

CONTENTS

NOTICES	2
PUBLICATION ALERTS.....	2
ACADEMIA.EDU – Brain ontogeny and life history in Pleistocene hominins.....	2
JEAN-JACQUES HUBLIN, SIMON NEUBAUER & PHILIPP GUNZ – Brain ontogeny and life history in Pleistocene hominins.....	2
SCIENTEDIRECT – Variations in size, shape and asymmetries of the third frontal convolution in hominids.....	3
ANTOINE BALZEAU et al – Variations in size, shape and asymmetries of the third frontal convolution in hominids: Paleoneurological implications for hominin evolution and the origin of language.....	3
SCIENTEDIRECT – Communicative capacities in Middle Pleistocene humans from the Sierra de Atapuerca.....	3
I.MARTÍNEZ et al – Communicative capacities in Middle Pleistocene humans from the Sierra de Atapuerca in Spain.....	3
NEWS	3
BREAKING SCIENCE – Reconstruction of Oral Microbiomes of Neanderthals, Paleolithic & Modern Humans.....	3
NATURE BRIEFING – ‘Spectacular’ Neanderthal find in Italy.....	4
SAPIENS – Rock art in South Africa.....	4
SCIENCE DAILY – For twins, gesture and speech go hand-in-hand in language development.....	4
SCIENCE DAILY – Team 'reads minds' to understand human tool use.....	4
SCIENCE DAILY – The emergence of cooperation.....	4
SCIENCE DAILY – Ankle and foot bone evolution gave prehistoric mammals a leg up.....	4
SCIENCE NEWS – Neanderthals carb loaded, helping grow their big brains.....	4
SCIENCE NEWS – Earth was once a planet of the apes—and they set the stage for human evolution.....	4
THE CONVERSATION – Why do people with synaesthesia link senses, and how does it work?.....	4
THE CONVERSATION – Dunbar’s number: why my theory has withstood 30 years of scrutiny.....	5
PUBLICATIONS	5
American Journal of Physical Anthropology.....	5
PAPERS	5
QUYI JIANG et al – First direct evidence of conservative foraging ecology of early Gigantopithecus blacki (~2 Ma) in Guangxi, southern China.....	5
DREW K. ENIGK et al with RICHARD W. WRANGHAM – Female-directed aggression by adolescent male chimpanzees primarily constitutes dominance striving, not sexual coercion.....	5
Current Biology.....	5
PAPERS	5
LOGAN S. JAMES et al – Phylogeny and mechanisms of shared hierarchical patterns in birdsong.....	5
VEITH WEILNHAMMER et al – An active role of inferior frontal cortex in conscious experience.....	5
Evolutionary Anthropology.....	6
PAPERS	6
SHYAMALIKA GOPALAN et al – Inferring archaic introgression from hominin genetic data.....	6
Frontiers for Young Minds.....	6
PAPERS	6
CATHERINE J. CROMPTON et al – Double Empathy: Why Autistic People Are Often Misunderstood.....	6
Frontiers in Psychology.....	6
ARTICLES	6
ERIK O. KIMBROUGH, GORDON M. MYERS & ARTHUR J. ROBSON – Infanticide and Human Self Domestication.....	6
PAPERS	6
PRAKASH MONDAL – The Limits of Language-Thought Influences Can Be Set by the Constraints of Embodiment.....	6
HOLLIS TAYLOR – Evidence for Teaching in an Australian Songbird.....	7
TINA C. ROESKE, DAVID ROTHENBERG & DAVID E. GAMMON – Mockingbird Morphing Music: Structured Transitions in a Complex Bird Song.....	7
ALFONSO GARCÍA-MONGE, HENAR RODRÍGUEZ-NAVARRO & DANIEL BORES-GARCÍA – New Images for Old Symbols: Meanings That Children Give to a Traditional Game.....	7
BENJAMIN SWETS et al – A Cross-Linguistic Study of Individual Differences in Speech Planning.....	7
Journal of Language Evolution.....	8
PAPERS	8
NIKLAS ERBEN JOHANSSON, JON W CARR & SIMON KIRBY – Cultural evolution leads to vocal iconicity in an experimental iterated learning task.....	8
MIKI TAKAHASI, KAZUO OKANOYA & REIKO MAZUKA – How vocal temporal parameters develop: a comparative study between humans and songbirds, two distantly related vocal learners.....	8

GUILLAUME DEZECACHE et al with KLAUS ZUBERBÜHLER – Flexibility in wild infant chimpanzee vocal behavior	8
FIONA KIRTON et al with SIMON KIRBY & KENNY SMITH – Constituent order in silent gesture reflects the perspective of the producer	9
Nature	9
NEWS	9
Microbes in Neanderthals’ mouths reveal their carb-laden diet	9
ARTICLES.....	9
GLENNIS A. LOGSDON & EVAN E. EICHLER – Mining the gaps of chromosome 8	9
Nature Communications	9
PAPERS.....	9
DANIEL A. YUDKIN et al – Binding moral values gain importance in the presence of close others.....	9
Nature Scientific Reports.....	10
PAPERS.....	10
LAURA MIETH, AXEL BUCHNER & RAOUL BELL – Moral labels increase cooperation and costly punishment in a Prisoner’s Dilemma game with punishment option	10
ALEKSANDRA ĆWIEK et al with MARCUS PERLMAN – Novel vocalizations are understood across cultures	10
ANIL PRAKASH & MOINAK BANERJEE – Genomic selection signatures in autism spectrum disorder identifies cognitive genomic tradeoff and its relevance in paradoxical phenotypes of deficits versus potentialities	10
ELEANOR M. L. SCERRI et al with MICHAEL D. PETRAGLIA – The expansion of Acheulean hominins into the Nefud Desert of Arabia	10
New Scientist	11
ARTICLES.....	11
MICHAEL MARSHALL – Ancient hominins may have needed midwives to help deliver babies	11
PLoS Biology.....	11
PAPERS.....	11
NICHOLAS A. FROST, ANNA HAGGART & VIKAS S. SOHAL – Dynamic patterns of correlated activity in the prefrontal cortex encode information about social behavior	11
PLoS One.....	11
PAPERS.....	11
BRIAN M. WOOD et al – Hunter-Gatherers in context: Mammal community composition in a northern Tanzania landscape used by Hadza foragers and Datoga pastoralists	11
J. M. M. BROWN et al – Middle ratings rise regardless of grammatical construction: Testing syntactic variability in a repeated exposure paradigm	12
Proceedings of the Royal Society B.....	12
PAPERS.....	12
JULES DEZEURE et al – Birth timing generates reproductive trade-offs in a non-seasonal breeding primate.....	12
THIBAUT LENGRONNE et al – Multi-level social organization and nest-drifting behaviour in a eusocial insect	12
Science Advances.....	12
PAPERS.....	12
ALI GHAZIZADEH & OKIHIDE HIKOSAKA – Common coding of expected value and value uncertainty memories in the prefrontal cortex and basal ganglia output	12
Trends in Cognitive Sciences	13
CORRECTIONS	13
THOMAS O'ROURKE et al with CEDRIC BOECKX – Capturing the Effects of Domestication on Vocal Learning Complexity	13
SUBSCRIBE to the EAORC Bulletin	13
UNSUBSCRIBE from the EAORC Bulletin	13
PRODUCED BY AND FOR THE EAORC EMAIL GROUP.....	13

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.

