

CONTENTS

NOTICES	2
PUBLICATION ALERTS.....	2
SCIENCE NEWS – Mysterious Australian rock art may depict the chaos following rising seas.....	2
SOCIETY FOR SCIENCE – A new genetic analysis reveals that modern Africans have some Neandertal DNA.....	2
SOCIETY FOR SCIENCE – Wasp nests provide the key to dating 12,000-year-old Aboriginal rock art.....	2
BREAKING SCIENCE – Wild Gray Seals Filmed Clapping Underwater.....	2
BREAKING SCIENCE – Ancient Nests of Mud Wasps Used to Date Australian Aboriginal Rock Art.....	2
SCIENCE DAILY – 'Parentese' helps parents, babies make 'conversation' and boosts language development.....	3
SCIENCE DAILY – Grey seals discovered clapping underwater to communicate.....	3
SCIENCE DAILY – Altruistic babies? Infants are willing to give up food, help others.....	3
SCIENCE DAILY – 9,900-year-old Mexican female skeleton distinct from other early American settlers.....	3
SCIENCE DAILY – Wasp nests used to date ancient Kimberley rock art.....	3
SCIENCE DAILY – Breathing may change your mind about free will.....	3
ACADEMIA.EDU – Stone tools for the hunt.....	3
PAOLA VILLA et al – Stone tools for the hunt: points with impact scars from a Middle Paleolithic site in southern Italy.....	3
OTHER NEWS – INDEPENDENT – Penguin language obeys same rules as human speech, researchers say.....	3
PUBLICATIONS	3
Frontiers in Psychology.....	3
PAPERS	3
XINYU NIE et al – Nudging Altruism by Color: Blue or Red?.....	3
ANDREA BENDER – What Early Sapiens Cognition Can Teach Us: Untangling Cultural Influences on Human Cognition Across Time.....	4
MARTIN HASPELMATH – Human Linguisticity and the Building Blocks of Languages.....	4
ANNA BELFER-COHEN & ERELLA HOVERS – Prehistoric Perspectives on “Others” and “Strangers”.....	4
Mind & Language.....	5
PAPERS	5
OLLE BLOMBERG – Intentional cooperation and acting as part of a single body.....	5
Nature Communications.....	5
PAPERS	5
CARLA HANDLEY & SARAH MATHEW – Human large-scale cooperation as a product of competition between cultural groups.....	5
HELEN M. DITZ & ANDREAS NIEDER – Format-dependent and format-independent representation of sequential and simultaneous numerosity in the crow endbrain.....	5
MATTHEW J. HASENJAGER, WILLIAM HOPPITT & ELLOUISE LEADBEATER – Network-based diffusion analysis reveals context-specific dominance of dance communication in foraging honeybees.....	5
Nature Scientific Reports.....	5
PAPERS	5
RODOLFO CORTES BARRAGAN, RECHELE BROOKS & ANDREW N. MELTZOFF – Altruistic food sharing behavior by human infants after a hunger manipulation.....	5
DENA J. CLINK, ABDUL HAMID AHMAD & HOLGER KLINCK – Gibbons aren’t singing in the rain: presence and amount of rainfall influences ape calling behavior in Sabah, Malaysia.....	6
PNAS.....	6
PAPERS	6
MICHAEL HAHN, DAN JURAFSKY & RICHARD FUTRELL – Universals of word order reflect optimization of grammars for efficient communication.....	6
JOHN E. KUTZBACH et al – African climate response to orbital and glacial forcing in 140,000-y simulation with implications for early modern human environments.....	6
DARREN REBAR et al – An evolutionary switch from sibling rivalry to sibling cooperation, caused by a sustained loss of parental care.....	6
DAVID A. LEOPOLD & RICHARD J. KRAUZLIS – How the brain pays attention to others’ attention.....	7
MEIKE T. WORTEL et al – Continual evolution through coupled fast and slow feedbacks.....	7
Royal Society Open Science.....	7
PAPERS	7
ANASTASIA KRASHENINNIKOVA et al – Assessing African grey parrots’ prosocial tendencies in a token choice paradigm.....	7
PHILIP GREULICH et al – Stability and steady state of complex cooperative systems: a diakoptic approach.....	8
SOFYA DOLOTOVSKAYA, SARAH WALKER & ECKHARD W. HEYMANN – What makes a pair bond in a Neotropical primate: female and male contributions.....	8

ERHAO GE et al – Large-scale cooperation driven by reputation, not fear of divine punishment	8
SARAH F. V. EITELJOERGE et al – Consistency of co-occurring actions influences young children’s word learning.....	8
PÉTER RÁCZ et al – Usage frequency and lexical class determine the evolution of kinship terms in Indo-European.....	9
SARAH E. KOOPMAN et al with STEVEN T. PIANTADOSI – One-to-one correspondence without language	9
VICTORIA E. LEE et al – Social learning about dangerous people by wild jackdaws	9
EAMONN FERGUSON et al – To help or punish in the face of unfairness: men and women prefer mutually-beneficial strategies over punishment in a sexual selection context	9
Science Advances.....	9
PAPERS.....	9
DAMIEN FINCH et al – 12,000-year-old Aboriginal rock art from the Kimberley region, Western Australia	9
To subscribe to the EAORC Bulletin	10
To unsubscribe from the EAORC Bulletin	10
Produced by and for the EAORC email group	10

