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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, 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, let me know.

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

EDITORIAL INTERJECTIONS

Comments in curly brackets are editorial interjections. The Editor reserves the right to be wrong.

ACADEMIA.EDU – Constraining the Likely Technological Niches of Late Middle Pleistocene Hominins
In Nicholas J. Conard (ed.), When Neanderthals and Modern Humans Met, Tübingen Publications in Prehistory, 5-20 (2006).

GERRIT L. DUSSELDORP & MARLIZE LOMBARD – Constraining the Likely Technological Niches of Late Middle Pleistocene Hominins with Homo naledi as Case Study

We develop a framework to differentiate the technological niches of co-existing hominin species by reviewing some theoretical biases influential in thinking about techno-behaviours of extinct hominins, such as a teleological bias in discussing technological evolution. We suggest that some stone-tool classification systems underestimate technological variability, while overestimating the complexity of the behaviours most commonly represented. To model the likely technological niches of extinct populations, we combine ecological principles (i.e. competitive exclusion) with physical anthropology and the archaeological record. We test the framework by applying it to the co-existence of Homo naledi and Homo sapiens during the late Middle Pleistocene in southern Africa. Based on our analysis, we suggest that tool use was probably not an essential part of H. naledi's niche, but that technology occasionally provided caloric benefits. In contrast, tool use was a structural part of the H. sapiens way of life. We provide reasoning for our interpretation that the latter population is associated with more sophisticated reduction strategies and the development of prepared core technology. The method also has applicability to cases such as the co-existence of different toolmakers during the Earlier Stone Age (ESA) in East Africa and the co-existence of Neanderthals and H. sapiens in Eurasia.

https://www.academia.edu/44989362/Constraining_the_Likely_Technological_Niches_of_Late_Middle_Pleistocene_Hominins_with_Homo_naledi_as_Case_Study

NEWS

NATURE BRIEFING – Cave provided shelter for 10,000 years

Hundreds of artefacts sheltered by a lava-tube cave in what is now Saudi Arabia show that herders and their livestock used the cave on and off for the past 10,000 years. The region near the Umm Jirsan cave was once lush and green. Now, wind and scorching heat mean that, across the surface of Saudi Arabia, “the fossil record is just horrendous”, says zooarchaeologist and study co-author Mathew Stewart. But an 88,000-year-old finger bone described in 2018 — one of the oldest human fossils found outside Africa — hints at the region's hidden history.

<https://www.nature.com/articles/d41586-024-01131-3>

PHYS.ORG – Evolution's recipe book: How 'copy paste' errors led to insect flight and human cognition

Seven hundred million years ago, a remarkable creature emerged for the first time. Though it may not have been much to look at by today's standards, the animal had a front and a back, a top and a bottom. This was a groundbreaking adaptation at the time, and one which laid down the basic body plan which most complex animals, including humans, would eventually inherit. The inconspicuous animal resided in the ancient seas of Earth, likely crawling along the seafloor. This was the last common ancestor of bilaterians, a vast supergroup of animals including vertebrates (fish, amphibians, reptiles, birds, and mammals), and invertebrates (insects, arthropods, mollusks, worms, echinoderms and many more).

To this day, more than 7,000 groups of genes can be traced back to the last common ancestor of bilaterians, according to a study of 20 different bilaterian species including humans, sharks, mayflies, centipedes and octopuses. The findings were made by researchers at the Centre for Genomic Regulation (CRG) in Barcelona and are published today in the journal Nature Ecology & Evolution. Remarkably, the study found that around half of these ancestral genes have since been repurposed by animals for use in specific parts of the body, particularly in the brain and reproductive tissues. The findings are surprising because ancient, conserved genes usually have fundamental, important jobs that are needed in many parts of the body. When the researchers took a closer look, they found a series of serendipitous "copy paste" errors during bilaterian evolution were to blame. For example, there was a significant moment early in the history of vertebrates. A bunch of tissue-specific genes first appeared coinciding with two whole genome duplication events. Animals could keep one copy for fundamental functions, while the second copy could be used as raw material for evolutionary innovation. Events like these, at varying degrees of scale, occurred constantly throughout the bilaterian evolutionary tree.

<https://phys.org/news/2024-04-evolution-recipe-errors-insect-flight.html>

SCIENCEADVISER – Bonobos, the 'hippie chimps,' might not be so mellow after all

It was five o'clock in the morning, and Maud Mouginitot was waiting for the sun to rise over the Kokolopori Bonobo Reserve. Suddenly, two male apes came hurtling out of the darkness—one rushing through the trees, the other giving chase. Judging by the terrified cries of the fleeing male, this encounter was no friendly game of tag. Mouginitot, an anthropologist, hadn't expected to witness such behavior from bonobos, which—unlike chimps—have a reputation for making love, not war.

Mouginitot's new research, published in Current Biology, shows that male bonobos actually engage in aggressive behavior more often than male chimps. Their aggression also doesn't appear to be a turn-off for female bonobos, who prefer to mate with more combative males. But while chimpanzee violence tends to be intense and indiscriminate, with males frequently ganging up to kill rivals or coerce females into sex, male bonobos almost exclusively pick fights with fellow males.

As Mougnot argues, this discovery suggests that the common perception of bonobos as peace-loving may fail to capture “the nuance of a species that has a lot of complex behavior.” Because chimps and bonobos are the closest living relatives of modern humans, she adds, the differences between their societies could help us understand how aggression—and friendliness—evolved in our own species.

<https://www.science.org/content/article/bonobos-hippie-chimps-might-not-be-so-mellow-after-all>

SCIENCE DAILY – Can animals count?

Researchers have made a groundbreaking discovery regarding number sense in animals by confirming the existence of discrete number sense in rats, offering a crucial animal model for investigating the neural basis of numerical ability and disability in humans.

<https://www.sciencedaily.com/releases/2024/04/240415231839.htm>

SCIENCE DAILY – Evolution's recipe book: How 'copy paste' errors cooked up the animal kingdom

A series of whole genome and gene duplication events that go back hundreds of millions of years have laid the foundations for tissue-specific gene expression, according to a new study. The 'copy-paste' errors allowed animals to keep one copy of their genome or genes for fundamental functions, while the second copy could be used as raw material for evolutionary innovation. Events like these, at varying degrees of scale, occurred constantly throughout the bilaterian evolutionary tree and enabled traits and behaviours as diverse as insect flight, octopus camouflage and human cognition.

