

## CONTENTS

<b>NOTICES</b> .....	<b>2</b>
PUBLICATION ALERTS.....	2
EAORC NEWS – 1. New Website Preview Available.....	2
EAORC NEWS – 2. Biennial Membership Check.....	2
EAORC NEWS – 3. PDF bulletins? Your choice.....	2
SOCIETY FOR SCIENCE – The oldest known grass beds from 200,000 years ago included insect repellents.....	2
SOCIETY FOR SCIENCE – Ancient sculptures hint at universal facial expressions across cultures.....	3
BREAKING SCIENCE – Archaeologists Find 200,000-Year-Old Grass Beds in South African Cave.....	3
BREAKING SCIENCE – Mother Bats Use ‘Baby Talk’ to Speak to Their Offspring.....	3
LIVESCIENCE – Ancient stone ‘breadcrumbs’ reveal early human migration out of Africa.....	3
SCIENCE DAILY – Termite-fishing chimpanzees provide clues to the evolution of technology.....	3
THE CONVERSATION – Humans aren’t inherently selfish – we’re actually hardwired to work together.....	3
<b>PUBLICATIONS</b> .....	<b>3</b>
American Journal of Physical Anthropology.....	3
<b>PAPERS</b> .....	<b>3</b>
MARKUS PORT et al – The evolution of social philopatry in female primates.....	3
Biolinguistics.....	4
<b>PAPERS</b> .....	<b>4</b>
SHIRO OJIMA & KAZUO OKANOYA – Children’s Learning of a Semantics-Free Artificial Grammar with Center Embedding.....	4
Current Biology.....	4
<b>PAPERS</b> .....	<b>4</b>
ANNA F. SMET & RICHARD W. BYRNE – African elephants interpret a trunk gesture as a clue to direction of interest.....	4
Frontiers in Neuroscience.....	4
<b>PAPERS</b> .....	<b>4</b>
LOUIS N. IRWIN – Renewed Perspectives on the Deep Roots and Broad Distribution of Animal Consciousness.....	4
Frontiers in Psychology.....	4
<b>PAPERS</b> .....	<b>4</b>
THOMAS FUCHS – The Circularity of the Embodied Mind.....	4
Nature Scientific Reports.....	5
<b>PAPERS</b> .....	<b>5</b>
MARIE-HÉLÈNE MONCEL et al – The origin of early Acheulean expansion in Europe 700 ka ago: new findings at Notarchirico (Italy).....	5
KATIE E. FAILLACE, M. GEORGE B. FOODY & RICHARD MADGWICK – Exploring the potential of TEM analysis for understanding cooking at prehistoric feasting sites.....	5
PeerJ.....	5
<b>PAPERS</b> .....	<b>5</b>
MARIA PADRELL et al – Personality, cognition and behavior in chimpanzees: a new approach based on Eysenck’s model.....	5
PLOS Biology.....	6
<b>PAPERS</b> .....	<b>6</b>
ALEXANDER SOUTSCHEK et al – The right temporoparietal junction enables delay of gratification by allowing.....	6
PLOS One.....	6
<b>PAPERS</b> .....	<b>6</b>
DAVIDE DELPIANO & THORSTEN UTHMEIER – Techno-functional and 3D shape analysis applied for investigating the variability of backed tools in the Late Middle Paleolithic of Central Europe.....	6
SILVIA M. BELLO et al – Artists on the edge of the world: An integrated approach to the study of Magdalenian engraved stone plaquettes from Jersey (Channel Islands).....	6
PNAS.....	7
<b>PAPERS</b> .....	<b>7</b>
EDOUARD BARD et al – Extended dilation of the radiocarbon time scale between 40,000 and 48,000 y BP and the overlap between Neanderthals and Homo sapiens.....	7
STACY ROSENBAUM et al – Social bonds do not mediate the relationship between early adversity and adult glucocorticoids in wild baboons.....	7
RACHEL KRANTON et al – Deconstructing bias in social preferences reveals groupy and not-groupy behavior.....	7
PATRICK K. DURKEE, AARON W. LUKASZEWSKI & DAVID M. BUSS – Psychological foundations of human status allocation.....	7
Science Advances.....	8

<b>PAPERS</b> .....	<b>8</b>
ALAN S. COWEN & DACHER KELTNER – Universal facial expressions uncovered in art of the ancient Americas: A computational approach.....	8
LEI ZHANG & JAN GLÄSCHER – A brain network supporting social influences in human decision-making.....	8
Trends in Cognitive Sciences .....	8
<b>PAPERS</b> .....	<b>8</b>
JONATHAN BIRCH, ALEXANDRA K. SCHNELL & NICOLA S. CLAYTON – Dimensions of Animal Consciousness.....	8
Trends in Ecology and Evolution.....	8
<b>PAPERS</b> .....	<b>8</b>
CYRIL C. GRUETER et al – Multilevel Organisation of Animal Sociality .....	8
<b>To subscribe to the EAORC Bulletin .....</b>	<b>9</b>
<b>To unsubscribe from the EAORC Bulletin .....</b>	<b>9</b>
<b>Produced by and for the EAORC email group .....</b>	<b>9</b>

## NOTICES

### PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, do please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts.

