

CONTENTS

NOTICES	2
PUBLICATION ALERTS.....	2
ACADEMIA.EDU – The prehistory of handedness: Archaeological data and comparative ethology.....	2
NATALIE T. UOMINI – The prehistory of handedness: Archaeological data and comparative ethology.....	2
ACADEMIA.EDU – Invention, Reinvention and Innovation: The Makings of Oldowan Lithic Technology.....	3
ERELLA HOVERS – Invention, Reinvention and Innovation: The Makings of Oldowan Lithic Technology.....	3
ACADEMIA.EDU – Comments on ‘Linguistic structure: A plausible theory’.....	3
RICHARD HUDSON – Comments on ‘Linguistic structure: A plausible theory’.....	3
ACADEMIA.EDU – Stone Tools: Evidence of Something in Between Culture and Cumulative Culture?.....	3
IAIN DAVIDSON – Stone Tools: Evidence of Something in Between Culture and Cumulative Culture?.....	3
NEWS	3
SCIENCE DAILY – Bat study reveals secrets of the social brain.....	3
SCIENCE DAILY – Researchers map neurons in the brain involved with social interactions in groups.....	3
SCIENCE DAILY – Scientists look beyond the individual brain to study the collective mind.....	3
SCIENCE DAILY – African grey parrots may have better self-control than macaws.....	4
SCIENCE DAILY – Savannah chimpanzees, a model for the understanding of human evolution.....	4
SCIENCE NEWS – Yellow warblers remember warning calls 1 day later, suggesting long-term memory.....	4
SOCIETY FOR SCIENCE – The earliest evidence of tobacco use dates to over 12,000 years ago.....	4
PUBLICATIONS	4
Evolutionary Anthropology.....	4
PAPERS	4
PAIGE MADISON & BERNARD WOOD – Birth of Australopithecus.....	4
MARLIZE LOMBARD & JOHN J. SHEA – Did Pleistocene Africans use the spearthrower-and-dart?.....	4
CYRIL C. GRUETER & MICHAEL L. WILSON – Do we need to reclassify the social systems of gregarious apes?.....	4
JAYNE WILKINS – Homo sapiens origins and evolution in the Kalahari Basin, southern Africa.....	4
Frontiers in Psychology.....	5
PAPERS	5
EVA MURILLO, IGNACIO MONTERO & MARTA CASLA – On the Multimodal Path to Language: The Relationship Between Rhythmic Movements and Deictic Gestures at the End of the First Year.....	5
Journal of Child Language.....	5
FREE SPECIAL ISSUE UNTIL 15 NOVEMBER 2021	5
PAPERS	5
WILLIAM SNYDER – A parametric approach to the acquisition of syntax.....	5
INBAL ARNON – The Starting Big approach to language learning.....	5
HEIKE BEHRENS – Constructivist Approaches to First Language Acquisition.....	5
MICHAEL RAMSCAR – How children learn to communicate discriminatively.....	6
Language Sciences.....	6
PAPERS	6
TALBOT J. TAYLOR & JASPER C. VAN DEN HERIK – Metalinguistic exchanges in child language development.....	6
FRED CUMMINS – Language as a problem.....	6
Mind & Language.....	6
PAPERS	6
WOLFRAM HINZEN & OTÁVIO MATTOS – Explaining early generics: A linguistic model.....	6
Nature Human Behaviour.....	7
ARTICLES	7
BERTRAM F. MALLE – What the mind is.....	7
PAPERS	7
LAURA SCHMID et al with MARTIN A. NOWAK – A unified framework of direct and indirect reciprocity.....	7
STEFANI A. CRABTREE et al – Landscape rules predict optimal superhighways for the first peopling of Sahul.....	7
MAXWELL N. BURTON-CHELLEW & STUART A. WEST – Payoff-based learning best explains the rate of decline in cooperation across 237 public-goods games.....	7
KAI RUGGERI et mul – The general fault in our fault lines.....	7
JOSEPH HEFFNER, JAE-YOUNG SON & ORIEL FELDMANHALL – Emotion prediction errors guide socially adaptive behaviour.....	8

Nature Humanities & Social Sciences Communications	8
PAPERS.....	8
ALIKI PAPA et al with MONICA TAMARIZ – Effects of verbal instruction vs. modelling on imitation and overimitation	8
Nature Reviews.....	8
ARTICLES.....	8
KATHERINE WHALLEY – Regulators of human brain evolution	8
Nature Scientific Reports.....	8
PAPERS.....	8
SANDRINE YAZBEK et al – Tractography of the arcuate fasciculus in healthy right-handed and left-handed multilingual subjects and its relation to language lateralization on functional MRI	8
HIROFUMI MATSUMURA et al – Female craniometrics support the ‘two-layer model’ of human dispersal in Eastern Eurasia.....	9
PeerJ	9
ARTICLES.....	9
PEERJ COMMUNITY – Author Interview: Vocal communication in wild chimpanzees: a call rate study	9
PAPERS.....	9
ANNE-SOPHIE CRUNCHANT, FIONA A. STEWART & ALEX K. PIEL – Vocal communication in wild chimpanzees: a call rate study	9
DEXTER ZIRKLE, RICHARD S. MEINDL & C. OWEN LOVEJOY – Upright walking has driven unique vascular specialization of the hominin ilium.....	9
PNAS.....	10
PAPERS.....	10
CHRISTOPH HAUERT & MICHAEL DOEBELI – Spatial social dilemmas promote diversity	10
Science.....	10
PAPERS.....	10
MAIMON C. ROSE et al – Cortical representation of group social communication in bats	10
Trends in Cognitive Sciences	10
PAPERS.....	10
MORITZ F. WURM & ALFONSO CARAMAZZA – Two ‘what’ pathways for action and object recognition.....	10
SUBSCRIBE to the EAORC Bulletin	11
UNSUBSCRIBE from the EAORC Bulletin	11
PRODUCED BY AND FOR THE EAORC EMAIL GROUP.....	11