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 – Mysterious Australian rock art may depict the chaos following rising seas

When lost Australian rancher Joseph Bradshaw stumbled across dancing, mulberry-colored figures painted on a rock shelter in the northwestern Kimberly region in 1891, he was mesmerized: They looked like no rock art he had seen before. Since then, the slender, detailed figures—now known as Gwions—have puzzled archaeologists, who didn’t know when they were painted or by whom. Now, scientists have used tiny specks of charcoal in fossilized wasp nests to come up with a new date for the paintings: 12,000 years ago.

https://www.sciencemag.org/news/2020/02/mysterious-australian-rock-art-may-depict-chaos-following-rising-seas?utm_campaign=news_daily_2020-02-05&et rid=17774313&et cid=3195007

SOCIETY FOR SCIENCE – A new genetic analysis reveals that modern Africans have some Neandertal DNA

Humans migrating back to Africa brought genetic material from humans’ extinct Neandertal relatives along for the ride.

<http://click.societyforscience->

[email.com/?qs=0175954f159f1decf0c220c604c89f2f198a7fa2c43caf3ebcf67ed058060202cafdb4b3310bbf7b397fe55f109c089b78819afc0a2839ee](http://click.societyforscience-email.com/?qs=0175954f159f1decf0c220c604c89f2f198a7fa2c43caf3ebcf67ed058060202cafdb4b3310bbf7b397fe55f109c089b78819afc0a2839ee)

SOCIETY FOR SCIENCE – Wasp nests provide the key to dating 12,000-year-old Aboriginal rock art

Dating wasp nest remnants found beneath and atop painted rock art in Australia suggests the pictures were made some 5,000 years later than thought.

<http://click.societyforscience->

[email.com/?qs=df49696a1d596f1ea40226975fd408d78686b0b28b2dbd81ab567a406bb38f52e4e9fa9ea432398f71b0b16038ac4ee220697b4bf7550ff5](http://click.societyforscience-email.com/?qs=df49696a1d596f1ea40226975fd408d78686b0b28b2dbd81ab567a406bb38f52e4e9fa9ea432398f71b0b16038ac4ee220697b4bf7550ff5)

BREAKING SCIENCE – Wild Gray Seals Filmed Clapping Underwater

A video recorded underwater by marine biologists shows a gray seal (*Halichoerus grypus*) clapping in the wild, producing a gunshot-like ‘crack.’ “The discovery of ‘clapping seals’ might not seem that surprising, after all, they’re famous for clapping in zoos and aquaria,” said Dr. David Hocking, a researcher in the School of Biological Sciences at Monash.

http://feedproxy.google.com/~r/BreakingScienceNews/~3/ctAjE6jdpSk/wild-gray-seals-clapping-underwater-08085.html?utm_source=feedburner&utm_medium=email

BREAKING SCIENCE – Ancient Nests of Mud Wasps Used to Date Australian Aboriginal Rock Art

Mud wasp nests have helped establish a date for the Gwion Gwion rock art in the Kimberley region of Western Australia. “The Kimberley region hosts thousands of rock art sites with some earlier depictions in a remarkably good state of preservation,” said Professor Peter Veth, from the Centre for Rock Art Research and Management at the University of Western Australia.

http://feedproxy.google.com/~r/BreakingScienceNews/~3/7jTgYwJvS4/gwion-gwion-rock-art-08099.html?utm_source=feedburner&utm_medium=email

SCIENCE DAILY – 'Parentese' helps parents, babies make 'conversation' and boosts language development

A new study finds the value of using 'parentese,' an exaggerated speaking style that conveys total engagement with a child.

<https://www.sciencedaily.com/releases/2020/02/200203151158.htm>

SCIENCE DAILY – Grey seals discovered clapping underwater to communicate

Wild grey seals can clap their flippers underwater during breeding season.

<https://www.sciencedaily.com/releases/2020/02/200203104510.htm>

SCIENCE DAILY – Altruistic babies? Infants are willing to give up food, help others

New research finds that altruism may begin in infancy. In a study of nearly 100 19-month-olds, researchers found that children, even when hungry, gave a tasty snack to a stranger in need.

<https://www.sciencedaily.com/releases/2020/02/200204091354.htm>

SCIENCE DAILY – 9,900-year-old Mexican female skeleton distinct from other early American settlers

A new skeleton discovered in the submerged caves at Tulum sheds new light on the earliest settlers of Mexico.

