

# CULTURED SCENE



## WHAT IS THIS?

The humble origins of a periodic newsletter for the community of young social learning researchers.

## MANCHESTER MEETUP

Plans for the meetup on January 27th are underway, and you can give your ideas online.

## FRESHLY PRESSED

The latest in social learning from within and beyond academic circles.



Cover: Nader Sharaf ([www.nadersharaf.com](http://www.nadersharaf.com)) Proteus Magazine  
Art: darkarchmage (<http://www.deviantart.com/art/Culture-66551809>)

CULTURED SCENE

# SOCIETY FORUM

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This society aims to foster a supportive community of social learning researchers.

**Cultured Scene** is a forum for shared ideas and information of interest to this community.

This newsletter is an initiative to encourage members of our community to contribute articles that fall outside the purview of academic journals, yet still address issues related to social learning, culture, or personal experiences as a young scientist. All manner of material is welcome, from summaries of interesting articles, to speculative essays on a topic related to the field. It is also a place to share personal experiences, or address issues relating to life as a researcher.

We encourage people to contribute any material that they want to share. The audience is a collection of people who have chosen to study social learning as a living, and this newsletter is an opportunity to build upon that connection. If you have anything at all to contribute, please don't hesitate to get in touch. This is going to be a community publication, and it requires a community effort.

Please contact Stephen Heap ([stephen.m.heap@jyu.fi](mailto:stephen.m.heap@jyu.fi)) if you've got something.



# MANCHESTER

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# 2017

FRIDAY

**JANUARY 27**

2017

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**The date for the first self-organised meetup of the Young Social Learning Researchers has been confirmed.**

We have an exciting day planned for you. The workshop is built around three themes: (1) getting to know each other, (2) exchanging ideas and visions about our research field, and (3) exploring ways for public outreach. Two keynote speakers, group activities, posters, talks and after-party! **January 27 is the time. Manchester is the place. Be there.**

You can find out more and submit your abstract or interest at <http://www.yslr.co.uk/winter-workshop-2017/>.

You can give your thoughts for the meetup at [yslr.slack.com](http://yslr.slack.com)

If you have any good ideas, please feel free to mention something on the mailing list ([mailinglist@yslr.co.uk](mailto:mailinglist@yslr.co.uk)) or **join the discussion on slack.**

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# FRESHLY PRESSED

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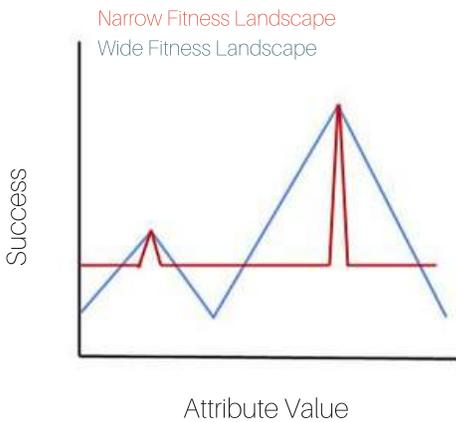
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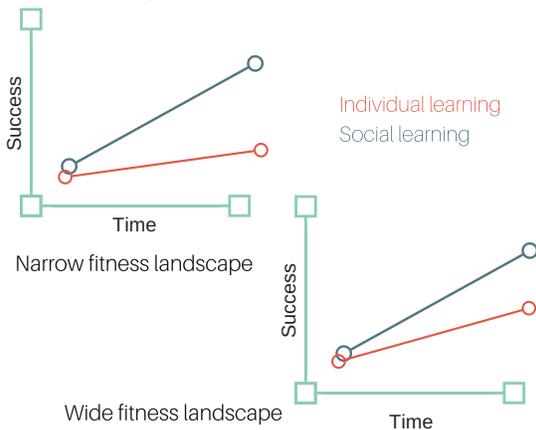
Social learning solves the problem of narrow-peaked search landscapes: experimental evidence in humans.

ROYAL SOCIETY OPEN SCIENCE, 3(9).