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 – The prehistory of handedness: Archaeological data and comparative ethology

In Journal of Human Evolution 57, 411-419 (2009)

NATALIE T. UOMINI – The prehistory of handedness: Archaeological data and comparative ethology

Homo sapiens sapiens displays a species wide lateralised hand preference, with 85% of individuals in all populations being right-handed for most manual actions. In contrast, no other great ape species shows such strong and consistent population level biases, indicating that extremes of both direction and strength of manual laterality (i.e., species-wide right-handedness) may have emerged after divergence from the last common ancestor. To reconstruct the hand use patterns of early hominins, laterality is assessed in prehistoric artefacts. Group right side biases are well established from the Neanderthals onward, while patchy evidence from older fossils and artefacts indicates a preponderance of right-handed individuals. Individual hand preferences and group level biases can occur in chimpanzees and other apes for skilled tool use and food processing.

Comparing these findings with human ethological data on spontaneous hand use reveals that the great ape clade (including humans) probably has a common effect at the individual level, such that a person can vary from ambidextrous to completely lateralised depending on the action. However, there is currently no theoretical model to explain this result. The degree of task complexity and bimanual complementarity have been proposed as factors affecting lateralisation strength. When primatology meets palaeoanthropology, the evidence suggests species-level right-handedness may have emerged through the social transmission of increasingly complex, bimanually differentiated, tool using activities.

https://www.academia.edu/31389901/The_prehistory_of_handedness_archaeological_data_and_comparative_ethology

ACADEMIA.EDU – Invention, Reinvention and Innovation: The Makings of Oldowan Lithic Technology
In Scott Elias (ed.), Origins of Human Innovation and Creativity. Elsevier, 51-68 (2012)

ERELLA HOVERS – Invention, Reinvention and Innovation: The Makings of Oldowan Lithic Technology

The two most creative processes on our planet are biological and cultural evolution. It can be argued that both are Darwinian processes, regulated by blind variation and selective retention (Simonton, 1999,2000). This statement requires qualification; unlike biological evolution, cultural evolution is goal-directed through creative individuals who struggle to construct their niche by manipulating ecological obstacles and social relations (Laland et al., 2000;Simonton, 1999;Ziman, 2000). Creativity lies at the root of the cultural diversity of modern humans. Intimately linked with notions of progress and improvement, it propels much of the dynamics of change and diversity in major cultural undertakings of contemporary cultures such as science, art, design or engineering. In the modern world, creativity often culminates in material things or ideas about how to make them (e.g.,Basalla, 1988;Gold, 2007). It stands to reason that archaeologists, who work with a 2.5-Ma record of material culture, will concern themselves with identifying and explaining a great amount of cultural diversity through objects, and by implication will have a vested interest in the processes of creative thought (Mithen, 1998a).

https://www.academia.edu/1846295/Hovers_E_2012_Invention_reinvention_and_innovation_makings_of_Oldowan_lithic_techology_In_Elias_S_Ed_Origins_of_Human_Innovation_and_Creativity_Developments_in_Quaternary_Science_vol_16_Elsevier_B_V_pp_51_68

ACADEMIA.EDU – Comments on ‘Linguistic structure: A plausible theory’

In Language Under Discussion 4:1, 38-43 (2016)

RICHARD HUDSON – Comments on ‘Linguistic structure: A plausible theory’

This comment on Sydney Lamb’s article “Language structure: A plausible theory” explores the similarities and differences between Lamb’s theory and my own theory called Word Grammar, which was inspired by Lamb’s work in the 1960s. The two theories share Lamb’s view that language is a symbolic network, just like the rest of our knowledge. The note explains this claim, then picks out a number of differences between the theories, all of which centre on the distinction between types and tokens. In Word Grammar, tokens are represented as temporary nodes added to the permanent network, and allow the theory to use dependency structure rather than phrase structure, to include mental referents, to recognise the messiness of spreading activation and to include a monotonic theory of default inheritance.

https://www.academia.edu/59036587/Comments_on_Linguistic_structure_A_plausible_theory

ACADEMIA.EDU – Stone Tools: Evidence of Something in Between Culture and Cumulative Culture?

In M.N. Haide, N.J. Conard and M. Bolus (eds.), The Nature of Culture. Springer, 99-120 (2016)

IAIN DAVIDSON – Stone Tools: Evidence of Something in Between Culture and Cumulative Culture?

This paper goes back to some first principles about what culture might be and how it can be investigated in order to ask questions about the Last Common Ancestor and the role of stone tools in changing the nature of culture. In doing so it considers the relations between learned behavior, tradition, culture, cumulative culture, and cultures: I juxtapose models used by ROCEEH with an alternative model that shows how creatures which can be argued to have such behaviors, and thus the behaviors are related to each other through time and across the animal world *{sic}*.

https://www.academia.edu/20660756/Davidson_I_2016_Stone_Tools_Evidence_of_Something_in_Between_Culture_and_Cumulative_Culture_In_M_N_Haide_N_J_Conard_and_M_Bolus_eds_The_Nature_of_Culture_pp_99_120_Vertebrate_Paleobiology_and_Paleoanthropology_Springer_Netherlands_10_1007_978_94_017_7426_0_10

NEWS

SCIENCE DAILY – Bat study reveals secrets of the social brain

Neuroscientists used wireless devices to record the neural activity of freely interacting Egyptian fruit bats, providing researchers with the first glimpse into how the brains of social mammals process complex group interactions.

