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## EAORC 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 – Reading: skilled linguistic action

*Language Sciences in press (2021) 101364*

#### STEPHEN J. COWLEY – Reading: skilled linguistic action

The paper links critique of ‘inner process’ to a perspective that treats language as activity that is accomplished by living beings. The view traces reading to human ways of coordinating with ‘the seen’. Having contrasted this distributed view with organism-first alternatives, I use a case study of reports to sketch how readers engage with written materials to both select details and project an imagined ‘source’ (e.g. a meaning, author or intention). Far from using inner process(‘decoding’) readers coordinate with a field of patternings. Where skilled, they use recollecting to link looking, silent thinking, expectations and strategic moves. Using judgements, they trans-form what they observe by setting off experience. I thus build on Wittgenstein’s critique of inner process while also endorsing Trybulec’s (2019) radicalization of his view. To avoid treating the sense of ‘written words’ as subjective, the material aspect of patternings is taken to index out-ward criteria (roughly, standards of judgement). In seeking to replace theories that presuppose ‘text’, I stress how patternings invite directed sensorimotor activity by an intelligent person. In-deed, since persons learn to see wordings (or take a language stance) arrangements of patternings act as marks, ‘symbols’ and aggregations that set off recollection, judgements and iterated action. Skilled readers can use re-reading, the already read etc. to modulate ways of attending. Readers link the said, hints, recollections and ways of actualizing movements to grant reading experience a specific sense. By considering how outer criteria are evoked, reading is traced back to skilled linguistic action.

[https://www.academia.edu/45067956/Reading\\_skilled\\_linguistic\\_action?email\\_work\\_card=view-paper](https://www.academia.edu/45067956/Reading_skilled_linguistic_action?email_work_card=view-paper)

### ACADEMIA.EDU – Intentionality-based Hypothesis on the Emergence of Music

*Studies about Languages 25, 65-76 (2014)*

#### ALESSANDRO MIANI – Symbolizing Iconic Indexes: An Intentionality-based Hypothesis on the Emergence of Music

The most recognized feature of music is the capacity to arouse emotions in listeners: are such emotions inherent to music (indexes) or are they evoked by resemblance to an analogous emotional expression (icons)? The claim is that music is a conventionalized imitation of an expression of an emotional state (i.e., a symbolized iconic index), but to reach this form three evolutionary steps in human thinking are required: individual, joint, and collective intentionality, which parallel the emergence — and overlap — of indexes, icons, and symbols. Providing a comparative view of the genetic and neuroanatomical infrastructures required for the

emergence of music, it will be hypothesized that: (i) music is rooted in ape vocalizations as an index of emotions performed by individual-intentionality agents; (ii) with the capacity for recursive mindreading of joint intentionality agents, music evolved as an iconized index of emotions; (iii) as a consequence of demographic changes, collective-intentionality agents

created musical instruments in order to reduce the structural complexity of the sign aiming at coordinating in joint musical activities and culturally transmitting symbolized iconic indexes of emotions.

[https://www.academia.edu/9691063/Symbolizing\\_Iconic\\_Indexes\\_An\\_Intentionality\\_based\\_Hypothesis\\_on\\_the\\_Emergence\\_of\\_Music?email\\_work\\_card=view-paper](https://www.academia.edu/9691063/Symbolizing_Iconic_Indexes_An_Intentionality_based_Hypothesis_on_the_Emergence_of_Music?email_work_card=view-paper)

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## NEWS

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### BREAKING SCIENCE – 48,000-Year-Old Fossils Hint at Neanderthal-Human Interbreeding

Several hominin teeth found at the Paleolithic site of La Cotte de St Brelade in Jersey may belong to Neanderthal-Homo sapiens hybrids, according to new research led by the Natural History Museum, London. The thirteen permanent fully erupted teeth were excavated at the Paleolithic site of La Cotte de St Brelade in 1910 and 1911.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/HiEOwgEo2NY/jersey-neanderthal-homo-sapiens-hybrids-09308.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/HiEOwgEo2NY/jersey-neanderthal-homo-sapiens-hybrids-09308.html?utm_source=feedburner&utm_medium=email)

