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## NOTICES

### PUBLICATION ALERTS

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

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

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

### ACADEMIA.EDU – Developmental phenomenology: examples from social cognition

*In Continental Philosophy Review 54, 183–199 (2021)*

#### **STEFANO VINCINI & SHAUN GALLAGHER – Developmental phenomenology: examples from social cognition**

We explore relationships between phenomenology and developmental psychology through an in-depth analysis of a particular problem in social cognition: the most fundamental access to other minds. In the first part of the paper, we examine how developmental science can benefit phenomenology. We explicate the connection between cognitive psychology and developmental phenomenology as a form of constructive phenomenological psychology. Nativism in contemporary science constitutes a strong impulse to conceive of the possibility of an innate ability to perceive others’ mental states, an idea which also has a transcendental implication. In the second part, we consider how phenomenology can contribute to developmental science. Phenomenology can go beyond the necessary evaluation and reinterpretation of experimental results. Some phenomenological notions and theories can be put forward on a par with alternative cognitive-psychological models and compete with them on grounds of empirical adequacy. For example, Husserl and Merleau-Ponty’s notion of pairing can constitute a viable account of how infants access other minds. We outline a number of ways in which this account can be tested and can thus contribute to generating empirical knowledge.

[https://www.academia.edu/50233092/Vincini\\_S\\_and\\_Gallagher\\_S\\_2021\\_Developmental\\_phenomenology\\_examples\\_from\\_social\\_cognition\\_Continental\\_Philosophy\\_Review\\_54\\_2\\_183\\_199](https://www.academia.edu/50233092/Vincini_S_and_Gallagher_S_2021_Developmental_phenomenology_examples_from_social_cognition_Continental_Philosophy_Review_54_2_183_199)

### CONFERENCE ALERT – Human Evolution: From Fossils to Ancient and Modern Genomes – 02-04 Nov 2021

Wellcome Connecting Science Virtual from Wellcome Genome Campus, Hinxton, UK

Contact: [Conferences@wellcomeconnectingscience.org](mailto:Conferences@wellcomeconnectingscience.org)

Website link:

<https://coursesandconferences.wellcomeconnectingscience.org/event/human-evolution-from-fossils-to-ancient-and-modern-genomes-virtual-conference-20211102/>

Abstract and bursary deadlines: 21 September 2021

Registration deadline: 26 October 2021

Summary:

Understanding of human evolution and history is being reshaped by the application of genomic analysis and recent archaeological and palaeontological discoveries. This virtual event will highlight emerging archaeological discoveries and advances in genetic tools that are transforming the field. The focus of this year's conference will be human evolution and disease, genetic admixture and adaptation human demography, as well as population structure, palaeoanthropology, and linguistic ancient DNA methods. Global participation is encouraged with sessions running in afternoons for Europe and Africa, mornings for the Americas. The conference will run from Tuesday, 02 November until Thursday, 04 November 2021. Sessions will start at 13:00 GMT and finish at approximately 18:00 GMT each day.

Topics will include: \* Human Evolution and disease; \* Ancient and modern genetic admixture; \* Inferring human demography from genomic data; \* Population Structure; \* Human Adaptation

The Wellcome Sanger Institute is operated by Genome Research Limited, a charity registered in England with number 1021457 and a company registered in England with number 2742969, whose registered office is 215 Euston Road, London, NW1 2BE.