If there is a journal you feel I should be tracking on a regular basis, do let me know.

And if you have any other ideas for extending the “EAORC experience”, please contact me.

### EAORC NEWS – 1. New Website Preview Available

Since the creation of EAORC I have been using Webplus from Serif. Originally X4, I updated to X5, X6, X7 and X8, and I found it to be an outstanding product. Unfortunately, as is the way of anything outstanding in this World, Serif ceased to support the software in August 2018. Since then I have been using X8, despite its increasing unreliability, and trying out other web design solutions to find an alternative.

Eventually, out of desperation, I tried to redesign one of my websites (the EAORC site, because it’s the simplest) in Microsoft products – mostly Word, with PowerPoint and Paint (good old Paint) to help gussy things up. It turns out that this is a quite good solution. I have now produced a reasonable version of the EAORC website, which is available for your inspection at [http://martinedwardes.me.uk/eaorc\\_test/](http://martinedwardes.me.uk/eaorc_test/). If people are content with this new site then I will replace the existing website in September.

Many thanks to those who have already responded.

### EAORC NEWS – 2. Biennial Membership Check

2020 is a membership checking year; this normally begins in June, but I have delayed the check until September because of the 2020 plethora of crises. However, in September I will start asking for confirmation that you wish to continue receiving the bulletins. Anyone who has not indicated they wish to continue will be taken off the list at the end of October. This biennial membership check has been in operation since 2008, and GDPR has made it even more important that it is carried out regularly.

### EAORC NEWS – 3. PDF bulletins? Your choice

It has been suggested that, as I produce a weekly pdf bulletin for the website, I could send that to the email group instead of the text email. The pdf has several advantages over the current email in terms of presentation, curation, and searching, but it has the disadvantage of being larger: the average EAORC pdf for the past few months has been about 350kb, the average bulletin email has been (I think) about 80kb. There are also issues to be considered of how your security system reacts to emails with a lot of links, or how it reacts to emails with attachments.

Let me know which option you prefer by sending me a two-word email: EAORC pdf or EAORC email. I will go with the majority choice. I will leave the voting open until end August to allow people otherwise out of contact to

Many thanks to those who have already responded.

### SOCIETY FOR SCIENCE – The oldest known grass beds from 200,000 years ago included insect repellents

Found in South Africa, 200,000-year-old bedding remnants included fossilized grass, bug-repelling ash and once aromatic camphor leaves.

<http://click.societyforscience-email.com/?qs=ec4837aeab53bf69f9286842c23875d17a321267d1724f8311c1eaf289f317c53db4c0b1209727d3229741a5c961dd8b10d880f3a2bd6724>

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## SOCIETY FOR SCIENCE – Ancient sculptures hint at universal facial expressions across cultures

Interpreting the emotions carved onto sculptures from long ago offers a new way to study how humans perceive facial expressions.

<http://click.societyforscience-email.com/?qs=97ac3e24ef5421841d34066e93155d76d89750c383666eb49b781156097e389a57b2f4f5b20a154e13d7bd4275319b6770a49ab47177d9db>

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## BREAKING SCIENCE – Archaeologists Find 200,000-Year-Old Grass Beds in South African Cave

An international team of archaeologists reports the discovery of grass bedding used to create comfortable areas for sleeping and working by Paleolithic humans who lived in South Africa's Border Cave at least 200,000 years ago.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/2ZqPWLnHMt0/border-cave-beds-08750.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/2ZqPWLnHMt0/border-cave-beds-08750.html?utm_source=feedburner&utm_medium=email)

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## BREAKING SCIENCE – Mother Bats Use 'Baby Talk' to Speak to Their Offspring