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### BREAKING SCIENCE – 357,000-Year-Old Abrading Tool Unearthed in Israel

The 357,000-year-old abrader found in the Lower Paleolithic layers of Tabun Cave in Israel is presently the earliest documented artifact of its kind. The abrading tool from Tabun Cave is an ovate dolomite cobble measuring 9.4 x 8.8 x 6 cm (3.7 x 3.5 x 2.4 inches) and weighing almost 0.5 kg.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/4Td50Jn-SRU/abrading-tool-tabun-cave-israel-09305.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/4Td50Jn-SRU/abrading-tool-tabun-cave-israel-09305.html?utm_source=feedburner&utm_medium=email)

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### BREAKING SCIENCE – 120,000-Year-Old Engraved Aurochs Bone Found in Israel

The 120,000-year-old animal bone fragment with six incised lines is one of the oldest representations of abstract patterns produced by Middle Paleolithic and Middle Stone Age hominins and the oldest known so far in the Levant.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/eFqKcF53M/engraved-aurochs-bone-nesher-ramla-israel-09326.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/eFqKcF53M/engraved-aurochs-bone-nesher-ramla-israel-09326.html?utm_source=feedburner&utm_medium=email)

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### NATURE BRIEFING – How gut microbes drive brain disorders

Evidence is building that the trillions of bacteria in the gut could have profound effects on the brain, and might be tied to a whole host of disorders. What was once a fringe theory — the gut-brain axis — is seeing an explosion of interest. Now, researchers are working to separate hope from hype to develop better and easier treatments for brain diseases.

<https://nature.us17.list-manage.com/track/click?u=2c6057c528fdc6f73fa196d9d&id=657d1224e1&e=1db4b9a19b>

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### SAPIENS – Earliest-known animal cave art

Archaeologists' dates on ancient cave art in Indonesia push the timeline for the first animal depictions back thousands of years. / Read More

<https://sapiens.us11.list-manage.com/track/click?u=80f6cf678900daf984bf763b7&id=e054569bc9&e=dc0eff6180>

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### SCIENCE DAILY – What we see shapes what we hear

People often move their hands up and down to 'highlight' what they are saying. Are such 'beat gestures' important for communication? Researchers created words with an ambiguous stress pattern and asked listeners what they heard (DIScount or disCOUNT?). The beat gestures people saw influenced what they heard, showing that listeners quickly integrate verbal and visual information during speech recognition.

<https://www.sciencedaily.com/releases/2021/01/210129090517.htm>

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### SCIENCE DAILY – Use of pronouns may show signs of an impending breakup

Evidence of an impending breakup may exist in the small words used in everyday conversations months before either partner realizes where their relationship is heading, according to new psychology research.

<https://www.sciencedaily.com/releases/2021/02/210201155447.htm>

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### SCIENCE NEWS – Marmosets eavesdrop on their neighbors—and judge them accordingly

Like a nosy neighbor, marmosets eavesdrop on the conversations of others—and judge them based on what they “say,” new research finds. The pint-size primates might be using the behavior to screen strangers, preferring to mingle with those they feel will make the best nannies for their offspring.

[https://www.sciencemag.org/news/2021/02/marmosets-eavesdrop-their-neighbors-and-judge-them-accordingly?utm\\_campaign=news\\_daily\\_2021-02-03&et rid=17774313&et cid=3654450](https://www.sciencemag.org/news/2021/02/marmosets-eavesdrop-their-neighbors-and-judge-them-accordingly?utm_campaign=news_daily_2021-02-03&et rid=17774313&et cid=3654450)

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## SOCIETY FOR SCIENCE – Humanlike thumb dexterity may date back as far as 2 million years ago

A computer analysis suggests early Homo species developed a powerful grip, giving them an evolutionary edge over some other tool-using hominids.

