Liste erstellt am 2017-09-16

References

Aktuell

Abrahao 2017

Bruno Abrahao, Paolo Parigi, Alok Gupta & Karen S. Cook, *Reputation offsets trust judgments based on social biases among Airbnb users.* PNAS **114** (2017), 9848–9853.

To provide social exchange on a global level, sharing-economy companies leverage interpersonal trust between their members on a scale unimaginable even a few years ago. A challenge to this mission is the presence of social biases among a large heterogeneous and independent population of users, a factor that hinders the growth of these services. We investigate whether and to what extent a sharing-economy platform can design artificially engineered features, such as reputation systems, to override people's natural tendency to base judgments of trustworthiness on social biases. We focus on the common tendency to trust others who are similar (i.e., homophily) as a source of bias. We test this argument through an online experiment with 8,906 users of Airbnb, a leading hospitality company in the sharing economy. The experiment is based on an interpersonal investment game, in which we vary the characteristics of recipients to study trust through the interplay between homophily and reputation. Our findings show that reputation systems can significantly increase the trust between dissimilar users and that risk aversion has an inverse relationship with trust given high reputation. We also present evidence that our experimental findings are confirmed by analyses of 1 million actual hospitality interactions among users of Airbnb.

Keywords: online trust | reputation systems | sharing economy | social biases | risk

Significance: We investigate the extent to which artificial features engineered by sharing-economy platforms, such as reputation systems, can be used to override people's tendency to base judgments of trustworthiness on social biases, such as to trust others who are similar (i.e., homophily). To this end, we engaged 8,906 users of Airbnb as volunteers in an online experiment. We demonstrate that homophily based on several demographic characteristics is a relatively weak driver of trust. In fact, having high reputation is enough to counteract homophily. Using Airbnb data, we present evidence that the effects we found experimentally are at work in the actual platform. Lastly, we found an inverse relationship between risk aversion and trust in those with positive reputations.

Lewis 2017

Louise A. Lewis, *Hold the salt, Freshwater origin of primary plastids.* PNAS **114** (2017), 9759–9760.

The cyanobacterial ancestry of primary plastids is no longer debated, but the precise donor of primary plastids, the timing and ecological context of the merger, and modifications since the event have received much attention (3–6). In PNAS, Sánchez-Baracaldo et al. (7) examine the evolution of primary photosynthesis and its habitat of origin using the most comprehensive dataset thus far from photosynthetic cyanobacteria and eukaryotes.

Milner 2017

Alexander M. Milner et al., *Glacier shrinkage driving global changes in downstream systems*. PNAS **114** (2017), 9770–9778.

Glaciers cover ≈10 % of the Earth's land surface, but they are shrinking rapidly across most parts of the world, leading to cascading impacts on downstream systems. Glaciers impart unique footprints on river flow at times when other water sources are low. Changes in river hydrology and morphology caused by climate-induced glacier loss are projected to be the greatest of any hydrological system, with major implications for riverine and near-shore marine environments. Here, we synthesize current evidence of how glacier shrinkage will alter hydrological regimes, sediment transport, and biogeochemical and contaminant fluxes from rivers to oceans. This will profoundly influence the natural environment, including many facets of biodiversity, and the ecosystem services that glacier-fed rivers provide to humans, particularly provision of water for agriculture, hydropower, and consumption. We conclude that human society must plan adaptation and mitigation measures for the full breadth of impacts in all affected regions caused by glacier shrinkage.

Keywords: glacier | runoff | biogeochemistry | biodiversity | ecosystem services

Morelli 2017

Sylvia A. Morelli, Desmond C. Ong, Rucha Makati, Matthew O. Jackson & Jamil Zaki, *Empathy and well-being correlate with centrality in different social networks*. PNAS **114** (2017), 9843–9847.