<https://www.sciencedaily.com/releases/2024/04/240415110553.htm>

SCIENCE DAILY – Interspecies competition led to even more forms of ancient human

Competition between species played a major role in the rise and fall of hominins -- and produced a 'bizarre' evolutionary pattern for the Homo lineage -- according to a new study that revises the start and end dates for many of our early ancestors.

<https://www.sciencedaily.com/releases/2024/04/240417131021.htm>

SCIENCE DAILY – When thoughts flow in one direction

Contrary to previous assumptions, nerve cells in the human neocortex are wired differently than in mice. The study found that human neurons communicate in one direction, while in mice, signals tend to flow in loops. This increases the efficiency and capacity of the human brain to process information. These discoveries could further the development of artificial neural networks.

<https://www.sciencedaily.com/releases/2024/04/240418165159.htm>

SCIENCE DAILY – Metacognitive abilities may be more influenced by environment than genetics

Twin studies have proven invaluable for teasing out the effects of both genetics and the environment on human biology. Researchers studied pairs of twins to look at how the interplay of genetics and environment affect cognitive processing -- the way that people think. They found that some cognitive abilities appear to be regulated more by environmental factors than by genetics.

<https://www.sciencedaily.com/releases/2024/04/240418132655.htm>

SCIENCE.ORG NEWS – Bonobos, the ‘hippie chimps,’ might not be so mellow after all

Male bonobos are about three times as likely as chimps to engage in aggressive behavior—pushing, hitting, and biting.

<https://www.science.org/content/article/bonobos-hippie-chimps-might-not-be-so-mellow-after-all>

THE CONVERSATION – How logic alone may prove that time doesn't exist

In 1908, the English philosopher J. M. E. McTaggart published an important paper on the logic of time.

<https://theconversation.com/how-logic-alone-may-prove-that-time-doesnt-exist-227817>

PUBLICATIONS

Biolinguistics

PAPERS

STEFANIE BODE – Uniformity and Diversity of Language in an Evolutionary Context

The paper explores a view on language that is in line with the Strong Minimalist Thesis and that derives an evolutionary scenario predicting language variation in time and space. A stable and uniform UG making available recursive Merge shaped by laws of nature such as simplicity and efficiency has been integrated by a sudden rewiring of the brain into an existing biological system which is comparable to the concept of the faculty of language in the broad sense. The basic oppositions such as symmetry and asymmetry, internal language/thought and externalization, uniformity and diversity, universality and particular languages are derived as an automatic consequence of the architecture of the grammar as it evolved in the human

species in concert with general principles of nature. A stable and simple system can be reconciled with a dynamic complex one.

{“A sudden rewiring of the brain” – one brain or all the brains? It sounds to me like another appeal to the miracle of Christmas.}

<https://bioling.psychopen.eu/index.php/bioling/article/view/12823/12823.pdf>

Evolutionary Human Sciences

PAPERS

ROBIN WATSON et al – Investigating the effects of social information on spite in an online game

While humans are highly cooperative, they can also behave spitefully. Yet, spite remains understudied. Spite can be normatively driven and while previous experiments have found some evidence that cooperation and punishment may spread via social learning, no experiments have considered the social transmission of spiteful behaviour. Here we present an online experiment where, following an opportunity to earn wealth, we asked participants to choose an action toward an anonymous partner across a full spectrum of social behaviour, from spite to altruism. In accordance with cultural evolutionary theory, participants were presented with social information that varied in source and content. Across six conditions, we informed participants that either the majority or the highest earner had chosen to behave spitefully, neutrally or altruistically. We found an overall tendency towards altruism, but at lower levels among those exposed to spite compared to altruism. We found no difference between social information that came from the majority or the highest earner. Exploratory analysis revealed that participants' earnings negatively correlated with altruistic behaviour. Our results contrast with previous literature that report high rates of spite in experimental samples and a greater propensity for individuals to copy successful individuals over the majority.

<https://www.cambridge.org/core/journals/evolutionary-human-sciences/article/investigating-the-effects-of-social-information-on-spite-in-an-online-game/>

Frontiers in Behavioral Economics

PAPERS

ABHISHEK SAHAI & JAISON A. MANJALY – Risky mindset: prior exposure to risk increases utilitarian choices in sacrificial moral scenarios

Evidence of cross-domain spillover into the moral domain has been limited to altruistic and consumption behaviors. Building on the literature on spillover effects and domain-general decision processes, we predicted that choice behavior in the economic domain would affect subsequent choices in sacrificial moral dilemmas. We tested this prediction using hypothetical risky gambles and vignettes for moral dilemmas. We found that prior exposure to risky gambles increased utilitarian responses toward sacrificial moral dilemmas. Mediation analysis suggests that this is due to the spillover of a cost–benefit mindset. This mindset increases the probability of making utilitarian-type choices when faced with moral dilemmas but does not affect moral judgment. These results suggest that moral decisions are susceptible to cross-domain spillover effects. Moral values might get easily traded off in transactional scenarios in which cost–benefit analysis is a dominant decision strategy.

<https://www.frontiersin.org/articles/10.3389/frbhe.2024.1332416/full>

Frontiers in Earth Science

PAPERS

MOHAMMAD JAVAD SHOAEI et al with MICHAEL PETRAGLIA – Initial Upper Paleolithic in the Zagros Mountains

The Iranian Plateau and the Zagros Mountain chain, located at the crossroads of Africa and Eurasia, occupy a critical geographical position in out-of-Africa scenarios, sitting astride a major dispersal corridor into southern and central Asia. Yet, the region's role in human population expansions remains under-investigated. Here, we present findings from new excavations at Pebdeh Cave, a site located in the southern zone of the Zagros Mountains. Pebdeh contained a well-defined layer dating to ~42–40,000 years ago (ka), with Levallois elements alongside laminar reduction. This transitional feature in the Zagros was not dated and recorded before, and, given its similarity to Western and Central Asian industries with respect to chronology and technological features, we define it here as the Zagros Initial Upper Paleolithic (IUP). Although Late Middle Paleolithic and Early Upper Paleolithic technologies have been identified in the Zagros in the time period ranging between 50 and 40 ka, suggesting the presence of Neanderthals and modern humans in the mountainous region, the overall abrupt and constrained chronology of the IUP at Pebdeh, together with the penecontemporaneous appearance of other Upper Paleolithic sites in the Zagros Mountains, is compatible with a population expansion of *Homo sapiens* rather than an autochthonous development.