<http://click.societyforscience-email.com/?qs=8b6cc2329ab590e3cad3dc94f595501008ab4c2106a492984c061616b4730c4956cfe230450a52e5e470748d9d343c5c8794ba39040690fb>

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## SOCIETY FOR SCIENCE – Naked mole-rat colonies speak with unique dialects

Machine learning reveals that these social rodents communicate with distinctive speech patterns that are culturally inherited.

<http://click.societyforscience-email.com/?qs=7cc08bba14cab3e324b0c117c7c34e177b2ab91e64c8a64a4e643bac5fa5886e3f23cd6c53ebc5b055e38e5d6a48689f40a68f6d7c78c035>

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## PUBLICATIONS

### Frontiers in Psychology

#### PAPERS

#### **D. KIMBROUGH OLLER & ULRIKE GRIEBEL – Functionally Flexible Signaling and the Origin of Language**

At the earliest break of ancient hominins from their primate relatives in vocal communication, we propose a selection pressure on vocal fitness signaling by hominin infants. Exploratory vocalizations, not tied to expression of distress or immediate need, could have helped persuade parents of the wellness and viability of the infants who produced them. We hypothesize that hominin parents invested more in infants who produced such signals of fitness plentifully, neglecting or abandoning them less often than infants who produced the sounds less frequently. Selection for such exploratory vocalization provided a critically important inclination and capability relevant to language, we reason, because the system that encouraged spontaneous vocalization also made vocalization functionally flexible to an extent that has not been observed in any other animal. Although this vocal flexibility did not by itself create language, it provided an essential foundation upon which language would evolve through a variety of additional steps. In evaluating this speculation, we consider presumable barriers to evolving language that are thought to be implications of Darwinian Theory. It has been claimed that communication always involves sender self-interest and that self-interest leads to deceit, which is countered through clever detection by receivers. The constant battle of senders and receivers has been thought to pose an insuperable challenge to honest communication, which has been viewed as a requirement of language. To make communication honest, it has been proposed that stable signaling requires costly handicaps for the sender, and since language cannot entail high cost, the reasoning has suggested an insurmountable obstacle to the evolution of language. We think this presumed honesty barrier is an illusion that can be revealed by recognition of the fact that language is not inherently honest and in light of the distinction between illocutionary force and semantics. Our paper also considers barriers to the evolution of language (not having to do with honesty) that we think may have actually played important roles in preventing species other than humans from evolving language.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2020.626138/full>

#### **EDUARDO MERCADO III – Song Morphing by Humpback Whales: Cultural or Epiphenomenal?**

Singing humpback whales (*Megaptera noavaengliae*) collectively and progressively change the sounds and patterns they produce within their songs throughout their lives. The dynamic modifications that humpback whales make to their songs are often cited as an impressive example of cultural transmission through vocal learning in a non-human. Some elements of song change challenge this interpretation, however, including: (1) singers often incrementally and progressively morph phrases within and across songs as time passes, with trajectories of change being comparable across multiple time scales; (2) acoustically isolated subpopulations singing similar songs morph the acoustic properties of songs in similar ways; and (3) complex sound patterns, including phrases, themes, and whole songs, recur across years and populations. These properties of song dynamics suggest that singing humpback whales may be modulating song features in response to local conditions and genetic predispositions rather than socially learning novel sound patterns by copying other singers. Experimental and observational tests of key predictions of these alternative hypotheses are critical to identifying how and why singing humpback whales constantly change their songs.

<https://www.frontiersin.org/articles/10.3389/fpsyg.2020.574403/full>

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### International Journal of Primatology

#### PAPERS

#### **KRISTIN HAVERCAMP, NARUKI MORIMURA & SATOSHI HIRATA – Sleep Patterns of Aging Chimpanzees (*Pan troglodytes*)**

Diurnal primates spend around half of their lifetime sleeping or inactive. These nocturnal behaviors are considerably understudied compared to daytime activities. While it is well established that sleep quality diminishes with age in humans,

