

Literatur

Aktuell

BALTER 2011

Michael Balter, *South African Cave Slowly Shares Secrets of Human Culture*. *science* **332** (2011), 1260–1261.

In the hands of a skilled archaeologist, a South African site serves as a laboratory for testing ideas about early human culture and cognition.

A stream of papers from Wadley's team about early *H. sapiens*' activities at Sibudu has made her one of archaeology's most influential theorists and thrust Sibudu into the archaeological limelight.

This extremely long occupation record includes two sophisticated stone tool industries found across southern Africa, called the Still Bay and the Howieson's Poort and dated to about 71,000 to 72,000 years ago and 60,000 to 65,000 years ago, respectively (*Science*, 6 May, p. 658). Wadley and her team have microscopically analyzed residues on the Howieson's Poort tools and uncovered important clues about how they were used. Archaeologist Marlize Lombard of the University of Johannesburg found traces of tree gum and wood on the tools. That, along with patterns of wear that suggest the tools were not used for cutting or scraping, led her to conclude that they had been hafted to handles of wood or bone and probably used for hunting.

EDITORIAL 2011

Mismeasure for mismeasure. *nature* **474** (2011), 419.

A critique of the work of Stephen Jay Gould should serve as encouragement to scrutinize the celebrated while they are still alive.

Just as important is the readiness of the scientific community to undertake such studies, and to see them through the sometimes difficult publication process. The criticism of Gould was rejected by the journal *Current Anthropology*, and spent eight months in the review process at *PLoS Biology*. And although an undergraduate did publish a more modest study scrutinizing Gould in 1988, it is remarkable that it has taken more than 30 years for a research group to check Gould's claims thoroughly. Did Gould's compelling writing and admirable anti-racist motivations help to delay scrutiny of his facts? Quite possibly, and this is regrettable. Although future historians will be happy to scrutinize our most persuasive and celebrated luminaries, today's scientists should not leave the job to them.

HAND 2011

Eric Hand, *Word Play*. *nature* **474** (2011), 436–440.

By mining a database of the world's books, Erez Lieberman Aiden is attempting to automate much of humanities research. But is the field ready to be digitized?

Other scholars have deep reservations about the digital humanities movement as a whole – especially if it will come at the expense of traditional approaches. “You can't help but worry that this is going to sweep the deck of all money for humanities everywhere else,” says Anthony Grafton, a historian at Princeton and president of the American Historical Association, who uses a giant, geared wooden reading wheel to help him manage his oversized, Renaissance texts. He wants researchers to hold onto the power that comes with intimately knowing their primary sources, right down to the scribbled notes in the margin that would elude the book scanners. “You don't want to give up what is your own core activity,” he says.

“What do children do?” says Lander. “They learn, they’re curious, they’re stimulated. The problem is, at some point, many people get in a rut. They’re not really interested in learning more. They’re not able to be fascinated and delighted by everything around them. Erez he hasn’t lost the playfulness.

HUANG 2011

Yi Huang, Stephen Leroy & Richard M. Goody, *Discriminating between climate observations in terms of their ability to improve an ensemble of climate predictions*. [PNAS 108 \(2011\), 10405–10409](#).

In view of the cost and complexity of climate-observing systems, it is a matter of concern to know which measurements, by satellite or in situ, can best improve the accuracy and precision of long-term ensembles of climate projections. We follow a statistical procedure to evaluate the relative capabilities of a wide variety of observable data types for improving the accuracy and precision of an ensemble of Intergovernmental Panel on Climate Change (IPCC) models. Thirty-two data types are evaluated for their potential for improving a 50-y surface air temperature trend prediction with data from earlier periods, with an emphasis on 20 y. Data types can be ordered in terms of their ability to increase the precision of a forecast. Results show that important conclusions can follow from this ordering. The small size of the IPCC model ensemble (20 members) creates uncertainties in these conclusions, which need to be substantiated with the larger ensembles expected in the future. But the larger issue of whether the methodology can provide useful answers is demonstrated.

climate monitoring | climate model | remote sensing | climate change

HUEY 2011

Raymond B. Huey & Joel G. Kingsolver, *Variation in universal temperature dependence of biological rates*. [PNAS 108 \(2011\), 10377–10378](#).