ACADEMIA.EDU – Brain ontogeny and life history in Pleistocene hominins

Philosophical Transactions of the Royal Society B 370: 20140062 (2015)

JEAN-JACQUES HUBLIN, SIMON NEUBAUER & PHILIPP GUNZ – Brain ontogeny and life history in Pleistocene hominins

A high level of encephalization is critical to the human adaptive niche and emerged among hominins over the course of the past 2Myr. Evolving larger brains required important adaptive adjustments, in particular regarding energy allocation and life

history. These adaptations included a relatively small brain at birth and a protracted growth of highly dependent offspring within a complex social environment. In turn, the extended period of growth and delayed maturation of the brain structures of humans contribute to their cognitive complexity. The current palaeoanthropological evidence shows that, regarding life history and brain ontogeny, the Pleistocene hominin taxa display different patterns and that one cannot simply contrast an 'ape-model' to a 'human-model'. Large-brained hominins such as Upper Pleistocene Neandertals have evolved along their own evolutionary pathway and can be distinguished from modern humans in terms of growth pattern and brain development. The life-history pattern and brain ontogeny of extant humans emerged only recently in the course of human evolution.

https://www.academia.edu/10277936/Hublin_J_J_Neubauer_S_and_P_Gunz_2015_Brain_ontogeny_and_life_history_in_Pleistocene_hominins_Philosophical_Transactions_of_the_Royal_Society_B_370_20140062_http_dx_doi_org_10_1098_rstb_2014_0062

SCIEDIRECT – Variations in size, shape and asymmetries of the third frontal convolution in hominids

Journal of Human Evolution 76, 116-128 (2014)

ANTOINE BALZEAU et al – Variations in size, shape and asymmetries of the third frontal convolution in hominids: Paleoneurological implications for hominin evolution and the origin of language

The study of brain structural asymmetries as anatomical substrates of functional asymmetries in extant humans, great apes, and fossil hominins is of major importance in understanding the structural basis of modern human cognition. We propose methods to quantify the variation in size, shape and bilateral asymmetries of the third frontal convolution (or posterior inferior frontal gyrus) among recent modern humans, bonobos and chimpanzees, and fossil hominins using actual and virtual endocasts. These methodological improvements are necessary to extend previous qualitative studies of these features. We demonstrate both an absolute and relative bilateral increase in the size of the third frontal convolution in width and length between Pan species, as well as in hominins. We also observed a global bilateral increase in the size of the third frontal convolution across all species during hominin evolution, but also non-allometric intra-group variations independent of brain size within the fossil samples. Finally, our results show that the commonly accepted leftward asymmetry of Broca's cap is biased by qualitative observation of individual specimens. The trend during hominin evolution seems to be a reduction in size on the left compared with the right side, and also a clearer definition of the area. The third frontal convolution considered as a whole projects more laterally and antero-posteriorly in the right hemisphere. As a result, the left 'Broca's cap' looks more globular and better defined. Our results also suggest that the pattern of brain asymmetries is similar between Pan paniscus and hominins, leaving the gradient of the degree of asymmetry as the only relevant structural parameter. As the anatomical substrate related to brain asymmetry has been present since the appearance of the hominin lineage, it is not possible to prove a direct relationship between the extent of variations in the size, shape, and asymmetries of the third frontal convolution and the origin of language in hominins.

<https://www.sciencedirect.com/science/article/abs/pii/S0047248414001535>

SCIEDIRECT – Communicative capacities in Middle Pleistocene humans from the Sierra de Atapuerca

Quaternary International 295, 94-101 (2013)

I.MARTÍNEZ et al – Communicative capacities in Middle Pleistocene humans from the Sierra de Atapuerca in Spain

The present study presents new data on the abilities of *Homo heidelbergensis* to produce and perceive the sounds emitted during modern human spoken language. The pattern of sound power transmission was studied through the outer and middle ears in five individuals from the Sima de los Huesos, four chimpanzees and four modern humans. The results were then used to calculate the occupied bandwidth of the outer and middle ears, an important variable related with communicative capacities. The results demonstrate that the Atapuerca SH hominins were similar to modern humans in this aspect, falling within the lower half of the range of variation, and clearly distinct from chimpanzees. Specifically, the Atapuerca SH hominins show a bandwidth that is slightly displaced and considerably extended to encompass the frequencies that contain relevant acoustic information in human speech, permitting the transmission of a larger amount of information with fewer errors. At the same time, the presence of a complete cervical segment of the spinal column associated with Cranium 5 from the Sima de los Huesos Middle Pleistocene site (Sierra de Atapuerca, Spain) makes it possible to estimate the vocal tract proportions in *H. heidelbergensis* for the first time. The results demonstrate that it is similar to the reconstructed vocal tract in the La Ferrassie 1 Neandertal individual, which has been suggested to have been capable of producing the full range of sounds emitted during modern human spoken language. These results in the Atapuerca (SH) hominins are consistent with other recent suggestions for an ancient origin for human speech capacity.

<https://www.sciencedirect.com/science/article/abs/pii/S1040618212004752>

NEWS

BREAKING SCIENCE – Reconstruction of Oral Microbiomes of Neanderthals, Paleolithic & Modern Humans

The oral microbiome plays key roles in human biology, health, and disease, but little is known about the global diversity, variation, or evolution of this microbial community. To better understand the evolution and changing ecology of the human oral microbiome, a multinational team of scientists analyzed dental biofilm metagenomes of Neanderthals and Late

Pleistocene to present-day humans spanning the past 100,000 years and compared them with those of chimpanzees, gorillas, and New World howler monkeys.

http://feedproxy.google.com/~r/BreakingScienceNews/~3/2J0MCdJLjEo/hominid-oral-microbiomes-09644.html?utm_source=feedburner&utm_medium=email

NATURE BRIEFING – ‘Spectacular’ Neanderthal find in Italy

The remains of 9 Neanderthals who died between 50,000 and 100,000 years ago have been unearthed in a cave outside Rome. According to archaeologists, the Neanderthals were killed by hyenas and dragged into the cave to be devoured. The bones were found in the Guattari Cave, the site of an earlier Neanderthal discovery in 1939. “It is a spectacular find,” says archaeologist Mario Rollo. “A collapse, perhaps caused by an earthquake, sealed this cave for more than 60,000 years, thereby preserving the remains left inside for tens of thousands of years.”