<https://www.frontiersin.org/articles/10.3389/feart.2024.1352099/full>

Frontiers in Research Metrics and Analytics

PAPERS

FATEMEH MORADI & MOHAMMAD REZA MONTAZERI – Voices in methodology: analyzing self-mention markers in English and Persian psychology research articles

Although previous preconceived notions discourage authors from asserting their presence in research articles (RAs), recent studies have substantiated that the use of self-mention markers offer a means to establish authorial identity and recognition in a given discipline. Few studies, however, explored specific sections of research articles to uncover how self-mentions function within each section's conventions. Exploring the use of self-mention markers, the present study aimed at comparing the method sections written by native English writers and L-1 Persian writers in the field of psychology. The corpus contained 120 RAs, with each sub-corpora including 60 RAs. The RAs were then examined structurally and functionally. The data were analyzed both quantitatively, using frequency counts and chi-square analyses, and qualitatively through content analysis. The findings indicated a significant difference between English and Persian authors concerning the frequency of self-mentions and the dimension of rhetorical functions; however, the differences in the dimensions of grammatical forms and hedging and boosting were found insignificant. Native English authors were inclined to make more use of self-mentions in their research articles. The findings of the current study can assist EAP and ESP novice researchers in taking cognizance of the conventions of authorial identity in each genre.

<https://www.frontiersin.org/articles/10.3389/frma.2024.1336190/full>

HGG Advances

PAPERS

LEILA JAMAL et al – Queering Genomics: How Cisnormativity Undermines Genomic Science

Over the past century, genetics and genomics (“genomics”) have contributed significantly to knowledge of human biology and disease. Genomics has also bolstered inaccurate and harmful arguments about “essential” differences between socially defined groups. These purported differences have reinforced class hierarchies and justified the mistreatment of groups such as Black, Indigenous, and other people of color and people with disabilities. With this history in mind, we explore how genomics is used to reinforce scientifically unsound understandings of the relationship between two fundamental aspects of the human experience: sex and gender. We argue that imprecise, inaccurate practices for collecting data and conducting genomic research have adversely influenced genomic science and can contribute to the stigmatization of people whose sex and/or gender challenge binary expectations. The results have been to preclude transgender and intersex people from accessing high-quality, evidence-based healthcare and to hinder their participation in scientifically sound research. In this article, we use the lens of queer theory to render this situation more visible. First, we highlight the theoretical contributions queer theory can make to genomic science. Second, we examine practices in research and clinical genomics that exclude and stigmatize transgender and intersex people. Third, we highlight ways that many current genomic research practices generate false conclusions that are used to support unjust public policies. We conclude by recommending ways that clinicians and researchers can—and should—harness the scientific, social, and cultural power of genomics to advance knowledge and improve lives across the spectra of sex and gender.

[https://www.cell.com/hgg-advances/fulltext/S2666-2477\(24\)00036-8](https://www.cell.com/hgg-advances/fulltext/S2666-2477(24)00036-8)

Language Sciences

PAPERS

OSKAR LINDWALL & ERIK BOSTRÖM – Conversation analysis, dialogism, and the case for a minimal communicative unit

Severinson Eklundh and Linell (1983) asked whether a minimal form of communicative interaction exists and, if so, how many moves it would require. In conversation analysis, the response to these questions has traditionally been that such a form exists and that it takes the form of a pair of adjacent utterances consisting of a first pair part (e.g., a greeting or a question) and a second pair part (e.g., a greeting in return or an answer to the question). Severinson Eklundh and Linell acknowledged that communicative exchanges could take the form of two-part sequences, but they argued that this format is relatively limited in scope. Instead, they proposed that the basic format for most communicative interactions is a three-part sequence and that this structure should not be reduced to a base pair with a sequence closing third as an expansion of the pair. This issue has been the subject of ongoing debate over the last four decades. In this article, we discuss how conversation analysis and extended dialogism have addressed the idea of a minimal form of communicative interaction. We review different approaches and how they overlap and diverge, and we make conceptual distinctions to account for their differences.

<https://www.sciencedirect.com/science/article/pii/S0388000124000159>

HANNELE DUFVA – From ‘psycholinguistics’ to the study of distributed sense-making: Psychological reality revisited

The paper discusses the ‘psychological reality’ of human languaging. Basing on the dialogical and distributed arguments, the point of departure is in observations of the actualities of languaging in different modalities and environments. Arguing against the psychological reality of ‘mental grammars’ as storages of internal rules and representations, the concept of decontextual and amodal language knowledge is replaced by a know-how that is associated both with the modality and

indexicality of usages. Further, instead of a 'grammar', the reservoir of agentive knowledge is approached as a personal repertoire that is discussed, using the concept of timescales, as an assemblage that develops during the agent's personal trajectory, but that at the same time is made possible by developments over cultural-historical and evolutionary timescales. The discussion is associated particularly with the field of applied linguistics, and aims at offering new theoretical arguments for the research on language learning and teaching.

<https://www.sciencedirect.com/science/article/pii/S0388000124000160>

SARAH BRO TRASMUNDI & SUNE VORK STEFFENSEN – Dialogical cognition

In this article we review Per Linell's work within the last five decades that led to his dialogism framework, which he defines as a general epistemology of language, cognition and communication. We critically discuss how his contribution on the one hand, altered and qualified existent models within language, communication and cognitive science, because dialogism removed language and cognition from their abstract and mental seat in the brain, and embedded them instead in situational contexts and embodied interaction. In that sense, his dialogism successfully replaced monological assumptions about the mind, action and thinking with more contextual and temporally distributed ones. On the other hand, we also question why Linell has not pursued a more rigorous empirical program for studying human cognition, when he did establish a theoretical apparatus for approaching cognition from a dialogical starting point. In going through Linell's arguments over the past five decades we suggest that this absence of an empirical program is due to his humanistic roots which both have sensitised him to appreciating the contingencies and dynamics of human sense making and cognition, and have impeded him from buying into a necessary condition for pursuing a cognitive analysis, even if he conceptually and methodologically accepts a distributed view on cognition. The outcome of this discussion leads to an empirical-based cognitive analysis of a medical interaction. Altogether, the purpose of this article is to show how Linell's conceptual framework can be put to use in ways that make a dialogical cognitive science achievable.