little is known about the effects of advanced age on sleep in our closest primate relatives. We aimed to describe captive chimpanzee (*Pan troglodytes*) sleep patterns and examine whether individual sleep quality changed over an 11-yr period. We recorded the individual night rooms of 12 chimpanzees for six nights using infrared video cameras and analyzed 72 nights (936 h) of video. To evaluate long-term changes, we compared our data from 2018–2019 with previously published data from 2007–2008 on the same individuals living under the same conditions. We used complete inactivity and a head-down, lying posture as a proxy measurement for sleep. Each night individuals slept a mean of 10.5 ( $\pm$  SD 1.8) h and woke up 15.1 ( $\pm$  3.6) times. The mean duration of sleep bouts was 45.4 ( $\pm$  16.8) and the mean duration of awake bouts was 10.2 ( $\pm$  8.2) min. We found that as chimpanzees aged they experienced significantly more frequent awakenings and shorter sleep bouts (i.e., more fragmented sleep), but nightly sleep duration and the length of awake bouts did not differ significantly between the two study periods. Our results suggest that chimpanzees experience some changes in sleep with age similar to those in humans and other animals.

<https://link.springer.com/article/10.1007/s10764-020-00190-3>

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## Mind & Language

### PAPERS

#### **MICHAEL DEVITT – Semantic polysemy and psycholinguistics**

The paper urges that polysemous phenomena are typically semantic not pragmatic. The part of a message sent by a polysemous expression is typically one of its meanings encoded in the speaker's language and not the result of pragmatic modification. The hearer receives that part of the message by a process of disambiguation, by detecting which item in the lexicon the speaker has selected. This is the best explanation of observed regularities. The paper argues that the experimental evidence from psycholinguistics, particularly that produced in discussions of “underspecification” and “overspecification,” does not undermine this view nor support the pragmatic alternative.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/mila.12327?campaign=wolearlyview>

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## Nature

### ARTICLES

#### **ANDREW F. G. BOURKE – The role and rule of relatedness in altruism**

Inclusive fitness theory shows that social partners must be related for altruism to evolve, yet some models suggest that relatedness is not needed. An analysis concludes that assumptions in those models build in a role for relatedness, after all.

<https://www.nature.com/articles/d41586-021-00210-z>

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## Nature European Journal of Human Genetics

### PAPERS

#### **EBERHARD PASSARGE – Origins of human genetics. A personal perspective**

Genetics evolved as a field of science after 1900 with new theories being derived from experiments obtained in fruit flies, bacteria, and viruses. This personal account suggests that the origins of human genetics can best be traced to the years 1949 to 1959. Several genetic scientific advances in genetics in 1949 yielded results directly relating to humans for the first time, except for a few earlier observations. In 1949 the first textbook of human genetics was published, the American Journal of Human Genetics was founded, and in the previous year the American Society of Human Genetics. In 1940 in Britain a textbook entitled Introduction to Medical Genetics served as a foundation for introducing genetic aspects into medicine. The introduction of new methods for analyzing chromosomes and new biochemical assays using cultured cells in 1959 and subsequent years revealed that many human diseases, including cancer, have genetic causes. It became possible to arrive at a precise cause-related genetic diagnosis. As a result the risk of occurrence or re-occurrence of a disease within a family could be assessed correctly. Genetic counseling as a new concept became a basis for improved patient care. Taken together the advances in medically orientated genetic research and patient care since 1949 have resulted in human genetics being both, a basic medical and a basic biological science. Prior to 1949 genetics was not generally viewed in a medical context. Although monogenic human diseases were recognized in 1902, their occurrence and distribution were considered mainly at the population level.

<https://www.nature.com/articles/s41431-020-00785-7>

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## Nature Humanities & Social Sciences Communications

### PAPERS

#### **PHILIP Z. MAYMIN & ELLEN J. LANGER – Cognitive biases and mindfulness**

In a study testing whether mindfulness decreases cognitive biases, respondents answered 22 standard cognitive bias questions to measure susceptibility to the endowment effect, overconfidence, mental accounting, anchoring, loss aversion, and 17 other biases, as well as the 14 questions of the Langer mindfulness survey (LMS), measuring the traits of novelty-seeking, novelty producing, and engagement. A portion of the respondents were randomly pre-assigned to a condition that induced mindfulness. On 19 of the 22 biases, those induced to be mindful were less likely to show the bias. They also scored higher on 11 of the 14 LMS questions. The method by which we induced mindfulness was unrelated to the context of the

later questions, involving image comparisons and standard Langerian instructions to notice three new things. People can boost their decision-making abilities merely by increasing their mindfulness, with no need for meditation, psychological training, or statistical education.