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=4b0737e3be&e=1db4b9a19b>

SAPIENS – Rock art in South Africa

With the help of key contemporary ethnographic texts about modern San peoples, archaeologists are reconsidering the meaning of cave paintings created by ancient San in a new – and sacred – light.

<https://www.sapiens.org/archaeology/rock-art-south-africa/>

SCIENCE DAILY – For twins, gesture and speech go hand-in-hand in language development

Twins produce fewer gestures and gesture to fewer objects than other children. Language use also lags for twins, and language -- but not gesture -- is also affected by sex, with girls performing better than boys.

<https://www.sciencedaily.com/releases/2021/05/210510161431.htm>

SCIENCE DAILY – Team 'reads minds' to understand human tool use

Researchers have made an astonishing new discovery about how our brains control our hands. The team used MRI data to study which parts of the brain are used when we handle tools. The findings could help shed light on the regions of the brain that evolved in humans and set us apart from primates, and could pave the way for the development of next-generation prosthetic limbs that tap into the brain's control center.

<https://www.sciencedaily.com/releases/2021/05/210510133204.htm>

SCIENCE DAILY – The emergence of cooperation

Cooperation plays a crucial role in evolution. A team of scientists has now created a new model that shows how different kinds of cooperative strategies among humans develop. Using their unified framework, they show how an individual's experience and the reputation of others influence the emergence of successful cooperation.

<https://www.sciencedaily.com/releases/2021/05/210513142406.htm>

SCIENCE DAILY – Ankle and foot bone evolution gave prehistoric mammals a leg up

The evolution of ankle and foot bones into different shapes and sizes helped mammals adapt and thrive after the extinction of the dinosaurs, a study suggests.

<https://www.sciencedaily.com/releases/2021/05/210513100033.htm>

SCIENCE NEWS – Neanderthals carb loaded, helping grow their big brains

Here's another blow to the popular image of Neanderthals as brutish meat eaters: A new study of bacteria collected from Neanderthal teeth shows that our close cousins ate so many roots, nuts, or other starchy foods that they dramatically altered the type of bacteria in their mouths. The finding suggests our ancestors had adapted to eating lots of starch by at least 600,000 years ago—about the same time as they needed more sugars to fuel a big expansion of their brains.

<https://www.sciencemag.org/news/2021/05/neanderthals-carb-loaded-helping-grow-their-big-brains>

SCIENCE NEWS – Earth was once a planet of the apes—and they set the stage for human evolution

More than 10 million years ago, the world was brimming with a wide variety of apes. Scientists studying the ones that are still alive today can learn a lot about human evolution—but they miss out on many clues that can only be found from the apes that went extinct. Watch to learn how fossil apes have strengthened ideas about how humans evolved, and what steps we can take to learn even more about our ancient ancestors.

<https://www.sciencemag.org/news/2021/05/earth-was-once-planet-apes-and-they-set-stage-human-evolution>

THE CONVERSATION – Why do people with synaesthesia link senses, and how does it work?

If you can "hear" colours or "taste" words then your brain is being activated in unusual ways.

<https://theconversationuk.cmail20.com/t/r-l-tilclt-khhiliah-p/>

THE CONVERSATION – Dunbar’s number: why my theory has withstood 30 years of scrutiny

The claim that our brain size limits us to 150 meaningful friendships has been challenged by a recent paper.

<https://theconversationuk.cmail19.com/t/r-l-tlilhkl-t-khhllilahh-x/>

PUBLICATIONS

American Journal of Physical Anthropology

PAPERS

QUYI JIANG et al – First direct evidence of conservative foraging ecology of early *Gigantopithecus blacki* (~2 Ma) in Guangxi, southern China

Gigantopithecus blacki, the largest hominoid known, is one of the representative Pleistocene mammals in southern China and northern Southeast Asia. Here we investigate the feeding ecology of *G. blacki* in its core habitat (Guangxi, Southern China) during the early Early Pleistocene, which was the early period in its evolution.

The isotopic data show Guangxi was characterized by closed C3 forest and humid climate in the early Early Pleistocene. Niche partitioning is found among *G. blacki*, *Sinomastodon*, *Ailuropoda* and *Stegodon*, the typical megafauna in South China in the early Early Pleistocene. This could be one of the important factors for them to co-exist until the Middle Pleistocene. Smallest isotopic variations of *G. blacki* are found compared with those of contemporary animals, indicating a conservative foraging ecology i.e., limited foraging area and/or narrow dietary flexibility. Furthermore, the more confined foraging ecology of *G. blacki* is also seen in comparison with fossil and extant large-bodied primates. However, the unique dietary pattern of *G. blacki* does not seem to have hindered its survival. The environment in Guangxi during the early Early Pleistocene offered the suitable conditions for *G. blacki* to become one of the typical species in the faunal assemblages.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24300>

DREW K. ENIGK et al with RICHARD W. WRANGHAM – Female-directed aggression by adolescent male chimpanzees primarily constitutes dominance striving, not sexual coercion

Chimpanzees (*Pan troglodytes*) are notable for exhibiting high levels of male-to-female aggression. Much of this aggression from adult males serves sexually coercive functions. Despite being smaller and lower-ranking than adult males, adolescent males also engage in regular aggression against adult females. Here, we test whether the primary function of this aggression is sexual coercion, as in adult males, or, alternatively, whether adolescent males use aggression to establish social dominance over females.

Our data illustrate that the establishment of social dominance was more important than sexual coercion in explaining patterns of adolescent male aggression toward females. In comparison, evidence for sexual coercion was clear and compelling in adult males. These findings highlight that the primary function of male-to-female aggression differs between adolescent and adult males.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/ajpa.24296>

Current Biology

PAPERS

LOGAN S. JAMES et al – Phylogeny and mechanisms of shared hierarchical patterns in birdsong