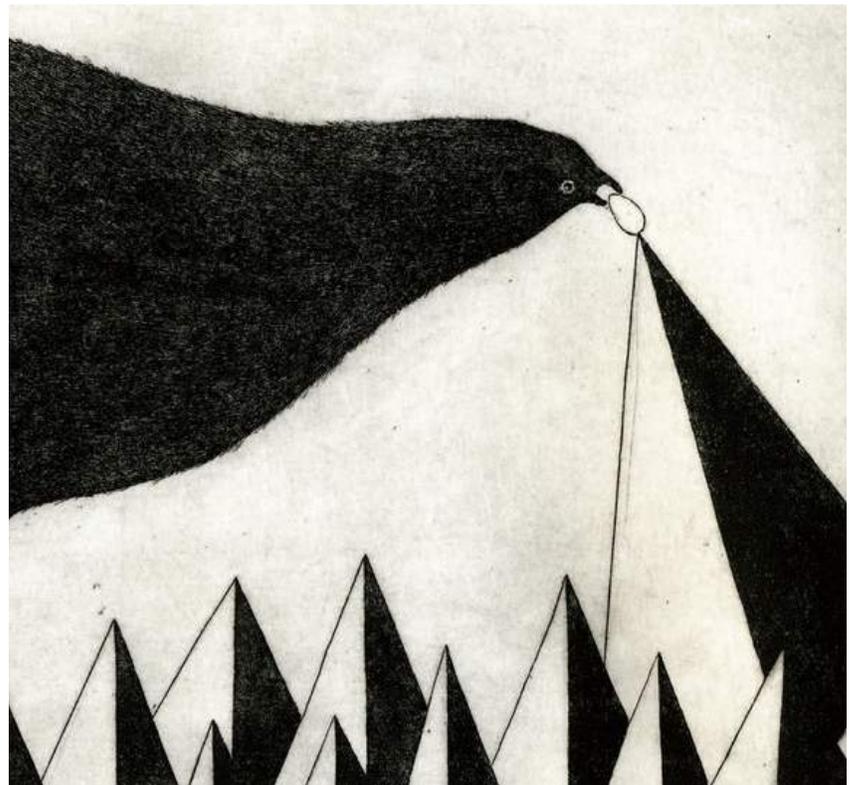
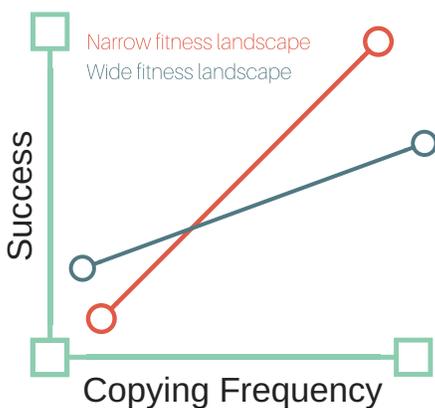
➔ The shape of the fitness landscape may influence the payoffs of social learning



➔ Individual learning has reduced effectiveness for narrow fitness landscapes



➔ Success increases with social learning, and this is pronounced when the fitness landscape is narrow.



# LEARNING TO CLIMB ON THE FITNESS LANDSCAPE

By Stephen Heap

Nature presents a diversity of challenges that individuals can address through learning, and the best learning strategies to employ can depend on the type of challenge. Challenges can vary in how rewarding a given solution is, with respect to how closely it resembles some optimal ideal. In some cases, small incremental improvements toward the ideal provide adequate feedback between solution and reward for an individual to learn a socially (wide fitness landscape). By contrast, individuals have inadequate guidance for tracking an ideal solution and rely more on social learning when only some solutions are rewarded (narrow fitness landscape).

**Acerbi, Tennie and Mesoudi** tested this proposition with an experiment on human subjects in a simulated hunt, for which success was dependent on the design of an arrowhead. Subjects were informed of how well their arrowhead performed on a hunt, and could redesign their arrowheads over a hunting season. The experiment employed a two-factor design. Firstly, whilst all individuals were given feedback for their own designs, one condition allowed individuals access to social information on the arrowhead designs of others. The demonstrators in this case were actually fabricated as part of the experimental design in order to control for the content of social information. Secondly, the scoring rule that relates an arrowhead design to its success in hunting produced one of two types of fitness landscape. Wide fitness landscapes rewarded a range of solutions, whilst rewards were restricted to very specific solutions when the fitness landscape was narrow.



Photographer Sabino Joson | Stylist Teagan Yaitoo | MUA Laura Diverio

**T**ests reveal that individual learning performs poorly in narrow-peaked landscapes, yet social learning can act as a kind of buffer that protects against getting stuck with a poor solution. That is, whilst social learning can be advantageous in a range of conditions, its advantages can become more pronounced as the fitness landscape narrows. The paper advocates that we pay greater attention to the fitness landscape for a given challenge when wanting to understand the evolution of social learning. Different landscapes are likely to give rise to different sets of learning strategies, and the nature of challenges being faced by early humans may have influenced the shape of the evolving cognitive toolkit.