<https://www.sciencedaily.com/releases/2021/10/211021175145.htm>

SCIENCE DAILY – Researchers map neurons in the brain involved with social interactions in groups

In social experiments, three monkeys sat around a rotary table and took turns offering food to one of the other two monkeys. Certain neurons in the brain responded to the actions of other monkeys in the group and influenced an animal's upcoming decisions to reciprocate or retaliate.

<https://www.sciencedaily.com/releases/2021/10/211021175207.htm>

SCIENCE DAILY – Scientists look beyond the individual brain to study the collective mind

Scientists argue that efforts to understand human cognition should expand beyond the study of individual brains. They call on neuroscientists to incorporate evidence from social science disciplines to better understand how people think.

<https://www.sciencedaily.com/releases/2021/10/211021175116.htm>

SCIENCE DAILY – African grey parrots may have better self-control than macaws

African grey parrots may be better able than macaws to delay gratification -- rejecting an immediate reward in favour of a better one in the future -- according to a new study.

<https://www.sciencedaily.com/releases/2021/10/211020203704.htm>

SCIENCE DAILY – Savannah chimpanzees, a model for the understanding of human evolution

To prosper, most great apes need lush forests in Africa (bonobos, chimpanzees, and gorillas) or Southeast Asia (orangutans), except for some groups of chimpanzees that live in Savannahs, habitats characterized by high temperatures and very low seasonal rainfall.

<https://www.sciencedaily.com/releases/2021/10/211020140009.htm>

SCIENCE NEWS – Yellow warblers remember warning calls 1 day later, suggesting long-term memory

Females spend more time at the nest after hearing cowbird alarm

<https://www.science.org/content/article/yellow-warblers-remember-warning-calls-1-day-later-suggesting-long-term-memory>

SOCIETY FOR SCIENCE – The earliest evidence of tobacco use dates to over 12,000 years ago

Burned seeds at an archaeological site in Utah hint at tobacco's popularity long before it was domesticated.

<http://click.societyforscience->

email.com/?qs=bd0f679f91405fc202d8d23d0951d73dd1d53bb3fec39d66185c2e960c943e827b417d8e0700d18274fb9647e94195d1cb6fa1c1d34371ce

PUBLICATIONS

Evolutionary Anthropology

PAPERS

PAIGE MADISON & BERNARD WOOD – Birth of Australopithecus

The announcement of a fossilized child's skull discovered in a quarry in 1924 sub-Saharan Africa might not have seemed destined to be a classic paper. This contribution focuses on anatomist Raymond Dart's 1925 paper in which he designated the Taungs skull the type specimen of *Australopithecus africanus*. We combine an account of Dart's training and experience, with a telling of the fossil's discovery, analysis, the initial response of a mostly skeptical community, and a review of subsequent discoveries that consolidated the case Dart made for a hitherto unknown human close relative. Dart's paper presented evidence that confirmed the prescience of Charles Darwin's prediction that Africa was the birthplace of modern humans. The Taungs skull's unique mix of great ape and human attributes eventually led to a paradigm shift in our understanding of human evolution.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21917>

MARLIZE LOMBARD & JOHN J. SHEA – Did Pleistocene Africans use the spearthrower-and-dart?

Archeologists commonly suppose that among complex projectile weapons humans use as subsistence aids, the spearthrower-and-dart preceded bow-and-arrow use. And yet, neither ethnographic nor archeological records furnish any robust evidence for spearthrower-and-dart use in Africa. Instead, evidence grows apace for ever-more ancient bow-and-arrow use. Here we explore these findings and their implications for models of early *Homo sapiens* behavior.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21912>

CYRIL C. GRUETER & MICHAEL L. WILSON – Do we need to reclassify the social systems of gregarious apes?

Decades of research have led to a solid understanding of the social systems of gregarious apes: chimpanzees, bonobos, gorillas, and gibbons. As field studies have increasingly collected data from multiple neighboring habituated groups, genetic and social interconnections have been revealed. These findings provide a more nuanced picture of intergroup relations in apes, and have led to claims in the literature that some ape taxa have multilevel societies. A multilevel society is defined as a nested collection of social entities comprising at least two discernible levels of social integration between the individual and the population. We argue that the evidence for multilevel sociality *sensu stricto* in apes is currently inconclusive and that it is premature to abandon the traditional classification of ape social systems. However, available findings appear to be consistent with the existence of some degree of higher social grouping patterns. We propose the term supra-group organization which may adequately capture ape social systems when viewed from a top-down perspective.

