EAORC BULLETIN 866 – 19 January 2020

CONTENTS

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.

SCIENCE NEWS – Watch wolf puppies stun scientists by playing fetch

Playing fetch with your dog isn't as simple as it seems. Your pooch must be perceptive enough to realize you want the ball back—and social enough to want to play with you in the first place. It's such an advanced skill, in fact, that many scientists think it could have arisen only over thousands of years of domestication. But a new study reveals that some gray wolves—the ancestors of dogs—can also play fetch. The work supports the idea that the roots of many of the traits and behaviors we see in domesticated animals, from cats to chickens, may be present in their wild relatives.
https://www.sciencemag.org/news/2020/01/watch-wolf-puppies-stun-scientists-playing-fetch?utm_campaign=news_daily_2020-01-16&et_rid=17774313&et_cid=3167164

SOCIETY FOR SCIENCE – Homo erectus arrived in Indonesia 300,000 years later than previously thought

The extinct, humanlike hominid likely reached the island of Java by around 1.3 million years ago, a study finds.
http://click.societyforscience-email.com/?qs=d1e1597bef974cba7e16cf9f18a6f3547b0a4342fd49caa43627ba649701ae37035b2741fba3f24d6feea4188b360c505db20b74142561f0

SOCIETY FOR SCIENCE – Neandertals dove and harvested clamshells for tools near Italy's shores

The discovery of sharpened shells broadens the reputation of Stone Age human relatives: Neandertals weren't just one-trick mammoth hunters.

http://click.societyforscience-email.com/?qs=f7e5752c4515818b43c4191f9b5496d5a8985a940be23d8eb194c0291d33a470b571938c24f6a83ef6a4ba0efd211a450e9fa77c59053c70

SCIAM NEWS – In Search of the Brain's Social Road Maps

Neural circuits that track our whereabouts in space and time may also play vital roles in determining how we relate to other people

https://www.scientificamerican.com/article/in-search-of-the-brains-social-road-maps/

BREAKING SCIENCE – Music Triggers 13 Key Emotions, Says New Study

In a study published in the Proceedings of the National Academy of Sciences, an international team of researchers examined the feelings evoked by 2,168 music excerpts in the U.S. and China. Using large-scale statistical tools, the scientists uncovered 13 distinct types of subjective experience associated with music in both cultures: amusement, joy, eroticism, beauty, relaxation, [...]

http://feedproxy.google.com/~r/BreakingScienceNews/~3/UV0FD5C2KjY/music-key-emotions-08007.html?utm_source=feedburner&utm_medium=email

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BREAKING SCIENCE – Homo erectus Reached Java around 1.3 Million Years Ago

Homo erectus, a hominin species that originated in equatorial Africa or the Caucasus region of Eurasia, arrived on the island of Java in Indonesia around 1.3 million years ago — 300,000 years later than previously thought, according to an analysis of zircon grains in tuffs from the archaeological site of Sangiran.

http://feedproxy.google.com/~r/BreakingScienceNews/~3/ykL1b_ASjxA/homo-erectus-java-08013.html?utm_source=feedburner&utm_medium=email

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BREAKING SCIENCE – Seabirds Spotted Using Tools for the First Time

An international team of researchers from the University of Oxford and the South Iceland Nature Research Centre has observed two Atlantic puffins (Fratercula arctica) scratching themselves with a small wooden stick — the first known instance of wild seabirds using tools.

http://feedproxy.google.com/~r/BreakingScienceNews/~3/QNS7KhPHE24/atlantic-puffin-tool-use-08015.html?utm_source=feedburner&utm_medium=email

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BREAKING SCIENCE – Neanderthals Dived into Mediterranean Sea for Clam Shells

Shell fishing was a common activity of Neanderthals, according to new research led by University of Colorado, Boulder archaeologists. In 1949, archaeologists working at the site of Grotta dei Moscerini, a cave in the Latium region of central Italy, found a large collection of unusual artifacts: 171 shells of the smooth clam (Callista chione).

http://feedproxy.google.com/~r/BreakingScienceNews/~3/TM45vHa8ERE/shell-fishing-neanderthals-08023.html?utm_source=feedburner&utm_medium=email

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SCIENCE DAILY – Speech-disrupting brain disease reflects patients' native tongue

English and Italian speakers with dementia-related language impairment experience distinct kinds of speech and reading difficulties based on features of their native languages, according to new research by scientists at the UC San Francisco Memory and Aging Center and colleagues at the Neuroimaging Research Unit and Neurology Unit at the San Raffaele Scientific Institute in Milan.

https://www.sciencedaily.com/releases/2020/01/200110174111.htm

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SCIENCE DAILY – CLICS: World's largest database of cross-linguistic lexical associations