Jane Murphy [jane.murphy@wellcomeconnectingscience.org](mailto:jane.murphy@wellcomeconnectingscience.org)

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## NEWS

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### **BREAKING SCIENCE – Kea Parrots are Capable of Innovating Self-Care Tooling, New Study Shows**

A new study published in the journal Scientific Reports provides empirical evidence for deliberate self-care tooling in a species of bird. “Most reports of tooling in birds revolve around foraging,” said study lead author Amalia Bastos, a Ph.D. candidate in the School of Psychology at the University of Auckland.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/2NuHThBCi\\_Q/kea-parrots-self-care-tooling-10061.html](http://feedproxy.google.com/~r/BreakingScienceNews/~3/2NuHThBCi_Q/kea-parrots-self-care-tooling-10061.html)

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### **BREAKING SCIENCE – Lunar Cycle’s Effects on Sleep are More Pronounced among Men: Study**

A new community-dwelling study from Sweden suggests that the lunar cycle affects sleep in humans, with more pronounced sleep alterations in men than women. “Both the new and full moons represent significant turning points during the lunar cycle,” said lead author Dr. Christian Benedict, a researcher in the Department of Neuroscience at Uppsala University, and his colleagues.

<http://feedproxy.google.com/~r/BreakingScienceNews/~3/XLwQhiMleig/lunar-cycles-effects-sleep-men-10062.html>

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### **BREAKING SCIENCE – Middle-Pleistocene Hominin Hand and Foot Impressions Found in Tibet**

A series of previously unreported hand and foot impressions from the Tibetan Plateau dates to between 169,000 and 226,000 years ago (middle Pleistocene period) and may be the oldest work of art. “The question is: What does this mean? How do we interpret these prints? They’re clearly not accidentally placed,” said co-author Dr. Thomas Urban.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/h3qJzCnjimE/earliest-parietal-art-tibet-10069.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/h3qJzCnjimE/earliest-parietal-art-tibet-10069.html?utm_source=feedburner&utm_medium=email)

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### **SCIENCE DAILY – Major branches in the tree of language reconstructed**

A team of researchers is using a novel technique to comb through the data and to reconstruct major branches in the linguistic tree.

<https://www.sciencedaily.com/releases/2021/09/210910172735.htm>

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### **SCIENCE DAILY – Prehistoric humans rarely mated with their cousins**

At present-day, more than ten percent of all global marriages occur among first or second cousins. While cousin-marriages are common practice in some societies, unions between close relatives are discouraged in others. In a new study, researchers investigated how common close parental relatedness was in our ancestors.

<https://www.sciencedaily.com/releases/2021/09/210914124950.htm>

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### **SCIENCE DAILY – Who’s in cognitive control?**

A new study into cognitive control promises to be the first of many aimed at understanding its origins in the brain and its variations between people and among groups.

<https://www.sciencedaily.com/releases/2021/09/210910172724.htm>

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### **SCIENCE DAILY – Life-sized camel carvings in Northern Arabia date to the Neolithic period**

A new study uses a wide range of methods to date the heavily eroded reliefs, and connecting them to a period in which a green Arabia was home to monument-building pastoralists.

<https://www.sciencedaily.com/releases/2021/09/210915085845.htm>

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### **SCIENCE DAILY – Primate mothers may carry infants after death as a way of grieving, study finds**

Some primate species may express grief over the death of their infant by carrying the corpse with them, sometimes for months, according to a new UCL-led study - with implications for our understanding of how non-human animals experience emotion.

<https://www.sciencedaily.com/releases/2021/09/210914192804.htm>

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## SCIENCE DAILY – People synchronize heart rates while listening attentively to stories

People often unconsciously synchronize bodily functions like heartbeat and breathing when they share an experience, such as a live performance or have a personal conversation. According to a new study, subjects' heart rates synchronize even if they are just listening to a story by themselves, and this synchronization only occurs when the subjects are paying attention to the story.

<https://www.sciencedaily.com/releases/2021/09/210914111238.htm>

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## SCIENCE DAILY – Ancient bone tools found in Moroccan cave were used to work leather, fur

When researchers first started to look at animal bones from Contrebandiers Cave, Morocco, they wanted to learn about the diet and environment of early human ancestors who lived there between 120,000 and 90,000 years ago. But they soon realized that the bones they had found weren't just meal scraps. They'd been shaped into tools, apparently for use in working leather and fur.