<https://onlinelibrary.wiley.com/doi/abs/10.1002/evan.21919>

JAYNE WILKINS – *Homo sapiens* origins and evolution in the Kalahari Basin, southern Africa

The Kalahari Basin, southern Africa preserves a rich archeological record of human origins and evolution spanning the Early, Middle and Late Pleistocene. Since the 1930s, several stratified and dated archeological sites have been identified and investigated, together with numerous open-air localities that provide landscape-scale perspectives. However, next to recent

discoveries from nearby coastal regions, the Kalahari Basin has remained peripheral to debates about the origins of Homo sapiens. Though the interior region of southern Africa is generally considered to be less suitable for hunter-gatherer occupation than coastal and near-coastal regions, especially during glacial periods, the archeological record documents human presence in the Kalahari Basin from the Early Pleistocene onwards, and the region is not abandoned during glacial phases. Furthermore, many significant behavioral innovations have an early origin in the Kalahari Basin, which adds support to poly-centric, pan-African models for the emergence of our species.

<https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21914>

Frontiers in Psychology

PAPERS

EVA MURILLO, IGNACIO MONTERO & MARTA CASLA – On the Multimodal Path to Language: The Relationship Between Rhythmic Movements and Deictic Gestures at the End of the First Year

The aim of this study is to analyze the relationship between rhythmic movements and deictic gestures at the end of the first year of life, and to focus on their unimodal or multimodal character. We hypothesize that multimodal rhythmic movement performed with an object in the hand can facilitate the transition to the first deictic gestures. Twenty-three children were observed at 9 and 12 months of age in a naturalistic play situation with their mother or father. Results showed that rhythmic movements with objects in the hand are a frequent behavior in children's repertoires. Rhythmic behaviors tend to decrease from 9 to 12 months, specifically when they are unimodal. Multimodal rhythmic behavior production at 9 months is positively related with proximal deictic gestures 3 months later. Multimodal rhythmic movements are not directly related to distal deictic gestures, but are indirectly related via proximal deictic gestures. These results highlight the relevance of multimodal behaviors in the transition to the use of early gestures, and can be considered as a transitional phenomenon between the instrumental action and early communicative gestures.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.616812/full>

Journal of Child Language

FREE SPECIAL ISSUE UNTIL 15 NOVEMBER 2021

<https://www.cambridge.org/core/journals/journal-of-child-language/issue/7845B4340C7100997D6DFB5F45B74476>

PAPERS

WILLIAM SNYDER – A parametric approach to the acquisition of syntax

Three case-studies, using longitudinal records of children's spontaneous speech, illustrate what happens when a child's syntax changes. The first, examining acquisition of English verb-particle constructions, shows a near-total absence of commission errors. The second, examining acquisition of prepositional questions in English or Spanish, shows that children (i) may go as long as 9 months producing both direct-object questions and declaratives with prepositional phrases, before first attempting a prepositional question; and (ii) at some point, abruptly begin producing prepositional questions that are correctly formed for the target language. The third case study shows that in children acquiring English, the onset of verb-particle constructions occurs almost exactly when that child begins using novel noun-noun compounds. After a discussion of the implications for the nature of syntactic knowledge, and for the mechanisms by which it is acquired, two examples are presented of as-yet untested acquisitional predictions of parametric proposals in the syntax literature.

<https://www.cambridge.org/core/journals/journal-of-child-language/article/parametric-approach-to-the-acquisition-of-syntax/25186D96E0076A662DC103304443B977>

INBAL ARNON – The Starting Big approach to language learning

The study of language acquisition has a long and contentious history: researchers disagree on what drives this process, the relevant data, and the interesting questions. Here, I outline the Starting Big approach to language learning, which emphasizes the role of multiword units in language, and of coarse-to-fine processes in learning. I outline core predictions and supporting evidence. In short, the approach argues that multiword units are integral building blocks in language; that such units can facilitate mastery of semantically opaque relations between words; and that adults rely on them less than children, which can explain (some of) their difficulty in learning a second language. The Starting Big approach is a theory of how children learn language, how language is represented, and how to explain differences between first and second language learning. I discuss the learning and processing models at the heart of the approach and their cross-linguistic implications.

<https://www.cambridge.org/core/journals/journal-of-child-language/article/starting-big-approach-to-language-learning/2259A0F49128A15E6475D5F2844FAEBC>

HEIKE BEHRENS – Constructivist Approaches to First Language Acquisition

Constructivist approaches to language acquisition predict that form-function mappings are derived from distributional patterns in the input, and their contextual embedding. This requires a detailed analysis of the input, and the integration of information from different contingencies. Regarding the acquisition of morphology, it is shown which types of information leads to the induction of (lexical) categories, and to paradigm building. Regarding the acquisition of word order, it is shown how languages with fixed or variable word order profit from stable syntactic hyperschemas, but require a more detailed

analyses of the form-function contingencies to identify the underlying, more specific semantic, syntactic and morphological patterns. At a theoretical level, it is shown how findings from acquisition and processing converge into new linguistic theories that aim to account for regular as well as irregular phenomena in language.

<https://www.cambridge.org/core/journals/journal-of-child-language/article/constructivist-approaches-to-first-language-acquisition/9859E93FA9AA8D32F269DE38E721EEA6>

MICHAEL RAMSCAR – How children learn to communicate discriminatively

How do children learn to communicate, and what do they learn? Traditionally, most theories have taken an associative, compositional approach to these questions, supposing children acquire an inventory of form-meaning associations, and procedures for composing / decomposing them; into / from messages in production and comprehension. This paper presents an alternative account of human communication and its acquisition based on the systematic, discriminative approach embodied in psychological and computational models of learning, and formally described by communication theory. It describes how discriminative learning theory offers an alternative perspective on the way that systems of semantic cues are conditioned onto communicative codes, while information theory provides a very different view of the nature of the codes themselves. It shows how the distributional properties of languages satisfy the communicative requirements described in information theory, enabling language learners to align their expectations despite the vastly different levels of experience among language users, and to master communication systems far more abstract than linguistic intuitions traditionally assume. Topics reviewed include morphological development, the acquisition of verb argument structures, and the functions of linguistic systems that have proven to be stumbling blocks for compositional theories: grammatical gender and personal names.