<https://www.nature.com/articles/s41599-021-00712-1>

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## Nature Scientific Reports

### PAPERS

#### **JAMIE L. SCHAFFROTH et al – No evidence that monkeys attribute mental states to animated shapes in the Heider–Simmel videos**

Human Theory of Mind (ToM) is so automatic and pervasive that we spontaneously attribute mental states to animated abstract shapes, as evidenced by the classic Heider–Simmel findings. The extent to which this represents a fundamental characteristic of primate social cognition is debated. Prior research suggests that monkeys spontaneously predict behavior and attribute basic goals to conspecifics, but it remains unclear whether, like humans, they spontaneously ascribe mental states to animated shapes. Here, we address this question by analyzing rhesus monkeys' viewing patterns of the classic Heider–Simmel animations. We hypothesized that if rhesus monkeys also spontaneously attribute mental states to animated shapes, then, like humans, they would have the longest fixation durations for theory of mind animations, medium duration fixation for goal-directed animations, and shortest fixations for animations with random motion. In contrast, if attributing mental states to animations is specific to humans and perhaps other apes, then we predict no differences in looking time across animation categories. Unlike humans, monkeys did not fixate longer on ToM videos. Critically, monkeys' viewing patterns did not correlate with humans' viewing patterns or intentionality ratings from previously published research. The only major difference in viewing patterns between animation categories tracked differences in low-level visual motion. Thus, monkeys do not view the classic Heider–Simmel animations like humans do and we found no evidence that they spontaneously attribute mental states to animated shapes.

<https://www.nature.com/articles/s41598-021-82702-6>

#### **JOSE LUIS GOMEZ-MELARA et al – Dominance style predicts differences in food retrieval strategies**

In several species, rank predicts access to food, and subordinates may need specific behavioural strategies to get a share of resources. This may be especially important in despotic species, where resources are strongly biased in favour of dominants and subordinates may more strongly rely on specific tactics to maximize food intake. Here, we compared three macaque species with an experimental set-up reproducing feeding competition contest. Following our predictions, more tolerant species mostly retrieved food in the presence of others and were less dependent on specific tactics. Contrarily, subordinates in more despotic species more likely collected food (1) when dominants could not see food or (2) were attacking others, (3) while “dissimulating”, or (4) “storing food”. Our study reveals that dominance styles reliably predict the probability of using specific food retrieval tactics and provides important insights on the social conditions that might have led to the emergence of tactical deception.

<https://www.nature.com/articles/s41598-021-82198-0>

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## New Scientist

### NEWS

#### **Using hand gestures when we talk influences what others hear**

Making simple up and down hand movements while speaking may influence the way people hear what you are saying.

<https://www.newscientist.com/article/2266039-using-hand-gestures-when-we-talk-influences-what-others-hear/#ixzz6lajKM93Y>

#### **Naked mole rats mimic the dialect of their colony's queen**

Colonies of naked mole rats develop dialects in their vocalisations that may help them distinguish between friends and foes. These dialects are influenced by each colony's queen, and become more varied if the queen dies.

<https://www.newscientist.com/article/2266135-naked-mole-rats-mimic-the-dialect-of-their-colonys-queen/#ixzz6lajY7xEv>

#### **Our dexterous thumbs have a 2 million-year-old origin**

Our thumbs allow us to use a variety of tools, from hammers to smartphones, and a new analysis suggests they have a long history. Researchers have found that some hominins started developing more dexterous thumbs about 2 million years ago, which could have allowed them to exploit more resources, eventually leading to the emergence of human culture.