Dell et al. (7) then systematically explored factors potentially underlying this heterogeneity. They started by developing an ontology of response types and classified most response traits as “autonomic” (e.g., basal metabolic rate), “negative motivation” (e.g., escape speed from predators), and “positive motivation” (e.g., consumption or foraging rate). They found that the thermal sensitivity (E) for negative-motivation traits was markedly lower than for positive or autonomic traits (Fig. 1). They interpret this fascinating result with reference to the “life/dinner” principle (15), which posits that selection is stronger on prey than on predators: If a prey loses, it dies; but if a predator loses, it merely loses a meal. Specifically, Dell et al. (7) propose that low E could reflect selection on prey to maintain high (i.e., escape) response capacity across a range of temperature. Alternatively, low E may reflect the lower thermal sensitivity of anaerobic metabolism, which fuels escape responses, relative to aerobic metabolism, which fuels less intense, voluntary activities (16).

KARLAN 2011

Dean Karlan & Jonathan Zinman, *Microcredit in Theory and Practice: Using Randomized Credit Scoring for Impact Evaluation*. [science 332 \(2011\), 1278–1284](#).

s332-1278-Supplement.pdf, s332-1278-Supplement.zip

Microcredit institutions spend billions of dollars fighting poverty by making small loans primarily to female entrepreneurs. Proponents argue that microcredit mitigates market failures, spurs micro-enterprise growth, and boosts borrowers’ well-being. We tested these hypotheses with the use of an innovative, replicable experimental design that randomly assigned individual liability microloans (of \$225 on average) to 1601 individuals in the Philippines through credit scoring. After 11 to 22 months, we found evidence consistent

with unmet demand at the current price (a roughly 60% annualized interest rate): Net borrowing increased in the treatment group relative to controls. However, the number of business activities and employees in the treatment group decreased relative to controls, and subjective well-being declined slightly. We also found little evidence that treatment effects were more pronounced for women. However, we did find that microloans increase ability to cope with risk, strengthen community ties, and increase access to informal credit. Thus, microcredit here may work, but through channels different from those often hypothesized by its proponents.

KINTISCH 2011

Eli Kintisch, *Computer Scientist Goes on Offensive To Defend Climate Scientists*. [science](#) **332** (2011), 1250–1251.

This month he scored a prominent victory when the journal Computational Statistics & Data Analysis (CSDA) retracted a 2008 paper co-authored by economist and climate skeptic Edward Wegman. Mashey had attacked the article last September in a 250-page analysis released online and headlined “Strange Scholarship in the Wegman Report.” Last week, the journal’s editors issued a statement saying that the article contained “portions of other authors’ writings on the same topic in other publications, without sufficient attribution to these earlier works being given.” To Mann, “the retraction validates [Mashey’s] efforts.”

“For a long time, the amateurs in the online wars over climate science have been on the other side,” Mann says. Those combatants include Steve McIntyre, a Canadian skeptic blogger and mining consultant. McIntyre’s critique on the statistical analysis behind the so-called hockey stick (a graph by Mann showing that recent decades were warmer than any since 1400) was praised in the Wegman report and reported on the front page of The Wall Street Journal. Mashey, Mann says, is “the anti-Steve McIntyre.”