Organizational patterns can be shared across biological systems, and revealing the factors shaping common patterns can provide insight into fundamental biological mechanisms. The behavioral pattern that elements with more constituents tend to consist of shorter constituents (Menzerath’s law [ML]) was described first in speech and language (e.g., words with more syllables consist of shorter syllables) and subsequently in music and animal communication. Menzerath’s law is hypothesized to reflect efficiency in information transfer, but biases and constraints in motor production can also lead to this pattern. We investigated the evolutionary breadth of ML and the contribution of production mechanisms to ML in the songs of 15 songbird species. Negative relationships between the number and duration of constituents (e.g., syllables in phrases) were observed in all 15 species. However, negative relationships were also observed in null models in which constituents were randomly allocated into observed element durations, and the observed negative relationship for numerous species did not differ from the null model; consequently, ML in these species could simply reflect production constraints and not communicative efficiency. By contrast, ML was significantly different from the null model for more than half the cases, suggesting additional organizational rules are imposed onto birdsongs. Production mechanisms are also underscored by the finding that canaries and zebra finches reared without auditory experiences that guide vocal development produced songs with nearly identical ML patterning as typically reared birds. These analyses highlight the breadth with which production mechanisms contribute to this prevalent organizational pattern in behavior.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00528-5](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00528-5)

VEITH WEILNHAMMER et al – An active role of inferior frontal cortex in conscious experience

In the search for the neural correlates of consciousness, it has remained controversial whether prefrontal cortex determines what is consciously experienced or, alternatively, serves only complementary functions, such as introspection or action. Here, we provide converging evidence from computational modeling and two functional magnetic resonance imaging experiments

that indicated a key role of inferior frontal cortex in detecting perceptual conflicts caused by ambiguous sensory information. Crucially, the detection of perceptual conflicts by prefrontal cortex turned out to be critical in the process of transforming ambiguous sensory information into unambiguous conscious experiences: in a third experiment, disruption of neural activity in inferior frontal cortex through transcranial magnetic stimulation slowed down the updating of conscious experience that occurs in response to perceptual conflicts. These findings show that inferior frontal cortex actively contributes to the resolution of perceptual ambiguities. Prefrontal cortex is thus causally involved in determining the contents of conscious experience.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)00578-9](https://www.cell.com/current-biology/fulltext/S0960-9822(21)00578-9)

Evolutionary Anthropology

PAPERS

SHYAMALIKA GOPALAN et al – Inferring archaic introgression from hominin genetic data

Questions surrounding the timing, extent, and evolutionary consequences of archaic admixture into human populations have a long history in evolutionary anthropology. More recently, advances in human genetics, particularly in the field of ancient DNA, have shed new light on the question of whether or not *Homo sapiens* interbred with other hominin groups. By the late 1990s, published genetic work had largely concluded that archaic groups made no lasting genetic contribution to modern humans; less than a decade later, this conclusion was reversed following the successful DNA sequencing of an ancient Neanderthal. This reversal of consensus is noteworthy, but the reasoning behind it is not widely understood across all academic communities. There remains a communication gap between population geneticists and paleoanthropologists. In this review, we endeavor to bridge this gap by outlining how technological advancements, new statistical methods, and notable controversies ultimately led to the current consensus.

<https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21895>

Frontiers for Young Minds

PAPERS

CATHERINE J. CROMPTON et al – Double Empathy: Why Autistic People Are Often Misunderstood

Autism affects how someone makes sense of the world around them. About 1–2% of people are autistic. You might have an autistic classmate or family member, or maybe you are autistic. Autistic people might communicate differently than people who are not autistic. This means that it can be difficult for other people to understand what autistic people are trying to say or what they mean. We tend to think that people who are not autistic might be more successful at understanding other people, but in fact, autistic people may be better understood by other autistic people. We will examine and explain some research that has explored how autistic and non-autistic people communicate with each other and explore how this research fits with a theory called the double empathy problem. Understanding what makes interaction comfortable and easy for different people can help us all understand each other better.

<https://kids.frontiersin.org/article/10.3389/frym.2021.554875>

Frontiers in Psychology

ARTICLES

ERIK O. KIMBROUGH, GORDON M. MYERS & ARTHUR J. ROBSON – Infanticide and Human Self Domestication

The notion of domestication has played a role in attempts to understand human evolution going right back to Darwin (1859) (see Hare, 2017). Two of the leading current proponents of human self-domestication (HSD) are Hare and Wrangham. Hare (2017) lays out his account in “Survival of the Friendliest” and Wrangham has done much of the recent work on HSD; see Wrangham (2019) and references there.

HSD starts from the premise that our species' evolution in the later Pleistocene is consistent with a domestication syndrome, including traits such as a reduction in body mass, shortening of the face accompanied by a reduction in tooth size, reduced sexual dimorphism due to feminization, and a reduction in cranial capacity. Hare (2017 p. 157) argues that HSD, “draws on comparative, developmental, fossil, and neurobiological evidence to show that late human evolution was dominated by selection for intragroup prosociality over aggression. As a result, modern humans possess traits consistent with the syndrome associated with domestication in other animals. An example is the long running silver fox experiments in Siberia.”

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.667334/full>

PAPERS

PRAKASH MONDAL – The Limits of Language-Thought Influences Can Be Set by the Constraints of Embodiment

Language and thought are intimately related to one another, but the level or degree of connectedness between language and thought is not clear due to the fact that the influence of language over thought can be more context-specific or general (see Zlatev and Blomberg, 2015). This reflects general assumptions from the Sapir–Whorf Hypothesis (Whorf, 1956). If the influence of language over thought, thinking, and reasoning is very context-specific in being applicable to specific modes/modalities of cognition, such as color, space, visual motion, etc., this may suggest that the constraints of embodiment determine how modal linguistic symbols come to be grounded in neurally instantiated modality-specific systems (Barsalou, 2008).

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.593137/full>

HOLLIS TAYLOR – Evidence for Teaching in an Australian Songbird

Song in oscine birds (as in human speech and song) relies upon the rare capacity of vocal learning. Transmission can be vertical, horizontal, or oblique. As a rule, memorization and production by a naïve bird are not simultaneous: the long-term storage of song phrases precedes their first vocal rehearsal by months. While a wealth of detail regarding songbird enculturation has been uncovered by focusing on the apprentice, whether observational learning can fully account for the ontogeny of birdsong, or whether there could also be an element of active teaching involved, has remained an open question. Given the paucity of knowledge on animal cultures, I argue for the utility of an inclusive definition of teaching that encourages data be collected across a wide range of taxa. Borrowing insights from musicology, I introduce the Australian pied butcherbird (*Cracticus nigrogularis*) into the debate surrounding mechanisms of cultural transmission. I probe the relevance and utility of mentalistic, culture-based, and functionalist approaches to teaching in this species. Sonographic analysis of birdsong recordings and observational data (including photographs) of pied butcherbird behavior at one field site provide evidence that I assess based on criteria laid down by Caro and Hauser, along with later refinements to their functionalist definition. The candidate case of teaching reviewed here adds to a limited but growing body of reports supporting the notion that teaching may be more widespread than is currently realized. Nonetheless, I describe the challenges of confirming that learning has occurred in songbird pupils, given the delay between vocal instruction and production, as well as the low status accorded to anecdote and other observational evidence commonly mustered in instances of purported teaching. As a corrective, I press for an emphasis on biodiversity that will guide the study of teaching beyond human accounts and intractable discipline-specific burdens of proof.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.593532/full>