A special form of vocal feedback in humans, infant-directed speech — also known as motherese or 'baby talk' — facilitates language learning and is socially beneficial by increasing attention and arousal in the child. It is characterized by high pitch, expanded intonation contours and slower speech tempo. Among animals, mothers often engage in infant-directed vocalizations too, but does this also imply voice changes? In a new study, a team of researchers from the Smithsonian Tropical Research Institute, Free University of Berlin and the Natural History Museum in Berlin wanted to investigate if they can detect a phenomenon reminiscent of baby talk in infant-directed female vocalizations of bats. Their results show that parent-offspring communication in bats is more complex and multifaceted than previously thought, with female pup-directed vocalizations reminiscent of human baby talk and male pup-directed vocalizations that may facilitate the transmission of a vocal signature across generations.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/0eUTupviG\\_g/bat-baby-talk-08762.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/0eUTupviG_g/bat-baby-talk-08762.html?utm_source=feedburner&utm_medium=email)

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## LIVESCIENCE – Ancient stone 'breadcrumbs' reveal early human migration out of Africa

About 130,000 years ago, an early wave of anatomically modern humans — Homo sapiens — left the Horn of Africa and spread north along the center of the Arabian Peninsula, which was wetter and greener than it is now. Their distinctive way of making flint points has been used as a "breadcrumb" trail to mark their progress. Now, scientists may have found the northernmost of these breadcrumbs in Israel's Negev Desert.

<https://www.livescience.com/early-humans-out-of-africa-flints.html>

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## SCIENCE DAILY – Termite-fishing chimpanzees provide clues to the evolution of technology

Unlike chimpanzees in East and West Africa, who use a single tool to extract termites, chimpanzees in Central Africa's Congo Basin use tool sets -- puncturing sticks or perforating twigs plus fishing probes -- to harvest the insects from underground nests or towering earthen mounds scattered across lowland forests.

<https://www.sciencedaily.com/releases/2020/08/200819120657.htm>

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## THE CONVERSATION – Humans aren't inherently selfish – we're actually hardwired to work together

The 'good' side of our nature is much more deep-rooted than the 'evil' side.

<https://theconversationuk.cmail19.com/t/r-l-jkkdijid-khhlilalh-p/>

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## PUBLICATIONS

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### American Journal of Physical Anthropology

#### PAPERS

#### MARKUS PORT et al – The evolution of social philopatry in female primates

The transition from solitary life to sociality is considered one of the major transitions in evolution. In primates, this transition is currently not well understood. Traditional verbal models appear insufficient to unravel the complex interplay of environmental and demographic factors involved in the evolution of primate sociality, and recent phylogenetic reconstructions have produced conflicting results. We therefore analyze a theoretical model for the evolution of female social philopatry that sheds new light on the question why most primates live in groups. In individual-based simulations, we study the evolution of dispersal strategies of both resident females and their offspring. The model reveals that social philopatry can evolve through kin selection, even if retention of offspring is costly in terms of within-group resource competition and provides no direct benefits. Our model supports the role of predator avoidance as a selective pressure for group-living in primates, but it also suggests that a second benefit of group-living, communal resource defense, might be required to trigger the evolution of sizable groups. Lastly, our model reveals that seemingly small differences in demographic parameters can have profound effects on primate social evolution.

## Biolinguistics

### PAPERS

#### **SHIRO OJIMA & KAZUO OKANOYA – Children’s Learning of a Semantics-Free Artificial Grammar with Center Embedding**

Whether non-human animals have an ability to learn and process center embedding, a core property of human language syntax, is still debated. Artificial-grammar learning (AGL) has been used to compare humans and animals in the learning of center embedding. However, up until now, human participants have only included adults, and data on children, who are the key players of natural language acquisition, are lacking. We created a novel game-like experimental paradigm combining the go/no-go procedure often used in animal research with the stepwise learning methods found effective in human adults’ center-embedding learning. Here we report that some children succeeded in learning a semantics-free artificial grammar with center embedding (A2B2 grammar) in the auditory modality. Although their success rate was lower than adults’, the successful children looked as efficient learners as adults. Where children struggled, their memory capacity seemed to have limited their AGL performance.

<https://www.biolinguistics.eu/index.php/biolinguistics/article/view/425?fbclid=IwAR1M-IYLdx-F4yuUk9XLH2iY8dMi7Kjn0BUo9Gc52m2cuLHQazclv56ytQQ>

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## Current Biology

### PAPERS

#### **ANNA F. SMET & RICHARD W. BYRNE – African elephants interpret a trunk gesture as a clue to direction of interest**