<https://www.sciencedirect.com/science/article/pii/S0388000124000044>

STEPHEN J. COWLEY – Other orientation: uncovering the roots of praxis

In honouring Per Linell's achievements, I pursue how dialogue was traced back to praxis. Hence, I begin with how, countering generative theory as overblown, Linell found a hard middle way and, thus, adopted a modest realism. In early work, he traced phonology to what can be heard and, later, diagnosed exclusive emphasis on things or rules as written language bias. Since much depends on how we speak, verbalizing derives, in part, from the influence of others. In modelling speech performance, he therefore turns to a duality of planning and execution. Activity can be orienting to others and/or their doings and sayings. The pattern recurs in initiative-response analysis which effectively tracks isomorphisms in the push and pull of dialogue (initiative and response). Given samenesses, forms, ways of acting, and uses of wordings, we sustain the sociological consciousness of practical and linguistic knowhow. Praxis prompts people to act, transcend situations, use dialogue, construct practical theories and, slowly, change their languaging. In scaling down, I argue that the future prospects of Linell's work lie in rethinking the interdisciplinary area that is concerned with languages, human practices and, above all, their effects.

<https://www.sciencedirect.com/science/article/pii/S0388000124000135>

SIMON BORCHMANN – A little less conversation – On the completeness of discourse-initial action-guiding subsententials

This study analyzes the relation between utterances and human activities with a view to determining how and under what conditions discourse-initial verbless utterances can be considered pragmatically, semantically, and grammatically complete. The study is empirically based on a set of observations of discourse-initial action-guiding verbless speech acts, which for a large part have been observed in a cognitive ethnographic field study of the activity of gliding. Using the concept of illocutionary acts and ecological value theory as an overarching framework, the analysis shows how discourse-initial action-guiding subsententials are enabled and constrained by the activity, i.e. the lawful constraints, the available affordances, the information that specify affordances, and the values that guide the activity. The analysis shows that a discourse-initial action-guiding subsentential is a response to a present or emerging discrepancy between the state of variation a current action causes and the state of variation that the values that guide the activity requires. The conventional effect and the contextual conditions for the effect of discourse-initial action-guiding subsententials is specified and provide the criteria for what constitutes a meaningful unit and thus also the criteria for semantic completeness. The semantic structure of discourse-initial action-guiding subsententials is identified as a specification. On the basis of this semantic analysis, the grammatical patterns that realize this semantic unit is identified. It is a single-word focus construction. Based on this grammatical analysis, another more complex grammatical construction that realizes two communicative tasks is identified: a specification of an affordance and an indication of the condition for rightness of the action possibility. It is argued that this combination of communicative tasks is conducive to the performance of activities, and hence, may exert a functional pressure on the conventionalization of grammatical construction. In this way, it is shown how subsentential constructions can emerge from non-conversational, practical activities.

<https://www.sciencedirect.com/science/article/pii/S0388000124000172>

Nature Ecology & Evolution

PAPERS

FEDERICA MANTICA et al – Evolution of tissue-specific expression of ancestral genes across vertebrates and insects

Regulation of gene expression is arguably the main mechanism underlying the phenotypic diversity of tissues within and between species. Here we assembled an extensive transcriptomic dataset covering 8 tissues across 20 bilaterian species and performed analyses using a symmetric phylogeny that allowed the combined and parallel investigation of gene expression evolution between vertebrates and insects. We specifically focused on widely conserved ancestral genes, identifying strong cores of pan-bilaterian tissue-specific genes and even larger groups that diverged to define vertebrate and insect tissues. Systematic inferences of tissue-specificity gains and losses show that nearly half of all ancestral genes have been recruited into tissue-specific transcriptomes. This occurred during both ancient and, especially, recent bilaterian evolution, with several gains being associated with the emergence of unique phenotypes (for example, novel cell types). Such pervasive evolution of tissue specificity was linked to gene duplication coupled with expression specialization of one of the copies, revealing an unappreciated prolonged effect of whole-genome duplications on recent vertebrate evolution.

<https://www.nature.com/articles/s41559-024-02398-5>

LAURA A. VAN HOLSTEIN & ROBERT A. FOLEY – Diversity-dependent speciation and extinction in hominins

The search for drivers of hominin speciation and extinction has tended to focus on the impact of climate change. Far less attention has been paid to the role of interspecific competition. However, research across vertebrates more broadly has shown that both processes are often correlated with species diversity, suggesting an important role for interspecific competition. Here we ask whether hominin speciation and extinction conform to the expected patterns of negative and positive diversity dependence, respectively. We estimate speciation and extinction rates from fossil occurrence data with preservation variability priors in a validated Bayesian framework and test whether these rates are correlated with species diversity. We supplement these analyses with calculations of speciation rate across a phylogeny, again testing whether these are correlated with diversity. Our results are consistent with clade-wide diversity limits that governed speciation in hominins overall but that were not quite reached by the Australopithecus and Paranthropus subclade before its extinction. Extinction was not correlated with species diversity within the Australopithecus and Paranthropus subclade or within hominins overall; this is concordant with climate playing a greater part in hominin extinction than speciation. By contrast, *Homo* is characterized by positively diversity-dependent speciation and negatively diversity-dependent extinction—both exceedingly rare patterns across all forms of life. The genus *Homo* expands the set of reported associations between diversity and macroevolution in vertebrates, underscoring that the relationship between diversity and macroevolution is complex. These results indicate an important, previously underappreciated and comparatively unusual role of biotic interactions in *Homo* macroevolution, and speciation in particular. The unusual and unexpected patterns of diversity dependence in *Homo* speciation and extinction may be a consequence of repeated *Homo* range expansions driven by interspecific competition and made possible by recurrent innovations in ecological strategies. Exploring how hominin macroevolution fits into the general vertebrate macroevolutionary landscape has the potential to offer new perspectives on longstanding questions in vertebrate evolution and shed new light on evolutionary processes within our own lineage.