<https://www.sciencedaily.com/releases/2021/09/210916114534.htm>

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## SOCIETY FOR SCIENCE – Fossils and ancient DNA paint a vibrant picture of human origins

Paleoanthropologists have sketched a rough timeline of how human evolution played out, centering the early action in Africa.

<http://click.societyforscience->

[email.com/?qs=aab3dfb84aa411ac93f081f0332e9dcd406920b7bb4e0617701c0702f0fd68118688bca2462ccc878cd8eaccec786cba2992ad30eceeaa346a4d9ebd84db46041](mailto:email.com/?qs=aab3dfb84aa411ac93f081f0332e9dcd406920b7bb4e0617701c0702f0fd68118688bca2462ccc878cd8eaccec786cba2992ad30eceeaa346a4d9ebd84db46041)

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## TEDX TALK – The Origin of Meaning-Sound-concept correspondence: Tarun Gupta

It's often claimed that language is arbitrary. That is, the process through which sounds or symbols acquire correspondence to abstract concepts and ideas is arbitrary. How can natural sciences inform the linguistic models of concept acquisition? Is there a more natural relationship between sounds and their meanings? A neuroscientist's perspective and reflections on the origin of meaning in language.

<https://www.academia.edu/video/IBrQEI>

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## THE CONVERSATION – We discovered the earliest prehistoric art is hand prints made by children

Prehistoric hand and footprints analysed by a team of researchers are an early example of art.

<https://theconversationuk.cmail20.com/t/r-l-trmdka-khhllilahlh-q/>

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## PUBLICATIONS

### Current Biology

#### PAPERS

#### **DANIEL YON & CHRIS D. FRITH – Precision and the Bayesian brain**

Scientific thinking about the minds of humans and other animals has been transformed by the idea that the brain is Bayesian. A cornerstone of this idea is that agents set the balance between prior knowledge and incoming evidence based on how reliable or 'precise' these different sources of information are — lending the most weight to that which is most reliable. This concept of precision has crept into several branches of cognitive science and is a lynchpin of emerging ideas in computational psychiatry — where unusual beliefs or experiences are explained as abnormalities in how the brain estimates precision. But what precisely is precision? In this Primer we explain how precision has found its way into classic and contemporary models of perception, learning, self-awareness, and social interaction. We also chart how ideas around precision are beginning to change in radical ways, meaning we must get more precise about how precision works.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)01034-4](https://www.cell.com/current-biology/fulltext/S0960-9822(21)01034-4)

#### **SARA DE FELICE, GABRIELLA VIGLIOCCO & ANTONIA F. DE C. HAMILTON – Social interaction is a catalyst for adult human learning in online contexts**

Human learning is highly social. Advances in technology have increasingly moved learning online, and the recent coronavirus disease 2019 (COVID-19) pandemic has accelerated this trend. Online learning can vary in terms of how "socially" the material is presented (e.g., live or recorded), but there are limited data on which is most effective, with the majority of studies conducted on children and inconclusive results on adults. Here, we examine how young adults (aged 18–35) learn information about unknown objects, systematically varying the social contingency (live versus recorded lecture) and social richness (viewing the teacher's face, hands, or slides) of the learning episodes. Recall was tested immediately and after 1 week. Experiment 1 (n = 24) showed better learning for live presentation and a full view of the teacher (hands and face). Experiment 2 (n = 27; pre-registered) replicated the live-presentation advantage. Both experiments showed an interaction between social contingency and social richness: the presence of social cues affected learning differently depending on whether teaching was interactive or not. Live social interaction with a full view of the teacher's face provided the optimal

setting for learning new factual information. However, during observational learning, social cues may be more cognitively demanding and/or distracting, resulting in less learning from rich social information if there is no interactivity. We suggest that being part of a genuine social interaction catalyzes learning, possibly via mechanisms of joint attention, common ground, or (inter-)active discussion, and as such, interactive learning benefits from rich social settings.

