FAMILY TIES
A novel approach for studying kinship
HELLO AGAIN!

With this issue, we come to the end of an exciting year for our young Society. I am proud of our Society’s activities and specifically of our journal and all its contributors. We have again a series of very exciting articles waiting for you. Sam Passmore, for example, introduces Kinbank, a new database that collects the various kin naming schemes across the world. We use kinship terms to navigate our close social environment. For example, your father’s brother’s son is your cousin. As is your mother’s sister’s daughter. But did you know that this is not universal across different cultures, languages, and societies? Sam discusses the potential use cases of the database. It might help us, for example, to better understand how language reflects or even affects social organisation and social behaviour. Simon Carrignon and María Coto talk about their modelling work on the spread of Roman amphorae and what this can tell us about Mediterranean trade. Aside from these research articles, we also report on the recent conference of the Cultural Evolution Society in Tempe. If you followed the conference on Twitter you might have seen Kate Cross’ haikus, a famous short poem that originates in Japan. We have asked her why she writes and publishes them, and how she is damn good at it. Our Agony Aunt asked for your opinions on how to strike the right balance between life and work. And finally, we have an exciting interview with Catherine Hobaiter on receiving an ERC Starting Grant to secure her future work on chimpanzees. As always, I hope you enjoy reading Cultured Scene as much as we enjoy writing it. I wish you and your families happy holidays and a grand start into 2019. See you on the other side!

Marco Smolla, Chair
Amphorae Design Spread

Amphorae have been important for storing and transporting different types of food and drink for centuries. Now they might tell us more about how their production skills spread throughout the Roman Empire.
Our Successes in 2018

As 2018 is coming to an end, we look back to a fantastic year for ESLR. We could not be happier with what we achieved. Earlier this year our website received a new design and content.

We successfully secured funding for our annual summer workshop in St. Andrews. With 37 participants this was our largest workshop so far. In July, we published a workshop proceedings paper in Evolutionary Anthropology.

As part of the workshop, we also held our very first Annual General Meeting, where we not only confirmed the formation of ESLR but also formally adopted the Society’s constitution. Since August the Society owns a banking account at the Royal Bank of Scotland. This will make it easier for us to receive external funding and keep track of our finances. It also enables us to collect membership fees directly. We now also have a payment integration on our website. To date, we count 28 paying Society members. We are also very grateful to the 2 members who bought a generous membership.

Finally, with this issue, we successfully published three issues of Cultured Scene this year. We have published a variety of behind the paper stories, articles on new research methods, and perspectives on current issues in academia.

Earlier this year we registered Cultured Scene with the British Library. Cultured Scene now has its very own ISSN number.

Finally, looking to 2019 we have already begun with the preparations of the next summer workshop (see next page), for which have also secured funding.

Our Wishlist for 2019

There is a lot to look forward to in the new year. With the next workshop, we will try something new. This time the workshop will be more project-oriented and more hands-on. We hope again to attract a wide range of researchers and provide an intellectually stimulating environment.

We will also publish the first issue of our ESLR Handbook with a collection of information geared specially to early-career researchers.

Another project is our Social Learning Wikipedia Task Force (a.k.a. Social Learning WTF), a public outreach initiative that aims at monitoring and improving Wikipedia articles on social learning and cultural evolution. We are still looking for someone to take on the lead on this project. Get in touch if you are interested.

We are still in close contact with Natália Dutra, a fellow researcher from Brazil, and will use the next year to support the formation of an early-career network. Traditionally, researchers in South America have limited access to English education and funding. We hope to provide know-how and other support to kick-off a self-sustaining society in Brazil.

Finally, on an organisational note, we plan to give Cultured Scene its own website, which should make it easier to discover (full text) articles. We are also planning a small merchandise shop. More soon.

We cannot wait for the new year, the new challenges, and the many new opportunities for our Society. We hope that you are as eager as we are!