<https://www.nature.com/articles/s41559-024-02390-z>

Nature Scientific Reports

PAPERS

REBECCA Y. M. CHEUNG & LEMUELA DJEKOU – Self-compassion and grit mediated the relation between mindfulness and mind wandering based on cross-sectional survey data

Previous research suggests that mindfulness and mind wandering are opposing constructs. However, little is known about why and how they are negatively related. Through a process-oriented approach, this cross-sectional study tested self-compassion and grit as mediators for the relation between mindfulness and mind wandering. A total of 487 self-identified meditators were recruited from the UK (241 female, 49.49%). Participants reported a mean age of 38.98 years (SD = 10.03), with an average of 2.26 h of meditation practice per week (SD = 4.47). Upon informed consent, the participants completed a self-report questionnaire that assessed the core variables under study. Path analysis indicated that mindfulness was related to self-compassion. Greater self-compassion was, in turn, related to greater grit, which was then related to lower mind wandering. Bootstrapping analysis further indicated that self-compassion and grit as mediators between mindfulness and mind wandering, above and beyond age, gender, hours of meditation, income, and education as covariates. The cross-sectional findings provided initial evidence of mediation by showing that mindfulness and mind wandering were related through self-compassion and grit.

<https://www.nature.com/articles/s41598-024-58395-y>

AMIN MAHMOUDI & DARIUSZ JEMIELNIAK – Proof of biased behavior of Normalized Mutual Information

The Normalized Mutual Information (NMI) metric is widely utilized in the evaluation of clustering and community detection algorithms. This study explores the performance of NMI, specifically examining its performance in relation to the quantity of communities, and uncovers a significant drawback associated with the metric's behavior as the number of communities

increases. Our findings reveal a pronounced bias in the NMI as the number of communities escalates. While previous studies have noted this biased behavior, they have not provided a formal proof and have not addressed the causation of this problem, leaving a gap in the existing literature. In this study, we fill this gap by employing a mathematical approach to formally demonstrate why NMI exhibits biased behavior, thereby establishing its unsuitability as a metric for evaluating clustering and community detection algorithms. Crucially, our study exposes the vulnerability of entropy-based metrics that employ logarithmic functions to similar bias.

<https://www.nature.com/articles/s41598-024-59073-9>

DANIEL SCHMIDTKE & VICTOR KUPERMAN – A psycholinguistic study of intergroup bias and its cultural propagation

Intergroup bias is the tendency for people to inflate positive regard for their in-group and derogate the out-group. Across two online experiments (N = 922) this study revisits the methodological premises of research on language as a window into intergroup bias. Experiment 1 examined (i) whether the valence (positivity) of language production differs when communicating about an in- vs. out-group, and (ii) whether the extent of this bias is influenced by the positivity of input descriptors that were initially presented to participants as examples of how an in-group or out-group characterize themselves. Experiment 2 used the linear diffusion chain method to examine how biases are transmitted through cultural generations. Valence of verbal descriptions were quantified using ratings obtained from a large-scale psycholinguistic database. The findings from Experiment 1 indicated a bias towards employing positive language in describing the in-group (exhibiting in-group favoritism), particularly in cases where the input descriptors were negative. However, there was weak evidence for increased negativity aimed at the out-group (i.e., out-group derogation). The findings from Experiment 2 demonstrated that in-group positivity bias propagated across cultural generations at a higher rate than out-group derogation. The results shed light on the formation and cultural transmission of intergroup bias.

<https://www.nature.com/articles/s41598-024-58905-y>

FRANCESCO LUCIANO et al – The work to swing limbs in humans versus chimpanzees and its relation to the metabolic cost of walking

Compared to their closest ape relatives, humans walk bipedally with lower metabolic cost (C) and less mechanical work to move their body center of mass (external mechanical work, WEXT). However, differences in WEXT are not large enough to explain the observed lower C: humans may also do less work to move limbs relative to their body center of mass (internal kinetic mechanical work, WINT,k). From published data, we estimated differences in WINT,k, total mechanical work (WTOT), and efficiency between humans and chimpanzees walking bipedally. Estimated WINT,k is ~ 60% lower in humans due to changes in limb mass distribution, lower stride frequency and duty factor. When summing WINT,k to WEXT, between-species differences in efficiency are smaller than those in C; variations in WTOT correlate with between-species, but not within-species, differences in C. These results partially support the hypothesis that the low cost of human walking is due to the concerted low WINT,k and WEXT.

<https://www.nature.com/articles/s41598-024-59171-8>

New Scientist

NEWS

'Peaceful' male bonobos may actually be more aggressive than chimps

Bonobos have long been regarded as the peaceful ape, in sharp contrast with violent chimpanzees, but a study based on thousands of hours of observations suggests the real story is more nuanced.

<https://www.newscientist.com/article/2426678-peaceful-male-bonobos-may-actually-be-more-aggressive-than-chimps/>

ARTICLES

MICHAEL MARSHALL – Untangling the enigmatic origins of the human family's newest species

Five years ago, a fossil found in the Philippines was determined to be from a new species of hominin called *Homo luzonensis*. Since then, we've learned a bit more about the newest member of the human family.

<https://www.newscientist.com/article/2426655-untangling-the-enigmatic-origins-of-the-human-family-s-newest-species/>

PLoS One

PAPERS

STEFAN BAUMANN & JANNE LORENZEN – Boosting or inhibiting - how semantic-pragmatic and syntactic cues affect prosodic prominence relations in German

In this exploratory study, we investigate the influence of several semantic-pragmatic and syntactic factors on prosodic prominence production in German, namely referential and lexical newness/givenness, grammatical role, and position of a referential target word within a sentence. Especially in terms of the probabilistic distribution of accent status (nuclear, prenuclear, deaccentuation) we find evidence for an additive influence of the discourse-related and syntactic cues, with lexical newness and initial sentence position showing the strongest boosting effects on a target word's prosodic prominence. The relative strength of the initial position is found in nearly all prosodic factors investigated, both discrete (such as the

choice of accent type) and gradient (e.g., scaling of the Tonal Center of Gravity and intensity). Nevertheless, the differentiation of prominence relations is information-structurally less important in the beginning of an utterance than near the end: The prominence of the final object relative to the surrounding elements, especially the verbal component, is decisive for the interpretation of the sentence. Thus, it seems that a speaker adjusts locally important prominence relations (object vs. verb in sentence-final position) in addition to a more global, rhythmically determined distribution of prosodic prominences across an utterance.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0299746>

SOILE JUNGEWELTER et al – Maternal occupational noise exposure during pregnancy and children’s early language acquisition

Noise exposure during pregnancy may affect a child’s auditory system, which may disturb fetal learning and language development. We examined the impact of occupational noise exposure during pregnancy on children’s language acquisition at the age of one.