<https://www.sciencedaily.com/releases/2020/02/200205143351.htm>

SCIENCE DAILY – Wasp nests used to date ancient Kimberley rock art

Mud wasp nests collected from Kimberley sites with the permission of traditional owners help scientists establish ancient art rock unique to the area is 12,000 years old not 17,000 years old.

<https://www.sciencedaily.com/releases/2020/02/200206102717.htm>

SCIENCE DAILY – Breathing may change your mind about free will

Is free will just an illusion? For decades, a signal from the brain called the 'readiness potential' has been interpreted to mean that free will may be an illusion. Backed by signals from the brain and lungs, scientists have discovered that the readiness potential is in fact coupled to breathing and that acts of free will happen as you exhale -- providing an unexpected perspective on free will.

<https://www.sciencedaily.com/releases/2020/02/200206080449.htm>

ACADEMIA.EDU – Stone tools for the hunt

Journal of Archaeological Science 36 (2009) 850-859.

PAOLA VILLA et al – Stone tools for the hunt: points with impact scars from a Middle Paleolithic site in southern Italy

We present the find of impact scars on six Middle Paleolithic points from the rock shelter site of Oscurusciuto in southern Italy, dated to MIS 3. We review our knowledge of hunting weapons in the European Middle Paleolithic, the available evidence for the use of Mousterian points as spear tips and the interpretations of impact scars. Our identifications are based on comparisons to similar scars observed on experimental material and archaeological material of known function, made of the same raw materials (cryptocrystalline varieties of silica) as the points from the Oscurusciuto site. The scarce evidence available prior to our work suggested that at least some Mousterian points were used to tip hand-delivered spears already by MIS 6 (i.e. between 186 and 127 ka). The evidence from Oscurusciuto confirm that Neanderthals in Western Europe sometimes used Mousterian points to tip spears to hunt large and medium size mammals, like the fauna present at the Oscurusciuto site. The significance of this sample is not diminished by its small size, as indicated by a discussion of the factors that influence the frequencies of impact scars in different archaeological samples and a review of comparable evidence from residential sites of similar and younger ages.

https://www.academia.edu/23099577/Stone_tools_for_the_hunt_points_with_impact_scars_from_a_Middle_Paleolithic_site_in_southern_Italy?auto=download

OTHER NEWS – INDEPENDENT – Penguin language obeys same rules as human speech, researchers say

Experts believe they have found the 'first compelling evidence' for conformity to linguistic laws in non-primate species.

<https://www.independent.co.uk/news/science/penguin-science-study-language-linguistics-zipf-menzerathaltmann-torino-a9317921.html>

PUBLICATIONS

Frontiers in Psychology

PAPERS

XINYU NIE et al – Nudging Altruism by Color: Blue or Red?

Altruism can be spontaneously aroused by environmental factors. However, the mechanism behind these factors is subject to debate. We carried out a study of laboratory experiment using computer-based MouseLab method to determine the

mechanism. We found that different colors altered the altruistic behaviors of people. Specifically, blue enhanced altruism, whereas red discouraged altruism. We used a process-tracing technique to monitor the selection of an adaptive strategy and demonstrate that different colors can simulate changes in information acquisition and then lead to the corresponding behaviors. The results suggested that the decision heuristic plays a mediating role in the link between colors and individual altruistic behaviors.

https://www.frontiersin.org/articles/10.3389/fpsyg.2019.03086/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1232595_69_Psycho_20200204_arts_A

ANDREA BENDER – What Early Sapient Cognition Can Teach Us: Untangling Cultural Influences on Human Cognition Across Time

Evidence of cultural influences on cognition is accumulating, but untangling these cultural influences from one another or from non-cultural influences has remained a challenging task. As between-group differences are neither a sufficient nor a necessary indicator of cultural impact, cross-cultural comparisons in isolation are unable to furnish any cogent conclusions. This shortfall can be compensated by taking a diachronic perspective that focuses on the role of culture for the emergence and evolution of our cognitive abilities. Three strategies for reconstructing early human cognition are presented: the chaîne opératoire approach and its extension to brain-imaging studies, large-scale extrapolations, and phylogenetic comparative methods. While these strategies are reliant on our understanding of present-day cognition, they conversely also have the potential to advance this understanding in fundamental ways.

https://www.frontiersin.org/articles/10.3389/fpsyg.2020.00099/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1232595_69_Psycho_20200204_arts_A