A team of scientists has published a new version of the Database of Cross-Linguistic Colexifications (CLICS), covering lexical associations in more than 3,100 languages varieties. The new version of the database offers lexical data on an unprecedented scale and provides a detailed, reproducible workflow for data aggregation, allowing scholars from all over the world to contribute to future versions.

https://www.sciencedaily.com/releases/2020/01/200113075832.htm

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SCIENCE DAILY – 'Marshmallow test' redux: Children who depend on each other show better self-control

The researchers say their experiments are the first to show that children are more willing to delay gratification for cooperative reasons than for individual goals.

https://www.sciencedaily.com/releases/2020/01/200114104024.htm

SCIENCE DAILY – Glimpses of fatherhood found in non-pair-bonding chimps

Although they have no way of identifying their biological fathers, male chimpanzees form intimate bonds with them, a finding that questions the idea of fatherhood in some of humanity's closest relatives, according to a study of wild chimpanzees in Uganda.

https://www.sciencedaily.com/releases/2020/01/200115140504.htm

SCIENCE DAILY – Neanderthals went underwater for their tools

Neanderthals collected clam shells and volcanic rock from the beach and coastal waters of Italy during the Middle Paleolithic, according to a new study.

https://www.sciencedaily.com/releases/2020/01/200115140458.htm

SCIENCE DAILY – How zebra finches learn to sing

Complex learning processes like speaking or singing follow similar patterns. Using the example of zebra finches, researchers have investigated how young birds imitate the courtship songs of their fathers and practice them thousands of times. The study has revealed what aspects of the song are remembered overnight, and that sleep allows the bird to optimally build upon the progress made on the previous day.

https://www.sciencedaily.com/releases/2020/01/200115120628.htm

SCIENCE DAILY – What keeps couples together

In mammals, pair bonds are very rare, one of the few exceptions being red titi monkeys. Researchers have now investigated how pair relationships work in titi monkeys. Their results support the 'male-services hypothesis': Males provide a useful service by taking more care of the offspring and defending the territory against intruders, while females are more involved in relationship management and, for example, seek the proximity of their partner more often.

https://www.sciencedaily.com/releases/2020/01/200114224455.htm

SCIENCE DAILY – Human ancestors may have eaten hard plant tissues without damaging teeth

Hard plant foods may have made up a larger part of early human ancestors' diet than currently presumed, according to a new experimental study of modern tooth enamel. The results have implications for reconstructing diet, and for our interpretation of the fossil record of human evolution, researchers said.

https://www.sciencedaily.com/releases/2020/01/200117080838.htm

SCIENCE DAILY – Scientists unexpectedly witness wolf puppies play fetch

When it comes to playing a game of fetch, many dogs are naturals. But now, researchers report that the remarkable ability to interpret human social communicative cues that enables a dog to go for a ball and then bring it back also exists in wolves.

https://www.sciencedaily.com/releases/2020/01/200116121831.htm

SCIENCE DAILY – Making sense of the self

Interoception is the awareness of our physiological states. But precisely how the brain calculates and reacts to this information remains unclear. Neuroscientists now demonstrate how the insular cortex orchestrates the process. The work represents the first steps toward understanding the neural basis of interoception, which could allow researchers to address key questions in eating disorders, obesity, drug addiction, and a host of other diseases.

https://www.sciencedaily.com/releases/2020/01/200116121651.htm

SCIENCE DAILY – 'Living fossil' may upend basic tenet of evolutionary theory

A research team has discovered the first conclusive evidence that selection may also occur at the level of the epigenome -- a term that refers to an assortment of chemical 'annotations' to the genome that determine whether, when and to what extent genes are activated -- and has done so for tens of millions of years.

https://www.sciencedaily.com/releases/2020/01/200116121837.htm

SCIENCE DAILY – Male songbirds can't survive on good looks alone

Brightly colored male songbirds not only have to attract the female's eye, but also make sure their sperm can last the distance, according to new research.

https://www.sciencedaily.com/releases/2020/01/200115191520.htm

ACADEMIA.EDU – Still Bay and Howiesons Poort Foraging Strategies

Afr Archaeol Rev (2012) 29:7–50

GRANT S. MCCALL & JONATHAN T. THOMAS – Still Bay and Howiesons Poort Foraging Strategies: Recent Research and Models of Culture Change

The Still Bay (SB) and Howiesons Poort (HP) industries, endemic to southern Africa and dating to approximately 72–59 ka, have received a great deal of archaeological attention by virtue of their striking patterns of technology and their close association with some of the earliest unambiguously symbolic objects found in southern Africa. This paper reviews recent literature concerning SB and HP lithic assemblages, faunal remains, paleoenvironmental contexts, and chronological information. It argues that SB biface-dominated technology was designed to be multifunctional and to economize lithic raw material, a strategy well-suited to foragers moving frequently across a wide range of ecological zones in which access to resources and prey encounters were unpredictable. In contrast, HP blade-based tools, using backed blades as modular components in compound weapons, were efficient and reliable hunting weapons designed for specific tasks. More costly and difficult to maintain, HP technology resulted from the targeting of known, localized, and seasonal resources through planned logistical forays. We argue that these complicated patterns of innovation represent separate cultural responses to environmental instability during Marine Isotope Stage 4 and demographic pressures in southern Africa at this time. Against the backdrop of environmental and demographic shifts, the emergence of these innovative tools and associated symbolic objects reflects distinct but quintessentially modern cultural behaviors ethnographically associated with risk reduction, reciprocity, and information sharing.