A cohort study was conducted among women working in the food industry, as kindergarten teachers, musicians, dental nurses, or pharmacists who had a child aged <1 year. The analyses covered 408 mother-child pairs. Language acquisition was measured using the Infant-Toddler Checklist. An occupational hygienist assessed noise exposure individually as no (N = 180), low (70–78 dB; N = 108) or moderate/high exposure (>79 dB; N = 120).

Among the boys, the adjusted mean differences in language acquisition scores were -0.4 (95% CI -2.5, 1.8) for low, and -0.7 (95% CI -2.9, 1.4) for moderate/high exposure compared to no exposure. Among the girls the respective scores were +0.1 (95% CI -2.2, 2.5) and -0.1 (95% CI -2.3, 2.2). Among the children of kindergarten teachers, who were mainly exposed to human noise, low or moderate exposure was associated with lower language acquisition scores. The adjusted mean differences were -3.8 (95% CI -7.2, -0.4) for low and -4.9 (95% CI -8.6, -1.2) for moderate exposure.

In general, we did not detect an association between maternal noise exposure and children’s language acquisition among one-year-old children. However, the children of kindergarten teachers exposed to human noise had lower language acquisition scores than the children of the non-exposed participants. These suggestive findings merit further investigation by level and type of exposure.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0301144>

SIHAN CHEN et al with LJILJANA PROGOVAC & ANTONIO BENÍTEZ-BURRACO – Linguistic correlates of societal variation: A quantitative analysis

Traditionally, many researchers have supported a uniformitarian view whereby all languages are of roughly equal complexity, facilitated by internal trade-offs between complexity at different levels, such as morphology and syntax. The extent to which the speakers’ societies influence the trade-offs has not been well studied. In this paper, we focus on morphology and syntax, and report significant correlations between specific linguistic and societal features, in particular those relating to exoteric (open) vs. esoteric (close-knit) society types, characterizable in terms of population size, mobility, communication across distances, etc. We conduct an exhaustive quantitative analysis drawing upon WALS, D-Place, Ethnologue and Glottolog, finding some support for our hypothesis that languages spoken by exoteric societies tend towards more complex syntaxes, while languages spoken by esoteric societies tend towards more complex morphologies.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0300838>

HOLLY BRADLEY, BETH A. SMITH & RAN XIAO – Associations between EEG power and coherence with cognition and early precursors of speech and language development across the first months of life

The neural processes underpinning cognition and language development in infancy are of great interest. We investigated EEG power and coherence in infancy, as a reflection of underlying cortical function of single brain region and cross-region connectivity, and their relations to cognition and early precursors of speech and language development. EEG recordings were longitudinally collected from 21 infants with typical development between approximately 1 and 7 months. We investigated relative band power at 3-6Hz and 6-9Hz and EEG coherence of these frequency ranges at 25 electrode pairs that cover key brain regions. A correlation analysis was performed to assess the relationship between EEG measurements across frequency bands and brain regions and raw Bayley cognitive and language developmental scores. In the first months of life, relative band power is not correlated with cognitive and language scales. However, 3-6Hz coherence is negatively correlated with receptive language scores between frontoparietal regions, and 6-9Hz coherence is negatively correlated with expressive language scores between frontoparietal regions. The results from this preliminary study contribute to the existing literature on the relationship between electrophysiological development, cognition, and early speech precursors in this age group. Future work should create norm references of early development in these domains that can be compared with infants at risk for neurodevelopmental disabilities.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0300382>

EMILY S. NICHOLS et al – A design for life: Predicting cognitive performance from lifestyle choices

Maintaining cognitive capacity through adulthood has been the target of many recent studies that have examined the influence of lifestyle choices such as exercise, diet, and sleeping habits. Many of these studies have focused on a single factor

(e.g., diet) and its effect on cognitive abilities; however, humans make numerous lifestyle choices every single day, many of which interact and influence each other. Here, we investigated whether combinations of lifestyle choices can predict better or worse cognitive performance in the general population, and whether optimal combinations of choices existed depending on the cognitive domain. Specifically, we examined 20 self-reported lifestyle choices, such as playing video games, drinking alcohol, and amount of exercise taken, in a sample of almost 10,000 participants. All participants also completed 12 cognitive tests that have been shown to generate three composite cognitive domain scores pertaining to short-term memory, verbal abilities, and reasoning. Using recursive feature elimination and random forest regression, we were able to explain 9% of the variance in short-term memory scores, 8% of the variance in reasoning scores, and 7% of the variance in verbal ability scores. While the regression model provided predictive power in all three domains, these levels indicate that even when considering a large number of lifestyle choices, there remains a considerable degree of variability in predicting short-term memory, reasoning and verbal abilities. Thus, while some modifiable lifestyle factors may have an impact on cognitive capacity, there likely exists no single optimal design for life.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0298899>

AMBER D. FANDEL, KIRSTEN SILVA & HELEN BAILEY – Vocal signatures affected by population identity and environmental sound levels