MARTIN HASPELMATH – Human Linguisticity and the Building Blocks of Languages

This paper discusses the widely held idea that the building blocks of languages (features, categories, and architectures) are part of an innate blueprint for Human Language, and notes that if one allows for convergent cultural evolution of grammatical structures, then much of the motivation for it disappears. I start by observing that human linguisticity (=the biological capacity for language) is uncontroversial, and that confusing terminology (“language faculty,” “universal grammar”) has often clouded the substantive issues in the past. I argue that like musicality and other biological capacities, linguisticity is best studied in a broadly comparative perspective. Comparing languages like other aspects of culture means that the comparisons are of the Greenbergian type, but many linguists have presupposed that the comparisons should be done as in chemistry, with the presupposition that the innate building blocks are also the material that individual grammars are made of. In actual fact, the structural uniqueness of languages (in lexicon, phonology, and morphosyntax) leads us to prefer a Greenbergian approach to comparison, which is also more in line with the Minimalist idea that there are very few domain-specific elements of the biological capacity for language.

https://www.frontiersin.org/articles/10.3389/fpsyg.2019.03056/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1232595_69_Psycho_20200204_arts_A

ANNA BELFER-COHEN & ERELLA HOVERS – Prehistoric Perspectives on “Others” and “Strangers”

Social “connectivity” through time is currently considered as one of the major drivers of cultural transmission and cultural evolution. Within this framework, the interactions within and between groups are impacted by individuals’ distinction of social relationships. In this paper, we focus on changes in a major aspect of social perceptions, “other” and “stranger.” As inferred from the archaeological record, this perception among human groups gained importance during the course of the Pleistocene. These changes would have occurred due to the plasticity of cognitive mechanisms, in response to the demands on behavior along the trajectory of human social evolution. The concepts of “other” and “stranger” have received little attention in the archaeological discourse, yet they are fundamental in the perception of social standing. The property of being an “other” is defined by one’s perception and is inherent to one’s view of the world around oneself; when shared by a group it becomes a social cognitive construct. Allocating an individual the status of a “stranger” is a socially-defined state that is potentially transient. We hypothesize that, while possibly entrenched in deep evolutionary origins, the latter is a relatively late addition to socio-cognitive categorization, associated with increased sedentism, larger groups and reduced territorial extent as part of the process of Neolithization. We posit that “others” and “strangers” can be approached from contextual archaeological data, with inferences as regards the evolution of cognitive social categories. Our analysis focused on raw material studies, observations on style, and evidence for craft specialization. We find that contrary to the null hypothesis the archaeological record implies earlier emergence of complex socio-cognitive categorization. The cognitive, cultural and social processes involved in the maintenance and distinction between “others” and “strangers” can be defined as “self-domestication” that is still an on-going process.

https://www.frontiersin.org/articles/10.3389/fpsyg.2019.03063/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1232595_69_Psycho_20200204_arts_A

Mind & Language

PAPERS

OLLE BLOMBERG – Intentional cooperation and acting as part of a single body

According to some accounts, an individual participates in joint intentional cooperative action by virtue of conceiving of himself or herself and other participants as if they were parts of a single agent or body that performs the action. I argue that this notional singularization move fails if they act as if they were parts of a single agent. It can succeed, however, if the participants act as if to bring about the goal of a properly functioning single body in action of which they would be parts. This latter version of the move manages to capture the cooperative character of joint intentional cooperative action, and does this without requiring of participants that they act on higher-order interlocking intentions.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12274?campaign=wolearlyview>

Nature Communications

PAPERS

CARLA HANDLEY & SARAH MATHEW – Human large-scale cooperation as a product of competition between cultural groups

A fundamental puzzle of human evolution is how we evolved to cooperate with genetically unrelated strangers in transient interactions. Group-level selection on culturally differentiated populations is one proposed explanation. We evaluate a central untested prediction of Cultural Group Selection theory, by assessing whether readiness to cooperate between individuals from different groups corresponds to the degree of cultural similarity between those groups. We documented the normative beliefs and cooperative dispositions of 759 individuals spanning nine clans nested within four pastoral ethnic groups of Kenya—the Turkana, Samburu, Rendille and Borana. We find that cooperation between groups is predicted by how culturally similar they are, suggesting that norms of cooperation in these societies have evolved under the influence of group-level selection on cultural variation. Such selection acting over human evolutionary history may explain why we cooperate readily with unrelated and unfamiliar individuals, and why humans' unprecedented cooperative flexibility is nevertheless culturally parochial.

<https://www.nature.com/articles/s41467-020-14416-8>

HELEN M. DITZ & ANDREAS NIEDER – Format-dependent and format-independent representation of sequential and simultaneous numerosity in the crow endbrain

Humans' symbolic counting skills are built on a primordial ability to approximately estimate the number of items, or numerosity. To date it is debated whether numerosities presented in categorically different formats, that is as temporal sequences versus spatial arrays, are represented abstractly in the brain. To address this issue, we identified the behavioral characteristics and neuronal codes for sequential and simultaneous number formats in crows. We find a format-dependent representation by distinct groups of selective neurons during the sensory encoding stage. However, an abstract and format-independent numerosity code emerges once the encoding phase is completed and numerosities needed to be memorized. These results suggest a successive two-stage code for categorically different number formats and help to reconcile conflicting findings observed in psychophysics and brain imaging.