LIEBERMAN 2007

Erez Lieberman, Jean-Baptiste Michel, Joe Jackson, Tina Tang & Martin A. Nowak, *Quantifying the evolutionary dynamics of language*. [nature](#) **449** (2007), 713–716.

n449-0713-Supplement1.pdf, n449-0713-Supplement2.txt, n449-0713-Supplement3.zip
Human language is based on grammatical rules¹⁻⁴. Cultural evolution allows these rules to change over time⁵. Rules compete with each other: as new rules rise to prominence, old ones die away. To quantify the dynamics of language evolution, we studied the regularization of English verbs over the past 1,200 years. Although an elaborate system of productive conjugations existed in English’s proto-Germanic ancestor, Modern English uses the dental suffix, ‘-ed’, to signify past tense⁶. Here we describe the emergence of this linguistic rule amidst the evolutionary decay of its exceptions, known to us as irregular verbs. We have generated a data set of verbs whose conjugations have been evolving for more than a millennium, tracking inflectional changes to 177 Old-English irregular verbs. Of these irregular verbs, 145 remained irregular in Middle English and 98 are still irregular today. We study how the rate of regularization depends on the frequency of word usage. The half-life of an irregular verb scales as the square root of its usage frequency: a verb that is 100 times less frequent regularizes 10 times as fast. Our study provides a quantitative analysis of the regularization process by which ancestral forms gradually yield to an emerging linguistic rule.

MORDUCH 2011

Jonathan Morduch, *Why Finance Matters*. [science](#) **332** (2011), 1271–1271.

A study from the Philippines adds to the case for rethinking the use and impact of micro-credit loans.

STAINFORTH 2005

D. A. Stainforth et al., *Uncertainty in predictions of the climate response to rising levels of greenhouse gases*. *nature* **433** (2005), 403–406.

n433-0403-Supplement1.doc, n433-0403-Supplement2.doc, n433-0403-Supplement3.pdf, n433-0403-Supplement4.pdf, n433-0403-Supplement5.pdf, n433-0403-Supplement6.pdf

D. A. Stainforth, T. Aina, C. Christensen, M. Collins, N. Faull, D. J. Frame, J. A. Kettleborough, S. Knight, A. Martin, J. M. Murphy, C. Piani, D. Sexton, L. A. Smith, R. A. Spicer, A. J. Thorpe & M. R. Allen

The range of possibilities for future climate evolution¹⁻³ needs to be taken into account when planning climate change mitigation and adaptation strategies. This requires ensembles of multidecadal simulations to assess both chaotic climate variability and model response uncertainty⁴⁻⁹. Statistical estimates of model response uncertainty, based on observations of recent climate change¹⁰⁻¹³, admit climate sensitivities—defined as the equilibrium response of global mean temperature to doubling levels of atmospheric carbon dioxide—substantially greater than 5K. But such strong responses are not used in ranges for future climate change¹⁴ because they have not been seen in general circulation models. Here we present results from the ‘climateprediction.net’ experiment, the first multi-thousand-member grand ensemble of simulations using a general circulation model and thereby explicitly resolving regional details¹⁵⁻²¹. We find model versions as realistic as other state-of-the-art climate models but with climate sensitivities ranging from less than 2K to more than 11 K. Models with such extreme sensitivities are critical for the study of the full range of possible responses of the climate system to rising greenhouse gas levels, and for assessing the risks associated with specific targets for stabilizing these levels.

Anthropologie

BATESON 2006

Melissa Bateson, Daniel Nettle & Gilbert Roberts, *Cues of being watched enhance cooperation in a real-world setting*. *Biology Letters* **2** (2006), 412–414.

We examined the effect of an image of a pair of eyes on contributions to an honesty box used to collect money for drinks in a university coffee room. People paid nearly three times as much for their drinks when eyes were displayed rather than a control image. This finding provides the first evidence from a naturalistic setting of the importance of cues of being watched, and hence reputational concerns, on human cooperative behaviour.

Keywords: cooperative behaviour; altruism; reputation; eyespots

BOYD 2011

Robert Boyd, Peter J. Richerson & Joseph Henrich, *The cultural niche: Why social learning is essential for human adaptation*. *PNAS* **108** (2011), 10918–10925.