TINA C. ROESKE, DAVID ROTHENBERG & DAVID E. GAMMON – Mockingbird Morphing Music: Structured Transitions in a Complex Bird Song

The song of the northern mockingbird, *Mimus polyglottos*, is notable for its extensive length and inclusion of numerous imitations of several common North American bird species. Because of its complexity, it is not widely studied by birdsong scientists. When they do study it, the specific imitations are often noted, and the total number of varying phrases. What is rarely noted is the systematic way the bird changes from one syllable to the next, often with a subtle transition where one sound is gradually transformed into a related sound, revealing an audible and specific compositional mode. It resembles a common strategy in human composing, which can be described as variation of a theme. In this paper, we present our initial attempts to describe the specific compositional rules behind the mockingbird song, focusing on the way the bird transitions from one syllable type to the next. We find that more often than chance, syllables before and after the transition are spectrally related, i.e., transitions are gradual, which we describe as morphing. In our paper, we categorize four common modes of morphing: timbre change, pitch change, squeeze (shortening in time), and stretch (lengthening in time). This is the first time such transition rules in any complex birdsong have been specifically articulated.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.630115/full>

ALFONSO GARCÍA-MONGE, HENAR RODRÍGUEZ-NAVARRO & DANIEL BORES-GARCÍA – New Images for Old Symbols: Meanings That Children Give to a Traditional Game

Traditional games are considered agents of enculturation. This article explores the procedure to access the cultural meanings transmitted in a traditional game. The goal is to understand what children aged 6–11 make of the game called ‘the chained bear’ and to compare the meanings retrieved with those of different traditional versions of the game. For such a purpose, through an exploratory cross-sectional study, cartoons depicting people playing the game were exhibited and viewers ($n = 359$; age range: 6–11; Mean age = 8.79; SD = 1.81) were asked to interpret them as a drama play, as well as contributing a title, a plot and saying how they would name the characters. The results show that, beyond the individual images that each child created in their mind, most of them coincided in stories about harassment and defense and theft and protection. These plots match those of the ludic tradition, showing that the actions evoke different pictures to each individual, but share common cultural meanings in turn. The study shows a procedure to access the meanings that traditional games transmit and confirms that games contain pieces of culture, which makes them agents of enculturation.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.676590/full>

BENJAMIN SWETS et al – A Cross-Linguistic Study of Individual Differences in Speech Planning

Although previous research has shown that there exist individual and cross-linguistic differences in planning strategies during language production, little is known about how such individual differences might vary depending on which language a speaker is planning. The present series of studies examines individual differences in planning strategies exhibited by speakers of American English, French, and German. Participants were asked to describe images on a computer monitor while their eye movements were monitored. In addition, we measured participants' working memory capacity and speed of processing. The results indicate that in the present study, English and German were planned less incrementally (further in advance) prior to speech onset compared to French, which was planned more incrementally (not as far in advance). Crucially, speed of processing predicted the scope of planning for French speakers, but not for English or German speakers. These results

suggest that the different planning strategies that are invoked by syntactic choices available in different languages are associated with the tendency for speakers to rely on different cognitive support systems as they plan sentences.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.655516/full>

Journal of Language Evolution

PAPERS

NIKLAS ERBEN JOHANSSON, JON W CARR & SIMON KIRBY – Cultural evolution leads to vocal iconicity in an experimental iterated learning task

Experimental and cross-linguistic studies have shown that vocal iconicity is prevalent in words that carry meanings related to SIZE and SHAPE. Although these studies demonstrate the importance of vocal iconicity and reveal the cognitive biases underpinning it, there is less work demonstrating how these biases lead to the evolution of a sound symbolic lexicon in the first place. In this study, we show how words can be shaped by cognitive biases through cultural evolution. Using a simple experimental setup resembling the game telephone, we examined how a single word form changed as it was passed from one participant to the next by a process of immediate iterated learning. About 1,500 naïve participants were recruited online and divided into five condition groups. The participants in the CONTROL-group received no information about the meaning of the word they were about to hear, while the participants in the remaining four groups were informed that the word meant either BIG or SMALL (with the meaning being presented in text), or ROUND or POINTY (with the meaning being presented as a picture). The first participant in a transmission chain was presented with a phonetically diverse word and asked to repeat it. Thereafter, the recording of the repeated word was played for the next participant in the same chain. The sounds of the audio recordings were then transcribed and categorized according to six binary sound parameters. By modelling the proportion of vowels or consonants for each sound parameter, the SMALL-condition showed increases of FRONT UNROUNDED vowels and the POINTY-condition increases of ACUTE consonants. The results show that linguistic transmission is sufficient for vocal iconicity to emerge, which demonstrates the role non-arbitrary associations play in the evolution of language.

<https://academic.oup.com/jole/article/6/1/1/6270843>

MIKI TAKAHASI, KAZUO OKANOYA & REIKO MAZUKA – How vocal temporal parameters develop: a comparative study between humans and songbirds, two distantly related vocal learners

Human infants acquire motor patterns for speech during the first several years of their lives. Sequential vocalizations such as human speech are complex behaviors, and the ability to learn new vocalizations is limited to only a few animal species. Vocalizations are generated through the coordination of three types of organs: namely, vocal, respiratory, and articulatory organs. Moreover, sophisticated temporal respiratory control might be necessary for sequential vocalization involving human speech. However, it remains unknown how coordination develops in human infants and if this developmental process is shared with other vocal learners. To answer these questions, we analyzed temporal parameters of sequential vocalizations during the first year in human infants and compared these developmental changes to song development in the Bengalese finch, another vocal learner. In human infants, early cry was also analyzed as an innate sequential vocalization. The following three temporal parameters of sequential vocalizations were measured: note duration (ND), inter-onset interval, and inter-note interval (INI). The results showed that both human infants and Bengalese finches had longer INIs than ND in the early phase. Gradually, the INI and ND converged to a similar range throughout development. While ND increased until 6 months of age in infants, the INI decreased up to 60 days posthatching in finches. Regarding infant cry, ND and INI were within similar ranges, but the INI was more stable in length than ND. In sequential vocalizations, temporal parameters developed early with subsequent articulatory stabilization in both vocal learners. However, this developmental change was accomplished in a species-specific manner. These findings could provide important insights into our understanding of the evolution of vocal learning.