<https://www.cambridge.org/core/journals/journal-of-child-language/article/how-children-learn-to-communicate-discriminatively/25796886D9D5A892B661DAA39A77DA2C>

Language Sciences

PAPERS

TALBOT J. TAYLOR & JASPER C. VAN DEN HERIK – Metalinguistic exchanges in child language development

In everyday speech, language is often the topic of talk. In this paper we aim to draw attention to the role of such metalinguistic activity in early language development. We approach this topic through an ecological lens. To achieve this goal, we examine observational data from a single child participating in conversational episodes concerning linguistic phenomena—episodes which we term “metalinguistic exchanges”—at 2 and 3 years old. We draw attention to how this child, at 2 years old, participates in naturally-occurring metalinguistic exchanges without yet having a productive command of metalinguistic vocabulary. The sequential organization of the metalinguistic exchanges enables her caregivers to scaffold her participation. We then compare the child's participation in metalinguistic exchanges recorded at 2 years old with a second set of exchanges recorded when she turned 3. This comparison shows that the child's participation in metalinguistic exchanges becomes increasingly skillful and agentive as she learns to initiate metalinguistic exchanges herself. We end the paper with recommendations for future research in an ecological approach to language development. We suggest that, in order to investigate the role of metalinguistic activity in language development, it is crucial to look at children's increasingly skillful and agentive participation in naturally-occurring metalinguistic exchanges.

<https://www.sciencedirect.com/science/article/pii/S0388000121000814>

FRED CUMMINS – Language as a problem

The term “language” is used for at least three distinct purposes. The first supports inquiry into coded message exchange. This has occupied most of the debate within the discipline of linguistics. Only here can we use notions of information and translation. The second use tries to speak to the profound change that happened to one species and that seems to be foundational in creating the human world, with all attendant problems. This is an entirely different sense, and it cannot be addressed with the technical terms developed in pursuit of the first sense. Finally, language has always played a central role in the definition of a people, however one might cash out that term. Like other globalising concepts such as “human,” “natural,” and “race,” the first sense of language-as-system carries with it a history of colonial appropriation and obliteration, of Christian universalization, and of a distinctly European ideology. The hegemony of English appears in this light to be a technological development rather than a linguistic fact, and a need arises to separate the valuable sense of a language as a defining characteristic of a people, from the technical sense of language as a mode of message exchange. Consequences for the boundaries and concerns of the discipline of linguistics are unavoidable.

<https://www.sciencedirect.com/science/article/pii/S0388000121000802>

Mind & Language

PAPERS

WOLFRAM HINZEN & OTÁVIO MATTOS – Explaining early generics: A linguistic model

Preschoolers naturally form mental representations that capture generic knowledge about object kinds. These have been considered to pose a special explanatory and learning challenge. We here argue for a new deductive model of them, where (i) the representations in question have a linguistic format from the start; (ii) they are inherently structurally simpler

compared to reference to individuals or quantifications; and (iii) formed in communicative contexts because communication in humans is linked to language. In this model, specific language-related resources explain the scope and limits of the forms of knowledge obtained, illustrating how language and cognition develop in tandem.

<https://onlinelibrary.wiley.com/doi/full/10.1111/mila.12367>

Nature Human Behaviour

ARTICLES

BERTRAM F. MALLE – What the mind is

shared conception of the human mind appears to be a cognitive structure that organizes numerous mental capacities along a small number of dimensions: bodily sensation, cognition and, in some cultural settings, emotion.

<https://www.nature.com/articles/s41562-021-01183-9>

PAPERS

LAURA SCHMID et al with MARTIN A. NOWAK – A unified framework of direct and indirect reciprocity

Direct and indirect reciprocity are key mechanisms for the evolution of cooperation. Direct reciprocity means that individuals use their own experience to decide whether to cooperate with another person. Indirect reciprocity means that they also consider the experiences of others. Although these two mechanisms are intertwined, they are typically studied in isolation. Here, we introduce a mathematical framework that allows us to explore both kinds of reciprocity simultaneously. We show that the well-known ‘generous tit-for-tat’ strategy of direct reciprocity has a natural analogue in indirect reciprocity, which we call ‘generous scoring’. Using an equilibrium analysis, we characterize under which conditions either of the two strategies can maintain cooperation. With simulations, we additionally explore which kind of reciprocity evolves when members of a population engage in social learning to adapt to their environment. Our results draw unexpected connections between direct and indirect reciprocity while highlighting important differences regarding their evolvability.

<https://www.nature.com/articles/s41562-021-01114-8>

STEFANI A. CRABTREE et al – Landscape rules predict optimal superhighways for the first peopling of Sahul

Archaeological data and demographic modelling suggest that the peopling of Sahul required substantial populations, occurred rapidly within a few thousand years and encompassed environments ranging from hyper-arid deserts to temperate uplands and tropical rainforests. How this migration occurred and how humans responded to the physical environments they encountered have, however, remained largely speculative. By constructing a high-resolution digital elevation model for Sahul and coupling it with fine-scale viewshed analysis of landscape prominence, least-cost pedestrian travel modelling and high-performance computing, we create over 125 billion potential migratory pathways, whereby the most parsimonious routes traversed emerge. Our analysis revealed several major pathways—superhighways—transecting the continent, that we evaluated using archaeological data. These results suggest that the earliest Australian ancestors adopted a set of fundamental rules shaped by physiological capacity, attraction to visually prominent landscape features and freshwater distribution to maximize survival, even without previous experience of the landscapes they encountered.