# DAWN OF CUMULATIVE CULTURE IN THE APES?

By Elisa Bandini

Davis, SJ; Vale GL; Schapiro SJ;  
Lambeth SP; Whiten, A.  
2016. Foundations of Cumulative  
Culture in Apes: Improved  
Foraging Efficiency Through  
Relinquishing and Combining  
Witnessed Behaviours in  
Chimpanzees (Pan  
troglodytes). Scientific Reports 6,  
Article number: 35953

Various species of animals have been shown to adopt social learning mechanisms (alongside other mechanisms) to acquire new information. Our closet living relatives, chimpanzees, have one of the most extensive repertoires of social and tool-use behaviours within the animal kingdom, suggesting a sophisticated and advanced ability to employ different learning mechanisms to create a unique chimpanzee culture. One important difference between human and chimpanzee culture, however, is our ability to 'ratchet' up behaviours and create 'cumulative culture (1-2).

Whether chimpanzees also have cumulative culture remains an open question, one which Davis et al. (2016) addressed in their recent paper.

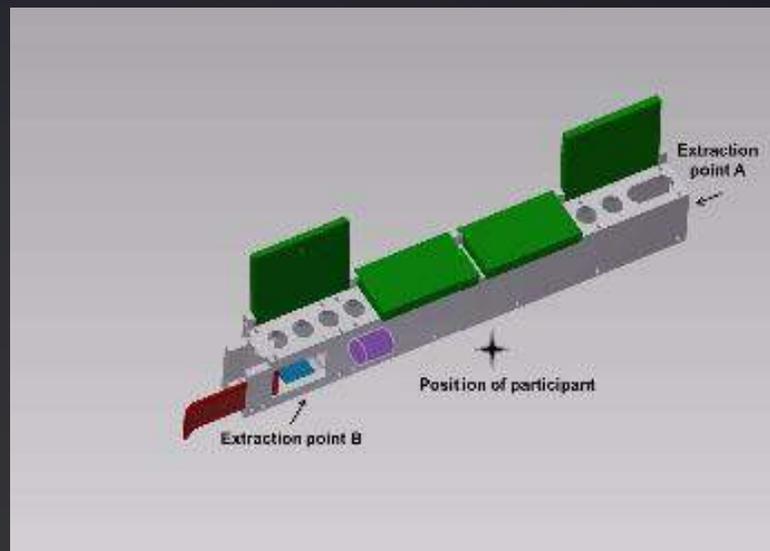
The authors focused on assessing whether chimpanzees were able to switch flexibly from a less efficient foraging method to a more productive alternative, which would suggest an ability to inhibit previously learnt information in favour of new, more efficient, information and serve as a prerequisite for cumulative culture. To test this, Davis et al. provided five groups of chimpanzees (N=19) with a puzzle box ('serialbox'). The serialbox allows numerous methods, which vary in efficiency, to be employed in removing a token from within (tokens can then be exchanged for food).

In the first experiment, tokens could be accessed by following an inefficient method (for which all individuals received training) or a more efficient method. After an extended period of inefficient removals, three of the groups ('social information' groups) were exposed to several demonstrations from a high-ranking female trained in the more efficient method. The other two groups ('non-seeded' groups), did not receive any demonstrations in the efficient method and the control group ('naïve' group) had access to the serialbox but were never provided with any training in either method.

Across the testing period, nine out of the 11 individuals in the 'social information' group and all individuals in the 'non-seeded' groups continued to use the less efficient method.

Interestingly, one individual in the naïve group spontaneously invented the more efficient technique, without any demonstrations. A second individual in the same group also demonstrated this behaviour shortly after the first invention. Thus, the chimpanzees showed a high level of conformity, as only two individuals switched to the more efficient method.

To further test this potential conformity, the authors increased the disparity between methods by making the inefficient method even less reliable.