<https://www.newscientist.com/article/2266033-our-dexterous-thumbs-have-a-2-million-year-old-origin/#ixzz6lajgu5Oc>

**ARBEL HARPAK & MOLLY PRZEWORSKI – The evolution of group differences in changing environments**

*This is an uncorrected proof.*

The selection pressures that have shaped the evolution of complex traits in humans remain largely unknown, and in some contexts highly contentious, perhaps above all where they concern mean trait differences among groups. To date, the discussion has focused on whether such group differences have any genetic basis, and if so, whether they are without fitness consequences and arose via random genetic drift, or whether they were driven by selection for different trait optima in different environments. Here, we highlight a plausible alternative that many complex traits evolve under stabilizing selection in the face of shifting environmental effects. Under this scenario, there will be rapid evolution at the loci that contribute to trait variation, even when the trait optimum remains the same. These considerations underscore the strong assumptions about environmental effects that are required in ascribing trait differences among groups to genetic differences.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001072>

**SEBASTIAN SAUPPE et al with BALTHASAR BICKEL – Neural signatures of syntactic variation in speech planning**

Planning to speak is a challenge for the brain, and the challenge varies between and within languages. Yet, little is known about how neural processes react to these variable challenges beyond the planning of individual words. Here, we examine how fundamental differences in syntax shape the time course of sentence planning. Most languages treat alike (i.e., align with each other) the 2 uses of a word like “gardener” in “the gardener crouched” and in “the gardener planted trees.” A minority keeps these formally distinct by adding special marking in 1 case, and some languages display both aligned and nonaligned expressions. Exploiting such a contrast in Hindi, we used electroencephalography (EEG) and eye tracking to suggest that this difference is associated with distinct patterns of neural processing and gaze behavior during early planning stages, preceding phonological word form preparation. Planning sentences with aligned expressions induces larger synchronization in the theta frequency band, suggesting higher working memory engagement, and more visual attention to agents than planning nonaligned sentences, suggesting delayed commitment to the relational details of the event. Furthermore, plain, unmarked expressions are associated with larger desynchronization in the alpha band than expressions with special markers, suggesting more engagement in information processing to keep overlapping structures distinct during planning. Our findings contrast with the observation that the form of aligned expressions is simpler, and they suggest that the global preference for alignment is driven not by its neurophysiological effect on sentence planning but by other sources, possibly by aspects of production flexibility and fluency or by sentence comprehension. This challenges current theories on how production and comprehension may affect the evolution and distribution of syntactic variants in the world’s languages.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001038>

**MATTHIAS URBAN & STEVEN MORAN – Altitude and the distributional typology of language structure: Ejectives and beyond**

The first decades of the 21st century have witnessed a renewed interest in the relationship between language structure and the various social and ecological niches in which the languages of the world are used and against the background of which they evolved. In this context, Everett (2013) argued for direct geographical influences on the sound structure of languages. It was observed that ejective consonants, produced with a sudden burst of non-pulmonic air to a salient acoustic effect, tend to occur in high-altitude environments in which these sounds may be adaptive due to a reduced articulatory effort and/or to prevent desiccation. Here, we evaluate this claim and at the same time place it into a broader context. We observe that the distribution of another class of typologically unusual sounds, uvulars, is highly similar to that of ejectives, but that the proposed explanations are not available to account for the similar geographical patterning of uvulars. Hence, we test an alternative explanatory account that would posit indirect rather than direct environmental influences on language structure that are mediated by anthropological factors, in particular the relative sociolinguistic isolation of speech communities at the highest altitudes. Applying Bayesian Logistic Mixed Effects Regression to a large database of phonological inventories of the world’s languages, however, we do not find strong support for either a correlation of ejectives or uvulars with high-altitude environments, though the association is somewhat stronger for ejectives than uvulars. A phylogenetic exploration of the development of both classes of sounds in two large language families spoken in widely different environments, Indo-European and Sino-Tibetan, together with a qualitative assessment of the dedicated literature, in contrast, suggests a strong role of language contact rather than environmental factors.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0245522>