<https://academic.oup.com/jole/article/6/1/26/6008683>

GUILLAUME DEZECACHE et al with KLAUS ZUBERBÜHLER – Flexibility in wild infant chimpanzee vocal behavior

How did human language evolve from earlier forms of communication? One way to address this question is to compare prelinguistic human vocal behavior with nonhuman primate calls. An important finding has been that, prior to speech and from early on, human infant vocal behavior exhibits functional flexibility, or the capacity to produce sounds that are not tied to one specific function. This is reflected in human infants' use of single categories of protophones (precursors of speech sounds) in various affective circumstances, such that a given call type can occur in and express positive, neutral, or negative affective states, depending on the occasion. Nonhuman primate vocal behavior, in contrast, is seen as comparably inflexible, with different call types tied to specific functions and sometimes to specific affective states (e.g. screams mostly occur in negative circumstances). As a first step toward addressing this claim, we examined the vocal behavior of six wild infant chimpanzees during their first year of life. We found that the most common vocal signal, grunts, occurred in a range of contexts that were deemed positive, neutral, and negative. Using automated feature extraction and supervised learning algorithms, we also found acoustic variants of grunts produced in the affective contexts, suggesting gradation within this vocal category. In contrast, the second most common call type of infant chimpanzees, the whimpers, was produced in only one affective context, in line with standard models of nonhuman primate vocal behavior. Insofar as our affective categorization reflects infants' true affective state, our results suggest that the most common chimpanzee vocalization, the

grunt is not affectively bound. Affective decoupling is a prerequisite for chimpanzee grunts (and other vocal categories) to be deemed 'functionally flexible'. If later confirmed to be a functionally flexible vocal type, this would indicate that the evolution of this foundational vocal capability occurred before the split between the Homo and Pan lineages.

<https://academic.oup.com/jole/article-abstract/6/1/37/6017427>

FIONA KIRTON et al with SIMON KIRBY & KENNY SMITH – Constituent order in silent gesture reflects the perspective of the producer

Understanding the relationship between human cognition and linguistic structure is a central theme in language evolution research. Numerous studies have investigated this question using the silent gesture paradigm in which participants describe events using only gesture and no speech. Research using this paradigm has found that Agent–Patient–Action (APV) is the most commonly produced gesture order, regardless of the producer's native language. However, studies have uncovered a range of factors that influence ordering preferences. One such factor is salience, which has been suggested as a key determiner of word order. Specifically, humans, who are typically agents, are more salient than inanimate objects, so tend to be mentioned first. In this study, we investigated the role of salience in more detail and asked whether manipulating the salience of a human agent would modulate the tendency to express humans before objects. We found, first, that APV was less common than expected based on previous literature. Secondly, salience influenced the relative ordering of the patient and action, but not the agent and patient. For events involving a non-salient agent, participants typically expressed the patient before the action and vice versa for salient agents. Thirdly, participants typically omitted non-salient agents from their descriptions. We present details of a novel computational solution that infers the orders participants would have produced had they expressed all three constituents on every trial. Our analysis showed that events involving salient agents tended to elicit AVP; those involving a non-salient agent were typically described with APV, modulated by a strong tendency to omit the agent. We argue that these findings provide evidence that the effect of salience is realized through its effect on the perspective from which a producer frames an event.

<https://academic.oup.com/jole/article-abstract/6/1/54/6179035>

Nature

NEWS

Microbes in Neanderthals' mouths reveal their carb-laden diet

Gunk on ancient teeth yields bacterial DNA, allowing scientists to trace the oral microbiome's evolution.

<https://www.nature.com/articles/d41586-021-01260-z>

ARTICLES

GLENNIS A. LOGSDON & EVAN E. EICHLER – Mining the gaps of chromosome 8

The first gapless, telomere-to-telomere sequence of a human autosome, chromosome 8, is complete. Sequencing and assembly of the corresponding centromere in the chimpanzee, orangutan and macaque reveals details of its rapid evolution over the past 25 million years.

<https://www.nature.com/articles/d41586-021-01095-8>

Nature Communications

PAPERS

DANIEL A. YUDKIN et al – Binding moral values gain importance in the presence of close others

A key function of morality is to regulate social behavior. Research suggests moral values may be divided into two types: binding values, which govern behavior in groups, and individualizing values, which promote personal rights and freedoms. Because people tend to mentally activate concepts in situations in which they may prove useful, the importance they afford moral values may vary according to whom they are with in the moment. In particular, because binding values help regulate communal behavior, people may afford these values more importance when in the presence of close (versus distant) others. Five studies test and support this hypothesis. First, we use a custom smartphone application to repeatedly record participants' (n = 1166) current social context and the importance they afforded moral values. Results show people rate moral values as more important when in the presence of close others, and this effect is stronger for binding than individualizing values—an effect that replicates in a large preregistered online sample (n = 2016). A lab study (n = 390) and two preregistered online experiments (n = 580 and n = 752) provide convergent evidence that people afford binding, but not individualizing, values more importance when in the real or imagined presence of close others. Our results suggest people selectively activate different moral values according to the demands of the situation, and show how the mere presence of others can affect moral thinking.

<https://www.nature.com/articles/s41467-021-22566-6>

LAURA MIETH, AXEL BUCHNER & RAOUL BELL – Moral labels increase cooperation and costly punishment in a Prisoner’s Dilemma game with punishment option

To determine the role of moral norms in cooperation and punishment, we examined the effects of a moral-framing manipulation in a Prisoner’s Dilemma game with a costly punishment option. In each round of the game, participants decided whether to cooperate or to defect. The Prisoner’s Dilemma game was identical for all participants with the exception that the behavioral options were paired with moral labels (“I cooperate” and “I cheat”) in the moral-framing condition and with neutral labels (“A” and “B”) in the neutral-framing condition. After each round of the Prisoner’s Dilemma game, participants had the opportunity to invest some of their money to punish their partners. In two experiments, moral framing increased moral and hypocritical punishment: participants were more likely to punish partners for defection when moral labels were used than when neutral labels were used. When the participants’ cooperation was enforced by their partners’ moral punishment, moral framing did not only increase moral and hypocritical punishment but also cooperation. The results suggest that moral framing activates a cooperative norm that specifically increases moral and hypocritical punishment. Furthermore, the experience of moral punishment by the partners may increase the importance of social norms for cooperation, which may explain why moral framing effects on cooperation were found only when participants were subject to moral punishment.