*Serialbox (Coloured parts represent access points to the tokens). Figure taken from the source without permission.*

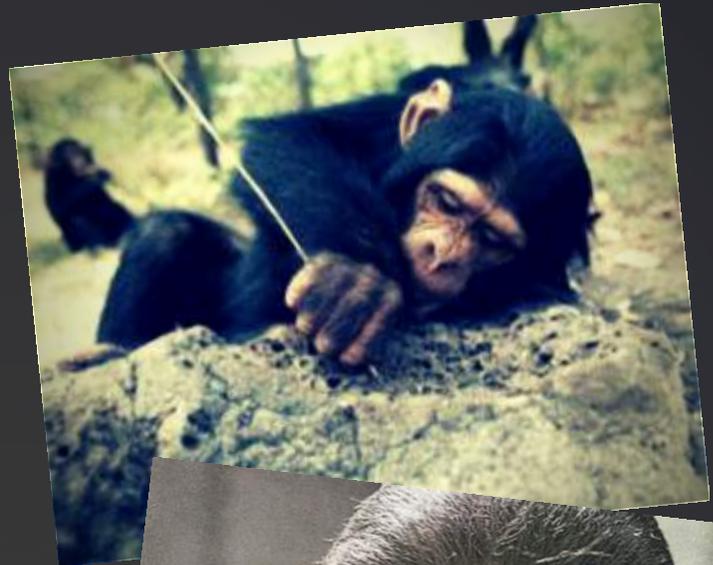
Individuals were also shown human demonstrations of the more efficient method, with the naïve group (who now exclusively used the efficient method) not being included. In the social information group, five individuals switched to the more efficient method, and after human demonstrations, four more switched. In the non-seeded group, one individual spontaneously invented the more efficient method without demonstrations. This experiment saw more individuals across both groups switch to a more efficient method with and without demonstrations, but some still consistently used the less efficient method.

In a final experiment, Davis et al. investigated the chimpanzees' ability to not only change between methods flexibly, but also to accumulate information across methods.

To test this, chimpanzees were now required to combine elements from the original inefficient method with elements unique to the efficient method. On the other hand, individuals could also revert back to the original inefficient method to remove the tokens. In the social information group, seven individuals switched to using the new compound method. In the non-seeded group, the individual who first discovered the efficient method in the second experiment built upon that knowledge to adopt the compound method. Across all groups, five individuals used the efficient method, three switched between the two methods, and two returned to using the original inefficient method.

The authors conclude that chimpanzees will preferentially remain with already established techniques if the new technique is not hugely superior in efficiency, consistent with previous reports on conformity in chimpanzees. However, once the difference in efficiency passes a certain threshold, most (although not all) chimpanzees switch to the new, more efficient method, even when it involved compound techniques. Davis et al. suggest that this data matches the requirements for the preconditions of cumulative culture, and that chimpanzees can and do combine known behaviours to create more efficient methods. One very interesting element of this study was the spontaneous invention of the more efficient techniques. This suggests that individual learning also plays an important role in the acquisition of new methods and behaviours.

Perhaps more studies on social learning could provide an extended baseline condition (where no social information is provided) to observe how naïve individuals solve problems through individual learning, as was done in this study.



1. Tomasello M. *The Cultural Origins of Human Cognition*. Harvard: Harvard University Press; 1999.
2. Tennie C, Call J, Tomasello M. Ratcheting up the ratchet: On the evolution of cumulative culture. *Phil Trans. R. Soc.* 2009; 364: 2405-2415.



# ~~IN~~FINITE THINGS TO LEARN

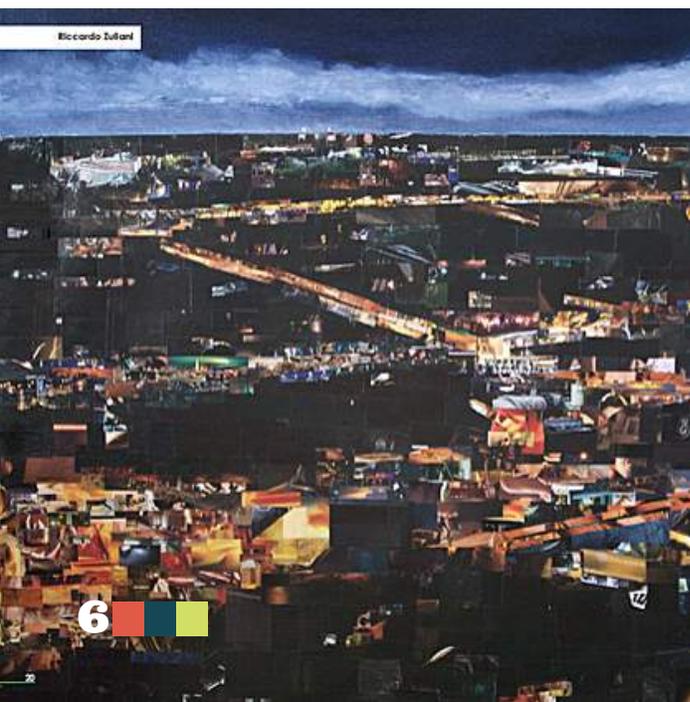
Fogarty, Wakano, Feldman and Aoki (2016).