Individuals benefit from occupying central roles in social networks, but little is known about the psychological traits that predict centrality. Across four college freshman dorms (n = 193), we characterized individuals with a battery of personality questionnaires and also asked them to nominate dorm members with whom they had different types of relationships. This revealed several social networks within dorm communities with differing characteristics. In particular, additional data showed that networks varied in the degree to which nominations depend on (i) trust and (ii) shared fun and excitement. Networks more dependent upon trust were further defined by fewer connections than those more dependent on fun. Crucially, network and personality features interacted to predict individuals' centrality: people high in well-being (i.e., life satisfaction and positive emotion) were central to networks characterized by fun, whereas people high in empathy were central to networks characterized by trust. Together, these findings provide network-based corroboration of psychological evidence that well-being is socially attractive, whereas empathy supports close relationships. More broadly, these data highlight how an individual's personality relates to the roles that they play in sustaining their community.

Keywords: social networks | empathy | well-being | centrality | personality

Significance: Which traits make individuals popular or lead others to turn to them in times of stress? We examine these questions by observing newly formed social networks in first-year college dormitories. We measured dorm members' traits (for example, their empathy) as well as their position in their dorm's social networks. Via network analysis, we corroborate insights from psychological research: people who exude positive emotions are sought out by others for fun and excitement, whereas empathic individuals are sought out for trust and support. These findings show that individuals' traits are related to their network positions and to the different roles that they play in supporting their communities.

Sánchez-Baracaldo 2017

Patricia Sánchez-Baracaldo, John A. Raven, Davide Pisani & Andrew

H. Knoll, *Early photosynthetic eukaryotes inhabited low-salinity habitats*. PNAS **114** (2017), E7737–E7745.

The early evolutionary history of the chloroplast lineage remains an open question. It is widely accepted that the endosymbiosis that established the chloroplast lineage in eukaryotes can be traced back to a single event, in which a cyanobacterium was incorporated into a protistan host. It is still unclear, however, which Cyanobacteria are most closely related to the chloroplast, when the plastid lineage first evolved, and in what habitats this endosymbiotic event occurred. We present phylogenomic and molecular clock analyses, including data from cyanobacterial and chloroplast genomes using a Bayesian approach, with the aim of estimating the age for the primary endosymbiotic event, the ages of crown groups for photosynthetic eukaryotes, and the independent incorporation of a cyanobacterial endosymbiont by Paulinella. Our analyses include both broad taxon sampling (119 taxa) and 18 fossil calibrations across all Cyanobacteria and photosynthetic eukaryotes. Phylogenomic analyses support the hypothesis that the chloroplast lineage diverged from its closet relative Gloeomargarita, a basal cyanobacterial lineage, ≈2.1 billion y ago (Bya). Our analyses suggest that the Archaeplastida, consisting of glaucophytes, red algae, green algae, and land plants, share a common ancestor that lived ≈1.9 Bya. Whereas crown group Rhodophyta evolved in the Mesoproterozoic Era (1,600–1,000 Mya), crown groups Chlorophyta and Streptophyta began to radiate early in the Neoproterozoic (1,000–542 Mya). Stochastic mapping analyses indicate that the first endosymbiotic event occurred in low-salinity environments. Both red and green algae colonized marine environments early in their histories, with prasinophyte green phytoplankton diversifying 850–650 Mya.

Keywords: photosynthetic eukaryotes | chloroplast | Cyanobacteria | phylogenomics | relaxed molecular clock

Significance: Although it is widely accepted that the chrloroplasts in photosynthetic eukaryotes can be traced back to a single cyanobacterial ancestor, the nature of that ancestor remains debated. Chloroplasts have been proposed to derive from either early- or late-branching cyanobacterial lineages, and similarly, the timing and ecological setting of this event remain uncertain. Phylogenomic and Bayesian relaxed molecular clock analyses show that the chloroplast lineage branched deep within the cyanobacterial tree of life ≈2.1 billion y ago, and ancestral trait reconstruction places this event in low-salinity environments. The chloroplast took another 200 My to become established, with most extant groups originating much later. Our analyses help to illuminate the little known evolutionary history of early life on land.