In the last 60,000 y humans have expanded across the globe and now occupy a wider range than any other terrestrial species. Our ability to successfully adapt to such a diverse range of habitats is often explained in terms of our cognitive ability. Humans have relatively bigger brains and more computing power than other animals, and this allows us to figure out how to live in a wide range of environments. Here we argue that humans may be smarter than other creatures, but none of us is nearly smart enough to acquire all of the information necessary to survive in any single habitat. In even the simplest foraging societies, people depend on a vast array of tools, detailed bodies of local knowledge, and complex social arrangements and often do not understand why these tools, beliefs, and

behaviors are adaptive. We owe our success to our uniquely developed ability to learn from others. This capacity enables humans to gradually accumulate information across generations and develop well-adapted tools, beliefs, and practices that are too complex for any single individual to invent during their lifetime.

cognitive niche | cultural evolution | human evolution | human adaptation | intelligence

FERRING 2011

Reid Ferring et al., *Earliest human occupations at Dmanisi (Georgian Caucasus) dated to 1.85–1.78 Ma*. *PNAS* **108** (2011), 10432–10436.

Reid Ferring, Oriol Oms, Jordi Agustí, Francesco Berna, Medea Nioradze, Teona Shelia, Martha Tappen, Abesalom Vekua, David Zhvania and David Lordkipanidze

The early Pleistocene colonization of temperate Eurasia by *Homo erectus* was not only a significant biogeographic event but also a major evolutionary threshold. Dmanisi's rich collection of hominin fossils, revealing a population that was small-brained with both primitive and derived skeletal traits, has been dated to the earliest Upper Matuyama chron (ca. 1.77 Ma). Here we present archaeological and geologic evidence that push back Dmanisi's first occupations to shortly after 1.85 Ma and document repeated use of the site over the last half of the Olduvai subchron, 1.85–1.78 Ma. These discoveries show that the southern Caucasus was occupied repeatedly before Dmanisi's hominin fossil assemblage accumulated, strengthening the probability that this was part of a core area for the colonization of Eurasia. The secure age for Dmanisi's first occupations reveals that Eurasia was probably occupied before *Homo erectus* appears in the East African fossil record.

Lower Paleolithic | paleoanthropology

JACQUET 2011

Jennifer Jacquet, Christoph Hauert, Arne Traulsen & Manfred Milinski, *Shame and honour drive cooperation*. *Biology Letters* (2011) preprint, 1–3. <<http://dx.doi.org/10.1098/rsbl.2011.0367>>.

BiolLett2011-preprint-Supplement.pdf

Can the threat of being shamed or the prospect of being honoured lead to greater cooperation? We test this hypothesis with anonymous six-player public goods experiments, an experimental paradigm used to investigate problems related to overusing common resources. We instructed the players that the two individuals who were least generous after 10 rounds would be exposed to the group. As the natural antithesis, we also test the effects of honour by revealing the identities of the two players who were most generous. The non-monetary, reputational effects induced by shame and honour each led to approximately 50 per cent higher donations to the public good when compared with the control, demonstrating that both shame and honour can drive cooperation and can help alleviate the tragedy of the commons.

Keywords: cooperation; honour; shame; public goods game; tragedy of the commons

MILINSKI 2002

Manfred Milinski, Dirk Semmann & Hans-Jürgen Krambeck, *Reputation helps solve the 'tragedy of the commons'*. *nature* **415** (2002), 424–426.

The problem of sustaining a public resource that everybody is free to overuse – the 'tragedy of the commons' – emerges in many social dilemmas, such as our inability to sustain the global climate. Public goods experiments, which are used to study this type of problem, usually confirm that the collective benefit will not be produced. Because individuals and countries often participate in several social games simultaneously, the interaction of these games may provide a sophisticated way by which to maintain the public resource. Indirect reciprocity, 'give and you shall receive', is built on reputation and can sustain a

high level of cooperation, as shown by game theorists. Here we show, through alternating rounds of public goods and indirect reciprocity games, that the need to maintain reputation for indirect reciprocity maintains contributions to the public good at an unexpectedly high level. But if rounds of indirect reciprocation are not expected, then contributions to the public good drop quickly to zero. Alternating the games leads to higher profits for all players. As reputation may be a currency that is valid in many social games, our approach could be used to test social dilemmas for their solubility.