[https://www.cell.com/current-biology/fulltext/S0960-9822\(21\)01159-3](https://www.cell.com/current-biology/fulltext/S0960-9822(21)01159-3)

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eLife

PAPERS

**PIERO AMODIO et al – Little evidence that Eurasian jays protect their caches by responding to cues about a conspecific's desire and visual perspective**

Eurasian jays have been reported to protect their caches by responding to cues about either the visual perspective or current desire of an observing conspecific, similarly to other corvids. Here, we used established paradigms to test whether these birds can - like humans - integrate multiple cues about different mental states and perform an optimal response accordingly. Across five experiments, which also include replications of previous work, we found little evidence that our jays adjusted their caching behaviour in line with the visual perspective and current desire of another agent, neither by integrating these social cues nor by responding to only one type of cue independently. These results raise questions about the reliability of the previously reported effects and highlight several key issues affecting reliability in comparative cognition research.

<https://elifesciences.org/articles/69647>

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Frontiers in Communication

PAPERS

**OLIVIA M. BULLOCK, HILLARY C. SHULMAN & RICHARD HUSKEY – Narratives are Persuasive Because They are Easier to Understand: Examining Processing Fluency as a Mechanism of Narrative Persuasion**

Theory suggests that people are more persuaded by information presented within a narrative. We argue there is room for greater understanding about why this may be the case. Accordingly, we 1) examine whether narratives are indeed more persuasive than non-narratives and 2) evaluate two theoretical mechanisms that could be responsible for these effects. Results from a laboratory-based, preregistered experiment (N = 554) support our primary argument that narratives are processed more fluently (easily) than non-narratives, and when processing is eased, persuasion becomes more likely. This work offers a parsimonious and powerful explanation for the advantages of providing persuasive information within a narrative format and advances theory in narrative persuasion.

<https://www.frontiersin.org/articles/10.3389/fcomm.2021.719615/full>

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**SAMUEL KAYODE AKINBO – The Language of Gáangan, A Yorùbá Talking Drum**

It is widely known that Yorùbá drummers communicate through their native drums. This paper investigates the grammar of gáangan, which belongs to a family of Yoruba drums called dùndún. The results of this study show that Yorùbá drummers represent the phonetic realisation of lexical and grammatical tones of their language with the drum. Statistically, the speech tones and the acoustic correlate of the corresponding drum representations have a significant positive relationship. In both spoken and drum communication, vowel (V) and consonant-vowel (CV) prosodic units have different statuses. To conclude, Yorùbá drummers communicate via the gáangan drum by transposing certain and maybe phonological conditions of their language to musical forms.

<https://www.frontiersin.org/articles/10.3389/fcomm.2021.650382/full>

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**STEF SPRONCK & DANIELA CASARTELLI – In a Manner of Speaking: How Reported Speech May Have Shaped Grammar**

We present a first, broad-scale typology of extended reported speech, examples of lexicalised or grammaticalised reported speech constructions without a regular quotation meaning. These typically include meanings that are conceptually close to reported speech, such as think or want, but also interpretations that do not appear to have an obvious conceptual relation with talking, such as cause or begin to. Reported speech may therefore reflect both concepts of communication and inner worlds, and meanings reminiscent of 'core grammar', such as evidentiality, modality, aspect (relational) tense and clause linking. We contextualise our findings in the literature on fictive interaction and perspective and suggest that extended reported speech may lend insight into a fundamental aspect of grammar: the evolution of verbal categories. Based on the striking similarity between the meanings of extended reported speech and grammatical categories, we hypothesise that the phenomenon represents a plausible linguistic context in which grammar evolved.

