Native German speakers encoded words by reading them (baseline condition) or by reading them in tandem with picture observation, gesture observation, or gesture observation and execution. Surface electromyogram (EMG) activity from both arms was recorded during the word recognition task and responses were detected using eye-tracking. The recognition of words encoded with self-performed gestures coincided with an increase in arm muscle EMG activity compared to the recognition of words learned under other conditions. This finding suggests that sensorimotor networks resonate into the periphery and provides new evidence for a strongly embodied view of recognition memory.

<https://www.nature.com/articles/s41598-021-96792-9>

## **J. BRAGA et al – Cochlear shape distinguishes southern African early hominin taxa with unique auditory ecologies**

Insights into potential differences among the bony labyrinths of Plio-Pleistocene hominins may inform their evolutionary histories and sensory ecologies. We use four recently-discovered bony labyrinths from the site of Kromdraai to significantly expand the sample for *Paranthropus robustus*. Diffeomorphometry, which provides detailed information about cochlear shape, reveals size-independent differences in cochlear shape between *P. robustus* and *Australopithecus africanus* that exceed those among modern humans and the African apes. The cochlea of *P. robustus* is distinctive and relatively invariant, whereas cochlear shape in *A. africanus* is more variable, resembles that of early *Homo*, and shows a degree of morphological polymorphism comparable to that evinced by modern species. The curvature of the *P. robustus* cochlea is uniquely derived and is consistent with enhanced sensitivity to low-frequency sounds. Combined with evidence for selection, our findings suggest that sound perception shaped distinct ecological adaptations among southern African early hominins.

<https://www.nature.com/articles/s41598-021-96543-w>

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## **New Scientist**

### **NEWS**

#### **Bat pups babble like human babies do in order to practice vocalising**

Young greater sac-winged bats babble just like human babies. A detailed analysis of the sounds has shown that they share many similar features with the babbling of human babies.

<https://www.newscientist.com/article/2287410-bat-pups-babble-like-human-babies-do-in-order-to-practice-vocalising/#ixzz74hAmAoFB>

#### **Male chimps with more friends are more likely to have offspring**

It's good to be social. Male chimpanzees with more friends are more likely to father offspring – and there are at least three ways this can occur.

<https://www.newscientist.com/article/2287215-male-chimps-with-more-friends-are-more-likely-to-have-offspring/#ixzz74hByknYM>

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## **PeerJ**

### **PAPERS**

#### **RAMISH JAMIL et al – Detecting sarcasm in multi-domain datasets using convolutional neural networks and long short term memory network model**

Sarcasm emerges as a common phenomenon across social networking sites because people express their negative thoughts, hatred and opinions using positive vocabulary which makes it a challenging task to detect sarcasm. Although various studies have investigated the sarcasm detection on baseline datasets, this work is the first to detect sarcasm from a multi-domain dataset that is constructed by combining Twitter and News Headlines datasets. This study proposes a hybrid approach where the convolutional neural networks (CNN) are used for feature extraction while the long short-term memory (LSTM) is trained and tested on those features. For performance analysis, several machine learning algorithms such as random forest, support vector classifier, extra tree classifier and decision tree are used. The performance of both the proposed model and machine learning algorithms is analyzed using the term frequency-inverse document frequency, bag of words approach, and global vectors for word representations. Experimental results indicate that the proposed model surpasses the performance of the traditional machine learning algorithms with an accuracy of 91.60%. Several state-of-the-art approaches for sarcasm detection are compared with the proposed model and results suggest that the proposed model outperforms these approaches concerning the precision, recall and F1 scores. The proposed model is accurate, robust, and performs sarcasm detection on a multi-domain dataset.

<https://peerj.com/articles/cs-645/>

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## **Philosophical Transactions of the Royal Society B**

### **PAPERS**

#### **ANIRUDDH D. PATEL – Vocal learning as a preadaptation for the evolution of human beat perception and synchronization**

The human capacity to synchronize movements to an auditory beat is central to musical behaviour and to debates over the evolution of human musicality. Have humans evolved any neural specializations for music processing, or does music rely entirely on brain circuits that evolved for other reasons? The vocal learning and rhythmic synchronization hypothesis proposes that our ability to move in time with an auditory beat in a precise, predictive and tempo-flexible manner originated in the neural circuitry for complex vocal learning. In the 15 years, since the hypothesis was proposed a variety of studies have supported it. However, one study has provided a significant challenge to the hypothesis. Furthermore, it is increasingly clear that vocal learning is not a binary trait animals have or lack, but varies more continuously across species. In the light of these developments and of recent progress in the neurobiology of beat processing and of vocal learning, the current paper revises the vocal learning hypothesis. It argues that an advanced form of vocal learning acts as a preadaptation for sporadic beat perception and synchronization (BPS), providing intrinsic rewards for predicting the temporal structure of complex acoustic sequences. It further proposes that in humans, mechanisms of gene-culture coevolution transformed this preadaptation into

a genuine neural adaptation for sustained BPS. The larger significance of this proposal is that it outlines a hypothesis of cognitive gene-culture coevolution which makes testable predictions for neuroscience, cross-species studies and genetics. <https://royalsocietypublishing.org/doi/full/10.1098/rstb.2020.0326>