SANTOS 2011

Francisco C. Santos & Jorge M. Pacheco, *Risk of collective failure provides an escape from the tragedy of the commons*. [PNAS 108 \(2011\), 10421–10425](#). From group hunting to global warming, how to deal with collective action may be formulated in terms of a public goods game of cooperation. In most cases, contributions depend on the risk of future losses. Here, we introduce an evolutionary dynamics approach to a broad class of cooperation problems in which attempting to minimize future losses turns the risk of failure into a central issue in individual decisions. We find that decisions within small groups under high risk and stringent requirements to success significantly raise the chances of coordinating actions and escaping the tragedy of the commons. We also offer insights on the scale at which public goods problems of cooperation are best solved. Instead of large-scale endeavors involving most of the population, which as we argue, may be counterproductive to achieve cooperation, the joint combination of local agreements within groups that are small compared with the population at risk is prone to significantly raise the probability of success. In addition, our model predicts that, if one takes into consideration that groups of different sizes are interwoven in complex networks of contacts, the chances for global coordination in an overall cooperating state are further enhanced.

climate change | collective risk | game theory

SOMMERFELD 2007

Ralf D. Sommerfeld, Hans-Jürgen Krambeck, Dirk Semmann & Manfred Milinski, *Gossip as an alternative for direct observation in games of indirect reciprocity*. [PNAS 104 \(2007\), 17435–17440](#).

Communication about social topics is abundant in human societies, and many functions have been attributed to such gossiping. One of these proposed functions is the management of reputations. Reputation by itself has been shown to have a strong influence on cooperation dynamics in games of indirect reciprocity, and this notion helps to explain the observed high level of cooperation in humans. Here we designed a game to test a widespread assumption that gossip functions as a vector for the transmission of social information. This empirical study (with 14 groups of nine students each) focuses on the composition of gossip, information transfer by gossip, and the behavior based on gossip information. We show that gossip has a strong influence on the resulting behavior even when participants have access to the original information (i.e., direct observation) as well as gossip about the same information. Thus, it is evident that gossip has a strong manipulative potential. Furthermore, gossip about cooperative individuals is more positive than gossip about uncooperative individuals, gossip comments transmit social information successfully, and cooperation levels are higher when people encounter positive compared with negative gossip.

cooperation; reputation; language; manipulation

WHITEN 2009

Andrew Whiten, Nicola McGuigan, Sarah Marshall-Pescini & Lydia M. Hopper, *Emulation, imitation, over-imitation and the scope of culture for child and chimpanzee*. [Phil. Trans. Royal Society B 354 \(2009\), 2417–2428](#).

PhilTransRSocB354-2417-Supplement1.doc, PhilTransRSocB354-2417-Supplement2.doc

We describe our recent studies of imitation and cultural transmission in chimpanzees and children, which question late twentieth-century characterizations of children as imitators, but chimpanzees as emulators. As emulation entails learning only about the results of others' actions, it has been thought to curtail any capacity to sustain cultures. Recent chimpanzee diffusion experiments have by contrast documented a significant capacity for copying local behavioural traditions. Additionally, in recent 'ghost' experiments with no model visible, chimpanzees failed to replicate the object movements on which emulation is supposed to focus. We conclude that chimpanzees rely more on imitation and have greater cultural capacities than previously acknowledged. However, we also find that they selectively apply a range of social learning processes that include emulation. Recent studies demonstrating surprisingly unselective 'over-imitation' in children suggest that children's propensity to imitate has been underestimated too. We discuss the implications of these developments for the nature of social learning and culture in the two species. Finally, our new experiments directly address cumulative cultural learning. Initial results demonstrate a relative conservatism and conformity in chimpanzees' learning, contrasting with cumulative cultural learning in young children. This difference may contribute much to the contrast in these species' capacities for cultural evolution.

Keywords: imitation; emulation; social learning; cultural transmission; cumulative culture; chimpanzees

WOOD 2011

Bernard Wood, *Did early Homo migrate "out of" or "in to" Africa?* [PNAS 108 \(2011\), 10375–10376](#).

