

Literatur

Aktuell

ATKINSON 2012

Quentin D. Atkinson, *Response to Comments on “Phonemic Diversity Supports a Serial Founder Effect Model of Expansion from Africa”*. [science 335 \(2012\), 657](#).

Concerns have been raised about my proposal that global phonemic diversity was shaped by a serial founder effect during the human expansion from Africa. I welcome this discussion of new data and alternative interpretations. Although this work highlights interesting questions for future research, it does not undermine support for a serial founder effect model of expansion of language from Africa.

BERGELSON 2012

Elika Bergelson & Daniel Swingley, *At 6–9 months, human infants know the meanings of many common nouns*. [PNAS 109 \(2012\), 3253–3258](#).

It is widely accepted that infants begin learning their native language not by learning words, but by discovering features of the speech signal: consonants, vowels, and combinations of these sounds. Learning to understand words, as opposed to just perceiving their sounds, is said to come later, between 9 and 15 mo of age, when infants develop a capacity for interpreting others' goals and intentions. Here, we demonstrate that this consensus about the developmental sequence of human language learning is flawed: in fact, infants already know the meanings of several common words from the age of 6 mo onward. We presented 6- to 9-mo-old infants with sets of pictures to view while their parent named a picture in each set. Over this entire age range, infants directed their gaze to the named pictures, indicating their understanding of spoken words. Because the words were not trained in the laboratory, the results show that even young infants learn ordinary words through daily experience with language. This surprising accomplishment indicates that, contrary to prevailing beliefs, either infants can already grasp the referential intentions of adults at 6 mo or infants can learn words before this ability emerges. The precocious discovery of word meanings suggests a perspective in which learning vocabulary and learning the sound structure of spoken language go hand in hand as language acquisition begins.

word learning | cognitive development | infant cognition

CYSOUW 2012

Michael Cysouw, Dan Dediu & Steven Moran, *Comment on “Phonemic Diversity Supports a Serial Founder Effect Model of Language Expansion from Africa”*. [science 335 \(2012\), 657](#).

s332-0346-Supplement1.pdf

We show that Atkinson's (Reports, 15 April 2011, p. 346) intriguing proposal-that global linguistic diversity supports a single language origin in Africa-is an artifact of using suboptimal data, biased methodology, and unjustified assumptions. We criticize his approach using more suitable data, and we additionally provide new results suggesting a more complex scenario for the emergence of global linguistic diversity.

HOEKSTRA 2012

Arjen Y. Hoekstra & Mesfin M. Mekonnen, *The water footprint of humanity*. [PNAS 109 \(2012\), 3232–3237](#).

This study quantifies and maps the water footprint (WF) of humanity at a high spatial resolution. It reports on consumptive use of rainwater (green WF) and ground and surface water (blue WF) and volumes of water polluted (gray WF). Water footprints are estimated per nation from both a production and consumption perspective. International virtual water flows are estimated based on trade in agricultural and industrial commodities. The global annual average WF in the period 1996–2005 was 9,087 Gm³/y (74 % green, 11 % blue, 15 % gray). Agricultural production contributes 92 %. About one-fifth of the global WF relates to production for export. The total volume of international virtual water flows related to trade in agricultural and industrial products was 2,320 Gm³/y (68 % green, 13 % blue, 19 % gray). The WF of the global average consumer was 1,385 m³/y. The average consumer in the United States has a WF of 2,842 m³/y, whereas the average citizens in China and India have WFs of 1,071 and 1,089 m³/y, respectively. Consumption of cereal products gives the largest contribution to the WF of the average consumer (27 %), followed by meat (22 %) and milk products (7 %). The volume and pattern of consumption and the WF per ton of product of the products consumed are the main factors determining the WF of a consumer. The study illustrates the global dimension of water consumption and pollution by showing that several countries heavily rely on foreign water resources and that many countries have significant impacts on water consumption and pollution elsewhere.

globalization | sustainable consumption | virtual water trade | water pollution

SCHATZ 2012

Gottfried Schatz, *The Endangered Bond*. [science 335 \(2012\), 635](#).