Orienting to gaze-direction is widespread among animal species, but evidence for spontaneous use of gesture for direction is limited. Remarkably, African elephants (*Loxodonta africana*) have been found able to follow human pointing, including subtle actions in which the contralateral hand is used, and in which the body silhouette is not broken. The natural origin of this ability is puzzling, as the species is not reported to use trunk- or limb-gesture for showing directions. One natural gesture, the ‘periscope-sniff’ presumed to be used to enhance olfactory sampling by an elephant in circumstances of alarm or curiosity, might also betray the elephant’s direction of focal attention. Here we investigate what information elephants gain from seeing periscope-sniff. When one elephant in a group gave a periscope-sniff, we recorded the location and orientation of the next periscope-sniff given. Elephants that could not see the first gesturer only gestured themselves if immediately adjacent to the first or closer to the presumed stimulus of interest. In contrast, elephants able to see the first signaller’s periscope-sniff were often a considerable distance behind it, further from the stimulus. Focusing on these cases, where making the periscope-sniff was apparently caused by seeing the first gesture, we found its orientation significantly matched the first, suggesting that direction information was gained from seeing the periscope-sniff. Elephants’ ability to use a conspecific’s periscope-sniff as if it were an ostensive pointing gesture enables them to react to the presence and location of potential dangers.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(20\)30922-2?dgcid=raven\\_jbs\\_etoc\\_email](https://www.cell.com/current-biology/fulltext/S0960-9822(20)30922-2?dgcid=raven_jbs_etoc_email)

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## Frontiers in Neuroscience

### PAPERS

#### **LOUIS N. IRWIN – Renewed Perspectives on the Deep Roots and Broad Distribution of Animal Consciousness**

The vast majority of neurobiologists have long abandoned the Cartesian view of non-human animals as unconscious automatons—acknowledging instead the high likelihood that mammals and birds have mental experiences akin to subjective consciousness. Several lines of evidence are now extending those limits to all vertebrates and even some invertebrates, though graded in degrees as argued originally by Darwin, correlated with the complexity of the animal’s brain. A principal argument for this view is that the function of consciousness is to promote the survival of an animal—especially one actively moving about—in the face of dynamic changes and real-time contingencies. Cognitive ecologists point to the unique features of each animal’s environment and the specific behavioral capabilities that different environments invoke, thereby suggesting that consciousness must take on a great variety of forms, many of which differ substantially from human subjective experience.

[https://www.frontiersin.org/articles/10.3389/fnsys.2020.00057/full?utm\\_source=F-AAE&utm\\_medium=EMLF&utm\\_campaign=MRK\\_1407965\\_55\\_Neuro\\_20200820\\_arts\\_A](https://www.frontiersin.org/articles/10.3389/fnsys.2020.00057/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1407965_55_Neuro_20200820_arts_A)

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## Frontiers in Psychology

### PAPERS

#### **THOMAS FUCHS – The Circularity of the Embodied Mind**

From an embodied and enactive point of view, the mind–body problem has been reformulated as the relation between the lived or subject body on the one hand and the physiological or object body on the other (“body–body problem”). The aim of the paper is to explore the concept of circularity as a means of explaining the relation between the phenomenology of lived experience and the dynamics of organism–environment interactions. This concept of circularity also seems suitable for connecting enactive accounts with ecological psychology. It will be developed in a threefold way:

(1) As the circular structure of embodiment, which manifests itself (a) in the homeostatic cycles between the brain and body and (b) in the sensorimotor cycles between the brain, body, and environment. This includes the interdependence of an organism's dispositions of sense-making and the affordances of the environment.

(2) As the circular causality, which characterizes the relation between parts and whole within the living organism as well as within the organism–environment system.

(3) As the circularity of process and structure in development and learning. Here, it will be argued that subjective experience constitutes a process of sense-making that implies (neuro-)physiological processes so as to form modified neuronal structures, which in turn enable altered future interactions.

On this basis, embodied experience may ultimately be conceived as the integration of brain–body and body–environment interactions, which has a top-down, formative, or ordering effect on physiological processes. This will serve as an approach to a solution of the body–body problem.

[https://www.frontiersin.org/articles/10.3389/fpsyg.2020.01707/full?utm\\_source=F-AAE&utm\\_medium=EMLF&utm\\_campaign=MRK\\_1407965\\_69\\_Psycho\\_20200820\\_arts\\_A](https://www.frontiersin.org/articles/10.3389/fpsyg.2020.01707/full?utm_source=F-AAE&utm_medium=EMLF&utm_campaign=MRK_1407965_69_Psycho_20200820_arts_A)

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## Nature Scientific Reports

### PAPERS

#### **MARIE-HÉLÈNE MONCEL et al – The origin of early Acheulean expansion in Europe 700 ka ago: new findings at Notarchirico (Italy)**