Anthropologie

Garvin 2017

Heather M. Garvin et al., *Body size, brain size, and sexual dimorphism in Homo naledi from the Dinaledi Chamber*. Journal of Human Evolution **111** (2017), 119–138.

Heather M. Garvin, Marina C. Elliott, Lucas K. Delezene, John Hawks, Steven E. Churchill, Lee R. Berger & Trenton W. Holliday

Homo erectus and later humans have enlarged body sizes, reduced sexual dimorphism, elongated lower limbs, and increased encephalization compared to Australopithecus, together suggesting a distinct ecological pattern. The mosaic expression of such features in early Homo, including Homo habilis, Homo rudolfensis, and some early H. erectus, suggests that these traits do not constitute an integrated package. We examined the evidence for body mass, stature, limb pro-

portions, body size and dental size dimorphism, and absolute and relative brain size in Homo naledi as represented in the Dinaledi Chamber sample. H. naledi stature and body mass are low compared to reported values for H. erectus, with the exception of some of the smaller bodied Dmanisi H. erectus specimens, and overlap with larger Australopithecus and early Homo estimates. H. naledi endocranial volumes (465–560 cc) and estimates of encephalization quotient are also similar to Australopithecus and low compared to all Homo specimens, with the exception of Homo floresiensis (LB1) and the smallest Dmanisi H. erectus specimen (D4500). Unlike Australopithecus, but similar to derived members of genus Homo, the Dinaledi assemblage of H. naledi exhibits both low levels of body mass and dental size variation, with an estimated body mass index of sexual dimorphism less than 20 %, and appears to have an elongated lower limb. Thus, the H. naledi bauplan combines features not typically seen in Homo species (e.g., small brains and bodies) with those characteristic of H. erectus and more recent Homo species (e.g., reduced mass dimorphism, elongated lower limb).

Keywords: Hominin | Sexual dimorphism | Body mass | Stature | Encephalization | Canine size dimorphism

Hawks 2017

John Hawks, *Neanderthals and Denisovans as biological invaders*. PNAS **114** (2017), 9761–9763.

Rogers 2017

Alan R. Rogers, Ryan J. Bohlender & Chad D. Huff, *Early history of Neanderthals and Denisovans*. PNAS **114** (2017), 9859–9863.

Extensive DNA sequence data have made it possible to reconstruct human evolutionary history in unprecedented detail. We introduce a method to study the past several hundred thousand years. Our results show that (i) the Neanderthal–Denisovan lineage declined to a small size just after separating from the modern lineage, (ii) Neanderthals and Denisovans separated soon thereafter, and (iii) the subsequent Neanderthal population was large and deeply subdivided. They also (iv) support previous estimates of gene flow from Neanderthals into modern Eurasians. These results suggest an archaic human diaspora early in the Middle Pleistocene.

Keywords: human evolution | archaic admixture | introgression | Neanderthals | Denisovans

Significance: Neanderthals and Denisovans were human populations that separated from the modern lineage early in the Middle Pleistocene. Many modern humans carry DNA derived from these archaic populations by interbreeding during the Late Pleistocene. We develop a statistical method to study the early history of these archaic populations. We show that the archaic lineage was very small during the 10,000 y that followed its separation from the modern lineage. It then split into two regional populations, the Neanderthals and the Denisovans. The Neanderthal population grew large and separated into largely isolated local groups.

Bibel

Segal 2014

Michael Segal, *Who is the 'Son of God' in 4Q246? An Overlooked Example of Early Biblical Interpretation*. Dead Sea Discoveries **21** (2014), 289–312.

The Aramaic Apocalypse of Daniel (4Q246) has been the subject of intense debate among scholars, primarily surrounding the enigmatic epithets brh dy ʿl "son of God" and br ʿlywn "son of the Most High." Previous interpreters have suggested either that this character is a human sovereign with divine pretensions or that he is a divine messianic figure. The current study posits a new identification of this figure based upon the analysis of the biblical texts underlying this Qumran scroll: in addition to its dependence upon Dan 7 (which has been previously recognized), 4Q246 also contains a hitherto overlooked allusion to Ps 82. In light of the relationship to these biblical passages, it is proposed that the character described as "son of God/the Most High" should be taken as the heavenly representative of the penultimate kingdom in Dan 7.