Social Secretary Vacancy

There is a vacancy at the Society’s committee. We are looking for a Social Secretary. The Social Secretary is important for facilitating communication between the Society and its members as well as for communication outside the Society. The major task of the Social Secretary is to run our social media outlets on Facebook and Twitter. A smaller part is to take care of the members’ database and the recurring Society newsletter. If you are interested, have a look at the extended call here: https://bit.ly/2V5ns0s.
We are excited to announce that our next ESLR summer workshop will take place next June at the Max Planck Institute in Leipzig, Germany! The main goal will be to develop a principled scientific workflow from theory to data and back again including theory development, using theory to design (comparative) empirical projects and drawing inferences from data to inform better theory. We want to exemplify such a principled workflow by working through a particular case study and chose conformity (conformist social learning) because there is both rich theory and diverse empirical approaches spanning many different species. All workshop sessions will involve active participation, practical exercises and group discussions supervised by members of the Department for Human Behavior, Ecology and Culture (https://www.eva.mpg.de/ecology/staff.html). We will have sessions on different forms of theory development, empirical approaches, data management and, finally, methods for statistical inference. Attendees can follow and further develop a principled and theory-driven way to do science while learning tons of useful skills, such as understanding mathematical recursions, simulating data in R, creating a GitHub repo and analyzing cultural transmission data. On top of the core workshop sessions, there will be two keynotes, a poster session for attendees to showcase their own research and plentiful opportunities to socialize!

Our website including all information will go live soon, so stay tuned and see you in Leipzig!
Members’ Publication List 2018

2018 has been a productive year for many ESLR members! Below is a list of papers published by our members this year. Congratulations to everyone, and we hope 2019 proves just as successful.


Forsman, J. T., Seppänen, J. T., Mönkkönen, M., Thomson, R. L., Kivelä, S. M., Krams, I., & Loukola, O. J. (2018). Is it interspecific information use or aggression between putative competitors that steers


If you would like to write a short article or take part in an interview about your research, you can contact Rachel at journalsec2@eslsociety.org
Comparative and cross-cultural psychology at CES Tempe

by Rachel Harrison

Presentations given at this year’s CES conference in Tempe, Arizona, covered a broad range of fields and subjects. Of most interest to me were the increase in talks regarding non-human research, and the increase in talks on cross-cultural psychological research.

Comparative research was showcased strongly, and went far beyond the chimpanzee-centric, or even primate-centric, approach one might expect at a typical cultural evolution conference. Presentations covered cetacean song revolutions, sea otter tool use, fruit fly mate choice copying, and bird nests. Dr Lucy Aplin gave an excellent plenary covering a wealth of research into the social transmission processes at work amongst wild great tits.

Speakers not only presented experimental data, but went beyond this to make novel theoretical arguments illustrated by their study species. Dr Thibaud Gruber presented evidence from moss-sponging chimpanzees in the Budongo forest, and homing pigeons studied by Dora Biro and Takao Sasaki, to argue that complexity may not be the best measure of cumulative cultural evolution. Damien Neadle presented a strong and compelling defence of the zone of latent solutions hypothesis, and put forward a new classification of ‘soft’ or ‘minimal’ culture that may prove useful to many comparative researchers.

The fact that the field is stepping away from (or has at least become aware of the limitations of) its previous focus upon WEIRD human populations...
was highlighted early on, with an explicit request that submitted abstracts discussing data from human participants state the national or cultural origins of the sample. As well as highlighting the amount of cross-cultural research at the conference, this request also served to remind us all that study participants from WEIRD societies do themselves come from distinct social and cultural contexts. Eight years after Henrich, Heine and Norenzayan’s seminal Nature paper, the field of cultural evolution appears to be seeing a continuing increase in the amount of research conducted in societies that do not have the five characteristics that define WEIRD societies.

While such research is expected from the fields of anthropology and human behavioural ecology (and indeed both were well represented at the conference), it remains relatively rare to see psychological studies conducted with cross-cultural samples. There was a strong showing in Tempe of cross-cultural developmental studies, with Dr Mark Atkinson presenting evidence of consistency across cultures in children’s use of social information, while Dr Jennifer Clegg showcased a series of studies demonstrating cross-cultural differences in children’s propensity for conformity and adults’ attitudes towards conformist behaviour.

While there were many excellent talks focused on non-human animals, and likewise many focused on non-traditional, non-WEIRD samples (in fact, too many of each to list in this article!), what was more encouraging than the specific content and quality of these talks was the integration of multiple fields under the umbrella of cultural evolution that was achieved at this year’s CES conference. I hope this trend continues in Japan in 2020!