https://www.academia.edu/1988141/Still_Bay_and_Howiesons_Poort_Foraging_Strategies?auto=download

OTHER NEWS – GUARDIAN – Neanderthals dived for shells to make tools, research suggests

Study adds weight to claims that stereotype of knuckle-headed Neanderthals is wrong.

https://www.theguardian.com/science/2020/jan/15/neanderthals-dived-for-shells-to-make-tools-research-suggests?utm_term=RWRpdG9yaWFsX0xhYk5vdGVzLTIwMDExNw%3D%3D&utm_source=esp&utm_medium=Email&CMP=labnotes_email&utm_campaign=LabNotes

PUBLICATIONS

American Journal of Physical Anthropology

PAPERS

MATT CARTMILL et al with ERICA A. CARTMILL – The gaits of marsupials and the evolution of diagonal-sequence walking in primates

Terrestrial marsupials' gaits overwhelmingly plot slightly below the theoretical "horse line" (Cartmill et al., Zoological Journal of the Linnean Society. 2002;136:401–420) typical of terrestrial mammals; arboreal marsupials' gaits overwhelmingly plot more decisively above it. Both distributions are roughly parallel to the horse line, but arboreal animals exhibit increased diagonality, so that their higher-speed walking gaits overlap with those of typical primates on the Hildebrand diagram of diagonality against duty factor.

Quadrupeds avoid gaits lying exactly on the (theoretically optimum) horse line, to avoid fore/hind limb interference ("forging"). This can be accomplished by either a slight reduction in diagonality ("downshifting") or a more decisive increase ("upshifting"). Tree-dwellers adopt the second option to eliminate unilateral bipods of support from the gait cycle. The upshifted horse line represents an early phase in the evolution of primate-like diagonal-sequence gaits.

https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.23959?campaign=woletoc

SUZANNA WHITE et al – Taxonomic variation in the supraorbital region of catarrhine primates

230 3D coordinates were used to record the supraorbital morphology of two datasets: one containing 460 non-hominin catarrhine primates from species and subspecies of Gorilla, Pan, Papio, and Macaca; and the other containing 55 Pleistocene hominins from Homo, Australopithecus, and Paranthropus. Principal component analyses in tangent, form, and allometry-free shape space were used to assess differentiation of taxa, with biological distinctiveness of taxa being established using step-wise discriminant analysis with subsampling.

This study indicates that the supraorbital region preserves taxonomic information that can be used to delineate between closely related groups, both within hominins and wider catarrhine primates. Therefore, this region may be used to provide insight when assessing the taxonomic affiliation of disputed hominin specimens.

https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.23975?campaign=woletoc

REBEKA RMOUTILOVÁ et al – A case of marked bilateral asymmetry in the sacral alae of the Neandertal specimen Regourdou 1 (Périgord, France)

A marked asymmetry was previously reported in the sacral alae and S1-L5 facets orientation of the Neandertal individual Regourdou 1. Here, we provide a detailed description and quantification of the morphology and degree of asymmetry of this sacrum.

Regourdou 1 was compared to a modern human sample composed of 24 females and 17 males, and to other Neandertal individuals. Both traditional and geometric morphometric analyses were used in order to quantify the degree of sacral asymmetry of Regourdou 1.

The asymmetry of both sacral alae and facets orientation substantially exceeds directional and absolute asymmetry of the healthy modern sample. Regourdou 1 shows a considerably shorter right ala, which is absolutely and relatively outside of the modern and Neandertal variations.
https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.23968?campaign=woletoc

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Interface: Journal of the Royal Society

PAPERS

ALASTAIR KEY, TOMOS PROFFITT & IGNACIO DE LA TORRE – Raw material optimization and stone tool engineering in the Early Stone Age of Olduvai Gorge (Tanzania)

For more than 1.8 million years hominins at Olduvai Gorge were faced with a choice: whether to use lavas, quartzite or chert to produce stone tools. All are available locally and all are suitable for stone tool production. Using controlled cutting tests and fracture mechanics theory we examine raw material selection decisions throughout Olduvai's Early Stone Age. We quantify the force, work and material deformation required by each stone type when cutting, before using these data to compare edge sharpness and durability. Significant differences are identified, confirming performance to depend on raw material choice. When combined with artefact data, we demonstrate that Early Stone Age hominins optimized raw material choices based on functional performance characteristics. Doing so flexibly: choosing raw materials dependent on their sharpness and durability, alongside a tool's loading potential and anticipated use-life. In this way, we demonstrate that early lithic artefacts at Olduvai Gorge were engineered to be functionally optimized cutting tools.
https://royalsocietypublishing.org/doi/full/10.1098/rsif.2019.0377