The identification of the allusion to Ps 82 within 4Q246 also enriches our analysis of Dan 7 itself, since the Qumran scroll demonstrates that early readers of the apocalyptic vision posited a literary-theological connection between Dan 7 and Ps 82. These texts together formed a cluster of related biblical passages that were read and interpreted in concert by ancient authors.

Keywords: 4Q246 | Son of God | Daniel 7 | Psalm 82 | biblical interpretation | apocalyptic

Biologie

Ehrmann 2014

Otto Ehrmann, Harald Biester, Arno Bogenrieder & Manfred Rösch, *Fifteen years of the Forchtenberg experiment, Results and implications for the understanding of Neolithic land use.* Vegetation History and Archaeobotany **23** (2014), Supplement 1, S5–S18.

Experimental research into Neolithic agriculture has been underway in Forchtenberg, southwest Germany, since 1998. The experimental area is a medium age mixed-deciduous forest featuring different soils, mainly haplic and stagnic luvisols. In this experimental setting, research has focussed on comparisons of soil nutrients and crop yields resulting from slash and burn cultivation and from cultivation with hoeing. We show that slash and burn produces significantly higher yields, although always depending on soil quality. Hoe tilling is only profitable on the best soils in the first year after clearance. Continuous cultivation with hoeing produces too low yields, but repeated annual cultivation on slash and burn sites also resulted in progressively lower yields due to decreasing levels of nitrogen in the soil. Nitrogen originates not from burned wood but from the burning and mineralisation of organic matter in the topsoil. After burning and cultivation, a break of about 10–15 years is necessary, not only for forest re-growth, but also for the regeneration of the top soil and its nitrogen content. Slash and burn agriculture is therefore an easy and reliable tool for food production by a small population living in a large forested area.

Keywords: Neolithic agriculture | Experimental archaeology | Slash and burn

Biologie Klima

Liu 2017

Yanlan Liu, Anthony J. Parolari, Mukesh Kumar, Cheng-Wei Huang, Gabriel G. Katul & Amilcare Porporato, *Increasing atmospheric humidity and CO_2 concentration alleviate forest mortality risk.* PNAS **114** (2017), 9918–9923.

Climate-induced forest mortality is being increasingly observed throughout the globe. Alarmingly, it is expected to exacerbate under climate change due to shifting precipitation patterns and rising air temperature. However, the impact of concomitant changes in atmospheric humidity and CO2 concentration through their influence on stomatal kinetics remains a subject of debate and inquiry. By using a dynamic soil–plant–atmosphere model, mortality risks associated with hydraulic failure and stomatal closure for 13 temperate and tropical forest biomes across the globe are analyzed. The mortality risk is evaluated in response to both individual and combined changes in precipitation amounts and their seasonal distribution, mean air temperature, specific humidity, and atmospheric CO2 concentration. Model results show that the risk is predicted to significantly increase due to changes in precipitation and air temperature regime for the period 2050–2069. However, this increase may largely get alleviated by concurrent increases in atmospheric specific humidity and CO2 concentration. The increase in mortality risk is expected to be higher for needleleaf forests than for broadleaf forests, as a result of disparity in hydraulic traits. These findings will facilitate decisions about intervention and management of different forest types under changing climate.

Keywords: forest mortality | drought | climate change | hydraulic failure | stomatal closure

Significance: The significance of forest mortality on ecosystem services, and water, carbon, and nutrient cycling is indubitable. While there is a general agreement that climate change-induced heat and drought stress is expected to intensify forest mortality, the concurrent influence of changes in atmospheric humidity and CO2 concentration remains unclear. Here, the response of mortality risk to projected climate change is evaluated in 13 biomes across the globe. Our results show that increasing specific humidity and CO2 concentration partially offset the intensification of risk by changing precipitation and air temperature. The risk response is also mediated by plant hydraulic traits. The study provides a mechanistic foundation for estimating future responses of forest mortality risk, which can facilitate ecosystem management.