**ARIEL MALINSKY-BULLER et al – Short-term occupations at high elevation during the Middle Paleolithic at Kalavan 2 (Republic of Armenia)**

The Armenian highlands encompasses rugged and environmentally diverse landscapes and is characterized by a mosaic of distinct ecological niches and large temperature gradients. Strong seasonal fluctuations in resource availability along topographic gradients likely prompted Pleistocene hominin groups to adapt by adjusting their mobility strategies. However,

the role that elevated landscapes played in hunter-gatherer settlement systems during the Late Pleistocene (Middle Palaeolithic [MP]) remains poorly understood. At 1640 m above sea level, the MP site of Kalavan 2 (Armenia) is ideally positioned for testing hypotheses involving elevation-dependent seasonal mobility and subsistence strategies. Renewed excavations at Kalavan 2 exposed three main occupation horizons and ten additional low densities lithic and faunal assemblages. The results provide a new chronological, stratigraphical, and paleoenvironmental framework for hominin behaviors between ca. 60 to 45 ka. The evidence presented suggests that the stratified occupations at Kalavan 2 locale were repeated ephemerally most likely related to hunting in a high-elevation within the mountainous steppe landscape.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0245700>

#### **PABLO LARA-MARTÍNEZ et al – Comparing phonological and orthographic networks: A multiplex analysis**

The complexity of natural language can be explored by means of multiplex analyses at different scales, from single words to groups of words or sentence levels. Here, we plan to investigate a multiplex word-level network, which comprises an orthographic and a phonological network defined in terms of distance similarity. We systematically compare basic structural network properties to determine similarities and differences between them, as well as their combination in a multiplex configuration. As a natural extension of our work, we plan to evaluate the preservation of the structural network properties and information-based quantities from the following perspectives: (i) presence of similarities across 12 natural languages from 4 linguistic families (Romance, Germanic, Slavic and Uralic), (ii) increase of the size of the number of words (corpus) from 104 to  $50 \times 103$ , and (iii) robustness of the networks. Our preliminary findings reinforce the idea of common organizational properties among natural languages. Once concluded, will contribute to the characterization of similarities and differences in the orthographic and phonological perspectives of language networks at a word-level.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0245263>

#### **KAZUKI HAYASHIDA et al – Goal sharing with others modulates the sense of agency and motor accuracy in social contexts**

Sense of agency (SoA), the feeling of control over one's own actions and their effects, is fundamental to goal-directed actions at the individual level and may constitute a cornerstone of everyday life, including cooperative behavior (i.e., goal sharing). Previous studies have demonstrated that goal sharing can activate the motor prediction of both agent's action and partner's action in joint-action tasks. Moreover, given that from an SoA perspective, predictive processes are an essential basis, there is a possibility that goal sharing may modulate SoA. However, the possibility for goal sharing to modulate SoA remains unclear. This study aimed to investigate whether goal sharing modulates the intentional binding (IB) effect (a method that can quantitatively measure SoA) of self-generated and observed partner's actions and improves motor accuracy. Participants were required to stop a circular horizontal moving object by pressing a key when the object reaches the center of a target in a social situation. This task measured IB by having participants estimate the time interval between action and effect in several 100 milliseconds, with shorter time interval estimations indicating enhancement of SoA. Participants were randomly divided into 13 Cooperative groups (goal sharing) and 13 Independent groups (non-goal sharing). Cooperative groups were instructed to perform the task together, while Independent groups did so individually. Participants estimated the time interval between them by pressing the key and hearing the corresponding sound (Self-generated action) and the other person pressing the key and hearing the sound (Observed action). Our results indicated that goal sharing improved motor accuracy and enhanced both the IB of Self-generated and Observed actions compared to non-goal sharing. We suggest that SoA can be modulated by goal sharing in specific social contexts.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0246561>

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## PNAS

### PAPERS

#### **SARAH SERAJ, KATE G. BLACKBURN & JAMES W. PENNEBAKER – Language left behind on social media exposes the emotional and cognitive costs of a romantic breakup**