CHRISTOPHER K. TOKITA & CORINA E. TARNITA – Social influence and interaction bias can drive emergent behavioural specialization and modular social networks across systems

In social systems ranging from ant colonies to human society, behavioural specialization—consistent individual differences in behaviour—is commonplace: individuals can specialize in the tasks they perform (division of labour (DOL)), the political behaviour they exhibit (political polarization) or the non-task behaviours they exhibit (personalities). Across these contexts, behavioural specialization often co-occurs with modular and assortative social networks, such that individuals tend to associate with others that have the same behavioural specialization. This raises the question of whether a common mechanism could drive co-emergent behavioural specialization and social network structure across contexts. To investigate this question, here we extend a model of self-organized DOL to account for social influence and interaction bias among individuals—social dynamics that have been shown to drive political polarization. We find that these same social dynamics can also drive emergent DOL by forming a feedback loop that reinforces behavioural differences between individuals, a feedback loop that is impacted by group size. Moreover, this feedback loop also results in modular and assortative social network structure, whereby individuals associate strongly with those performing the same task. Our findings suggest that DOL and political polarization—two social phenomena not typically considered together—may actually share a common social mechanism. This mechanism may result in social organization in many contexts beyond task performance and political behaviour.
https://royalsocietypublishing.org/doi/full/10.1098/rsif.2019.0564

Journal of Child Language

PAPERS

STEVEN L. ELMLINGER, JENNIFER A. SCHWADE & MICHAEL H. GOLDSTEIN – The ecology of prelinguistic vocal learning: parents simplify the structure of their speech in response to babbling

What is the function of babbling in language learning? We examined the structure of parental speech as a function of contingency on infants' non-cry prelinguistic vocalizations. We analyzed several acoustic and linguistic measures of caregivers' speech. Contingent speech was less lexically diverse and shorter in utterance length than non-contingent speech. We also found that the lexical diversity of contingent parental speech only predicted infant vocal maturity. These findings illustrate a new form of influence infants have over their ambient language in everyday learning environments. By vocalizing, infants catalyze the production of simplified, more easily learnable language from caregivers.
https://www.cambridge.org/core/journals/journal-of-child-language/article/ecology-of-prelinguistic-vocal-learning-parents-simplify-the-structure-of-their-speech-in-response-to-babbling/FA82E5857B22DDD5480E864E980029ED?utm_source=SFMC&utm_medium=email&utm_content=The+ecology+of+prelinguistic+vocal+learning%3a+parents+simplify+the+structure+of+their+speech+in+response+to+babbling&utm_campaign=JXM-JCL-most-downloaded-2019&WT.mc_id=JXM-JCL-most-downloaded-2019

FRANZISKA KÖDER & EMAR MAIER – The advantage of story-telling: children's interpretation of reported speech in narratives

Children struggle with the interpretation of pronouns in direct speech (Ann said, "I get a cookie"), but not in indirect speech (Ann said that she gets a cookie) (Köder & Maier, 2016). Yet children's books consistently favor direct over indirect speech (Baker & Freebody, 1989). To reconcile these seemingly contradictory findings, we hypothesize that the poor performance found by Köder and Maier (2016) is due to the information-transmission setting of that experiment, and that a narrative setting facilitates children's processing of direct speech. We tested 42 Dutch children (4;1–7;2) and 20 adults with a modified

version of Köder and Maier's referent selection task, where participants interpret speech reports in an interactive story book. Results confirm our hypothesis: children are much better at interpreting pronouns in direct speech in such a narrative setting than they were in an information-transmission setting. This indicates that the pragmatic context of reports affects their processing effort.
https://www.cambridge.org/core/journals/journal-of-child-language/article/advantage-of-storytelling-childrens-interpretation-of-reported-speech-in-narratives/AD7AEE3237FC94552519810A3C74B0C9?utm_source=SFMC&utm_medium=email&utm_content=The+advantage+of+story-telling%3a+children%26amp%3b%23x27%3bs+interpretation+of+reported+speech+in+narratives&utm_campaign=JXM-JCL-most-downloaded-2019&WT.mc_id=JXM-JCL-most-downloaded-2019

Language and Cognition

PAPERS

MARK DINGEMANSE & BILL THOMPSON – Playful iconicity: structural markedness underlies the relation between funniness and iconicity