### **TOMAS LENC et al – Mapping between sound, brain and behaviour: four-level framework for understanding rhythm processing in humans and non-human primates**

Humans perceive and spontaneously move to one or several levels of periodic pulses (a meter, for short) when listening to musical rhythm, even when the sensory input does not provide prominent periodic cues to their temporal location. Here, we review a multi-levelled framework to understanding how external rhythmic inputs are mapped onto internally represented metric pulses. This mapping is studied using an approach to quantify and directly compare representations of metric pulses in signals corresponding to sensory inputs, neural activity and behaviour (typically body movement). Based on this approach, recent empirical evidence can be drawn together into a conceptual framework that unpacks the phenomenon of meter into four levels. Each level highlights specific functional processes that critically enable and shape the mapping from sensory input to internal meter. We discuss the nature, constraints and neural substrates of these processes, starting with fundamental mechanisms investigated in macaque monkeys that enable basic forms of mapping between simple rhythmic stimuli and internally represented metric pulse. We propose that human evolution has gradually built a robust and flexible system upon these fundamental processes, allowing more complex levels of mapping to emerge in musical behaviours. This approach opens promising avenues to understand the many facets of rhythmic behaviours across individuals and species. <https://royalsocietypublishing.org/doi/full/10.1098/rstb.2020.0325>

### **REYNA L. GORDON et al with 23ANDME RESEARCH TEAM – Linking the genomic signatures of human beat synchronization and learned song in birds**

The development of rhythmicity is foundational to communicative and social behaviours in humans and many other species, and mechanisms of synchrony could be conserved across species. The goal of the current paper is to explore evolutionary hypotheses linking vocal learning and beat synchronization through genomic approaches, testing the prediction that genetic underpinnings of birdsong also contribute to the aetiology of human interactions with musical beat structure. We combined state-of-the-art-genomic datasets that account for underlying polygenicity of these traits: birdsong genome-wide transcriptomics linked to singing in zebra finches, and a human genome-wide association study of beat synchronization. Results of competitive gene set analysis revealed that the genetic architecture of human beat synchronization is significantly enriched for birdsong genes expressed in songbird Area X (a key nucleus for vocal learning, and homologous to human basal ganglia). These findings complement ethological and neural evidence of the relationship between vocal learning and beat synchronization, supporting a framework of some degree of common genomic substrates underlying rhythm-related behaviours in two clades, humans and songbirds (the largest evolutionary radiation of vocal learners). Future cross-species approaches investigating the genetic underpinnings of beat synchronization in a broad evolutionary context are discussed. <https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2020.0329>

### **WIM POUW et al – Multilevel rhythms in multimodal communication**

It is now widely accepted that the brunt of animal communication is conducted via several modalities, e.g. acoustic and visual, either simultaneously or sequentially. This is a laudable multimodal turn relative to traditional accounts of temporal aspects of animal communication which have focused on a single modality at a time. However, the fields that are currently contributing to the study of multimodal communication are highly varied, and still largely disconnected given their sole focus on a particular level of description or their particular concern with human or non-human animals. Here, we provide an integrative overview of converging findings that show how multimodal processes occurring at neural, bodily, as well as social interactional levels each contribute uniquely to the complex rhythms that characterize communication in human and non-human animals. Though we address findings for each of these levels independently, we conclude that the most important challenge in this field is to identify how processes at these different levels connect. <https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2020.0334>

### **FLEUR L. BOUWER et al – Rhythmic abilities in humans and non-human animals: a review and recommendations from a methodological perspective**

Rhythmic behaviour is ubiquitous in both human and non-human animals, but it is unclear whether the cognitive mechanisms underlying the specific rhythmic behaviours observed in different species are related. Laboratory experiments combined with highly controlled stimuli and tasks can be very effective in probing the cognitive architecture underlying rhythmic abilities. Rhythmic abilities have been examined in the laboratory with explicit and implicit perception tasks, and with production tasks, such as sensorimotor synchronization, with stimuli ranging from isochronous sequences of artificial sounds to human music. Here, we provide an overview of experimental findings on rhythmic abilities in human and non-human animals, while critically considering the wide variety of paradigms used. We identify several gaps in what is known about rhythmic abilities. Many bird species have been tested on rhythm perception, but research on rhythm production abilities in the same birds is lacking. By contrast, research in mammals has primarily focused on rhythm production rather than perception. Many experiments also do not differentiate between possible components of rhythmic abilities, such as processing of single temporal intervals, rhythmic patterns, a regular beat or hierarchical metrical structures. For future

research, we suggest a careful choice of paradigm to aid cross-species comparisons, and a critical consideration of the multifaceted abilities that underlie rhythmic behaviour.