1 Western, Educated, Industrialised, Rich, Democratic societies – a term introduced by Henrich, Heine & Norenzayan in 2010.

A very personal take on CES

by Limor Raviv

How do you know that you’re at the best conference of your short academic career? Well, it’s actually quite easy:

• You wake up excited at 6AM every day (ok, the jet-lag was probably a part of that too)
• You find it impossible to choose which of the parallel sessions to go to because they are all oh-so fascinating
• You don’t skip a single (!) moment throughout the entire conference (so you practically attend 90 talks in 3 days)
• You have the most invigorating and stimulating conversations over the 5-minute coffee break (I wish they were longer…)
• You can’t stop taking notes (or in my case, live-tweeting) at every talk, even when the topic is not really related to your own work

This is exactly how I felt during the Cultural Evolution Society Meeting (CES) in Tempe, Arizona this October. An amazing feeling that makes you fall in love with your field all over again – but at the same time can be pretty exhausting, mentally and psychically.

The amount of fascinating, varied and novel information I was exposed to was even a bit overwhelming. I learned about so many different topics, like tool-use, communication, music, culture, socio-cognitive behavior and more, in so many different species: modern humans, little humans (I consider kids as a different sub-species...), early humans and non-humans, spanning from primates, to whales, birds, honeybees, fruit flies, and much more.

To keep track of everything I learned, and to make sure that my future-self and others can access it later on, I took interim notes and little summaries of the main conclusions at almost every talk I attended. For me, this was done with a laptop and a Twitter account, rather than with a pen and paper (I have terrible hand-writing). I started live-tweeting conferences about a year ago and it’s been fun, but this time I was faced with a crazy challenge (that’s an understatement) given the truly diverse and interdisciplinary nature of the conference. The result (292 tweets) was eventually quite worthwhile: not just to me, but hopefully also to some of the people who were following the talks from afar. If you’re interested in some of the cool stuff that was presented at CES (and you should be, as curious humans!), you can find all these tweets under the hashtag #CESconf2018.

The days were long and draining, but overall I am happy to say that I learned a lot of new things, networked with a lot of wonderful people, got a lot of helpful feedback and useful ideas about my own study, and, to be honest, also ate a lot of yummy food (seriously, it was great, and I’m a vegan, so you can only imagine how good it was for everyone else).

My only regret is that I don’t have a time-travel device so that I can go back and attend all the other simultaneous sessions I had to miss out on (a world of knowledge beyond my reach...). Actually, now that I think of it, I would also go back and spend some more time soaking up the Arizonian sunshine (30 degrees Celsius at the end of October).

So all together, pretty solid good times at CES. Can’t wait to attend it again next time in beautiful Japan. Hope to see you there!

Limor Raviv is a PhD student at the Max Planck Institute for Psycholinguistics in Nijmegen, the Netherlands. Her research focuses on the cultural evolution of languages in different social environments. Using communication experiments with artificial languages, she is looking at how the grammatical structure of languages adapts to fit the structure of the community in which they evolve.
Conference travelling

BY MARCO SMOLLA

Sometimes a scientific conference gives us the opportunity to travel to countries and areas we have never been to before. What a great privilege it is if you can stay a couple of extra days. After this year’s conference of the Cultural Evolution Society in Tempe, Arizona, I was fortunate to spend some extra days to explore Arizona’s spectacular landscape.

Together with Rohan Kapitany, Sabine Nöbel, and Hanna Schleihaufl, I rented a car in Tempe and spent a day in Sedona’s Red Rocks and a day at the Grand Canyon. A left turn from the I17 takes you along the scenic I179. The curvy road meanders through the pointy but smooth surfaced, red-orange rocks that lend this area its name. We went for a short hike around Bell Rock (top). It is adjacent to the much bigger Courthouse Rock. This landscape was completely alien to me both the interestingly shaped mountains as well as the desert flora that have never seen before. We stopped many times to take photos as every new angle looked more impressive than the previous. We continued our hiking day at the nearby Cathedral Rock (bottom). The trail is steep and in the smooth surface is in parts almost slippery. However, we were rewarded with a stunning view over the red desert land.