<https://www.nature.com/articles/s41467-020-14519-2>

MATTHEW J. HASENJAGER, WILLIAM HOPPITT & ELLOUISE LEADBEATER – Network-based diffusion analysis reveals context-specific dominance of dance communication in foraging honeybees

The honeybee (*Apis mellifera*) dance communication system is a marvel of collective behaviour, but the added value it brings to colony foraging efficiency is poorly understood. In temperate environments, preventing communication of foraging locations rarely decreases colony food intake, potentially because simultaneous transmission of olfactory information also plays a major role in foraging. Here, we employ social network analyses that quantify information flow across multiple temporally varying networks (each representing a different interaction type) to evaluate the relative contributions of dance communication and hive-based olfactory information transfer to honeybee recruitment events. We show that virtually all successful recruits to novel locations rely upon dance information rather than olfactory cues that could otherwise guide them to the same resource. Conversely, during reactivation to known sites, dances are relatively less important, as foragers are primarily guided by olfactory information. By disentangling the contributions of multiple information networks, the contexts in which dance communication truly matters amid a complex system full of redundancy can now be identified.

<https://www.nature.com/articles/s41467-020-14410-0>

Nature Scientific Reports

PAPERS

RODOLFO CORTES BARRAGAN, RECHELE BROOKS & ANDREW N. MELTZOFF – Altruistic food sharing behavior by human infants after a hunger manipulation

Altruistic behavior entails giving valuable benefits to others while incurring a personal cost. A distinctively human form of altruistic behavior involves handing nutritious food to needy strangers, even when one desires the food. Engaging in altruistic food transfer, instead of keeping the food, is costly, because it reduces the caloric intake of the benefactor vis-à-vis the

beneficiary. Human adults engage in this form of altruistic behavior during times of war and famine, when giving food to others threatens one's own survival. Our closest living primate relatives, chimpanzees (*Pan troglodytes*) and bonobos (*Pan paniscus*), exhibit notable constraints on the proclivity to engage in such food transfer (particularly chimpanzees), although they share many social-cognitive commonalities with humans. Here we show that in a nonverbal test, 19-month-old human infants repeatedly and spontaneously transferred high-value, nutritious natural food to a stranger (Experiment 1) and more critically, did so after an experimental manipulation that imposed a feeding delay (Experiment 2), which increased their own motivation to eat the food. Social experience variables moderated the expression of this infant altruistic behavior, suggesting malleability.

<https://www.nature.com/articles/s41598-020-58645-9>

DENA J. CLINK, ABDUL HAMID AHMAD & HOLGER KLINCK – Gibbons aren't singing in the rain: presence and amount of rainfall influences ape calling behavior in Sabah, Malaysia

Early morning calling occurs across diverse taxa, which may be related to optimal conditions for sound transmission. There exists substantial inter- and intra-specific variation in calling time which is influenced by intrinsic, social and/or environmental factors. Here, we investigate environmental predictors of calling in gibbons. We hypothesized that male solos— which occur earlier and tend to be longer than duets—would be more influenced by environmental variables, if earlier, longer calling bouts are energetically costly, and therefore limited by overnight energy expenditure. Our top model for male solo events included amount of rain in the previous 24 hours, and explained 30% of the variance, whereas the top model for duet events (which included presence and amount of rainfall) explained only 5% of the variance. Rain the previous night led to a later start time of male solos (~30 minutes), but our top model for duet start time did not include any reliable predictors. Male solo events appear to be more influenced by environmental factors, and duets may be influenced more by social factors. Our results are in line with previous studies that show that changes in overnight conditions —which may alter energy expenditure—can influence early morning calling behavior.

<https://www.nature.com/articles/s41598-020-57976-x>

PNAS

PAPERS

MICHAEL HAHN, DAN JURAFSKY & RICHARD FUTRELL – Universals of word order reflect optimization of grammars for efficient communication

The universal properties of human languages have been the subject of intense study across the language sciences. We report computational and corpus evidence for the hypothesis that a prominent subset of these universal properties—those related to word order—result from a process of optimization for efficient communication among humans, trading off the need to reduce complexity with the need to reduce ambiguity. We formalize these two pressures with information-theoretic and neural-network models of complexity and ambiguity and simulate grammars with optimized word-order parameters on large-scale data from 51 languages. Evolution of grammars toward efficiency results in word-order patterns that predict a large subset of the major word-order correlations across languages.