Using archived social media data, the language signatures of people going through breakups were mapped. Text analyses were conducted on 1,027,541 posts from 6,803 Reddit users who had posted about their breakups. The posts include users' Reddit history in the 2 y surrounding their breakups across the various domains of their life, not just posts pertaining to their relationship. Language markers of an impending breakup were evident 3 mo before the event, peaking on the week of the breakup and returning to baseline 6 mo later. Signs included an increase in I-words, we-words, and cognitive processing words (characteristic of depression, collective focus, and the meaning-making process, respectively) and drops in analytic thinking (indicating more personal and informal language). The patterns held even when people were posting to groups unrelated to breakups and other relationship topics. People who posted about their breakup for longer time periods were less well-adjusted a year after their breakup compared to short-term posters. The language patterns seen for breakups replicated for users going through divorce ( $n = 5,144$ ; 1,109,867 posts) or other types of upheavals ( $n = 51,357$ ; 11,081,882 posts). The cognitive underpinnings of emotional upheavals are discussed using language as a lens.

<https://www.pnas.org/content/118/7/e2017154118>

## **TANYA MARIE LUHRMANN et al – Sensing the presence of gods and spirits across cultures and faiths**

Hearing the voice of God, feeling the presence of the dead, being possessed by a demonic spirit—such events are among the most remarkable human sensory experiences. They change lives and in turn shape history. Why do some people report experiencing such events while others do not? We argue that experiences of spiritual presence are facilitated by cultural models that represent the mind as “porous,” or permeable to the world, and by an immersive orientation toward inner life that allows a person to become “absorbed” in experiences. In four studies with over 2,000 participants from many religious traditions in the United States, Ghana, Thailand, China, and Vanuatu, porosity and absorption played distinct roles in determining which people, in which cultural settings, were most likely to report vivid sensory experiences of what they took to be gods and spirits.

<https://www.pnas.org/content/118/5/e2016649118.abstract?etoc>

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## Science Advances

### PAPERS

## **R. K. BRÜGGER, E. P. WILLEMS & J. M. BURKART – Do marmosets understand others' conversations? A thermography approach**

What information animals derive from eavesdropping on interactions between conspecifics, and whether they assign value to it, is difficult to assess because overt behavioral reactions are often lacking. An inside perspective of how observers perceive and process such interactions is thus paramount. Here, we investigate what happens in the mind of marmoset monkeys when they hear playbacks of positive or negative third-party vocal interactions, by combining thermography to assess physiological reactions and behavioral preference measures. The physiological reactions show that playbacks were perceived and processed holistically as interactions rather than as the sum of the separate elements. Subsequently, the animals preferred those individuals who had been simulated to engage in positive, cooperative vocal interactions during the playbacks. By using thermography to disentangle the mechanics of marmoset sociality, we thus find that marmosets eavesdrop on and socially evaluate vocal exchanges and use this information to distinguish between cooperative and noncooperative conspecifics.

[https://advances.sciencemag.org/content/7/6/eabc8790?utm\\_campaign=toc\\_advances\\_2021-02-05&et rid=17774313&et cid=3656961](https://advances.sciencemag.org/content/7/6/eabc8790?utm_campaign=toc_advances_2021-02-05&et rid=17774313&et cid=3656961)

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## Trends in Cognitive Sciences

### PAPERS

## **MILICA MORMANN & J. EDWARD RUSSO – Does Attention Increase the Value of Choice Alternatives?**

A growing recognition of the role of attention in decision-making has been driven by both the technology of eye tracking and the development of models that explicitly incorporate attention. One result of this convergence is the arresting claim that attention, by itself, can increase the perceived value of a decision alternative. In this review, we cover the origins of that claim, its empirical foundation, and the reasoning that supports it. The conclusion is that, to date, there is not sufficient evidence to support the claim. Alternative explanations for the extant evidentiary base are discussed, as is the balance between the bottom-up influence of empirical evidence and the top-down commitment to a conceptual framework.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(21\)00006-1?dgcid=raven\\_jbs\\_aip\\_email](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(21)00006-1?dgcid=raven_jbs_aip_email)

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