From my detached view as a retired biochemist, most lectures on biological topics appear so overloaded with unnecessary information, so obsessed with technical detail, and so cluttered with abbreviations, jargon, and acronyms as to be nearly incomprehensible to anyone but the specialist.

Such teaching should not produce polished orators but scientists who understand the difference between the important and the unimportant and who will focus their lectures on the essence of their findings. “Alles, was sich aussprechen lässt, lässt sich klar aussprechen” (Ludwig Wittgenstein)

VAN TUYL 2012

Rory Van Tuyl & Asya Pereltsvaig, *Comment on “Phonemic Diversity Supports a Serial Founder Effect Model of Language Expansion from Africa”*. [science 335 \(2012\), 657](#).

s332-0346-Supplement3.pdf

Atkinson (Reports, 15 April 2011, p. 346) concluded that language originated in western Africa and that, due to a serial founder effect, languages repeatedly lost phonemes the farther they moved from the African point of origin. Independent examination of the published data tends to refute both these claims.

WANG 2012

Chuan-Chao Wang, Qi-Liang Ding & Huan Tao, Hui Li, *Comment on “Phonemic Diversity Supports a Serial Founder Effect Model of Language Expansion from Africa”*. [science 335 \(2012\), 657](#).

s332-0346-Supplement2.pdf

Atkinson (Reports, 15 April 2011, p. 346) reported a declined trend of phonemic diversity from Africa that indicated the African exodus of modern languages. However, his claim

was only supported when the phonemic diversities were binned into three or five levels. Analyses using raw data without simplification suggest a decline from central Asia rather than from Africa.

Anthropologie

YAMAMOTO 2012

Shinya Yamamoto, Tatyana Humle & Masayuki Tanaka, *Chimpanzees' flexible targeted helping based on an understanding of conspecifics' goals*. [PNAS 109 \(2012\), 3588–3592](#).

[pnas109-03588-Supplement1.wmv](#), [pnas109-03588-Supplement2.wmv](#)

Humans extensively help others altruistically, which plays an important role in maintaining cooperative societies. Although some nonhuman animals are also capable of helping others altruistically, humans are considered unique in our voluntary helping and our variety of helping behaviors. Many still believe that this is because only humans can understand others' goals due to our unique "theory of mind" abilities, especially shared intentionality. However, we know little of the cognitive mechanisms underlying helping in nonhuman animals, especially if and how they understand others' goals. The present study provides the empirical evidence for flexible targeted helping depending on conspecifics' needs in chimpanzees. The subjects of this study selected an appropriate tool from a random set of seven objects to transfer to a conspecific partner confronted with differing tool-use situations, indicating that they understood what their partner needed. This targeted helping, (i.e., selecting the appropriate tool to transfer), was observed only when the helpers could visually assess their partner's situation. If visual access was obstructed, the chimpanzees still tried to help their partner upon request, but failed to select and donate the appropriate tool needed by their partner. These results suggest that the limitation in chimpanzees' voluntary helping is not necessarily due to failure in understanding others' goals. Chimpanzees can understand conspecifics' goals and demonstrate cognitively advanced targeted helping as long as they are able to visually evaluate their conspecifics' predicament. However, they will seldom help others without direct request for help.
altruism | prosocial behavior | instrumental helping | empathy | behavioral flexibility

Grundlagen

INCE 2012

Darrel C. Ince, Leslie Hatton & John Graham-Cumming, *The case for open computer programs*. [nature 482 \(2012\), 485–488](#).

Scientific communication relies on evidence that cannot be entirely included in publications, but the rise of computational science has added a new layer of inaccessibility. Although it is now accepted that data should be made available on request, the current regulations regarding the availability of software are inconsistent. We argue that, with some exceptions, anything less than the release of source programs is intolerable for results that depend on computation. The vagaries of hardware, software and natural language will always ensure that exact reproducibility remains uncertain, but withholding code increases the chances that efforts to reproduce results will fail.

Klima

BAMBER 2012

Jonathan Bamber, *Shrinking glaciers under scrutiny*. [nature 482 \(2012\), 482–483](#).

Melting glaciers contribute to sea-level rise, but measuring their mass loss over time is difficult. An analysis of satellite data on Earth's changing gravity field does just that, and delivers some unexpected results.