<https://www.pnas.org/content/117/5/2347.abstract?etoc>

JOHN E. KUTZBACH et al – African climate response to orbital and glacial forcing in 140,000-y simulation with implications for early modern human environments

A climate/vegetation model simulates episodic wetter and drier periods at the 21,000-y precession period in eastern North Africa, the Arabian Peninsula, and the Levant over the past 140,000 y. Large orbitally forced wet/dry extremes occur during interglacial time, ~130 to 80 ka, and conditions between these two extremes prevail during glacial time, ~70 to 15 ka. Orbital precession causes high seasonality in Northern Hemisphere (NH) insolation at ~125, 105, and 83 ka, with stronger and northward extended summer monsoon rains in North Africa and the Arabian Peninsula and increased winter rains in the Mediterranean Basin. The combined effects of these two seasonally distinct rainfall regimes increase vegetation and narrow the width of the Saharan–Arabian desert and semidesert zones. During the opposite phase of the precession cycle (~115, 95, and 73 ka), NH seasonality is low, and decreased summer insolation and increased winter insolation cause monsoon and storm track rains to decrease and the width of the desert zone to increase. During glacial time (~70 to 15 ka), forcing from large ice sheets and lowered greenhouse gas concentrations combine to increase winter Mediterranean storm track precipitation; the southward retreat of the northern limit of summer monsoon rains is relatively small, thereby limiting the expansion of deserts. The lowered greenhouse gas concentrations cause the near-equatorial zone to cool and reduce convection, causing drier climate with reduced forest cover. At most locations and times, the simulations agree with environmental observations. These changing regional patterns of climate/vegetation could have influenced the dispersal of early humans through expansions and contractions of well-watered corridors.

<https://www.pnas.org/content/117/5/2255.abstract?etoc>

DARREN REBAR et al – An evolutionary switch from sibling rivalry to sibling cooperation, caused by a sustained loss of parental care

Sibling rivalry is commonplace within animal families, yet offspring can also work together to promote each other's fitness. Here we show that the extent of parental care can determine whether siblings evolve to compete or to cooperate. Our

experiments focus on the burying beetle *Nicrophorus vespilloides*, which naturally provides variable levels of care to its larvae. We evolved replicate populations of burying beetles under two different regimes of parental care: Some populations were allowed to supply posthatching care to their young (Full Care), while others were not (No Care). After 22 generations of experimental evolution, we found that No Care larvae had evolved to be more cooperative, whereas Full Care larvae were more competitive. Greater levels of cooperation among larvae compensated for the fitness costs caused by parental absence, whereas parental care fully compensated for the fitness costs of sibling rivalry. We dissected the evolutionary mechanisms underlying these responses by measuring indirect genetic effects (IGEs) that occur when different sibling social environments induce the expression of more cooperative (or more competitive) behavior in focal larvae. We found that indirect genetic effects create a tipping point in the evolution of larval social behavior. Once the majority of offspring in a brood start to express cooperative (or competitive) behavior, they induce greater levels of cooperation (or competition) in their siblings. The resulting positive feedback loops rapidly lock larvae into evolving greater levels of cooperation in the absence of parental care and greater levels of rivalry when parents provide care.

<https://www.pnas.org/content/117/5/2544.abstract?etoc>

DAVID A. LEOPOLD & RICHARD J. KRAUZLIS – How the brain pays attention to others' attention

Humans and other primates have evolved skills to interpret and respond to highly complex social information. This ability is reflected in multiple cortical regions of the macaque brain devoted to the visual analysis of individuals, actions, and scenes. Beyond visual analysis, social perception engages brain areas that govern an observer's strategic examination of stimuli, for example directing attention to scene elements with the most relevant social information. Consider a monkey sneaking a cautious glance at a gathering of other monkeys. There exists information about many social variables: who is there, how they are feeling, why they are gathered, and what might happen next, to name a few. One's capacity to retrieve information is limited, and an observer must prioritize information that is of immediate relevance. How does the brain implement the selective attention to pertinent social information? An important clue comes from a recent electrophysiological study by Ramezanpour and Thier, who discovered that neurons in a specialized region of the macaque cerebral cortex become much more sensitive to the gaze direction of an observed face when the subject actively seeks that information.

<https://www.pnas.org/content/early/2020/02/05/2000121117?etoc=>

MEIKE T. WORTEL et al – Continual evolution through coupled fast and slow feedbacks

Continual evolution describes the unceasing evolution of at least one trait involving at least one organism. The Red Queen Hypothesis is a specific case in which continual evolution results from coevolution of at least two species. While microevolutionary studies have described examples in which evolution does not cease, understanding which general conditions lead to continual evolution or to stasis remains a major challenge. In many cases, it is unclear which experimental features or model assumptions are necessary for the observed continual evolution to emerge, and whether the described behavior is robust to variations in the given setup. Here, we aim to find the minimal set of conditions under which continual evolution occurs. To this end, we present a theoretical framework that does not assume any specific functional form and, therefore, can be applied to a wide variety of systems. Our framework is also general enough to make predictions about both monomorphic and polymorphic populations. We show that the combination of a fast positive and a slow negative feedback between environment, population, and evolving traits causes continual evolution to emerge even from the evolution of a single evolving trait, provided that the ecological timescale is sufficiently faster than the timescales of mutation and the negative feedback. Our approach and results thus contribute to a deeper understanding of the evolutionary dynamics resulting from biotic interactions.