<https://www.nature.com/articles/s41562-021-01106-8>

MAXWELL N. BURTON-CHELLEW & STUART A. WEST – Payoff-based learning best explains the rate of decline in cooperation across 237 public-goods games

What motivates human behaviour in social dilemmas? The results of public goods games are commonly interpreted as showing that humans are altruistically motivated to benefit others. However, there is a competing ‘confused learners’ hypothesis: that individuals start the game either uncertain or mistaken (confused) and then learn from experience how to improve their payoff (payoff-based learning). Here we (1) show that these competing hypotheses can be differentiated by how they predict contributions should decline over time; and (2) use metadata from 237 published public goods games to test between these competing hypotheses. We found, as predicted by the confused learners hypothesis, that contributions declined faster when individuals had more influence over their own payoffs. This predicted relationship arises because more influence leads to a greater correlation between contributions and payoffs, facilitating learning. Our results suggest that humans, in general, are not altruistically motivated to benefit others but instead learn to help themselves.

{Hmm. I disagree with the “in general” in the final sentence; all they can actually conclude is, “in the artificial environment of highly repetitive public goods games”. How many encounters in real life are simple, highly repetitive, highly repeated, and rely on easily-counted reward systems? I think they have failed to notice that repetition encourages modelling, modelling encourages treating the experiment as a game, and gaming encourages treating the whole thing as virtual, not real or actual. Altruism is about the actual, default, and instinctive treatment of others, not the calculated virtuality of a game. Public Goods games have their place, but they assume the pre-existence of altruism; they can measure altruism, but not prove or disprove it.}

<https://www.nature.com/articles/s41562-021-01107-7>

KAI RUGGERI et mul – The general fault in our fault lines

Pervading global narratives suggest that political polarization is increasing, yet the accuracy of such group meta-perceptions has been drawn into question. A recent US study suggests that these beliefs are inaccurate and drive polarized beliefs about

out-groups. However, it also found that informing people of inaccuracies reduces those negative beliefs. In this work, we explore whether these results generalize to other countries. To achieve this, we replicate two of the original experiments with 10,207 participants across 26 countries. We focus on local group divisions, which we refer to as fault lines. We find broad generalizability for both inaccurate meta-perceptions and reduced negative motive attribution through a simple disclosure intervention. We conclude that inaccurate and negative group meta-perceptions are exhibited in myriad contexts and that informing individuals of their misperceptions can yield positive benefits for intergroup relations. Such generalizability highlights a robust phenomenon with implications for political discourse worldwide.

<https://www.nature.com/articles/s41562-021-01092-x>

JOSEPH HEFFNER, JAE-YOUNG SON & ORIEL FELDMANHALL – Emotion prediction errors guide socially adaptive behaviour

People make decisions based on deviations from expected outcomes, known as prediction errors. Past work has focused on reward prediction errors, largely ignoring violations of expected emotional experiences—emotion prediction errors. We leverage a method to measure real-time fluctuations in emotion as people decide to punish or forgive others. Across four studies (N = 1,016), we reveal that emotion and reward prediction errors have distinguishable contributions to choice, such that emotion prediction errors exert the strongest impact during decision-making. We additionally find that a choice to punish or forgive can be decoded in less than a second from an evolving emotional response, suggesting that emotions swiftly influence choice. Finally, individuals reporting significant levels of depression exhibit selective impairments in using emotion—but not reward—prediction errors. Evidence for emotion prediction errors potentially guiding social behaviours challenge standard decision-making models that have focused solely on reward.

<https://www.nature.com/articles/s41562-021-01213-6>

Nature Humanities & Social Sciences Communications

PAPERS

ALIKI PAPA et al with MONICA TAMARIZ – Effects of verbal instruction vs. modelling on imitation and overimitation

Human culture is the result of a unique cumulative evolutionary process. Despite the importance of culture for our species the social transmission mechanisms underlying this process are still not fully understood. In particular, the role of language—another unique human behaviour—in social transmission is under-explored. In this first direct, systematic comparison of demonstration vs. language-based social learning, we ran transmission chains of participants (6- to 8-year-old children and adults from Cyprus) who attempted to extract a reward from a puzzle box after either watching a model demonstrate an action sequence or after listening to verbal instructions describing the action sequence. The initial seeded sequences included causally relevant and irrelevant actions allowing us to measure transmission fidelity and the accumulation of beneficial modifications through the lens of a subtractive ratchet effect. Overall, we found that, compared to demonstration, verbal instruction specifically enhanced the faithful transmission of causally irrelevant actions (overimitation) in children, but not in adults. Cumulative cultural evolution requires the faithful transmission of sophisticated, complex behaviour whose function may not be obvious. This indicates that, by supporting the retention of actions that appear to lack a causal function specifically by children, language may play a supportive role in cumulative cultural evolution.