Energie

Borghi 2017

Massimo Borghi, Enrico Mattarelli, Jarin Muscoloni, Carlo Alberto Rinaldini, Tommaso Savioli & Barbara Zardin, *Design and experimental development of a compact and efficient range extender engine.* Applied Energy **202** (2017), 507–526.

Highlights:

- New concept of compact, clean and fuel efficient range extender engine.
- Developments through CFD simulation and experiments.
- Significant step forward in comparison to the current 4-strokes.
- Weight: -35 %, brake efficiency: +6 %, heat rejected: -18 %, thermal load: -40 %.
- Cost effective technology for CO2 reduction in transportation.

The paper reviews the design and experimental development of an original range-extender single-cylinder two-stroke gasoline engine, rated at 30 kW (maximum engine speed: 4500 rpm). The goal of the project is to get most of the benefits of the two-stroke cycle (compactness, high power density, low cost), while addressing the typical issues affecting the conventional engines of this type. Among many recent similar propositions, the peculiarities of this engine, besides the cycle, are: external scavenging by means of an electric supercharger, piston controlled scavenge and exhaust ports (no poppet valves), gasoline direct injection (GDI),

and a patented rotary valve for the optimization of the scavenging process, of the loop type. Lubrication is identical to a conventional four-stroke engine, and the rotary valve, connected to the crankshaft, helps to improve the balance of the piston reciprocating forces, yielding an excellent NVH behavior. It should be noted that, except the patented rotary valve, all the engine parts are standard automotive commercial components, that don't require any specific expensive technology. In fact, the originality of the engine consists in the optimum combination of existing well assessed concepts.

The scavenging and combustion systems of the engine are developed in the first phase of the project, including the construction and the experimental testing of a prototype. In the second phase, the air metering system of the prototype is completely modified: the piston pump is replaced by an electric supercharger, and engine load is now controlled by the supercharger speed, without throttle valve.

The new engine is compared to a standard 4-stroke engine, developed in a previous project for the same application. The main advantages of the two-stroke engine may be summarized as follows: lower weight (-35 %), higher brake efficiency (+6 %, on average), less heat rejected (-18 %), lower thermal and mechanical loads within the cylinder (-40 %). The only concern, that will be addressed in a future phase of the study, is the compliance with very low NOx limits: in the worst scenario, the 2-stroke engine could be forced to adopt a well assessed but expensive after-treatment device.

Keywords: CFD simulation | 2-Stroke | Range extender | GDI | Electric supercharger

Isotope

Britton 2017

Kate Britton, *A stable relationship, Isotopes and bioarchaeology are in it for the long haul.* Antiquity **91** (2017), 853–864.

Antiquity091-0853-Supplement.pdf

A growing strength of isotope bioarchaeology is the sheer quantity of data generated from 'routine' applications. The publication of full isotope datasets, along with %C, %N, C:N or strontium concentration data, is increasingly common and ensures that other scientists can properly access the data. Although practices in data reporting still require improvement (Szpak et al. 2017), it is now possible to conduct original research using datasets combined from previously published studies. Such syntheses reveal diachronic and population-level trends, and allow enhanced critique of the capabilities of the techniques to, for example, identify immigrants from oxygen isotopes (Lightfoot & O'Connell 2016). New methods of analysing large datasets, such as Bayesian mixing models or GIS tools, will prove increasingly valuable (e.g. Fernandes et al. 2014; Willmes et al. 2014).

Perhaps the most immediate concern for the discipline and its future, however, lies with the availability and usability of datasets. The creation of a universal isotope data repository will not only allay curatorial concerns, but will lead to new directions in research. The harnessing of large datasets is likely to stimulate entirely new lines of enquiry into temporal, spatial and cultural variation. As recently voiced in ecological literature, and echoed in the archaeological community, 'IsoBank' would be a very welcome addition. Forty years on from the first published applications, we can be confident that bioarchaeology and isotopes are in it for the long haul, so perhaps it is time to start saving.