Notarchirico (Southern Italy) has yielded the earliest evidence of Acheulean settlement in Italy and four older occupation levels have recently been unearthed, including one with bifaces, extending the roots of the Acheulean in Italy even further back in time. New  $^{40}\text{Ar}/^{39}\text{Ar}$  on tephras and ESR dates on bleached quartz securely and accurately place these occupations between 695 and 670 ka (MIS 17), penecontemporaneous with the Moulin-Quignon and la Noira sites (France). These new data demonstrate a very rapid expansion of shared traditions over Western Europe during a period of highly variable climatic conditions, including interglacial and glacial episodes, between 670 and 650 (i.e., MIS17/MIS16 transition). The diversity of tools and activities observed in these three sites shows that Western Europe was populated by adaptable hominins during this time. These conclusions question the existence of refuge areas during intense glacial stages and raise questions concerning understudied migration pathways, such as the Sicilian route.

<https://www.nature.com/articles/s41598-020-68617-8>

#### **KATIE E. FAILLACE, M. GEORGE B. FOODY & RICHARD MADGWICK – Exploring the potential of TEM analysis for understanding cooking at prehistoric feasting sites**

This study explores the utility of transmission electron microscopy (TEM) analysis of bone collagen for investigating prehistoric cooking. Approaches to cooking practices have relied principally on artefactual evidence, macroscopic bone modification, and organic residue analysis. However, direct evidence for cooking of bone has been limited. Richter and Koon successfully applied TEM analysis of collagen to determine heating to modern and medieval bones, but this method has yet to be experimentally tested using prehistoric remains. Collagen will denature at relatively low temperatures, such as during roasting, boiling, or baking. The denaturation of collagen causes predictable structural changes that can be viewed through TEM. Zooarchaeological remains of sheep and pig with minimal taphonomic modifications were analysed from four later prehistoric (c. 800–500BC) sites in Britain (n = 33). Humeri and phalanges were selected to compare elements with high and low meat yields. Samples were classified into 'Heated' and 'Unheated' groups consistent with previous studies, and variable patterns were observed between different sites and taxa. Analytical limitations have hindered the study of cooking in the past, but this study demonstrates the potential of this taphonomic method for exploring prehistoric cooking practices and provides a springboard for wider studies.

<https://www.nature.com/articles/s41598-020-70628-4>

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## PeerJ

### PAPERS

#### **MARIA PADRELL et al – Personality, cognition and behavior in chimpanzees: a new approach based on Eysenck's model**

Personality has been linked to individual variation in interest and performance in cognitive tasks. Nevertheless, this relationship is still poorly understood and has rarely been considered in animal cognition research. Here, we investigated the association between personality and interest, motivation and task performance in 13 sanctuary chimpanzees (*Pan troglodytes*) housed at Fundació Mona (Spain). Personality was assessed with a 12-item questionnaire based on Eysenck's Psychoticism-Extraversion-Neuroticism model completed by familiar keepers and researchers. Additionally, personality ratings were compared to behavioral observations conducted over an 11-year period. Experimental tasks consisted in several puzzle boxes that needed to be manipulated in order to obtain a food reward. Dependent variables included participation (as an indicator of interest), success and latency (as measures of performance), and losing contact with the task (as an indicator of motivation). As predicted, we obtained significant correlations between Eysenck's personality traits and observed behaviors, although some expected associations were absent. We then analyzed data using Generalized Linear Mixed Models, running a model for each dependent variable. In both sexes, lower Extraversion and lower Dominance were linked to a higher probability of success, but this effect was stronger in females. Furthermore, higher Neuropsychoticism predicted

higher probability of success in females, but not in males. The probability of losing contact with the task was higher in young chimpanzees, and in those rated lower on Extraversion and higher on Dominance. Additionally, chimpanzees rated higher on Neuropsychoticism were also more likely to stop interacting with the task, but again this was more evident in females. Participation and latency were not linked to any personality trait. Our findings show that the PEN may be a good model to describe chimpanzee personality, and stress the importance of considering personality when interpreting the results of cognitive research in non-human primates.