<https://www.nature.com/articles/s41599-021-00925-4>

Nature Reviews

ARTICLES

KATHERINE WHALLEY – Regulators of human brain evolution

It is thought that the expanded size and synaptic complexity of the human prefrontal cortex (PFC) arose from evolutionary changes in patterns of developmental gene expression. Two new papers by Sestan and colleagues provide insight into the molecular basis of conserved and species-specific gene expression control in the developing PFC.

<https://www.nature.com/articles/s41583-021-00534-9>

Nature Scientific Reports

PAPERS

SANDRINE YAZBEK et al – Tractography of the arcuate fasciculus in healthy right-handed and left-handed multilingual subjects and its relation to language lateralization on functional MRI

Functional MRI (fMRI) enables evaluation of language cortical organization and plays a central role in surgical planning. Diffusion Tensor Imaging (DTI) or Tractography, allows evaluation of the white matter fibers involved in language. Unlike fMRI, DTI does not rely on the patient's cooperation. In monolinguals, there is a significant correlation between the lateralization of language on fMRI and on DTI. Our objective is to delineate the arcuate fasciculus (AF) in right- and left-handed trilinguals and determine if the AF laterality on DTI is correlated to language lateralization on fMRI. 15 right and 15 left-handed trilingual volunteers underwent fMRI and DTI. Laterality Index was determined on fMRI (fMRI-LI). Mean Diffusivity, Fractional Anisotropy (FA), Number of Fibers, Fiber Length, Fiber Volume and Laterality Index (DTI-LI) of the AF were calculated on DTI. 28 of the 30 subjects presented a bilateral AF. Most subjects (52%) were found to have a bilateral language lateralization of the AF on DTI. Only 4 subjects had bilateral lateralization of language on fMRI. The right AF

demonstrated lower diffusivity than the left AF in the total participants, the right-handed, and the left-handed subjects. FA, Volume and Length of the AF were not significantly different between the two hemispheres. No correlation was found between the DTI-LI of the AF and the fMRI-LI. A prominent role of the right AF and a bilateral structural organization of the AF was present in our multilingual population regardless of their handedness. While in prior studies DTI was able to determine language lateralization in monolingual subjects, this was not possible in trilingual highly educated subjects.
<https://www.nature.com/articles/s41598-021-00490-5>

HIROFUMI MATSUMURA et al – Female craniometrics support the ‘two-layer model’ of human dispersal in Eastern Eurasia

This study reports a craniomorphometric analysis of female human remains from seven archaeological sites in China, Vietnam and Taiwan that date between 16,000 and 5300 BP. The aim of the analysis is to test the “two-layer” model of human dispersal in eastern Eurasia, using previously unanalysed female remains to balance the large sample of previously-analysed males. The resulting craniometric data indicate that the examined specimens all belong to the “first layer” of dispersal, and share a common ancestor with recent Australian and Papuan populations, and the ancient Jomon people of Japan. The analysed specimens pre-date the expansion of agricultural populations of East/Northeast Asian origin—that is, the “second layer” of human dispersal proposed by the model. As a result of this study, the two-layer model, which has hitherto rested on evidence only from male skeletons, is now strongly supported by female-derived data. Further comparisons reveal that the people of the first layer were closer in terms of their facial morphology to modern Africans and Sri Lankan Vedda than to modern Asians and Europeans, suggesting that the Late Pleistocene through Middle Holocene hunter-gatherers examined in this study were direct descendants of the anatomically modern humans who first migrated out of Africa through southern Eurasia.

<https://www.nature.com/articles/s41598-021-00295-6>

PeerJ

ARTICLES

PEERJ COMMUNITY – Author Interview: Vocal communication in wild chimpanzees: a call rate study

PeerJ spoke to Alexander Piel about the recently published article Vocal communication in wild chimpanzees: a call rate study. Alexander is a lecturer in Anthropology at University College London, and director of a long-term primate project in the Issa Valley, Western Tanzania.

<https://peerj.com/blog/post/115284884945/author-interview-vocal-communication-in-wild-chimpanzees-a-call-rate-study/>

PAPERS

ANNE-SOPHIE CRUNCHANT, FIONA A. STEWART & ALEX K. PIEL – Vocal communication in wild chimpanzees: a call rate study

Patterns of vocal communication have implications for species conservation: a change in calling behaviour can, for instance, reflect a disturbed habitat. More importantly, call rate is a parameter that allows conservation planners to convert call density into animal density, when detecting calls with a passive acoustic monitoring system (PAM). We investigated chimpanzee (*Pan troglodytes schweinfurthii*) call rate during the late dry season in the Issa Valley, western Tanzania by conducting focal follows. We examined the socio-ecological factors that influence call production rate of savanna woodland chimpanzees. We found that sex, proportion of time spent in a vegetation type, proportion of time spent travelling, time of the day, party size and swollen parous female presence had a significant effect on the call rate. Call rate differed among the different demographic classes with subadult and adult males vocalising twice as often as the subadult and adult females and three times as often as the juveniles. The use of PAM and recent statistical developments to estimate animal density is promising but relies on our knowing individual call rate, often not available for many species. With the improvement in automatic call detection, we anticipate that PAM will increasingly be broadly applied to primates but also across taxa, for conservation.