In the most parsimonious version of the "outside of Africa" scenario for the origin of Homo, H. erectus would have evolved from a H. habilis-grade hominin either in Asia or in Southeast Asia, and then H. erectus would have migrated to Africa some time before 1.87 Ma. This scenario is consistent with the aspects of the morphology of the Dmanisi and the Liang Bua hominins that are more primitive than the condition seen in H. erectus sensu stricto. This primitive morphology is one of stumbling blocks for a "within Africa" scenario for the origin of H. erectus taxon, for it would mean the migration out of Africa of two hominins, first a H. habilis-grade taxon then H. erectus sensu stricto. Another stumbling block for an ancestor-descendant relationship between H. habilis and H. erectus sensu stricto within Africa is that both the ancestor and the descendant overlap in time in East Africa for several hundred thousand years.

Story or Book

BOOKS 2011

Books in brief. [nature 474 \(2011\), 447](#).

Nuclear Energy: What Everyone Needs to Know, Charles D. Ferguson, Oxford University Press, 240 pp. \$16.95 (2011)

With concerns about nuclear energy on the rise after Japan's Fukushima disaster, security scholar Charles Ferguson's accessible overview is timely. He sets out how nuclear power is generated, which countries use it and how much electricity they produce. He discusses safety issues, from defending plants against military attacks to technical failures. And he notes the roller-coaster of public attitudes to nuclear power, which have oscillated in the past decade from growing acceptance of its utility in reducing greenhouse-gas emissions to recent proposals to abandon the industry.

State of Wonder: A Novel, Ann Patchett, Harper, 368 pp., \$26.99 (2011)

A research scientist is the heroine of best-selling author Ann Patchett's latest novel.

Marina Singh is called away from her lab bench at a large pharmaceutical company in

Minnesota to search in the Brazilian rainforest for her old mentor, who has disappeared while looking for medicinal plants. The last person sent out to Brazil on the same mission was Singh's research partner and friend, who never returned. Singh tracks down her mentor, but what she finds in the jungle raises questions about her friend's fate, her company's future and her own past.

GRAYLING 2011

A. C. Grayling, *How we form beliefs*. [nature](#) **474** (2011), 446–447.

Religions and superstitions may stem from the brain's ability to spot patterns and intent, finds A. C. Grayling.

The Believing Brain: From Ghosts and Gods to Politics and Conspiracies – How We Construct Beliefs and Reinforce Them as Truths, Michael Shermer, Times Books: 2011. 400 pp. \$28, £19.99

The important point, Shermer says, is that we form our beliefs first and then look for evidence in support of them afterwards. He gives the names 'patternicity' and 'agenticity' to the brain's pattern-seeking and agency-attributing propensities, respectively. These underlie the diverse reasons why we form particular beliefs from subjective, personal and emotional promptings, in social and historical environments that influence their content. As a 'belief engine', the brain is always seeking to find meaning in the information that pours into it. Once it has constructed a belief, it rationalizes it with explanations, almost always after the event. The brain thus becomes invested in the beliefs, and reinforces them by looking for supporting evidence while blinding itself to anything contrary. Shermer describes this process as "belief-dependent realism" – what we believe determines our reality, not the other way around.

Shermer deals with the idea that theistic belief is an evolved, hard-wired phenomenon, an idea that is fashionable at present. The existence of atheists is partial evidence against it. More so is that the god-believing religions are very young in historical terms; they seem to have developed after and perhaps because of agriculture and associated settled urban life, and are therefore less than 10,000 years old.

The animism that preceded these religions, and which survives today in some traditional societies such as those of New Guinea and the Kalahari Desert, is fully explained by Shermer's agenticity concept. It is not religion but proto-science – an attempt to explain natural phenomena by analogy with the one causative power our ancestors knew well: their own agency. Instead of developing into science, this doubtless degenerated into superstition in the hands of emerging priestly castes or for other reasons, but it does not suggest a 'god gene' of the kind supposed for history's young religions with their monarchical deities.