<https://www.nature.com/articles/s41598-021-89675-6>

ALEKSANDRA ĆWIEK et al with MARCUS PERLMAN – Novel vocalizations are understood across cultures

Linguistic communication requires speakers to mutually agree on the meanings of words, but how does such a system first get off the ground? One solution is to rely on iconic gestures: visual signs whose form directly resembles or otherwise cues their meaning without any previously established correspondence. However, it is debated whether vocalizations could have played a similar role. We report the first extensive cross-cultural study investigating whether people from diverse linguistic backgrounds can understand novel vocalizations for a range of meanings. In two comprehension experiments, we tested whether vocalizations produced by English speakers could be understood by listeners from 28 languages from 12 language families. Listeners from each language were more accurate than chance at guessing the intended referent of the vocalizations for each of the meanings tested. Our findings challenge the often-cited idea that vocalizations have limited potential for iconic representation, demonstrating that in the absence of words people can use vocalizations to communicate a variety of meanings.

<https://www.nature.com/articles/s41598-021-89445-4>

ANIL PRAKASH & MOINAK BANERJEE – Genomic selection signatures in autism spectrum disorder identifies cognitive genomic tradeoff and its relevance in paradoxical phenotypes of deficits versus potentialities

Autism spectrum disorder (ASD) is a heterogeneous neurodevelopmental disorder characterized by paradoxical phenotypes of deficits as well as gain in brain function. To address this a genomic tradeoff hypothesis was tested and followed up with the biological interaction and evolutionary significance of positively selected ASD risk genes. SFARI database was used to retrieve the ASD risk genes while for population datasets 1000 genome data was used. Common risk SNPs were subjected to machine learning as well as independent tests for selection, followed by Bayesian analysis to identify the cumulative effect of selection on risk SNPs. Functional implication of these positively selected risk SNPs was assessed and subjected to ontology analysis, pertaining to their interaction and enrichment of biological and cellular functions. This was followed by comparative analysis with the ancient genomes to identify their evolutionary patterns. Our results identified significant positive selection signals in 18 ASD risk SNPs. Functional and ontology analysis indicate the role of biological and cellular processes associated with various brain functions. The core of the biological interaction network constitutes genes for cognition and learning while genes in the periphery of the network had direct or indirect impact on brain function. Ancient genome analysis identified de novo and conserved evolutionary selection clusters. The de-novo evolutionary cluster represented genes involved in cognitive function. Relative enrichment of the ASD risk SNPs from the respective evolutionary cluster or biological interaction networks may help in addressing the phenotypic diversity in ASD. This cognitive genomic tradeoff signatures impacting the biological networks can explain the paradoxical phenotypes in ASD.

<https://www.nature.com/articles/s41598-021-89798-w>

ELEANOR M. L. SCERRI et al with MICHAEL D. PETRAGLIA – The expansion of Acheulean hominins into the Nefud Desert of Arabia

The Arabian Peninsula is a critical geographic landmass situated between Africa and the rest of Eurasia. Climatic shifts across the Pleistocene periodically produced wetter conditions in Arabia, dramatically altering the spatial distribution of hominins both within and between continents. This is particularly true of Acheulean hominins, who appear to have been more tethered to water sources than Middle Palaeolithic hominins. However, until recently, chrono-cultural knowledge of the Acheulean of Arabia has been limited to one dated site, which indicated a hominin presence in Marine Isotope Stages (MIS) 7–6. Here, we report the first dated Acheulean site from the Nefud Desert of northern Saudi Arabia, together with palaeoecological evidence for an associated deep, probably fresh-water, lake. The site of An Nasim features varied and often finely flaked *façonnage* handaxes. Luminescence ages together with geomorphological and palaeoecological evidence

indicates that the associated artefacts date to MIS 9. At present, An Nasim represents the oldest yet documented Acheulean sites in Arabia, and adds to a growing picture of regionally diverse stone tool assemblages used by Middle Pleistocene hominins, and likely indicative of repeated population re-entry into the peninsula in wet 'Green Arabia' phases.

<https://www.nature.com/articles/s41598-021-89489-6>

New Scientist

ARTICLES

MICHAEL MARSHALL – Ancient hominins may have needed midwives to help deliver babies

It isn't just modern humans that have found giving birth painful and dangerous. Growing evidence suggests birth was difficult for our hominin relatives millions of years ago. As a result, earlier hominins like Australopithecus may have needed help to deliver their babies.

<https://www.newscientist.com/article/2276995-ancient-hominins-may-have-needed-midwives-to-help-deliver-babies/#ixzz6umQYb8Rk>

PLoS Biology

PAPERS

NICHOLAS A. FROST, ANNA HAGGART & VIKAA S. SOHAL – Dynamic patterns of correlated activity in the prefrontal cortex encode information about social behavior

This is an uncorrected proof.

New technologies make it possible to measure activity from many neurons simultaneously. One approach is to analyze simultaneously recorded neurons individually, then group together neurons which increase their activity during similar behaviors into an "ensemble." However, this notion of an ensemble ignores the ability of neurons to act collectively and encode and transmit information in ways that are not reflected by their individual activity levels. We used microendoscopic GCaMP imaging to measure prefrontal activity while mice were either alone or engaged in social interaction. We developed an approach that combines a neural network classifier and surrogate (shuffled) datasets to characterize how neurons synergistically transmit information about social behavior. Notably, unlike optimal linear classifiers, a neural network classifier with a single linear hidden layer can discriminate network states which differ solely in patterns of coactivity, and not in the activity levels of individual neurons. Using this approach, we found that surrogate datasets which preserve behaviorally specific patterns of coactivity (correlations) outperform those which preserve behaviorally driven changes in activity levels but not correlated activity. Thus, social behavior elicits increases in correlated activity that are not explained simply by the activity levels of the underlying neurons, and prefrontal neurons act collectively to transmit information about socialization via these correlations. Notably, this ability of correlated activity to enhance the information transmitted by neuronal ensembles is diminished in mice lacking the autism-associated gene Shank3. These results show that synergy is an important concept for the coding of social behavior which can be disrupted in disease states, reveal a specific mechanism underlying this synergy (social behavior increases correlated activity within specific ensembles), and outline methods for studying how neurons within an ensemble can work together to encode information.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001235>

PLoS One

PAPERS

BRIAN M. WOOD et al – Hunter-Gatherers in context: Mammal community composition in a northern Tanzania landscape used by Hadza foragers and Datoga pastoralists