<https://peerj.com/articles/12326/>

DEXTER ZIRKLE, RICHARD S. MEINDL & C. OWEN LOVEJOY – Upright walking has driven unique vascular specialization of the hominin ilium

A novel physis in hominins modulates broadening and shortening of the ilium. We report analysis of a vascular canal system whose origin may be associated with this physis and which appears to be also unique to hominins. Its presence is potentially identifiable in the fossil record by its association with a highly enlarged foramen that is consistently present in modern humans and hominin fossils. We measured the diameter of this foramen in humans, fossil hominins, and African great apes and corrected for body size. The mean relative human foramen diameter is significantly greater than those of either Pan or Gorilla. Moreover, eight of the nine values of the Cohen's *d* for these differences in ratios are highly significant and support the ordering of magnitudes: Pan < Gorilla < Homo. The relative foramen diameter of A.L. 288-1 is above the 75th percentile of all other hominoids and at the high end of humans. The foramen is also present in ARA-VP-6/500. We posit that the presence and significant enlargement of this foramen in fossils can reasonably serve as an indicator that its anterior inferior iliac spine emerged via the unique hominin physis. The foramen can therefore serve as an indicator of hominin iliac ontogenetic specialization for bipedality in fossil taxa.

PNAS

PAPERS

CHRISTOPH HAUERT & MICHAEL DOEBELI – Spatial social dilemmas promote diversity

Cooperative investments in social dilemmas can spontaneously diversify into stably coexisting high and low contributors in well-mixed populations. Here we extend the analysis to emerging diversity in (spatially) structured populations. Using pair approximation, we derive analytical expressions for the invasion fitness of rare mutants in structured populations, which then yields a spatial adaptive dynamics framework. This allows us to predict changes arising from population structures in terms of existence and location of singular strategies, as well as their convergence and evolutionary stability as compared to well-mixed populations. Based on spatial adaptive dynamics and extensive individual-based simulations, we find that spatial structure has significant and varied impacts on evolutionary diversification in continuous social dilemmas. More specifically, spatial adaptive dynamics suggests that spontaneous diversification through evolutionary branching is suppressed, but simulations show that spatial dimensions offer new modes of diversification that are driven by an interplay of finite-size mutations and population structures. Even though spatial adaptive dynamics is unable to capture these new modes, they can still be understood based on an invasion analysis. In particular, population structures alter invasion fitness and can open up new regions in trait space where mutants can invade, but that may not be accessible to small mutational steps. Instead, stochastically appearing larger mutations or sequences of smaller mutations in a particular direction are required to bridge regions of unfavorable traits. The net effect is that spatial structure tends to promote diversification, especially when selection is strong.

<https://www.pnas.org/content/118/42/e2105252118.abstract>

Science

PAPERS

MAIMON C. ROSE et al – Cortical representation of group social communication in bats

Many animals live and interact as part of social groups. Social groups present unique advantages to their members, but also necessitate viable modes of communication between individuals, such as vocalization. Yet the neural mechanisms that support group social-vocal communication remain largely unknown. This is because most previous studies have focused on only one side of communication at a time, have measured neural activity in only one brain at a time, and were conducted outside the group social setting. This limited studies of key aspects of group social communication, such as the neural representation of self versus others, individual identity, and the influence of social relationships and context on both inter- and intrabrain activity patterns. Therefore, a major knowledge gap exists between the ethology of group social communication and the study of its neurophysiological basis.

Egyptian fruit bats live in large groups where individuals form long-lasting social relationships. Communication within these groups occurs through vocalizations that carry socially relevant information relating to individual identity, context, and social relationships. Using simultaneous multi-animal wireless neurophysiological recordings and novel behavioral monitoring techniques, we set out to study the neural basis of social-vocal communication in a group. We focused on the frontal cortex, an area shown to be involved in aspects of vocal and social behaviors across a variety of species.

We allowed groups of bats to interact freely and vocalize as they naturally would when clustered together in the wild. During freely occurring social-vocal interactions, we observed two main patterns of neural activity, one within individual brains and one shared across the brains of group members. Within individual brains, we observed that single-neuron activity could be used to distinguish between vocalizations made by oneself and others. Moreover, the identity of the vocalizing individual could be decoded from the activity of single neurons, beyond what would be expected on the basis of acoustic differences between the vocalizing bats. Across brains, we found that vocalizations elicited synchrony in the power of the high-frequency local field potential between group members. These synchronization patterns were bidirectional and remained stable over weeks of recording. To further dissociate the sensorimotor aspects of the vocal interactions from the social-communicative aspects, we trained bats to vocalize for reward in a setting where vocalizations would not otherwise occur. We found that during trained vocalizations, single-neuron activity was restructured and interbrain shared activity patterns were abolished. Finally, we found that both the intra- and interbrain activity patterns were modulated by the social preferences of individual group members, such that bats preferring to spend more time with others elicited stronger neural identity representation and higher levels of interbrain synchrony.

<https://www.science.org/doi/10.1126/science.aba9584>

Trends in Cognitive Sciences

PAPERS

MORITZ F. WURM & ALFONSO CARAMAZZA – Two ‘what’ pathways for action and object recognition

The ventral visual stream is conceived as a pathway for object recognition. However, we also recognize the actions an object can be involved in. Here, we show that action recognition critically depends on a pathway in lateral occipitotemporal cortex, partially overlapping and topographically aligned with object representations that are precursors for action recognition. By contrast, object features that are more relevant for object recognition, such as color and texture, are typically found in

ventral occipitotemporal cortex. We argue that occipitotemporal cortex contains similarly organized lateral and ventral 'what' pathways for action and object recognition, respectively. This account explains a number of observed phenomena, such as the duplication of object domains and the specific representational profiles in lateral and ventral cortex.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(21\)00258-8](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00258-8)

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