By Edith Invernizzi

The Driving Forces  
of Cultural Complexity.  
Human Nature, 1-14.

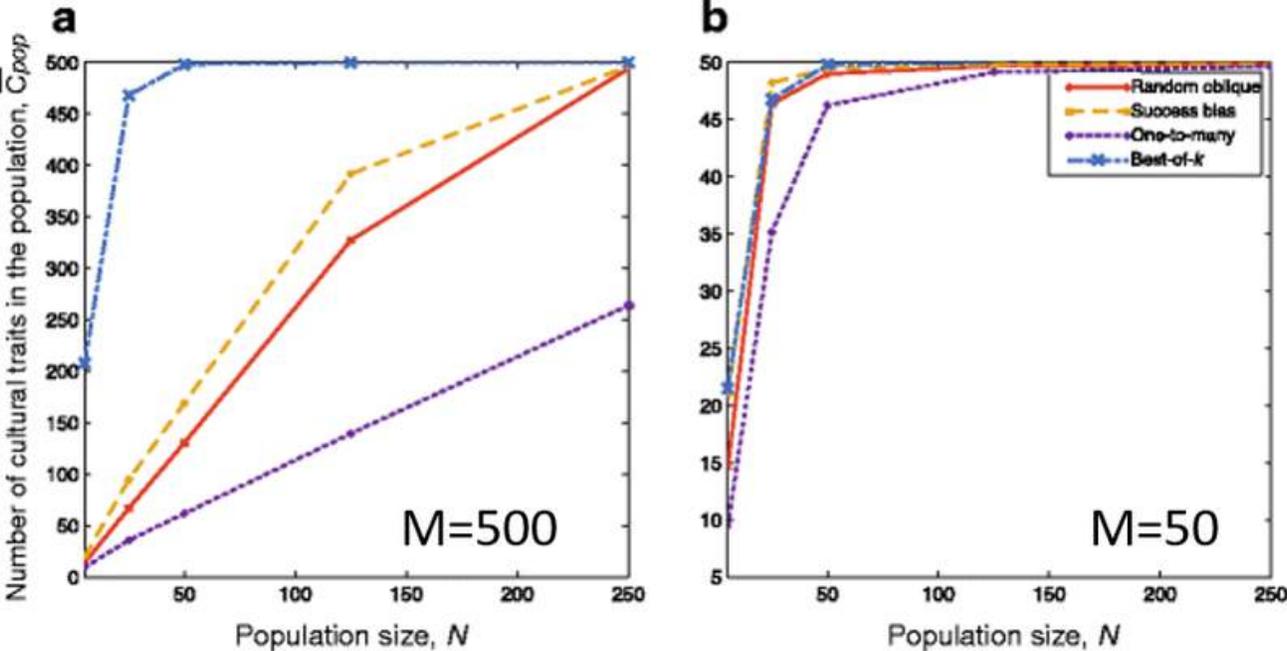


Whilst all humans share the ability to accumulate cultural innovations, there remains substantial variation in the rates of cultural acquisition and the size of cultural toolkit between contemporary modern humans (MH) and our distant relatives. Cultural complexity in early modern humans and our late Neanderthal contemporaries has been hypothesised to differ from ours due to differences in genetics and cognitive abilities, limiting their ability to innovate or accumulate culture. Alternatively, demographic features (e.g. population size or migration rates) may pose different pressures on individuals, and have been deemed particularly relevant in explaining variable toolkit size among contemporary hunter-gatherers. Tasmanian populations, for example, have been suggested to have differentially lost island-to-island parts of a pre-existing common toolkit as a consequence of isolation (Heinrich, 2004). Studies conducted on contemporary or recent historical populations, however, often do not show a correlation between population size and the size of toolkit. A recent theoretical model by Aoki et al. (2011), on the other hand, suggests that an increase in cultural complexity should be expected as population size increases under several types of social learning.



A possible factor that determines whether larger populations have greater cultural complexity could be the number of possible cultural traits a species can acquire (i.e. the limited character of cognitive capacity). Fogarty, Wakano, Feldman and Aoki (2016) explore the effect of cognitive limitations with an analytical and agent-based combination model that considers a range of limits to cognitive capacity (called  $M$ ) across populations of different sizes. Here, the correlation between population size and the number of cultural traits present in the population is evident only until cognitive capacity is reached. At this point, the population reaches cultural saturation and little to no innovation is possible, with smaller cognitive capacity leading to faster levelling of the accumulation curve.