The next day, we drove further North to see the Grand Canyon. We started our tour at Desert View (centre) with our very first look at the gigantic canyon and the Colorado River far down in the valley. It took me some time to grasp the scale of what I was seeing. After a while, my brain started to comprehend the dimensions. We had great weather that allowed us to observe how the colours of the scenery changed as the sun started to set. We walked back to our car after sunset and were, once more, rewarded with a beautiful starry night sky.
The road to an ERC Starting Grant in Primatology

Alba Motes Rodrigo interviewed Dr. Catherine Hobaiter for Cultured Scene about the process of applying for an ERC grant to fund her work on chimpanzees.

ERC Starting Grants are oriented towards early-career researchers based in the EU who want to move forward in their careers by becoming research leaders. These grants award up to 1.5 million Euros for conducting 5 years of research in any scientific field. In 2018, 277 ERC Starting Grants were awarded for Life science projects. One of this year’s grantees is Dr. Catherine Hobaiter, who received funding for a project entitled “Gestural origins: Linguistic Features of pan-African Ape Communication”.

Cultured Scene: Could you please tell us briefly about your background and the research you have been conducting so far? What has been your main focus until now?

Catherine Hobaiter: My main focus is communication and cognition in wild apes, and in particular gestural communication. My work has explored both types of gestures that apes use and what they use them for. Now we’re starting to look across more groups and species of apes.

Was this line of research the same that you had in mind when you first started in primatology? If not, what made you change course?

I first started out looking at baboon behavioural ecology, so the shift to ape gesture was a big one! But I’ve always been interested in a wide range of behaviour, some of my first papers had nothing to do with my PhD – imitation in chimps, and food processing in gorillas. It can be daunting at times...
trying to dive into a new area, but I feel that to fully understand ape communication we need to understand the world in which they communicate – everything from social relationships to environmental influences.

**Congratulations on your ERC Starting Grant! Could you please briefly describe for us what your project is about?**

Most of our data so far comes from one or two groups of chimps and bonobos, but in terms of understanding the full potential of ape communication this is like only studying human language in one or two small towns. We need to compare more sites to be able to ask questions like: do chimpanzees have gestural ‘accents’ or ‘dialects’.

We’re also finally putting the human apes back in the picture – using similar methods to those typically used with non-human apes, like focal follows and playback experiments, to explore human gestural communication.

**What are you most excited about regarding your ERC project? What worries you the most about it?**

I’m incredibly excited to explore so many new groups of apes. I love working in Budongo, I’ve been there for over 13-years and I’ve spent more time with the chimps there than with my friends and family. But at the same time the chance to meet new groups, new individuals, explore new environments is incredibly exciting. Having access to those new data sets isn’t just adding more of the same pieces to the puzzle; once we have everything in place we’ll be able to see a new picture and use it to ask fundamentally new questions about ape communication.

**What was the hardest part of the ERC application process? Do you have any advice for future applicants?**

Get as much advice as you can from a wide range of people! Learning how to pitch the writing for the experts in your field (reviewers) but also for experts in other fields (the panel) was tough, and the feedback I got from people who were not ape gesture experts was often the most useful. And reach out to people who’ve been through it – my colleagues were all incredibly generous and everyone’s advice was really useful in preparing me for all sorts of different aspects.

**What do you think is the secret for being a successful PI, both work-wise and on a personal level?**

I’m not sure I have a good answer for that! But I think getting comfortable with the fact that you don’t have to be the expert in everything – sometimes the best thing you can do is be the
matchmaker between the best people and the best projects. And learn to say no to things (because it’s in everyone’s best interest sometimes for you not to say yes).

What is the most important rule or habit that you have in order to keep a healthy work balance?

I find that hard, particularly when I’m just back from the field. The chimps don’t mind if it’s Wednesday or Sunday and they’re up at 6am everyday, so it’s easy to develop bad habits and let those filter into non-field time too. When I’m in Scotland I try to go climbing at least a couple of times a week – it helps that my climbing partner is not an academic, and she doesn’t care if it’s grant or marking season.

What experience/project/situation has been the highlight of your career in primatology so far?