Words like 'waddle', 'flop', and 'zigzag' combine playful connotations with iconic form–meaning resemblances. Here we propose that structural markedness may be a common factor underlying perceptions of playfulness and iconicity. Using collected and estimated lexical ratings covering a total of over 70,000 English words, we assess the robustness of this association. We identify cues of phonotactic complexity that covary with funniness and iconicity ratings and that, we propose, serve as metacommunicative signals to draw attention to words as playful and performative. To assess the generalisability of the findings we develop a method to estimate lexical ratings from distributional semantics and apply it to a dataset 20 times the size of the original set of human ratings. The method can be used more generally to extend coverage of lexical ratings. We find that it reliably reproduces correlations between funniness and iconicity as well as cues of structural markedness, though it also amplifies biases present in the human ratings. Our study shows that the playful and the poetic are part of the very texture of the lexicon.
https://www.cambridge.org/core/journals/language-and-cognition/article/playful-iconicity-structural-markedness-underlies-the-relation-between-funniness-and-iconicity/D67777B04B2F367193944F638318EEB2

Nature

PAPERS

YAN RIZAL et al – Last appearance of Homo erectus at Ngandong, Java, 117,000–108,000 years ago

Homo erectus is the founding early hominin species of Island Southeast Asia, and reached Java (Indonesia) more than 1.5 million years ago. Twelve H. erectus calvaria (skull caps) and two tibiae (lower leg bones) were discovered from a bone bed located about 20 m above the Solo River at Ngandong (Central Java) between 1931 and 1933, and are of the youngest, most-advanced form of H. erectus. Despite the importance of the Ngandong fossils, the relationship between the fossils, terrace fill and ages have been heavily debated. Here, to resolve the age of the Ngandong evidence, we use Bayesian modelling of 52 radiometric age estimates to establish—to our knowledge—the first robust chronology at regional, valley and local scales. We used uranium-series dating of speleothems to constrain regional landscape evolution; luminescence, 40argon/39argon (40Ar/39Ar) and uranium-series dating to constrain the sequence of terrace evolution; and applied uranium-series and uranium series–electron-spin resonance (US–ESR) dating to non-human fossils to directly date our re-excavation of Ngandong. We show that at least by 500 thousand years ago (ka) the Solo River was diverted into the Kendeng Hills, and that it formed the Solo terrace sequence between 316 and 31 ka and the Ngandong terrace between about 140 and 92 ka. Non-human fossils recovered during the re-excavation of Ngandong date to between 109 and 106 ka (uranium-series minimum)16 and 134 and 118 ka (US–ESR), with modelled ages of 117 to 108 thousand years (kyr) for the H. erectus bone bed, which accumulated during flood conditions. These results negate the extreme ages that have been proposed for the site and solidify Ngandong as the last known occurrence of this long-lived species.
https://www.nature.com/articles/s41586-019-1863-2

Nature Scientific Reports

PAPERS

SHINTARO ISHIZUKA et al – Comparisons of between-group differentiation in male kinship between bonobos and chimpanzees

Patterns of kinship among individuals in different groups have been rarely examined in animals. Two closest living relatives of humans, bonobos and chimpanzees share many characteristics of social systems including male philopatry, whereas one major difference between the two species is the nature of intergroup relationship. Intergroup relationship is basically antagonistic and males sometimes kill individuals of other groups in chimpanzees, whereas it is much more moderate in bonobos and copulations between individuals of different groups are often observed during intergroup encounters. Such behavioural differences may facilitate more frequent between-group male gene flow and greater between-group differentiation in male kinship in bonobos than in chimpanzees. Here we compared differences between average relatedness among males within groups and that among males of neighbouring groups, and between-group male genetic distance

between bonobos and chimpanzees. Contrary to expectation, the differences between average relatedness among males within groups and that among males of neighbouring groups were significantly greater in bonobos than in chimpanzees. There were no significant differences in autosomal and Y-chromosomal between-group male genetic distance between the two species. Our results showed that intergroup male kinship is similarly or more differentiated in bonobos than in chimpanzees.
https://www.nature.com/articles/s41598-019-57133-z

PeerJ

PAPERS

HAOQI LI, BRIAN BAUCOM & PANAYIOTIS GEORGIOU – Linking emotions to behaviors through deep transfer learning
Human behavior refers to the way humans act and interact. Understanding human behavior is a cornerstone of observational practice, especially in psychotherapy. An important cue of behavior analysis is the dynamical changes of emotions during the conversation. Domain experts integrate emotional information in a highly nonlinear manner; thus, it is challenging to explicitly quantify the relationship between emotions and behaviors. In this work, we employ deep transfer learning to analyze their inferential capacity and contextual importance. We first train a network to quantify emotions from acoustic signals and then use information from the emotion recognition network as features for behavior recognition. We treat this emotion-related information as behavioral primitives and further train higher level layers towards behavior quantification. Through our analysis, we find that emotion-related information is an important cue for behavior recognition. Further, we investigate the importance of emotional-context in the expression of behavior by constraining (or not) the neural networks' contextual view of the data. This demonstrates that the sequence of emotions is critical in behavior expression. To achieve these frameworks we employ hybrid architectures of convolutional networks and recurrent networks to extract emotion-related behavior primitives and facilitate automatic behavior recognition from speech.
https://peerj.com/articles/cs-246/