This new formulation of learning space allows agreement between cognitive constraint and demographic models in explaining the Neanderthal – MH cultural complexity divide when population size is equal.



Aoki, K., Lehmann, L., & Feldman, M. W. (2011). Rates of cultural change and patterns of cultural accumulation in stochastic models of social transmission. *Theoretical Population Biology*, 79(4), 192–202.

Henrich, J. (2004). Demography and cultural evolution: how adaptive cultural processes can produce maladaptive losses: the Tasmanian case. *American Antiquity*, 69(2), 197–214.

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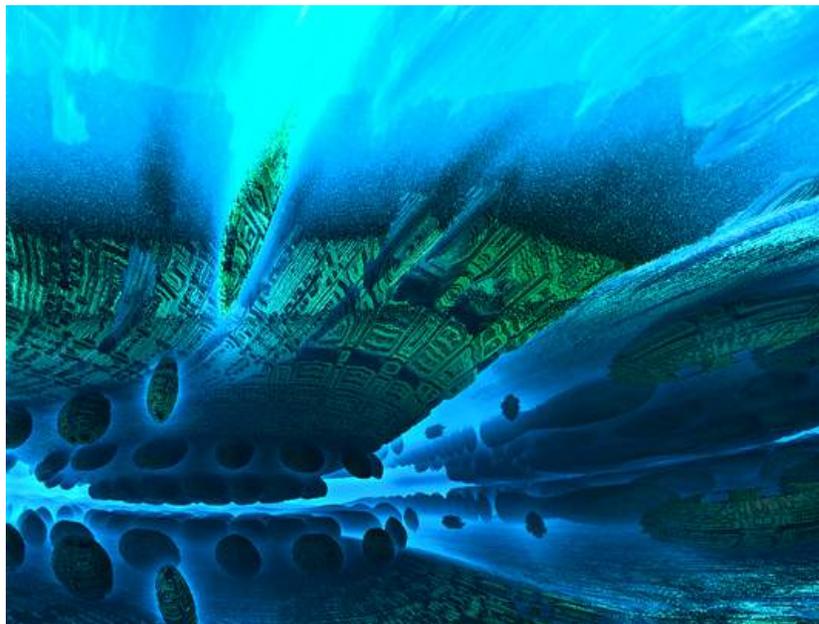
# *Sub (Marine)* CULTURE

BY ELENA MIU

Cantor, Whitehead, Gero, Rendell (2016).  
Cultural turnover among Galápagos sperm  
whales. *R. Soc. open sci.* 2016 3 160615



Culturally driven behavioural change in a population can occur by either replacing behaviours within a population, or by replacing the individuals themselves. Whilst behavioural replacement is relatively common in the non-human world, we are still lacking examples of individual replacement outside the human domain. Here, Cantor et al. document fast cultural turnover caused by the replacement of individual cultural groups over large spatio-temporal scales: sperm whales off the Galapagos Islands.