<https://peerj.com/articles/9707/>

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## PLoS Biology

### PAPERS

#### **ALEXANDER SOUTSCHEK et al – The right temporoparietal junction enables delay of gratification by allowing *This is an uncorrected proof.***

Studies of neural processes underlying delay of gratification usually focus on prefrontal networks related to curbing affective impulses. Here, we provide evidence for an alternative mechanism that facilitates delaying gratification by mental orientation towards the future. Combining continuous theta-burst stimulation (cTBS) with functional neuroimaging, we tested how the right temporoparietal junction (rTPJ) facilitates processing of future events and thereby promotes delay of gratification. Participants performed an intertemporal decision task and a mental time-travel task in the MRI scanner before and after receiving cTBS over the rTPJ or the vertex (control site). rTPJ cTBS led to both stronger temporal discounting for longer delays and reduced processing of future relative to past events in the mental time-travel task. This finding suggests that the rTPJ contributes to the ability to delay gratification by facilitating mental representation of outcomes in the future. On the neural level, rTPJ cTBS led to a reduction in the extent to which connectivity of rTPJ with striatum reflected the value of delayed rewards, indicating a role of rTPJ–striatum connectivity in constructing neural representations of future rewards. Together, our findings provide evidence that the rTPJ is an integral part of a brain network that promotes delay of gratification by facilitating mental orientation to future rewards.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000800>

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## PLoS One

### PAPERS

#### **DAVIDE DELPIANO & THORSTEN UTHMEIER – Techno-functional and 3D shape analysis applied for investigating the variability of backed tools in the Late Middle Paleolithic of Central Europe**

In the Late Middle Paleolithic of Central Europe, two main cultural complexes have been distinguished: the Micoquian or Keilmessergruppe (KMG), and the Mousterian. Their differences mainly consist in the frequency of some retouched tools and the presence of bifacial technology. When these industries coexist, one element of discussion is the application of different concepts to manufacture tools with the same techno-functionality. This is particularly true for backed artifacts, such as Keilmesser (backed, asymmetrical bifacially-shaped knives) opposed to flake-tools equipped with a natural or knapped back. We conducted a techno-functional analysis of the backed tools from the G-Layer-Complex of Sesselfelsgrötte, one of the main Late Middle Paleolithic sequences in Central Europe, characterized by a combination of KMG and Mousterian aspects. In order to better understand the morpho-metrical data, 3D scans were used for recording technical features and performing semi-automatic geometric morphometrics. Results indicate that the techno-functional schemes of Keilmesser show a moderate variability and often overlap with the schemes of other typological groups. Within bifacial backed knives, a process of imitation of unifacial flake tools' functionality was recognized particularly in the cutting edge manufacturing. Keilmesser proved to be the long-life, versatile version of backed flake-tools, also due to the recurrent valence as both tool and core. This is why Keilmesser represent an ideal strategic blank when a mobile and multi-functional tool is needed. Based on these data, it is assumed that the relationship between Mousterian and KMG is deeply rooted and the emergence of KMG aspects could be related to constrained situations characterizing the long cold stages of the Early Weichselian. A higher regional mobility caused by the comparably low predictability of resources characterized the subsistence tactics of Neanderthal groups especially at the borders of their overall distribution. For this reason, Keilmesser could have represented an ecological answer before possibly becoming a marker of cultural identity.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0236548>

#### **SILVIA M. BELLO et al – Artists on the edge of the world: An integrated approach to the study of Magdalenian engraved stone plaquettes from Jersey (Channel Islands)**

The Upper Palaeolithic is characterised by the appearance of iconographic expressions most often depicting animals, including anthropomorphic forms, and geometric signs. The Late Upper Palaeolithic Magdalenian saw a flourishing of such depictions, encompassing cave art, engraving of stone, bone and antler blanks and decoration of tools and weapons. Though Magdalenian settlement exists as far northwest as Britain, there is a limited range of art known from this region, possibly associated with only fleeting occupation of Britain during this period. Stone plaquettes, flat fragments of stone engraved on at least one surface, have been found in large quantities at numerous sites spanning the temporal and geographical spread of the Magdalenian, but they have been absent so far from the archaeological record of the British Isles. Between 2015 and 2018, ten fragments of stone plaquettes extensively engraved with abstract designs were uncovered at the Magdalenian site of Les Varines, Jersey, Channel Islands. In this paper, we report detailed analyses of these finds, which provide new evidence

for technologies of abstract mark-making, and their significance within the lives of people on the edge of the Magdalenian world. These engraved stone fragments represent important, rare evidence of artistic expression in what is the far northern and western range of the Magdalenian and add new insight to the wider significance of dynamic practices of artistic expression during the Upper Palaeolithic.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0236875>

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## PNAS

### PAPERS

#### **EDOUARD BARD et al – Extended dilation of the radiocarbon time scale between 40,000 and 48,000 y BP and the overlap between Neanderthals and Homo sapiens**

The new radiocarbon calibration curve (IntCal20) allows us to calculate the gradient of the relationship between  $^{14}\text{C}$  age and calendar age over the past 55 millennia before the present (55 ka BP). The new gradient curve exhibits a prolonged and prominent maximum between 48 and 40 ka BP during which the radiocarbon clock runs almost twice as fast as it should. This radiocarbon time dilation is due to the increase in the atmospheric  $^{14}\text{C}/^{12}\text{C}$  ratio caused by the  $^{14}\text{C}$  production rise linked to the transition into the Laschamp geomagnetic excursion centered around 41 ka BP. The major maximum in the gradient from 48 to 40 ka BP is a new feature of the IntCal20 calibration curve, with far-reaching impacts for scientific communities, such as prehistory and paleoclimatology, relying on accurate ages in this time range. To illustrate, we consider the duration of the overlap between Neanderthals and Homo sapiens in Eurasia.