First, the contribution of GICs (excluding the Antarctica and Greenland peripheral GICs) to sea-level rise was less than half the value of the most recent, comprehensive estimate 8 obtained from extrapolation of in situ measurements for 2001-05 (0.41 ± 0.08 compared with 1.1 mm yr^{-1}). Second, losses for the High Mountain Asia region – comprising the Himalayas, Karakoram, Tianshan, Pamirs and Tibet – were insignificant. Here, the mass-loss rate was just 4 ± 20 gigatonnes per year (corresponding to 0.01 mm yr^{-1} of sealevel rise), compared with previous estimates that were well over ten times larger. By a careful analysis, the authors discounted a possible tectonic origin for the huge discrepancy, and it seems that this region is more stable than previously believed.

CRAINE 2012

Joseph M. Craine, Jesse B. Nippert, Andrew J. Elmore, Adam M. Skibbe, Stacy L. Hutchinson & Nathaniel A. Brunsell, *Timing of climate variability and grassland productivity*. [PNAS 109 \(2012\), 3401–3405](#).

Future climates are forecast to include greater precipitation variability and more frequent heat waves, but the degree to which the timing of climate variability impacts ecosystems is uncertain. In a temperate, humid grassland, we examined the seasonal impacts of climate variability on 27 y of grass productivity. Drought and highintensity precipitation reduced grass productivity only during a 110-d period, whereas high temperatures reduced productivity only during 25 d in July. The effects of drought and heat waves declined over the season and had no detectable impact on grass productivity in August. If these patterns are general across ecosystems, predictions of ecosystem response to climate change will have to account not only for the magnitude of climate variability but also for its timing.

Konza | net primary production | streamflow | critical climate periods

JACOB 2012

Thomas Jacob, John Wahr, W. Tad Pfeffer & Sean Swenson, *Recent contributions of glaciers and ice caps to sea level rise*. [nature 482 \(2012\), 514–518](#). [n482-0514-Supplement.pdf](#)

Glaciers and ice caps (GICs) are important contributors to presentday global mean sea level rise¹⁻⁴. Most previous global mass balance estimates for GICs rely on extrapolation of sparse mass balance measurements representing only a small fraction of the GIC area, leaving their overall contribution to sea level rise unclear. Here we show that GICs, excluding the Greenland and Antarctic peripheral GICs, lost mass at a rate of $148 \pm 30 \text{ Gt yr}^{-1}$ from January 2003 to December 2010, contributing $0.41 \pm 0.08 \text{ mmyr}^{-1}$ to sea level rise. Our results are based on a global, simultaneous inversion of monthly GRACE-derived satellite gravity fields, from which we calculate the mass change over all ice-covered regions greater in area than 100 km^2 . The GIC rate for 2003-2010 is about 30 per cent smaller than the previous mass balance estimate that most closely matches our study period. The high mountains of Asia, in particular, show a mass loss of only 4620 Gt yr^{-1} for 2003-2010, compared with $47\text{-}55 \text{ Gt yr}^{-1}$ in previously published estimates. For completeness, we also estimate that the Greenland and Antarctic ice sheets, including their peripheral GICs, contributed $1.06 \pm 0.19 \text{ mmyr}^{-1}$ to sea level rise over the same time period. The total contribution to sea level rise from all ice-covered regions is thus $1.48 \pm 0.26 \text{ mmyr}^{-1}$, which agrees well with independent estimates of sea level rise originating from land ice loss and other terrestrial sources.

Methoden

STUMPF 2012

Michael P. H. Stumpf & Mason A. Porter, *Critical Truths About Power Laws. science* **335** (2012), 665–665.

Most reported power laws lack statistical support and mechanistic backing.

In the absence of a mechanism, purely empirical fitting does have the potential to be interesting, but one should simply report such results in a neutral fashion rather than provide unsubstantiated suggestions of universality.

Finally, and perhaps most importantly, even if the statistics of a purported power law have been done correctly, there is a theory that underlies its generative process, and there is ample and uncontroversial empirical support for it, a critical question remains: What genuinely new insights have been gained by having found a robust, mechanistically supported, and in-all-other-ways superb power law? We believe that such insights are very rare.