<https://www.frontiersin.org/articles/10.3389/fcomm.2021.624486/full>

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## Frontiers in Ecology and Evolution

### PAPERS

#### **GUILLERMO BLANCO, ANTONIO SÁNCHEZ-MARCO & JUAN JOSÉ NEGRO – Night Capture of Roosting Cave Birds by Neanderthals: An Actualistic Approach**

Evidence is accumulating on the regular and systematic Neanderthal exploitation of birds. However, the motivations, mechanisms, and circumstances underlying this behavior remains little explored despite their potential implications on Neanderthal ecology and capabilities. Fossil remains of choughs (*Pyrrhocorax*, Corvidae) are among the most abundant in cave sites with Mousterian technology. We reviewed the evidence showing that Neanderthals processed choughs for food, and confirmed that it occurred frequently over a widespread spatial and temporal scale. This lead us to propose the hypothesis that the cave-like refuge is the keystone resource connecting Neanderthals and choughs captured at night in rocky shelters eventually used by both species. By adopting an actualistic approach, we documented the patterns of refuge use and population dynamics of communally roosting choughs, the strategies and technology currently used to capture them, and their behavioral response against experimental human predators at night. Actualistic experiments showed that large numbers of choughs can be captured without highly sophisticated tools at night regularly and periodically, due to their occupation year-round during long-term periods of the same nocturnal shelters, the constant turnover of individuals, and their high site tenacity at these roost-sites even after recurrent disturbance and predation. Captures even with bare hands are further facilitated because choughs tend to flee confused into the cavity in darkness when dazzled and cornered by human (experimental) predators. Given the extreme difficulty of daylight chough capturing in open country, nocturnal hunting with the help of fire in the roosting caves and consumption in situ are proposed as the most plausible explanations for the strong association of choughs and Neanderthals in fossil assemblages. Night hunting of birds has implications for the social, anatomical, technological, and cognitive capacities of Neanderthals.

<https://www.frontiersin.org/articles/10.3389/fevo.2021.733062/full>

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## Nature

### NEWS

#### **Early Americans' huge earthworks show off their engineering might**

Analysis of mysterious earth mounds reveals their rapid construction and sophisticated composition.

<https://www.nature.com/articles/d41586-021-02439-0>

### PAPERS

#### **SHEVAN WILKIN et al with DAVID REICH – Dairying enabled Early Bronze Age Yamnaya steppe expansions**

During the Early Bronze Age, populations of the western Eurasian steppe expanded across an immense area of northern Eurasia. Combined archaeological and genetic evidence supports widespread Early Bronze Age population movements out of the Pontic–Caspian steppe that resulted in gene flow across vast distances, linking populations of Yamnaya pastoralists in Scandinavia with pastoral populations (known as the Afanasievo) far to the east in the Altai Mountains and Mongolia. Although some models hold that this expansion was the outcome of a newly mobile pastoral economy characterized by horse traction, bulk wagon transport, and regular dietary dependence on meat and milk, hard evidence for these economic features has not been found. Here we draw on proteomic analysis of dental calculus from individuals from the western Eurasian steppe to demonstrate a major transition in dairying at the start of the Bronze Age. The rapid onset of ubiquitous dairying at a point in time when steppe populations are known to have begun dispersing offers critical insight into a key catalyst of steppe mobility. The identification of horse milk proteins also indicates horse domestication by the Early Bronze Age, which provides support for its role in steppe dispersals. Our results point to a potential epicentre for horse domestication in the Pontic–Caspian steppe by the third millennium BC, and offer strong support for the notion that the novel exploitation of secondary animal products was a key driver of the expansions of Eurasian steppe pastoralists by the Early Bronze Age.