PLoS One

PAPERS

PAOLA VILLA et al – Neandertals on the beach: Use of marine resources at Grotta dei Moscerini (Latium, Italy)
Excavated in 1949, Grotta dei Moscerini, dated MIS 5 to early MIS 4, is one of two Italian Neandertal sites with a large assemblage of retouched shells (n = 171) from 21 layers. The other occurrence is from the broadly contemporaneous layer L of Grotta del Cavallo in southern Italy (n = 126). Eight other Mousterian sites in Italy and one in Greece also have shell tools but in a very small number. The shell tools are made on valves of the smooth clam Callista chione. The general idea that the valves of Callista chione were collected by Neandertals on the beach after the death of the mollusk is incomplete. At Moscerini 23.9% of the specimens were gathered directly from the sea floor as live animals by skin diving Neandertals. Archaeological data from sites in Italy, France and Spain confirm that shell fishing and fresh water fishing was a common activity of Neandertals, as indicated by anatomical studies recently published by E. Trinkaus. Lithic analysis provides data to show the relation between stone tools and shell tools. Several layers contain pumices derived from volcanic eruptions in the Ischia Island or the Campi Flegrei (prior to the Campanian Ignimbrite mega-eruption). Their rounded edges indicate that they were transported by sea currents to the beach at the base of the Moscerini sequence. Their presence in the occupation layers above the beach is discussed. The most plausible hypothesis is that they were collected by Neandertals. Incontrovertible evidence that Neandertals collected pumices is provided by a cave in Liguria. Use of pumices as abraders is well documented in the Upper Paleolithic. We prove that the exploitation of submerged aquatic resources and the collection of pumices common in the Upper Paleolithic were part of Neandertal behavior well before the arrival of modern humans in Western Europe.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0226690

DIETMAR CRAILSHEIM et al – Early life experience and alterations of group composition shape the social grooming networks of former pet and entertainment chimpanzees (Pan troglodytes)
The long-term effects of early life adversities on social capacities have been documented in humans and wild-caught former laboratory chimpanzees (Pan troglodytes). However, former pet and entertainment chimpanzees have received little attention to date. This study aimed to investigate the long-term effects of early life experience on 18 former pet and entertainment chimpanzees, based on social grooming data collected at a primate rescue centre over a 12-year period. Moreover, we also focused on the possible short-term effects that alterations to group composition might have on grooming patterns. For this purpose, we compared stable and unstable periods (i.e. where alterations to group composition occurred). We used two individual social network measures to analyse the grooming activity and the distribution of grooming among group mates for each individual. We could show that wild-caught chimpanzees were significantly more selective regarding their grooming partners and spent less time grooming when compared to their captive born companions. We also found that individuals who were predominantly housed without conspecifics during infancy spent less time grooming compared to those who were predominantly housed with conspecifics during infancy. Furthermore, we found that alterations to the group composition had short-term effects on the distribution of social grooming from a more equal distribution during periods with a stable group composition towards a more unequal and selective distribution during unstable periods. Thus, we conclude

that the social grooming networks of former pet and entertainment chimpanzees are shaped not only by long-term effects such as early life experience, but also by short-term effects such as alterations to group composition. Remarkably, we found not only captive born chimpanzees but also wild-caught individuals to adjust their grooming to socially challenging situations by modifying their grooming distribution in a similar way.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0226947

PNAS

ARTICLES

ANDREW WHITEN – Wild chimpanzees scaffold youngsters' learning in a high-tech community
Across human history, the spiraling complexities of our technologies have been accompanied by a progressive elaboration in the schooling necessary to instill the skills that increasingly technological societies require. Among peoples who still subsist by foraging for wild foodstuffs using a toolkit that can be carried on one's back, there is much to learn (1), but extensive formal schooling is unnecessary, as seems likely for our species' long hunting and gathering past. By contrast, children in the societies that read this journal experience over a decade of schooling, and technical apprenticeships often last many years. Ape technologies, although much simpler than our own, also have been found, in recent years, to show much regional variation in complexity. Some populations display unimagined levels of sophistication in their manufacture and use of tools (2), significantly exceeding the complexity seen in other communities (3). Comparing 2 such relatively high-tech and low-tech communities, Musgrave et al. (4) report in PNAS that, by analogy with the human technology–education linkages sketched above, young chimpanzees' social learning is more highly structured in the high-tech population, differing especially in the ways mothers offer costly support to the efforts of their offspring, which the authors class as an elementary form of teaching.
https://www.pnas.org/content/117/2/802?etoc=