Passive acoustic monitoring has improved our understanding of vocalizing organisms in remote habitats and during all weather conditions. Many vocally active species are highly mobile, and their populations overlap. However, distinct vocalizations allow the tracking and discrimination of individuals or populations. Using signature whistles, the individually distinct calls of bottlenose dolphins, we calculated a minimum abundance of individuals, characterized and compared signature whistles from five locations, and determined reoccurrences of individuals throughout the Mid-Atlantic Bight and Chesapeake Bay, USA. We identified 1,888 signature whistles in which the duration, number of extrema, start, end, and minimum frequencies of signature whistles varied significantly by site. All characteristics of signature whistles were deemed important for determining from which site the whistle originated and due to the distinct signature whistle characteristics and lack of spatial mixing of the dolphins detected at the Offshore site, we suspect that these dolphins are of a different population than those at the Coastal and Bay sites. Signature whistles were also found to be shorter when sound levels were higher. Using only the passively recorded vocalizations of this marine top predator, we obtained information about its population and how it is affected by ambient sound levels, which will increase as offshore wind energy is developed. In this rapidly developing area, these calls offer critical management insights for this protected species.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0299250>

MATHEW STEWART et al with MICHAEL D. PETRAGLIA & HUW S. GROUCUTT – First evidence for human occupation of a lava tube in Arabia: The archaeology of Umm Jirsan Cave and its surroundings, northern Saudi Arabia

Recent advances in interdisciplinary archaeological research in Arabia have focused on the evolution and historical development of regional human populations as well as the diverse patterns of cultural change, migration, and adaptations to environmental fluctuations. Obtaining a comprehensive understanding of cultural developments such as the emergence and lifeways of Neolithic groups has been hindered by the limited preservation of stratified archaeological assemblages and organic remains, a common challenge in arid environments. Underground settings like caves and lava tubes, which are prevalent in Arabia but which have seen limited scientific exploration, offer promising opportunities for addressing these issues. Here, we report on an archaeological excavation and a related survey at and around Umm Jirsan lava tube in the Harrat Khaybar, north-western Saudi Arabia. Our results reveal repeated phases of human occupation of the site ranging from at least the Neolithic through to the Chalcolithic/Bronze Age. Pastoralist use of the lava tube and surrounding landscape is attested in rock art and faunal records, suggesting that Umm Jirsan was situated along a pastoral route linking key oases. Isotopic data indicates that herbivores primarily grazed on wild grasses and shrubs rather than being provided with fodder, while humans had a diet consistently high in protein but with increasing consumption of C3 plants through-time, perhaps related to the emergence of oasis agriculture. While underground and naturally sheltered localities are globally prominent in archaeology and Quaternary science, our work represents the first such combined records for Saudi Arabia and highlight the potential for interdisciplinary studies in caves and lava tubes.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0299292>

Proceedings of the Royal Society B

PAPERS

ETTORE CAMERLENGHI et al – Social restructuring during harsh environmental conditions promotes cooperative behaviour in a songbird

Cooperation may emerge from intrinsic factors such as social structure and extrinsic factors such as environmental conditions. Although these factors might reinforce or counteract each other, their interaction remains unexplored in animal populations. Studies on multilevel societies suggest a link between social structure, environmental conditions and individual investment in cooperative behaviours. These societies exhibit flexible social configurations, with stable groups that overlap and associate hierarchically. Structure can be seasonal, with upper-level units appearing only during specific seasons, and lower-level units persisting year-round. This offers an opportunity to investigate how cooperation relates to social structure

and environmental conditions. Here, we study the seasonal multilevel society of superb fairy-wrens (*Malurus cyaneus*), observing individual responses to experimental playback of conspecific distress calls. Individuals engaged more in helping behaviour and less in aggressive/territorial song during the harsher non-breeding season compared to the breeding season. The increase in cooperation was greater for breeding group members than for members of the same community, the upper social unit, comprised of distinct breeding groups in association. Results suggest that the interaction between social structure and environmental conditions drives the seasonal switch in cooperation, supporting the hypothesis that multilevel societies can emerge to increase cooperation during harsh environmental conditions.

<https://royalsocietypublishing.org/doi/10.1098/rspb.2023.2427>

ALEXANDRA SCHUH et al with PHILIPP GUNZ & JEAN-JACQUES HUBLIN – A shared pattern of midfacial bone modelling in hominids suggests deep evolutionary roots for human facial morphogenesis

Midfacial morphology varies between hominoids, in particular between great apes and humans for which the face is small and retracted. The underlying developmental processes for these morphological differences are still largely unknown. Here, we investigate the cellular mechanism of maxillary development (bone modelling, BM), and how potential changes in this process may have shaped facial evolution. We analysed cross-sectional developmental series of gibbons, orangutans, gorillas, chimpanzees and present-day humans ($n = 183$). Individuals were organized into five age groups according to their dental development. To visualize each species's BM pattern and corresponding morphology during ontogeny, maps based on microscopic data were mapped onto species-specific age group average shapes obtained using geometric morphometrics. The amount of bone resorption was quantified and compared between species. Great apes share a highly similar BM pattern, whereas gibbons have a distinctive resorption pattern. This suggests a change in cellular activity on the hominid branch. Humans possess most of the great ape pattern, but bone resorption is high in the canine area from birth on, suggesting a key role of canine reduction in facial evolution. We also observed that humans have high levels of bone resorption during childhood, a feature not shared with other apes.

<https://royalsocietypublishing.org/doi/10.1098/rspb.2023.2738>

EVE JOURDAIN et al – Social and genetic connectivity despite ecological variation in a killer whale network

Philopatric kin-based societies encourage a narrow breadth of conservative behaviours owing to individuals primarily learning from close kin, promoting behavioural homogeneity. However, weaker social ties beyond kin, and across a behaviourally diverse social landscape, could be sufficient to induce variation and a greater ecological niche breadth. We investigated a network of 457 photo-identified killer whales from Norway (548 encounters in 2008–2021) with diet data available (46 mixed-diet individuals feeding on both fish and mammals, and 411 exclusive fish-eaters) to quantify patterns of association within and between diet groups, and to identify underlying correlates. We genotyped a subset of 106 whales to assess patterns of genetic differentiation. Our results suggested kinship as main driver of social bonds within and among cohesive social units, while diet was most likely a consequence reflective of cultural diffusion, rather than a driver. Flexible associations within and between ecologically diverse social units led to a highly connected network, reducing social and genetic differentiation between diet groups. Our study points to a role of social connectivity, in combination with individual behavioural variation, in influencing population ecology in killer whales.