<https://www.nature.com/articles/s41586-021-03798-4>

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## Nature Scientific Reports

### PAPERS

#### **CARMELA CALABRESE et al – Spontaneous emergence of leadership patterns drives synchronization in complex human networks**

Synchronization of human networks is fundamental in many aspects of human endeavour. Recently, much research effort has been spent on analyzing how motor coordination emerges in human groups (from rocking chairs to violin players) and how it is affected by coupling structure and strength. Here we uncover the spontaneous emergence of leadership (based on physical signaling during group interaction) as a crucial factor steering the occurrence of synchronization in complex human networks where individuals perform a joint motor task. In two experiments engaging participants in an arm movement synchronization task, in the physical world as well as in the digital world, we found that specific patterns of leadership emerged and increased synchronization performance. Precisely, three patterns were found, involving a subtle interaction between phase of the motion and amount of influence. Such patterns were independent of the presence or absence of physical interaction, and persisted across manipulated spatial configurations. Our results shed light on the mechanisms that

drive coordination and leadership in human groups, and are consequential for the design of interactions with artificial agents, avatars or robots, where social roles can be determinant for a successful interaction.

<https://www.nature.com/articles/s41598-021-97656-y>

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**ALEXANDER GAVASHELISHVILI et al – Landscape genetics and the genetic legacy of Upper Paleolithic and Mesolithic hunter-gatherers in the modern Caucasus**

This study clarifies the role of refugia and landscape permeability in the formation of the current genetic structure of peoples of the Caucasus. We report novel genome-wide data for modern individuals from the Caucasus, and analyze them together with available Paleolithic and Mesolithic individuals from Eurasia and Africa in order (1) to link the current and ancient genetic structures via landscape permeability, and (2) thus to identify movement paths between the ancient refugial populations and the Caucasus. The ancient genetic ancestry is best explained by landscape permeability implying that human movement is impeded by terrain ruggedness, swamps, glaciers and desert. Major refugial source populations for the modern Caucasus are those of the Caucasus, Anatolia, the Balkans and Siberia. In Rugged areas new genetic signatures take a long time to form, but once they do so, they remain for a long time. These areas act as time capsules harboring genetic signatures of ancient source populations and making it possible to help reconstruct human history based on patterns of variation today.

<https://www.nature.com/articles/s41598-021-97519-6>

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**NPJ Science of Learning**

**PAPERS**

**XIN KANG et al – Language and nonlanguage factors in foreign language learning: evidence for the learning condition hypothesis**

The question of why native and foreign languages are learned with a large performance gap has prompted language researchers to hypothesize that they are subserved by fundamentally different mechanisms. However, this hypothesis may not have taken into account that these languages can be learned under different conditions (e.g., naturalistic vs. classroom settings). With a large sample of 636 third language (L3) learners who learned Chinese and English as their first (L1) and second (L2) languages, the present study examined the association of learning success across L1–L3. We argue that learning conditions may reveal how these languages are associated in terms of learning success. Because these languages were learned under a continuum of naturalistic to classroom conditions from L1 to L3, this sample afforded us a unique opportunity to evaluate the hypothesis that similar learning conditions between languages could be an important driving force determining language learning success. After controlling for nonlanguage factors such as musical background and motivational factors and using a convergence of analytics including the general linear models, the structural equation models, and machine learning, we found that the closer two languages were on the continuum of learning conditions, the stronger their association of learning success. Specifically, we found a significant association between L1 and L2 and between L2 and L3, but not between L1 and L3. Our results suggest that learning conditions may have important implications for the learning success of L1–L3.

<https://www.nature.com/articles/s41539-021-00104-9>

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**PLoS Biology**

**PAPERS**

**JOAN ORPELLA et al – Language statistical learning responds to reinforcement learning principles rooted in the striatum**

Statistical learning (SL) is the ability to extract regularities from the environment. In the domain of language, this ability is fundamental in the learning of words and structural rules. In lack of reliable online measures, statistical word and rule learning have been primarily investigated using offline (post-familiarization) tests, which gives limited insights into the dynamics of SL and its neural basis. Here, we capitalize on a novel task that tracks the online SL of simple syntactic structures combined with computational modeling to show that online SL responds to reinforcement learning principles rooted in striatal function. Specifically, we demonstrate—on 2 different cohorts—that a temporal difference model, which relies on prediction errors, accounts for participants' online learning behavior. We then show that the trial-by-trial development of predictions through learning strongly correlates with activity in both ventral and dorsal striatum. Our results thus provide a detailed mechanistic account of language-related SL and an explanation for the oft-cited implication of the striatum in SL tasks. This work, therefore, bridges the long-standing gap between language learning and reinforcement learning phenomena.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001119>