PAPERS

YUKO HATTORI & MASAKI TOMONAGA – Rhythmic swaying induced by sound in chimpanzees (Pan troglodytes)
Music and dance are universal across human culture and have an ancient history. One characteristic of music is its strong influence on movement. For example, an auditory beat induces rhythmic movement with positive emotions in humans from early developmental stages. In this study, we investigated if sound induced spontaneous rhythmic movement in chimpanzees. Three experiments showed that: 1) an auditory beat induced rhythmic swaying and other rhythmic movements, with larger responses from male chimpanzees than female chimpanzees; 2) random beat as well as regular beat induced rhythmic swaying and beat tempo affected movement periodicity in a chimpanzee in a bipedal posture; and 3) a chimpanzee showed close proximity to the sound source while hearing auditory stimuli. The finding that male chimpanzees showed a larger response to sound than female chimpanzees was consistent with previous literature about "rain dances" in the wild, where male chimpanzees engage in rhythmic displays when hearing the sound of rain starting. The fact that rhythmic swaying was induced regardless of beat regularity may be a critical difference from humans, and a further study should reveal the physiological properties of sound that induce rhythmic movements in chimpanzees. These results suggest some biological foundation for dancing existed in the common ancestor of humans and chimpanzees ∼6 million years ago. As such, this study supports the evolutionary origins of musicality.
https://www.pnas.org/content/117/2/936.abstract?etoc

YILU WANG et al – Altruistic behaviors relieve physical pain
Engaging in altruistic behaviors is costly, but it contributes to the health and well-being of the performer of such behaviors. The present research offers a take on how this paradox can be understood. Across 2 pilot studies and 3 experiments, we showed a pain-relieving effect of performing altruistic behaviors. Acting altruistically relieved not only acutely induced physical pain among healthy adults but also chronic pain among cancer patients. Using functional MRI, we found that after individuals performed altruistic actions brain activity in the dorsal anterior cingulate cortex and bilateral insula in response to a painful shock was significantly reduced. This reduced pain-induced activation in the right insula was mediated by the neural activity in the ventral medial prefrontal cortex (VMPFC), while the activation of the VMPFC was positively correlated with the performer's experienced meaningfulness from his or her altruistic behavior. Our findings suggest that incurring personal costs to help others may buffer the performers from unpleasant conditions.
https://www.pnas.org/content/117/2/950.abstract?etoc

STEPHANIE MUSGRAVE, ELIZABETH LONSDORF et al with CRICKETTE SANZ – Teaching varies with task complexity in wild chimpanzees
Cumulative culture is a transformative force in human evolution, but the social underpinnings of this capacity are debated. Identifying social influences on how chimpanzees acquire tool tasks of differing complexity may help illuminate the evolutionary origins of technology in our own lineage. Humans routinely transfer tools to novices to scaffold their skill development. While tool transfers occur in wild chimpanzees and fulfill criteria for teaching, it is unknown whether this form of helping varies between populations and across tasks. Applying standardized methods, we compared tool transfers during termite gathering by chimpanzees in the Goualougo Triangle, Republic of Congo, and in Gombe, Tanzania. At Goualougo, chimpanzees use multiple, different tool types sequentially, choose specific raw materials, and perform modifications that improve tool efficiency, which could make it challenging for novices to manufacture suitable tools. Termite gathering at

Gombe involves a single tool type, fishing probes, which can be manufactured from various materials. Multiple measures indicated population differences in tool-transfer behavior. The rate of transfers and probability of transfer upon request were significantly higher at Goualougo, while resistance to transfers was significantly higher at Gombe. Active transfers of tools in which possessors moved to facilitate possession change upon request occurred only at Goualougo, where they were the most common transfer type. At Gombe, tool requests were typically refused. We suggest that these population differences in tool-transfer behavior may relate to task complexity and that active helping plays an enhanced role in the cultural transmission of complex technology in wild apes.
https://www.pnas.org/content/117/2/969.abstract?etoc

Proceedings of the Royal Society B

PAPERS

ANNIKA SCHIRMER et al – My niche: individual spatial niche specialization affects within- and between-species interactions

Intraspecific trait variation is an important determinant of fundamental ecological interactions. Many of these interactions are mediated by behaviour. Therefore, interindividual differences in behaviour should contribute to individual niche specialization. Comparable with variation in morphological traits, behavioural differentiation between individuals should limit similarity among competitors and thus act as a mechanism maintaining within-species variation in ecological niches and facilitating species coexistence. Here, we aimed to test whether interindividual differences in boldness covary with spatial interactions within and between two ecologically similar, co-occurring rodent species (Myodes glareolus, Apodemus agrarius). In five subpopulations in northeast Germany, we quantified individual differences in boldness via repeated standardized tests and spatial interaction patterns via capture–mark–recapture (n = 126) and automated VHF telemetry (n = 36). We found that boldness varied with space use in both species. Individuals of the same population occupied different spatial niches, which resulted in non-random patterns of within- and between-species spatial interactions. Behavioural types mainly differed in the relative importance of intra- versus interspecific competition. Within-species variation along this competition gradient could contribute to maintaining individual niche specialization. Moreover, behavioural differentiation between individuals limits similarity among competitors, which might facilitate the coexistence of functionally equivalent species and, thus, affect community dynamics and local biodiversity.
https://royalsocietypublishing.org/doi/full/10.1098/rspb.2019.2211