<https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2020.0335>

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## PLoS One

### PAPERS

#### **MICHAEL P. RICHARDS et al with JEAN-JACQUES HUBLIN – Strontium isotope evidence for Neanderthal and modern human mobility at the upper and middle palaeolithic site of Fumane Cave (Italy)**

To investigate the mobility patterns of Neanderthals and modern humans in Europe during the Middle-to-Upper Palaeolithic transition period, we applied strontium isotope analysis to Neanderthal ( $n = 3$ ) and modern human ( $n = 2$ ) teeth recovered from the site of Fumane Cave in the Monti Lessini region of Northern Italy. We also measured a large number of environmental samples from the region, to establish a strontium ‘baseline’, and also micromammals (vole teeth) from the levels associated with the hominin teeth. We found that the modern humans and Neanderthals had similar strontium isotope values, and these values match the local baseline values we obtained for the site and the surrounding region. We conclude that both groups were utilizing the local mountainous region where Fumane Cave is situated, and likely the nearby Lessini highlands and Adige plains, and therefore the strontium evidence does not show differing mobility patterns between Neanderthals and modern humans at the Fumane site.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0254848>

#### **SAMAN HEYDARI-GURAN et al with JEAN-JACQUES HUBLIN, ROBERT A. FOLEY & MARTA M. LAHR – The discovery of an in situ Neanderthal remain in the Bawa Yawan Rockshelter, West-Central Zagros Mountains, Kermanshah**

Neanderthal extinction has been a matter of debate for many years. New discoveries, better chronologies and genomic evidence have done much to clarify some of the issues. This evidence suggests that Neanderthals became extinct around 40,000–37,000 years before present (BP), after a period of coexistence with *Homo sapiens* of several millennia, involving biological and cultural interactions between the two groups. However, the bulk of this evidence relates to Western Eurasia, and recent work in Central Asia and Siberia has shown that there is considerable local variation. Southwestern Asia, despite having a number of significant Neanderthal remains, has not played a major part in the debate over extinction. Here we report a Neanderthal deciduous canine from the site of Bawa Yawan in the West-Central Zagros Mountains of Iran. The tooth is associated with Zagros Mousterian lithics, and its context is preliminary dated to between ~43,600 and ~41,500 years ago.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0253708>

#### **PAOLA VILLA et al – Elephant bones for the Middle Pleistocene toolmaker**

The use of bone as raw material for implements is documented since the Early Pleistocene. Throughout the Early and Middle Pleistocene bone tool shaping was done by percussion flaking, the same technique used for knapping stone artifacts, although bone shaping was rare compared to stone tool flaking. Until recently the generally accepted idea was that early bone technology was essentially immediate and expedient, based on single-stage operations, using available bone fragments of large to medium size animals. Only Upper Paleolithic bone tools would involve several stages of manufacture with clear evidence of primary flaking or breaking of bone to produce the kind of fragments required for different kinds of tools. Our technological and taphonomic analysis of the bone assemblage of Castel di Guido, a Middle Pleistocene site in Italy, now dated by  $40\text{Ar}/39\text{Ar}$  to about 400 ka, shows that this general idea is inexact. In spite of the fact that the number of bone bifaces at the site had been largely overestimated in previous publications, the number of verified, human-made bone tools is 98. This is the highest number of flaked bone tools made by pre-modern hominids published so far. Moreover the Castel di Guido bone assemblage is characterized by systematic production of standardized blanks (elephant diaphysis fragments) and clear diversity of tool types. Bone smoothers and intermediate pieces prove that some features of Aurignacian technology have roots that go beyond the late Mousterian, back to the Middle Pleistocene. Clearly the Castel di Guido hominids had done the first step in the process of increasing complexity of bone technology. We discuss the reasons why this innovation was not developed. The analysis of the lithic industry is done for comparison with the bone industry.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0256090>

#### **PABLO BRAÑAS-GARZA et al – Hyper-altruistic behavior vanishes with high stakes**

Using an incentivized experiment with statistical power, this paper explores the role of stakes in charitable giving of lottery prizes, where subjects commit to donate a fraction of the prize before they learn the outcome of the lottery. We study three stake levels: 5€ ( $n = 177$ ), 100€ ( $n = 168$ ), and 1,000€ ( $n = 171$ ). Although the donations increase in absolute terms as the stakes increase, subjects decrease the donated fraction of the pie. However, people still share roughly 20% of 1,000€, an amount as high as the average monthly salary of people at the age of our subjects. The number of people sharing 50% of the pie is remarkably stable across stakes, but donating the the whole pie—the modal behavior in charity-donation experiments—disappears with stakes. Such hyper-altruistic behavior thus seems to be an artifact of the stakes typically employed in economic and psychological experiments. Our findings point out that sharing with others is a prevalent human feature, but stakes are an important determinant of sharing. Policies promoted via prosocial frames (e.g., stressing the effects of mask-wearing or social distancing on others during the Covid-19 pandemic or environmentally-friendly behaviors on future generations) may thus be miscalibrated if they disregard the stakes at play.