<https://www.pnas.org/content/early/2020/08/12/2012307117.abstract?etoc>

#### **STACY ROSENBAUM et al – Social bonds do not mediate the relationship between early adversity and adult glucocorticoids in wild baboons**

In humans and other animals, harsh conditions in early life can have profound effects on adult physiology, including the stress response. This relationship may be mediated by a lack of supportive relationships in adulthood. That is, early life adversity may inhibit the formation of supportive social ties, and weak social support is itself often linked to dysregulated stress responses. Here, we use prospective, longitudinal data from wild baboons in Kenya to test the links between early adversity, adult social bonds, and adult fecal glucocorticoid hormone concentrations (a measure of hypothalamic–pituitary–adrenal [HPA] axis activation and the stress response). Using a causal inference framework, we found that experiencing one or more sources of early adversity led to a 9 to 14% increase in females' glucocorticoid concentrations across adulthood. However, these effects were not mediated by weak social bonds: The direct effects of early adversity on adult glucocorticoid concentrations were 11 times stronger than the effects mediated by social bonds. This pattern occurred, in part, because the effect of social bonds on glucocorticoids was weak compared to the powerful effects of early adversity on glucocorticoid levels in adulthood. Hence, in female baboons, weak social bonds in adulthood are not enough to explain the effects of early adversity on glucocorticoid concentrations. Together, our results support the well-established notions that early adversity and weak social bonds both predict poor adult health. However, the magnitudes of these two effects differ considerably, and they may act independently of one another.

<https://www.pnas.org/content/117/33/20052.abstract?etoc>

#### **RACHEL KRANTON et al – Deconstructing bias in social preferences reveals groupy and not-groupy behavior**

Group divisions are a continual feature of human history, with biases toward people's own groups shown in both experimental and natural settings. Using a within-subject design, this paper deconstructs group biases to find significant and robust individual differences; some individuals consistently respond to group divisions, while others do not. We examined individual behavior in two treatments in which subjects make pairwise decisions that determine own and others' incomes. In a political treatment, which divided subjects into groups based on their political leanings, political party members showed more in-group bias than Independents who professed the same political opinions. However, this greater bias was also present in a minimal group treatment, showing that stronger group identification was not the driver of higher favoritism in the political setting. Analyzing individual choices across the experiment, we categorize participants as "groupy" or "not groupy," such that groupy participants have social preferences that change for in-group and out-group recipients, while not-groupy participants' preferences do not change across group context. Demonstrating further that the group identity of the recipient mattered less to their choices, strongly not-groupy subjects made allocation decisions faster. We conclude that observed in-group biases build on a foundation of heterogeneity in individual groupiness.

<https://www.pnas.org/content/early/2020/08/17/1918952117.abstract?etoc>

#### **PATRICK K. DURKEE, AARON W. LUKASZEWSKI & DAVID M. BUSS – Psychological foundations of human status allocation**

Competing theories of status allocation posit divergent conceptual foundations upon which human status hierarchies are built. We argue that the three prominent theories of status allocation—competence-based models, conflict-based models, and dual-pathway models—can be distinguished by the importance that they place on four key affordance dimensions: benefit-generation ability, benefit-generation willingness, cost-infliction ability, and cost-infliction willingness. In the current study, we test competing theoretical predictions about the relative centrality of each affordance dimension to clarify the foundations of human status allocation. We examined the extent to which American raters' ( $n = 515$ ) perceptions of the

benefit-generation and cost-infliction affordances of 240 personal characteristics predict the status impacts of those same personal characteristics as determined by separate groups of raters (n = 2,751) across 14 nations. Benefit-generation and cost-infliction affordances were both positively associated with status allocation at the zero-order level. However, the unique effects of benefit-generation affordances explained most of the variance in status allocation when competing with cost-infliction affordances, whereas cost-infliction affordances were weak or null predictors. This finding suggests that inflicting costs without generating benefits does not reliably increase status in the minds of others among established human groups around the world. Overall, the findings bolster competence-based theories of status allocation but offer little support for conflict-based and dual-pathway models.