<https://www.pnas.org/content/early/2020/02/05/1916345117.abstract?etoc>

Royal Society Open Science

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>

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.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.191090>

SOFYA DOLOTOVSKAYA, SARAH WALKER & ECKHARD W. HEYMANN – What makes a pair bond in a Neotropical primate: female and male contributions

Pair living and pair bonding are rare in mammals, and the mechanisms of their maintenance remain a puzzle. Titi monkeys, a 'textbook example' for 'monogamous' primates, have strong pair bonds and extensive male care. To investigate mechanisms of pair-bond maintenance, we studied seven wild groups of red titi (*Plecturocebus cupreus*) in Peruvian Amazonia over a period of 14 months. We analysed pair bonds by measuring proximity, grooming and approaches/leaves within pairs, and collected data on intergroup encounters. Females contributed to grooming more than males, especially during infant dependency, when most of the grooming within pairs was done by females. Females were also more active in controlling proximity between pair mates, making most of the approaches and leaves. Males, on the other hand, invested more in territorial defences. They participated in more intergroup encounters than females and were more active during these encounters. Our data is most consistent with the 'male-services' hypothesis for pair-bond maintenance, where a female contributes more to the proximity and affiliation maintenance while a male provides beneficial services.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.191489>

ERHAO GE et al – Large-scale cooperation driven by reputation, not fear of divine punishment

Reputational considerations favour cooperation and thus we expect less cooperation in larger communities where people are less well known to each other. Some argue that institutions are, therefore, necessary to coordinate large-scale cooperation, including moralizing religions that promote cooperation through the fear of divine punishment. Here, we use community size as a proxy for reputational concerns, and test whether people in small, stable communities are more cooperative than people in large, less stable communities in both religious and non-religious contexts. We conducted a donation game on a large naturalistic sample of 501 people in 17 communities, with varying religions or none, ranging from small villages to large cities in northwestern China. We found that more money was donated by those in small, stable communities, where reputation should be more salient. Religious practice was also associated with higher donations, but fear of divine punishment was not. In a second game on the same sample, decisions were private, giving donors the opportunity to cheat. We found that donors to religious institutions were not less likely to cheat, and community size was not important in this game. Results from the donation game suggest donations to both religious and non-religious institutions are being motivated by reputational considerations, and results from both games suggest fear of divine punishment is not important. This chimes with other studies suggesting social benefits rather than fear of punishment may be the more salient motive for cooperative behaviour in real-world settings.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.190991>

SARAH F. V. EITELJOERGE et al – Consistency of co-occurring actions influences young children's word learning

Communication with young children is often multimodal in nature, involving, for example, language and actions. The simultaneous presentation of information from both domains may boost language learning by highlighting the connection between an object and a word, owing to temporal overlap in the presentation of multimodal input. However, the overlap is not merely temporal but can also covary in the extent to which particular actions co-occur with particular words and objects, e.g. carers typically produce a hopping action when talking about rabbits and a snapping action for crocodiles. The frequency with which actions and words co-occurs in the presence of the referents of these words may also impact young children's word learning. We, therefore, examined the extent to which consistency in the co-occurrence of particular actions and words impacted children's learning of novel word-object associations. Children (18 months, 30 months and 36–48 months) and adults were presented with two novel objects and heard their novel labels while different actions were performed on these objects, such that the particular actions and word-object pairings always co-occurred (Consistent group) or varied across trials (Inconsistent group). At test, participants saw both objects and heard one of the labels to examine whether participants recognized the target object upon hearing its label. Growth curve models revealed that 18-month-olds did not learn words for objects in either condition, and 30-month-old and 36- to 48-month-old children learned words for objects only in the Consistent condition, in contrast to adults who learned words for objects independent of the actions presented. Thus, consistency in the multimodal input influenced word learning in early childhood but not in adulthood. In terms of a dynamic systems account of word learning, our study shows how multimodal learning settings interact with the child's perceptual abilities to shape the learning experience.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.190097>

PÉTER RÁCZ et al – Usage frequency and lexical class determine the evolution of kinship terms in Indo-European

Languages do not replace their vocabularies at an even rate: words endure longer if they are used more frequently. This effect, which has parallels in evolutionary biology, has been demonstrated for the core vocabulary, a set of common, unrelated meanings. The extent to which it replicates in closed lexical classes remains to be seen, and may indicate how general this effect is in language change. Here, we use phylogenetic comparative methods to investigate the history of 10 kinship categories, a type of closed lexical class of content words, across 47 Indo-European languages. We find that their rate of replacement is correlated with their usage frequency, and this relationship is stronger than in the case of the core vocabulary, even though the envelope of variation is comparable across the two cases. We also find that the residual variation in the rate of replacement of kinship terms is related to genealogical distance of referent to kin. We argue that this relationship is the result of social changes and corresponding shifts in the entire semantic class of kinship terms, shifts typically not present in the core vocabulary. Thus, an understanding of the scope and limits of social change is needed to understand changes in kinship systems, and broader context is necessary to model cultural evolution in particular and the process of system change in general.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.191385>