<https://royalsocietypublishing.org/doi/10.1098/rspb.2024.0524>

Royal Society Open Science

PAPERS

LUKAS REINHARDT & HARVEY WHITEHOUSE – Why care for humanity?

Some of the most pressing challenges facing our planet—such as climate change, biodiversity loss, warfare and extreme poverty—require social cohesion and prosocial action on a global scale. How can this be achieved? Previous research suggests that identity fusion—a strong form of group cohesion motivating prosocial action—results from perceptions of shared personally transformative experiences or of common biological essence. Here, we present results from two studies with United States samples exploring each pathway to identity fusion on a global scale. Study 1 focused on globally shared motherhood experiences and found that US mothers were more fused with women around the world if they shared motherhood experiences with them, which was also reflected in money allocation behaviour. Study 2 showed that exposure to a talk about globally shared biology increased fusion with humanity at large, Americans and the extended family suggesting that fusion with humanity does not need to weaken fusion with nation or extended family. We discuss implications of our results for future research on bonding with humanity at large and for addressing collective action problems on a global scale.

<https://royalsocietypublishing.org/doi/10.1098/rsos.231632>

Trends in Cognitive Sciences

PAPERS

GARY LUPYAN, PABLO CONTRERAS KALLENS & RICK DALE – Information density as a predictor of communication dynamics

In a recent paper, Aceves and Evans computed information and semantic density measures for hundreds of languages, and showed that these measures predict the pace and breadth of ideas in communication. Here, we summarize their key findings and situate them in a broader debate about the adaptive nature of language.

[https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613\(24\)00079-2](https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(24)00079-2)

JUNYI CHU, JOSHUA B. TENENBAUM & LAURA E. SCHULZ – In praise of folly: flexible goals and human cognition

Humans often pursue idiosyncratic goals that appear remote from functional ends, including information gain. We suggest that this is valuable because goals (even prima facie foolish or unachievable ones) contain structured information that scaffolds thinking and planning. By evaluating hypotheses and plans with respect to their goals, humans can discover new ideas that go beyond prior knowledge and observable evidence. These hypotheses and plans can be transmitted independently of their original motivations, adapted across generations, and serve as an engine of cultural evolution. Here, we review recent empirical and computational research underlying goal generation and planning and discuss the ways that the flexibility of our motivational system supports cognitive gains for both individuals and societies.

[https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613\(24\)00059-7](https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(24)00059-7)

KRISTINA SUCHOTZKI & MATTHIAS GAMER – Detecting deception with artificial intelligence: promises and perils

Outside of books and movies, Pinocchio's nose does not exist. There are no valid behavioral cues that differentiate robustly between liars and truth-tellers, and no physiological or neural signature has been identified that can unambiguously be attributed to deception. With the rapid advancement of AI, hope has been placed in its potential to improve currently underperforming lie detection methods. Unfortunately, these developments have mostly focused on technical aspects at the expense of a solid methodological and theoretical foundation.

Existing AI deception detection approaches differ in the variables used to distinguish between truth and deceit and the algorithms developed for this differentiation. However, in all cases, they are first trained on an existing dataset in which statements are labeled as deceptive or truthful (often referred to as ground truth). These datasets are frequently generated in the laboratory by explicitly instructing participants when to lie and tell the truth, but in some cases, real-life data are also used, in which deception is inferred retrospectively. After an algorithm has been trained on this dataset, independent data are required for cross-validation. This mitigates the so-called overfitting problem and thus the fact that performance on the training set may overestimate the model's validity, as the classification model might not generalize to other datasets.

{I would suggest we need to define "lie" more closely. It implies an intention to deceive, which is missing from fiction (where the sender lets the receiver know they are being deceptive) and misinformation (where the sender believes what they are saying is not a lie). A successful lie also needs to be actually deceptive: there are ineffectual lies (where the receiver is not deceived) and naïve lies (where the sender does not know how to deceive successfully). The lies we really need a machine to help with are successful intentional lies; but then, if they are successful, how do we know to mark them as lies in the training scripts? Then there are matters of opinion, which are lies if the receiver believes them to be: Trump probably believes many of his counterfactuals, and some people are willing to support his erroneous belief; are they lying to themselves?}

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(24\)00081-0](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(24)00081-0)

COMMENTARIES

LIUBA PAPEO – What is abstract about seeing social interactions?

Social vision is a branch of vision science investigating the visual processing of socially relevant stimuli, primarily people. The focus of this research has recently moved from individuals (faces/bodies and their actions) to groups (two faces/bodies and their interactions). This new focus has revealed that the visual system is particularly sensitive to information that signals social interaction, or the social engagement of an agent. In a recent article in *TiCS*, McMahon and Isik propose that the visual system uses this information to generate abstract representations of social interaction on an 'exciting middle ground' that goes beyond the input structure, but precedes cognitive processes, such as theory of mind. A hierarchical organization that supports increasingly abstract levels of representation is common to many large-scale brain networks, and is probably a good model to understand the processing of social interaction. However, the mapping of different representational levels into the visual cortex is more uncertain than McMahon and Isik suggest.

[https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613\(24\)00031-7](https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(24)00031-7)

EMALIE MCMAHON & LEYLA ISIK – Abstract social interaction representations along the lateral pathway

Recent work in vision science and visual neuroscience has moved away from focusing on single people or objects to understanding the relations between them. Based on converging behavioral, computational, and neuroscience evidence, we recently argued that the visual system contains rich, abstract representations of social interactions between others. We also

outlined a framework for how this may be implemented in the human brain hierarchically, beginning with detecting agents, processing their physical relations, and finally recognizing their social interactions. As part of this framework we argue that mid-level visual features about the physical relations between agents, which we refer to as social primitives, are represented in the extrastriate body area (EBA) and nearby regions of lateral occipitotemporal cortex (LOTC), whereas more abstract information about social interactions is represented in more anterior regions along the superior temporal sulcus (STS). However, Papeo questions our claim that social interaction representations in the STS are, in fact, abstract. We review evidence here that strengthens our claims of a posterior-to-anterior gradient of increasingly abstract representations of social interaction features along the recently proposed lateral visual stream.

[https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613\(24\)00073-1](https://www.cell.com/trends/cognitive-sciences/abstract/S1364-6613(24)00073-1)

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