Habituating the Waibira chimpanzee community in Budongo has been an amazing experience – being present from the first days of field surveys almost 8-years ago, through the days when you were lucky to get a 5min glimpse of them, to today when you can spend real time with them and start to understand their day-to-day lives.

Do you have any funny/interesting anecdotes of working with primates?

Everyone has their field war-stories they break out over dinner: the time I turned round to find a black cobra sitting up behind me, or seeing a chimp fall flat on his face in the middle of a display because he got his foot stuck in a climber and trying (and failing) hard not to laugh.. It’s tough to pick! But one of my most memorable days was in the first weeks of trying to habituate the new chimp group – we’d been working flat out for weeks surveying and were excited to try to track the chimps for once. We heard a group nearby and were making our way slowly towards them feeling pretty smug about how well we were doing without spooking them – we eventually made it all the way to the base of their tree when a chimp swings through just next to us and on her way past looks right at me. I swear we both did a comedy double-take of recognition – it turns out that she was Nora, one of the females from our Sonso group, I’d worked with her right through my PhD but she’d emigrated at the end and we weren’t sure where to. Turns out she’d moved just next door! But the feeling that she knew who I was was really poignant. In the end she and the other Sonso girls we found later on became our secret weapon and were a huge factor in helping the group habituate to us much more quickly than we expected.

Dr. Catherine Hobaiter is a primatologist currently lecturing at the School of Psychology and Neuroscience at the University of St Andrews in Scotland. Dr. Hobaiter has conducted extensive research on the evolution of communication and social behavior, including long-term field studies mainly in the Budongo Forest Reserve but also in other African sites.
Family ties

Kinbank – a new database for kinship terms from around the world

by Sam Passmore

The words we use to describe are family are such a visceral part of life that the thought that it might be organised differently is rarely considered. For example, if you’re reading this you speak English and are likely to live in a western industrialized society. In this context mother and father have the strict cultural definition of a monogamous couple raising their children in a household separate from their parents. Most Europeans hold similar views on family, such as the responsibilities of the parents to their child and their nuclear family’s role in the wider community. This ‘typical’ style of family is so embedded in society, it is often thought to reflect genetic relationships and not the result of cultural beliefs. But this is objectively not true. For example, in English we use different words for female and male siblings, but the same word for female and male cousins, despite the average relatedness being the same between these pairs. Family organisation is cultural, and for English speakers, sometimes gender distinctions are important, and other times not. In the UK, these norms of family organisation transcend the cultural realm into law, dictating custody rights, inheritance, and even a child’s nationality. This means cultural differences in understanding how and why family differs can have serious implications when dealing with an increasingly globalised world.

While in contemporary western society who can become a parent is rightfully becoming more varied, family, or kinship, organisation isn’t. Across cultures however, family organisation is amazingly diverse. Few Europeans would consider that the term ‘mother’ should extend to include a mother’s sister, or ‘father’ to include a father’s brother. Aunts and uncles are a different category of relative, and that distinction is important. But in Tongan this is precisely how family are classified, where the term “fa’e” is used to refer to both a mother and her sisters, and “tamai” for a father and his brothers. What is different in Tongan society that makes this classification important? My research looks to investigate these kinds of questions, and also quantitatively explore how variable kinship really is, what makes certain distinctions important, and whether those things have the same impact in different parts of the world.

Anthropologists have been studying kinship and what social structures determine kinship organisation for over 100 years and have developed numerous theories. For example, if society places importance on the nuclear family, then you might give specific terms for the people within a nuclear family and lump together more distant relatives. This is the case in English, which is categorised as an ‘Eskimo-type’ system.1 Kinship systems have been categorised into 6 types, which focus on how siblings and cousins are organised and are named after the society in which they were first identified (early anthropologists didn’t study themselves very closely!). I collected a number of theories that suggest a particular social structure predicts the use of a particular terminology type. Theories tend to focus on marriage practices (who can you marry, and how many people), patterns of descent (do you align with your father’s family line, or mother’s, or both?), and patterns of residence (when you marry, do you move to the husband’s or

Methods

Kinbank

Is the relationship between social structure and family organisation the same across cultural groups living in different environments?