SARAH E. KOOPMAN et al with STEVEN T. PIANTADOSI – One-to-one correspondence without language

A logical rule important in counting and representing exact number is one-to-one correspondence, the understanding that two sets are equal if each item in one set corresponds to exactly one item in the second set. The role of this rule in children's development of counting remains unclear, possibly due to individual differences in the development of language. We report that non-human primates, which do not have language, have at least a partial understanding of this principle. Baboons were given a quantity discrimination task where two caches were baited with different quantities of food. When the quantities were baited in a manner that highlighted the one-to-one relation between those quantities, baboons performed significantly better than when one-to-one correspondence cues were not provided. The implication is that one-to-one correspondence, which requires intuitions about equality and is a possible building block of counting, has a pre-linguistic origin.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.190495>

VICTORIA E. LEE et al – Social learning about dangerous people by wild jackdaws

For animals that live alongside humans, people can present both an opportunity and a threat. Previous studies have shown that several species can learn to discriminate between individual people and assess risk based on prior experience. To avoid potentially costly encounters, it may also pay individuals to learn about dangerous people based on information from others. Social learning about anthropogenic threats is likely to be beneficial in habitats dominated by human activity, but experimental evidence is limited. Here, we tested whether wild jackdaws (*Corvus monedula*) use social learning to recognize dangerous people. Using a within-subjects design, we presented breeding jackdaws with an unfamiliar person near their nest, combined with conspecific alarm calls. Subjects that heard alarm calls showed a heightened fear response in subsequent encounters with the person compared to a control group, reducing their latency to return to the nest. This study provides important evidence that animals use social learning to assess the level of risk posed by individual humans.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.191031>

EAMONN FERGUSON et al – To help or punish in the face of unfairness: men and women prefer mutually-beneficial strategies over punishment in a sexual selection context

Consistent with a sexual selection account of cooperation, based on female choice, men, in romantic contexts, in general display mutually-beneficial behaviour and women choose men who do so. This evidence is based on a two-choice-architecture (cooperate or not). Here we extend this to include punishment options using a four-choice-architecture ('punishing a transgressor', 'compensating a victim', 'both punishing and compensating' or 'doing nothing'). Both compensation (a self-serving mutually-beneficial behaviour) and self-serving punishment, are associated with positive mate qualities. We test which is preferred by males and chosen by female undergraduates. We further explore effects of trait empathy and political ideology on these preferences. In a series of three studies using a third-party punishment and compensation (3PPC) game we show (Study One), that romantically-primed undergraduate males, express a preference to either 'compensate' or 'both compensate and punish', and undergraduate women find males who 'compensate' or 'compensate and punish' the most attractive (Studies Two and Three). Compensating men are perceived as compassionate, fair and strong by undergraduate women (Study Three). High trait empathy (Studies One and Three) and a left-wing political ideology (Study Three) are associated with a preference for compensation. Thus, self-serving mutually-beneficial behaviour can be preferred over self-serving punishment as a signal of mate quality in undergraduates. Implications for the evolution of cooperation are discussed with respect to sexual selection.

<https://royalsocietypublishing.org/doi/full/10.1098/rsos.181441>

Science Advances**PAPERS****DAMIEN FINCH et al – 12,000-year-old Aboriginal rock art from the Kimberley region, Western Australia**

The Kimberley region in Western Australia hosts one of the world's most substantial bodies of indigenous rock art thought to extend in a series of stylistic or iconographic phases from the present day back into the Pleistocene. As with other rock art

worldwide, the older styles have proven notoriously difficult to date quantitatively, requiring new scientific approaches. Here, we present the radiocarbon ages of 24 mud wasp nests that were either over or under pigment from 21 anthropomorphic motifs of the Gwion style (previously referred to as "Bradshaws") from the middle of the relative stylistic sequence. We demonstrate that while one date suggests a minimum age of c. 17 ka for one motif, most of the dates support a hypothesis that these Gwion paintings were produced in a relatively narrow period around 12,000 years ago.

https://advances.sciencemag.org/content/6/6/eaay3922?utm_campaign=toc_advances_2020-02-07&et rid=17774313&et cid=3198319

To subscribe to the EAORC Bulletin

If you would like to subscribe to this free weekly newsletter, please contact martin.edwardes@btopenworld.com.

To unsubscribe from the EAORC Bulletin

Send an email to martin.edwardes@btopenworld.com with the subject "EAORC unsubscribe".

Produced by and for the EAORC email group

EAORC is a fee-free academic internet news service and has no commercial sponsorship or other commercial interests.

EAORC website information is at <http://martinedwardes.me.uk/eaorc/>

If you have received this bulletin, and are unhappy about receiving it, please contact martin.edwardes@btopenworld.com.