Sjögren 2009
Karl-Göran Sjögren, T. Douglas Price & Torbjörn Ahlström, *Megaliths and mobility in south-western Sweden, Investigating relationships between a local society and its neighbours using strontium isotopes.* Journal of Anthropological Archaeology **28** (2009), 85–101.
Investigation of human movement in the past has been a confounding issue in archaeology. Direct measurement of past mobility has recently become feasible, however, through the application of strontium isotope analysis to human skeletal remains. In this study, we examine the question of changes in residence and place of origin among the inhabitants of the landscape of south-central Sweden. We focus specifically on the area known as Falbygden where an extraordinary concentration of megalithic tombs from the Neolithic preserves the skeletal remains of many individuals. Falbygden is also an unusual area in terms of its geology and stands as an island of sedimentary rocks in the midst of a larger region of igneous and metamorphic formations. This unusual geology is also reflected in the strontium isotope values of Falbygden and its inhabitants. We compare the isotopic ratios in human and faunal samples from Falbygden and the surrounding area and identify non-local individuals. Our study concludes with a discussion of the possible places of origin of non-local individuals and the social mechanisms that may be responsible for their change of residence.
Keywords: Megalithic tombs | Strontium isotopes | Human mobility | Neolithic | Falbygden | Sweden

Kultur

Risch 2017
Roberto Risch & Harald Meller, *The representation of violence in the rock art of the Sahara and the Spanish Levant.* In: Laurence Manolakakis, Nathan Schlanger & Anick Coudart (Hrsg.), *European Archaeology – Identities & Migrations, Hommages à Jean-Paul Demoule.* (Leiden 2017), 371–385.
The earliest representation of physical violence in human history is probably found in the rock art of the Spanish Levant and the Sahara. Amongst thousands of depictions known from both areas, a few dozen show combat scenes between small groups of archers. Contrary to the first representations of violence in Egypt and Mesopotamia during the IVth and IIIrd millennium but also in Bronze Age Europe, these images do not express a glorification or celebration of violence. A comparison between the fighting scenes of the Sahara and the Spanish Levant and their chronology allows us to delve into the social background of this first evidence of human awareness concerning violence and its consequences.
Keywords: Rock art | violence | Neolithic

Kupfer

Penhallurick 1986
R. D. Penhallurick, *Tin in Antiquity, Its mining and trade throughout the ancient world with particular reference to Cornwall.* (Leeds 2008).

Neolithikum

Gronenborn 2014

Detlef Gronenborn, *Häuptlinge und Sklaven? Anfänge gesellschaftlicher Differenzierung.* Archäologie in Deutschland **2014**, Sonderheft 5, 39–47.

Die Ethnografie zeigt jedoch, dass oftmals Individuen ohne festen Rechtsstatus – wie Kriegsgefangene oder Sklaven – nach ihrem Tod achtlos in Abfallgruben oder an den Rand des Siedlungsbereichs geworfen werden. Diese Interpretation ist jüngst von Philippe LeFranc und Christian Jeunesse erweitert worden: Sie sehen in Bestattungen von mehreren Individuen in Gruben – von denen eines zentral deponiert wurde – die Grablege einer höherstehenden Person mit ihren Sklaven. Solche Interpretationen, an vielen Orten der Welt nachvollziehbar, stehen jedoch den traditionellen Vorstellungen vieler Fachwissenschaftler über die Natur jungsteinzeitlicher Gemeinschaften entgegen und dürften daher zurückhaltend aufgenommen werden. Folgen wir jedoch dieser Interpretationslinie, so deutet sich eine rigide geordnete Gesellschaft an. Mehr wissen wir allerdings nicht über die politischen und sozialen Organisationsformen der Michelsberger Kulturen. Bislang sind lediglich aus der frühen Periode im Aisne-Tal in Frankreich aufwendige Gräber bekannt geworden.