1 The term “Eskimo” is considered derogatory in some parts of the world. I do not intend any derogatory meaning, but instead am following the current nomenclature. See https://www.uaf.edu/anlc/resources/inuit-eskimo/ for more info.
wife’s house, or start a new house?). These social structures are thought to influence which kin are brought together and which are separated, and that in turn changes who needs to be directly identifiable and who doesn’t. We also look at whether the relationships between social structure and family organisation are the same in Austronesian, Bantu (sub-Saharan Africa), and Uto-Aztecan (North America) cultural groups, which exist in different environments and have different time-depths. This is to test whether social structures always have the same effect on kinship organisation, or whether the effect is specific to language groups.

Most previous work in this area suffers from an annoying statistical hitch, named Galton’s Problem. Imagine, for instance, two neighbouring societies that both traditionally start a new household after marriage; it is more likely these two societies were once the same and maintained that tradition, rather than it being two independent incidents. In the past it was difficult to include the historical relationships between groups into any formal analyses, but now statistics has developed sufficiently for them to be included. When we incorporate the relationships between societies in our models we find no universal patterns of change and actually, many of the proposed relationships between kinship organisation and social structure are not true.

There are two possible reasons for this. Firstly, and simply, the theories were wrong and perhaps were the result of poor statistical understanding. This is a reasonable conclusion, since this has occurred in other domains which suffered from the same problem. However, to be thorough, a second possibility is to consider that the way kinship systems are being categorised is incorrect. As mentioned above, we use a 6-piece kinship typology, and within each category we know there is variation. For example, we know that most ‘Hawaiian’ systems in the Pacific distinguish older siblings from younger siblings, but that this doesn’t really happen in North American ‘Hawaiian’ systems. Is this an important distinction and why does it happen? Despite the similarities between societies’ kinship systems, there are also differences – but with the current typology, we can’t tell which are important and which are not. So, the next project is to build a database of kinship terms, rather than classifying societies by system type. This will allow us to test whether the typology of kinship system is appropriate and explore more granular models of change and their relationship to other parts of society.

Our database, KinBank, currently holds 150 different kin relationships for over 1000 languages across the world. The collection includes terms ranging from grandparents to grandchildren (G⁻² to G⁺² for the kinship nerds), parent’s siblings, and their siblings’ children. We also collect terms for relatives by marriage (nuclear kin’s affines). Where they exist, we also record terms that differ for sex of speaker (where men and women speakers have different kinship organisation), relative age (e.g. different words for older and younger brother), and by age of connecting relative (father’s older brother’s children vs father’s younger brother’s children). Each term has a referenced source, and each language is linked to other cultural/linguistic databases, such as D-PLACE and Glottolog. Which we hope means KinBank data will be in a format usable by scholars asking all sorts of questions.

KinBank is a key part of the European Research Council project VariKin. While it is work-in-progress, our current collection already contains 14 major language families. We’ve focused our data collection on societies linked to language phylogenies, enabling the use of phylogenetic comparative methods to further explore the problems discussed above. We hope to have our first release in Summer 2019 (UK). For future updates on KinBank, visit https://excd.org/research-activities/kinbank/

Sam Passmore studies cultural evolution and kinship using macro-evolutionary approaches. He is completing his PhD at the University of Bristol in the School of Anthropology and Archaeology. SamPassmore_ sam.passmore@bristol.ac.uk
The spread of amphorae design

Simon Carrignon and María Coto spoke to Cultured Scene about their new research examining the spread of amphora production techniques in 1st-3rd century Spain.

Cultured Scene: Your project used modelling to examine the potential social learning mechanisms at work in the production of amphorae in Spain in the 1st to 3rd centuries AD. Can you briefly outline the basics of the project?

Simon Carrignon and María Coto: The goal of this study was to analyse the transmission of technical skills among potters within Baelica province (currently Southern Spain). To do that, we analysed different Dressel 20 amphorae from different amphora workshops. Dressel 20 type amphorae were used to transport olive oil during the empire and they are well known as being linked to olive oil consumption. We proposed two questions. First, how amphora production was organized and second, how the production techniques spread from generation to generation of potters. However, we had to face some issues such as the lack of relevant written sources and the high level of uncertainty in the data. So even if researchers have assumptions about how amphorae production was organized, how pottery-making techniques were transmitted is still poorly understood.