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**PNAS**

**PAPERS**

**YUKI HORI et al – Interspecies activation correlations reveal functional correspondences between marmoset and human brain areas**

The common marmoset has enormous promise as a nonhuman primate model of human brain functions. While resting-state functional MRI (fMRI) has provided evidence for a similar organization of marmoset and human cortices, the technique

cannot be used to map the functional correspondences of brain regions between species. This limitation can be overcome by movie-driven fMRI (md-fMRI), which has become a popular tool for noninvasively mapping the neural patterns generated by rich and naturalistic stimulation. Here, we used md-fMRI in marmosets and humans to identify whole-brain functional correspondences between the two primate species. In particular, we describe functional correlates for the well-known human face, body, and scene patches in marmosets. We find that these networks have a similar organization in both species, suggesting a largely conserved organization of higher-order visual areas between New World marmoset monkeys and humans. However, while face patches in humans and marmosets were activated by marmoset faces, only human face patches responded to the faces of other animals. Together, the results demonstrate that higher-order visual processing might be a conserved feature between humans and New World marmoset monkeys but that small, potentially important functional differences exist.

<https://www.pnas.org/content/118/37/e2110980118.abstract>

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## Science

### ARTICLES

#### **TIM CLUTTON-BROCK – Social evolution in mammals**

Over the past 40 years, long-term, individual-based field studies have been able to use genetic techniques to explore the evolution of social organization and breeding systems in an increasing number of wild mammals. These range from species where members of both sexes live alone for part or all of the year to those where breeding adults live in pairs or small groups of close relatives where all members help to raise offspring born to the dominant female, as in meerkats and mole-rats, to species where multiple breeding females form stable, multigenerational groups that are often defended by one or more resident males. In most social mammals, groups consist of “natal” females that have remained in their birth group and are consequently related to each other while breeding males are immigrants from other groups, but in a minority of species (including all three African apes), females habitually disperse from their natal group or community after reaching sexual maturity, and groups typically consist of unrelated immigrant females and one or more resident males who may either be natal animals or immigrants. Combined with genetic information, field studies of mammals have shown how differences in social organization are associated with differences in mating systems that affect the degree of reproductive skew in both sexes, the intensity of reproductive competition, and the evolution of sex differences in growth, size, weaponry, and reproductive anatomy. The intensity of reproductive competition in males and the development of traits that increase their competitive ability are often associated with reductions in the duration of the breeding life spans of males compared with those of females as well as with increased susceptibility of males to adverse environmental conditions and food shortages. Differences in social organization and mating systems also affect the kinship structure of groups and the average degree of kinship between group members, which are associated with differences in the frequency of cooperation and conflict between group members as well as with patterns of dispersal.

<https://www.science.org/doi/10.1126/science.abc9699>

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## Science Advances

### PAPERS

#### **LEA ROUMAZEILLES et al – Social prediction modulates activity of macaque superior temporal cortex**

The ability to attribute thoughts to others, also called theory of mind (TOM), has been extensively studied in humans; however, its evolutionary origins have been challenged. Computationally, the basis of TOM has been interpreted within the predictive coding framework and associated with activity in the temporoparietal junction (TPJ). Here, we revealed, using a nonlinguistic task and functional magnetic resonance imaging, that activity in a region of the macaque middle superior temporal cortex was specifically modulated by the predictability of social situations. As in human TPJ, this region could be distinguished from other temporal regions involved in face processing. Our result suggests the existence of a precursor for the TOM ability in the last common ancestor of human and Old World monkeys.

<https://www.science.org/doi/full/10.1126/sciadv.abh2392>

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