In many regions of sub Saharan Africa large mammals occur in human-dominated areas, yet their community composition and abundance have rarely been described in areas occupied by traditional hunter-gatherers and pastoralists. Surveys of mammal populations in such areas provide important measures of biodiversity and provide ecological context for understanding hunting practices. Using a sampling grid centered on a Hadza hunter-gatherer camp and covering 36 km² of semi-arid savannah in northern Tanzania, we assessed mammals using camera traps (n = 19 stations) for c. 5 months (2,182 trap nights). In the study area (Tli'ika in the Hadza language), we recorded 36 wild mammal species. Rarefaction curves suggest that sampling effort was sufficient to capture mammal species richness, yet some species known to occur at low densities in the wider area (e.g. African lions, wildebeest) were not detected. Relative abundance indices of wildlife species varied by c. three orders of magnitude, from a mean of 0.04 (African wild dog) to 20.34 capture events per 100 trap-nights (Kirk's dik dik). To contextualize the relative abundance of wildlife in the study area, we compared our study's data to comparable camera trap data collected in a fully protected area of northern Tanzania with similar rainfall (Lake Manyara National Park). Raw data and negative binomial regression analyses show that wild herbivores and wild carnivores were generally detected in the national park at higher rates than in the Hadza-occupied region. Livestock were notably absent from the national park, but were detected at high levels in Tli'ika, and cattle was the second most frequently detected species in the Hadza-used area. We discuss how these data inform current conservation efforts, studies of Hadza hunting, and models of hunter-gatherer foraging ecology and diet.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0251076>

J. M. M. BROWN et al – Middle ratings rise regardless of grammatical construction: Testing syntactic variability in a repeated exposure paradigm

People perceive sentences more favourably after hearing or reading them many times. A prominent approach in linguistic theory argues that these types of exposure effects (satiation effects) show direct evidence of a generative approach to linguistic knowledge: only some sentences improve under repeated exposure, and which sentences do improve can be predicted by a model of linguistic competence that yields natural syntactic classes. However, replications of the original findings have been inconsistent, and it remains unclear whether satiation effects can be reliably induced in an experimental setting at all. Here we report four findings regarding satiation effects in wh-questions across German and English. First, the effects pertain to zone of well-formedness rather than syntactic class: all intermediate ratings, including calibrated fillers, increase at the beginning of the experimental session regardless of syntactic construction. Second, though there is satiation, ratings asymptote below maximum acceptability. Third, these effects are consistent across judgments of superiority effects in English and German. Fourth, wh-questions appear to show similar profiles in English and German, despite these languages being traditionally considered to differ strongly in whether they show effects on movement: violations of the superiority condition can be modulated to a similar degree in both languages by manipulating subject-object initiality and animacy congruency of the wh-phrase. We improve on classic satiation methods by distinguishing between two crucial tests, namely whether exposure selectively targets certain grammatical constructions or whether there is a general repeated exposure effect. We conclude that exposure effects can be reliably induced in rating experiments but exposure does not appear to selectively target certain grammatical constructions. Instead, they appear to be a phenomenon of intermediate gradient judgments.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0251280>

Proceedings of the Royal Society B

PAPERS

JULES DEZEURE et al – Birth timing generates reproductive trade-offs in a non-seasonal breeding primate

The evolutionary benefits of reproductive seasonality are often measured by a single-fitness component, namely offspring survival. Yet different fitness components may be maximized by different birth timings. This may generate fitness trade-offs that could be critical to understanding variation in reproductive timing across individuals, populations and species. Here, we use long-term demographic and behavioural data from wild chacma baboons (*Papio ursinus*) living in a seasonal environment to test the adaptive significance of seasonal variation in birth frequencies. We identify two distinct optimal birth timings in the annual cycle, located four-month apart, which maximize offspring survival or minimize maternal interbirth intervals (IBIs), by respectively matching the annual food peak with late or early weaning. Observed births are the most frequent between these optima, supporting an adaptive trade-off between current and future reproduction. Furthermore, infants born closer to the optimal timing favouring maternal IBIs (instead of offspring survival) throw more tantrums, a typical manifestation of mother-offspring conflict. Maternal trade-offs over birth timing, which extend into mother-offspring conflict after birth, may commonly occur in long-lived species where development from birth to independence spans multiple seasons. Our findings therefore open new avenues to understanding the evolution of breeding phenology in long-lived animals, including humans.

<https://royalsocietypublishing.org/doi/abs/10.1098/rspb.2021.0286>

THIBAUT LENGRONNE et al – Multi-level social organization and nest-drifting behaviour in a eusocial insect

Stable social groups usually consist of families. However, recent studies have revealed higher level social structure, with interactions between family groups across different levels of social organization in multiple species. The explanations for why this apparently paradoxical behaviour arises appear to be varied and remain untested. Here, we use automated radio-tagging data from over 1000 wasps from 93 nests and social network analyses of over 30 000 nest visitation records to describe and explain interactions across levels of social organization in the eusocial paper wasp *Polistes canadensis*. We detected three levels of social organization (nest, aggregation and community) which exchange 'drifter' individuals within and between levels. The highest level (community) may be influenced by the patchiness of high-quality nesting habitats in which these insects exist. Networks of drifter movements were explained by the distance between nests, the group size of donor nests and the worker-to-brood ratios on donor and recipient nests. These findings provide some explanation for the multi-level social interactions, which may otherwise seem paradoxical. Fitness benefits across multiple levels of social organization should be considered when trying to understand animal societies.

<https://royalsocietypublishing.org/doi/full/10.1098/rspb.2021.0275>

Science Advances

PAPERS

ALI GHAZIZADEH & OKIHIDE HIKOSAKA – Common coding of expected value and value uncertainty memories in the prefrontal cortex and basal ganglia output

Recent evidence implicates both basal ganglia and ventrolateral prefrontal cortex (vlPFC) in encoding value memories. However, comparative roles of cortical and basal nodes in value memory are not well understood. Here, single-unit recordings in vlPFC and substantia nigra reticulata (SNr), within macaque monkeys, revealed a larger value signal in SNr that was nevertheless correlated with and had a comparable onset to the vlPFC value signal. The value signal was maintained for many objects (>90) many weeks after reward learning and was resistant to extinction in both regions and to repetition

suppression in vIPFC. Both regions showed comparable granularity in encoding expected value and value uncertainty, which was paralleled by enhanced gaze bias during free viewing. The value signal dynamics in SNr could be predicted by combining responses of vIPFC neurons according to their value preferences consistent with a scheme in which cortical neurons reached snr via direct and indirect pathways.

<https://advances.sciencemag.org/content/7/20/eabe0693>

Trends in Cognitive Sciences

CORRECTIONS

THOMAS O'ROURKE et al with CEDRIC BOECKX – Capturing the Effects of Domestication on Vocal Learning Complexity
(*Trends in Cognitive Sciences* 25, 462–474; 2021)

Due to an error, Figure 2B, which depicts the dorsal striatal circuit, incorrectly displayed minus signs (–) for parts (iii) and (v), and incorrectly displayed a plus sign (+) for part (vi). The figure has now been corrected, such that:

(iii) + GABA

(v) + GABA

(vi) – GLUT

The original description of the figure provided in the figure caption and main text were correct and have not been altered. The authors apologize for any confusion this may have caused.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(21\)00123-6](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00123-6)

SUBSCRIBE to the EAORC Bulletin

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

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.