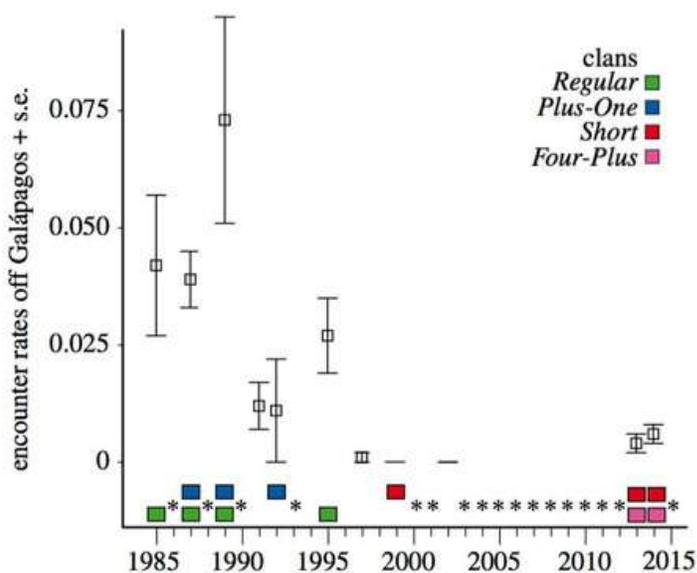
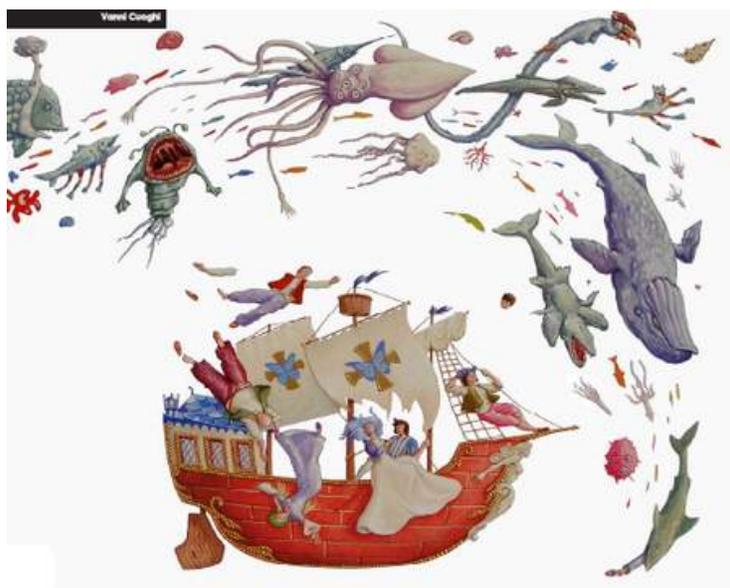


Female sperm whales live in multilevel societies – the largest social level is the vocal clan, which is distinguished by a characteristic repertoire of click patterns used in social communication (i.e. codas). Vocal clans are sympatric but socially segregated, with differing patterns of habitat use, foraging success, diet, and social behaviour, all suggesting that clan membership has wider implications above and beyond vocal dialect.

The authors tracked sperm whales visually and acoustically in deep water across the Tropical Pacific between 1986 and 2014, with a focus on the Galapagos archipelago as the main study area. Thousands of individuals have been identified from photos (individuals have identifying marks on their tails), alongside the codification of several thousand vocal codas.

Photo - ID results indicate that encounter rates decreased from 1985, with the whales having completely left the Galapagos by 2000. Surveys in 2013-2014 indicate a recent return of sperm whales in the area, none of which matched those previously identified. Furthermore, acoustic similarity analysis confirms that the two clans originally common around the Galapagos in the 1980s-1990s (the Regular and Plus-One clans) have actually been replaced by two other clans, who had previously been identified on the other side of the Tropical Pacific and not the Galapagos (the Short and Four-Plus clans).

These results support the idea of an emigration out of the Galapagos, possibly caused by large-scale environmental shifts and food shortages, or by population shifts from modern whaling. Nevertheless, these results highlight the intimate link between culture and population structure, and illustrate how tracking cultural change can reveal large-scale population dynamics in non-human animals.



Encounter rates over 30 years across clans identified in the area – as the population size decreases from 1985 to 2000 and increases again in 2013-2014, the Regular and Plus-One clans are replaced by the Short and Four-Plus clans (whiskers represent SE, asterisks indicate years with no dedicated surveys of the area). Figure obtained from the article, without permission

# Birds in their Little Nests Agree

*By Rachel Harrison*



Classically, nest-building in birds has been considered an innate behaviour. Although this behaviour involves several stages (e.g. material selection, nest-site selection, nest construction) and often results in elaborate structures, it is generally considered that cognition and learning are not involved. Recent research, however, has shown that both nest structure (1) and material choice (2) are affected by individual asocial experience – raising the question of what role social experience may have. Previous work has shown that great tits use social information in selecting a nest site (3), but it is unknown whether social information might contribute to other aspects of nest-building behaviour.

The authors therefore investigated the impact of social information in choosing nest-building material, using zebra finches that had never built a nest themselves and therefore could be expected to benefit from acquiring social information.

The initial preferences for material colour were first assessed in these inexperienced birds, before exposing them to a demonstrator bird that built a nest using the observer's least-preferred colour, whilst disregarding the observer's preferred colour. The demonstrator birds were either familiar birds that the observer had previously been housed with, or unfamiliar birds the observer had never encountered before.