<https://www.pnas.org/content/early/2020/08/17/2006148117.abstract?etoc>

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## Science Advances

### PAPERS

#### **ALAN S. COWEN & DACHER KELTNER – Universal facial expressions uncovered in art of the ancient Americas: A computational approach**

Central to the study of emotion is evidence concerning its universality, particularly the degree to which emotional expressions are similar across cultures. Here, we present an approach to studying the universality of emotional expression that rules out cultural contact and circumvents potential biases in survey-based methods: a computational analysis of apparent facial expressions portrayed in artwork created by members of cultures isolated from western civilization. Using data-driven methods, we find that facial expressions depicted in 63 sculptures from the ancient Americas tend to accord with western expectations for emotions that unfold in specific social contexts. Ancient American sculptures tend to portray at least five facial expressions in contexts predicted by Westerners, including “pain” in torture, “determination”/“strain” in heavy lifting, “anger” in combat, “elation” in social touch, and “sadness” in defeat-supporting the universality of these expressions.

[https://advances.sciencemag.org/content/6/34/eabb1005?utm\\_campaign=toc\\_advances\\_2020-08-21&et rid=17774313&et cid=3454978](https://advances.sciencemag.org/content/6/34/eabb1005?utm_campaign=toc_advances_2020-08-21&et rid=17774313&et cid=3454978)

#### **LEI ZHANG & JAN GLÄSCHER – A brain network supporting social influences in human decision-making**

Humans learn from their own trial-and-error experience and observing others. However, it remains unknown how brain circuits compute expected values when direct learning and social learning coexist in uncertain environments. Using a multiplayer reward learning paradigm with 185 participants (39 being scanned) in real time, we observed that individuals succumbed to the group when confronted with dissenting information but observing confirming information increased their confidence. Leveraging computational modeling and functional magnetic resonance imaging, we tracked direct valuation through experience and vicarious valuation through observation and their dissociable, but interacting neural representations in the ventromedial prefrontal cortex and the anterior cingulate cortex, respectively. Their functional coupling with the right temporoparietal junction representing instantaneous social information instantiated a hitherto uncharacterized social prediction error, rather than a reward prediction error, in the putamen. These findings suggest that an integrated network involving the brain’s reward hub and social hub supports social influence in human decision-making.

[https://advances.sciencemag.org/content/6/34/eabb4159?utm\\_campaign=toc\\_advances\\_2020-08-21&et rid=17774313&et cid=3454978](https://advances.sciencemag.org/content/6/34/eabb4159?utm_campaign=toc_advances_2020-08-21&et rid=17774313&et cid=3454978)

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## Trends in Cognitive Sciences

### PAPERS

#### **JONATHAN BIRCH, ALEXANDRA K. SCHNELL & NICOLA S. CLAYTON – Dimensions of Animal Consciousness**

How does consciousness vary across the animal kingdom? Are some animals ‘more conscious’ than others? This article presents a multidimensional framework for understanding interspecies variation in states of consciousness. The framework distinguishes five key dimensions of variation: perceptual richness, evaluative richness, integration at a time, integration across time, and self-consciousness. For each dimension, existing experiments that bear on it are reviewed and future experiments are suggested. By assessing a given species against each dimension, we can construct a consciousness profile for that species. On this framework, there is no single scale along which species can be ranked as more or less conscious. Rather, each species has its own distinctive consciousness profile.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(20\)30192-3?dgcid=raven\\_jbs\\_aip\\_email](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(20)30192-3?dgcid=raven_jbs_aip_email)

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## Trends in Ecology and Evolution

### PAPERS

#### **CYRIL C. GRUETER et al – Multilevel Organisation of Animal Sociality**

Multilevel societies (MLSs), stable nuclear social units within a larger collective encompassing multiple nested social levels, occur in several mammalian lineages. Their architectural complexity and size impose specific demands on their members requiring adaptive solutions in multiple domains. The functional significance of MLSs lies in their members being equipped to reap the benefits of multiple group sizes. Here, we propose a unifying terminology and operational definition of MLS. To identify new avenues for integrative research, we synthesise current literature on the selective pressures underlying the

evolution of MLSs and their implications for cognition, intersexual conflict, and sexual selection. Mapping the drivers and consequences of MLS provides a reference point for the social evolution of many taxa, including our own species.

[https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(20\)30133-6?dgcid=raven\\_jbs\\_etoc\\_email](https://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(20)30133-6?dgcid=raven_jbs_etoc_email)

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