## Royal Society Open Science

### PAPERS

#### **SHUANGMEI MA et al – Limited memory optimizes cooperation in social dilemma experiments**

Cooperation is one of the key collective behaviours of human society. Despite discoveries of several social mechanisms underpinning cooperation, relatively little is known about how our neural functions affect cooperative behaviours. Here, we study the effect of a main neural function, working-memory capacity, on cooperation in repeated Prisoner's Dilemma experiments. Our experimental paradigm overcomes the obstacles in measuring and changing subjects' working-memory capacity. We find that the optimal cooperation level occurs when subjects remember two previous rounds of information, and cooperation increases abruptly from no memory capacity to minimal memory capacity. The results can be explained by memory-based conditional cooperation of subjects. We propose evolutionary models based on replicator dynamics and Markov processes, respectively, which are in good agreement with experimental results of different memory capacities. Our experimental findings differ from previous hypotheses and predictions of existent models and theories, and suggest a neural basis and evolutionary roots of cooperation beyond cultural influences.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.210653>

#### **ALEXANDRA K. SCHNELL et al – Jays are sensitive to cognitive illusions**

Jays hide food caches, steal them from conspecifics and use tactics to minimize cache theft. Jays are sensitive to the content of their own caches, retrieving items depending on their preferences and the perishability of the cached item. Whether jays impose the same content sensitivity when they steal caches is less clear. We adapted the 'cups-and-balls' magic routine, creating a cognitive illusion to test whether jays are sensitive to the (i) content of hidden items and (ii) type of displacement. Subjects were presented with two conditions in which hidden food was consistent with their expectations; and two conditions in which food was manipulated to violate their expectations by switching their second preferred food for their preferred food (up-value) or vice versa (de-value). Subjects readily accepted food when it was consistent with their expectations but were more likely to re-inspect the baited cup and alternative cup when their expectations were violated. In the de-value condition, jays exhibited longer latencies to consume the food and often rejected it. Dominant subjects were more likely to reject the food, suggesting that social factors influence their responses to cognitive illusions. Using cognitive illusions offers innovative avenues for investigating the psychological constraints in diverse animal minds.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.202358>

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## Science

### ARTICLES

#### **CATHLEEN O'GRADY – Honesty study was based on fabricated data**

Researchers are calling behavioral science superstar Dan Ariely's large body of work into question after a 17 August blog post revealed part of an attention-getting 2012 paper about dishonesty that he co-wrote is based on fabricated data. All five study authors agree with that verdict, but Ariely's colleagues have washed their hands of responsibility for the fabrication. Ariely acknowledges that only he had handled the earliest known version of the data file, which contained the fabrications. However, he emphatically denies making up the data, saying they were collected by an insurance company, but that he no longer has records of interactions with the company that could reveal where things went awry.

<https://science.sciencemag.org/content/373/6558/950>

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## Science Advances

### PAPERS

#### **LUKA PAPAC et al with JOHANNES KRAUSE & DAVID REICH – Dynamic changes in genomic and social structures in third millennium BCE central Europe**

Europe's prehistory oversaw dynamic and complex interactions of diverse societies, hitherto unexplored at detailed regional scales. Studying 271 human genomes dated ~4900 to 1600 BCE from the European heartland, Bohemia, we reveal unprecedented genetic changes and social processes. Major migrations preceded the arrival of "steppe" ancestry, and at ~2800 BCE, three genetically and culturally differentiated groups coexisted. Corded Ware appeared by 2900 BCE, were initially genetically diverse, did not derive all steppe ancestry from known Yamnaya, and assimilated females of diverse backgrounds. Both Corded Ware and Bell Beaker groups underwent dynamic changes, involving sharp reductions and complete replacements of Y-chromosomal diversity at ~2600 and ~2400 BCE, respectively, the latter accompanied by increased Neolithic-like ancestry. The Bronze Age saw new social organization emerge amid a ≥40% population turnover.

<https://advances.sciencemag.org/content/7/35/eabi6941>

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## Trends in Cognitive Sciences

### PAPERS

#### **IGOR DOUVEN – How explanation guides belief change**

Philosophers have argued that people ought to change their graded beliefs via Bayes' rule. Recent work in psychology indicates that people sometimes violate that rule by attending to explanatory factors. Results from computational modeling suggest that such violations may actually be rational.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(21\)00179-0](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00179-0)

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