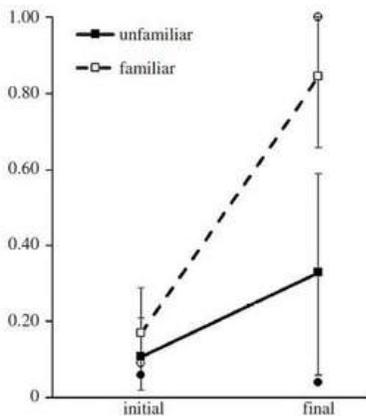
Observers of familiar demonstrators altered their own material preference following this demonstration, whilst birds that observed unfamiliar demonstrators maintained their own initial preference. This indicates that zebra finches are capable of using social information to alter their nest-building material choice, and that they preferentially use social information acquired from familiar conspecifics.



Demonstrator zebra finches shown having constructed a nest using pink material (the observer's less-preferred colour) whilst ignoring orange material (the observer's preferred material).

Photo credit: Lauren Guillette.

The proportion of demonstrated colour selected in initial and final preference tests by observer birds in the unfamiliar (filled marker) and familiar (open marker) conditions. Figure used without permission.



Not only does this study offer fascinating results in its own right, it also proves that nest-building can be an excellent study behaviour for social learning research. The authors create a paradigm similar to a classic two-action task, but in the context of a highly relevant, ecologically valid behaviour that can hold direct fitness implications.

1. Walsh, Hansell, Borello & Healy, 2009, DOI: 10.1098/rsbl.2009.0664
2. Bailey, Morgan, Bertin, Meddle & Healy, 2014, DOI: 10.1098/rspb.2013.3225
3. Loukola, Seppänen & Forsman, 2012, DOI: 10.1016/j.anbehav.2011.12.004

Art: TinyTopHats (DeviantArt), Zememz (DeviantArt), Ale+Ale

# CRACKED ON CULTURE

A REVIEW OF THE CRACKED PODCAST  
BY STEPHEN HEAP

**We typically study social learning and cultural evolution with an eye on the big picture, yet it's easy to forget that these processes are always working to shape our environment. Even so, culture is becoming ever more aware of itself and now provides its own running commentary. People everywhere are interested in social learning and culture and want to engage with it, with entire industries developing around the discussion of pop culture. If we as scientists pay attention to the kind of questions being asked in these domains, we can find a wealth of exciting research opportunities and more deeply engage with a curious public.**



Case in point is the **Cracked Podcast**, an offshoot from the comedy website, which was an offshoot from a magazine that was a poor man's version of the classic satire Mad Magazine. These days, Cracked remains a popular purveyor of pop culture analysis, portrayed through the lens of comedy.

Although the articles are written for entertainment, the editorial vision maintains the thesis that many of our models for social learning are found outside our own personal experience, and instead lie in the tropes, characters and themes of the culture we consume. Because these cultural products contain their own systemic biases, people are apt to learn a distorted view of reality.

Many articles on the site interpret what is being communicated in pop culture with reference to movie tropes and cultural artifacts (rather than to experimentation or theoretical model), but are all the same attempting to understand the questions of information and influence faced by social learning researchers.

The podcast takes the issues raised in these analytical articles for further discussion. A recent episode had presenters **Jack O'Brien**, **Jason Pargin** (aka David Wong) and **Alex Schmidt** (aka Schmittie the Clam) questioning how society has come to perceive the act of invention. To many people, invention is seen as something that happens in short periods of time with little effort, most often by a singular white-haired genius and set to an entertaining montage. This contrasts with the fact that most new innovations are the product of large collective efforts and thousands of grueling hours coping with trial-and-error.

The premise of their argument is that an individual's perception of the world is largely built on tropes developed in fiction. Not only are people immersed in fictional events that establish their mental representation of the world, but non-fiction borrows these story structures to make their product appealing or digestible. History, biography and current events are all commonly portrayed using culturally established story arcs. The dark side of this practice is that our social policies are often justified by simplified fictional scenarios rather than a more nuanced understanding of the truth. The problem emerges because the truth is often far too complex and so full of loose ends for us to efficiently communicate, and as such it is easily outcompeted by simplistic story structures that appeal to our pre-existing biases.

The discussion covers many points of interest to social learning research, including the cultural selection for specific types of demonstrator, and how individual biases in choosing a learning model can have consequences for a population. There's also an entertaining discussion on the nature of innovation and its reliance on social learning, with references to Gremlins, Ghostbusters and Iron Man among others.



**You can find the episode here:**

<https://soundcloud.com/crackedpod/stupid-lies-from-pop-culture-that-everybody-believes>

**The podcast is here:**

<http://www.earwolf.com/show/the-cracked-podcast/>

**The website is here:**

<http://www.cracked.com>





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