MANON K. SCHWEINFURTH & MICHAEL TABORSKY – Rats play tit-for-tat instead of integrating social experience over multiple interactions

Theoretical models of cooperation typically assume that agents use simple rules based on last encounters, such as 'tit-for-tat', to reciprocate help. By contrast, empiricists generally suppose that animals integrate multiple experiences over longer timespans. Here, we compared these two alternative hypotheses by exposing Norway rats to partners that cooperated on three consecutive days but failed to cooperate on the fourth day, and to partners that did the exact opposite. In additional controls, focal rats experienced cooperating and defecting partners only once. In a bar-pulling setup, focal rats based their decision to provide partners with food on last encounters instead of overall cooperation levels. To check whether this might be owing to a lack of memory capacity, we tested whether rats remember the outcome of encounters that had happened three days before. Cooperation was not diminished by the intermediate time interval. We conclude that rats reciprocate help mainly based on most recent encounters instead of integrating social experience over longer timespans.
https://royalsocietypublishing.org/doi/full/10.1098/rspb.2019.2423

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PAPERS

ANASTASIA KRASHENINNIKOVA et al – Assessing African grey parrots' prosocial tendencies in a token choice paradigm

Prosociality is defined as a voluntary, typically low-cost behaviour that benefits another individual. Social tolerance has been proposed as a potential driver for its evolution, both on the proximate and on the ultimate level. Parrots are an interesting species to study such other-regarding behaviours, given that they are highly social and stand out in terms of relative brain size and cognitive capacity. We tested eight African grey parrots in a dyadic prosocial choice test. They faced a choice between two different tokens, a prosocial (actor and partner rewarded) and a selfish (only actor rewarded) one. We found that the birds did not behave prosocially when one subject remained in the actor role; however, when roles were alternated, the birds' prosocial choices increased. The birds also seemed to reciprocate their partner's choices, given that a contingency between choices was observed. If the food provisioned to the partner was of higher quality than that the actor obtained, actors increased their willingness to provide food to their partner. Nonetheless, the control conditions suggest that the parrots did not fully understand the task's contingencies. In sum, African grey parrots show the potential for prosociality and reciprocity; however, considering their lack of understanding of the contingencies of the particular tasks used in this study, the underlying motivation for the observed behaviour remains to be addressed by future studies, in order to elucidate the phylogenetic distribution of prosociality further.
https://royalsocietypublishing.org/doi/full/10.1098/rsos.190696

SUBEKSHYA BIDARI , ORIT PELEG & ZACHARY P. KILPATRICK – Social inhibition maintains adaptivity and consensus of honeybees foraging in dynamic environments

To effectively forage in natural environments, organisms must adapt to changes in the quality and yield of food sources across multiple timescales. Individuals foraging in groups act based on both their private observations and the opinions of their neighbours. How do these information sources interact in changing environments? We address this problem in the context of honeybee colonies whose inhibitory social interactions promote adaptivity and consensus needed for effective foraging. Individual and social interactions within a mathematical model of collective decisions shape the nutrition yield of a group foraging from feeders with temporally switching quality. Social interactions improve foraging from a single feeder if temporal switching is fast or feeder quality is low. When the colony chooses from multiple feeders, the most beneficial form of social interaction is direct switching, whereby bees flip the opinion of nest-mates foraging at lower-yielding feeders. Model linearization shows that effective social interactions increase the fraction of the colony at the correct feeder (consensus) and the rate at which bees reach that feeder (adaptivity). Our mathematical framework allows us to compare a suite of social inhibition mechanisms, suggesting experimental protocols for revealing effective colony foraging strategies in dynamic environments.

https://royalsocietypublishing.org/doi/full/10.1098/rsos.191681

PHILIP GREULICH et al – Stability and steady state of complex cooperative systems: a diakoptic approach

Cooperative dynamics are common in ecology and population dynamics. However, their commonly high degree of complexity with a large number of coupled degrees of freedom renders them difficult to analyse. Here, we present a graph-theoretical criterion, via a diakoptic approach (divide-and-conquer) to determine a cooperative system's stability by decomposing the system's dependence graph into its strongly connected components (SCCs). In particular, we show that a linear cooperative system is Lyapunov stable if the SCCs of the associated dependence graph all have non-positive dominant eigenvalues, and if no SCCs which have dominant eigenvalue zero are connected by a path.

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