To deal with this issue, we used concepts from an evolutionary framework in order to study the impact that social learning processes might have on pottery production. Specifically, we wanted to identify whether amphora production might show variations that could indicate transmission by social learning among potters.

To do this, we tested two hypotheses: 1. The variability in the morphometric traits would be correlated with the geographical distance (with closer workshops having more contact with one another) and 2. Techniques would only be transmitted by vertical/oblique transmission at the beginning (from masters to disciples).

What are your findings so far?

SC & MC: We used an Agent Based Model to test
different modes of transmissions (Horizontal, Vertical and Oblique). Each model described different historical hypotheses to explain the social learning impact upon pottery production:

1. Learning was spread by itinerant potters moving between different workshops (*horizontal transmission*)
2. It was spread from master to disciples within the same workshop. Maybe it could be running within families (*vertical transmission*)
3. It took place from master to disciples with some horizontal transmission between nearby workshops (*oblique transmission*)

As a result, we can identify different patterns of amphora production using Agent Based Modelling. We also think that this study helped us show two things. First, at a methodological level, it is indeed possible to use Agent Based Models to understand different patterns of transmission of pottery production techniques. Then, at a historical level, our models tend to show that those transmission processes were very likely to be a mix of vertical/oblique transmission with some degree of horizontal transmission. As is often the case, there is no one strict answer, but a subtle mix of various processes.

**How did you arrive at the initial idea for this project?**

SC & MC: We are currently working in a project, EPNet (Production and Distribution of Food during the Roman Empire: Economic and Political Dynamics), that wants to encourage humanities researchers to investigate cultural processes using different tools such as statistics and computer simulation, among others. To achieve this goal, this project brought together an interdisciplinary team from different fields. María is an archaeologist and she has been working with ceramics for years. Simon is a cognitive scientist who uses Agent Based Models to understand evolutionary processes. María was testing this dataset using statistical analysis. Both of us were already studying and reading about Cultural Evolution and Social Learning theories. We thought this gave us a good framework to go one step ahead and test which processes could generate the pattern we observed. So we decided to use social learning theories to develop different models and then we could simulate them.

**Your data for this project came from amphorae made between the 1st and 3rd century AD – how did you access this data? Was it a pre-existing dataset, or did you need to construct the dataset yourselves?**

SC & MC: Maybe it was one of the hardest/funnest parts of the project. We collected all the data from different archaeological museums in Andalusia (Southern Spain). The main task was basically to take eight different measurements from each amphora. The measurements were done in rim sherds because this part of the amphora is well known as a good indicator of variation. It was a total mess contacting different museums and trying to convince them about our project. The main question we got was: “Why do you need to measure this type of amphora eight times!” In the end, they always ended up finding our work interesting, as they hadn’t seen anything similar. So finally, after months moving boxes in humid rooms at the back of museums, we created a new database with more than 600 measurements.

**What are your next steps for this project?**

SC & MC: Trying to understand how the standardisation process happens and how this process
can change depending on cultural reasons. In archaeology, we found some ceramics designs for which forms remain for a long time leading to standardization. Apparently, these ceramics have few changes over time. By contrast, other forms tend to disappear. We want to analyse this phenomenon and understand why this occurs and what the reasons are behind the success or failure of continuity of a material form. We would like to put that in the broader scope of “standardisation” and links between standardization and cultural change.

Do you think you may be able to apply these techniques to different archaeological datasets in the future?

SC & MC: Sure. Our framework can be applied to different historical periods and datasets. Material culture such as ceramics can explain a lot about our daily life and they are also the most commonly found in the archaeological records. Traditionally, ceramic studies have been focused on describing types with a methodology based on taxonomy. However, there are not so many studies talking about cultural patterns which explain decisions such as how a potter made an amphora. To explore these patterns, quantitative methods in Archaeology allow us to analyse and test statistically a large amount of very different data.

The use of these tools in the archaeological community is increasing thanks to their accessibility and powerful computational tools. This can be useful to unveil different aspects of historical events that could not be documented by the archaeological evidence.

What were some of the biggest challenges you faced in conducting this project, and how will this inform your future work?

SC & MC: Aside from the museum hunting challenge, one of the main difficulties was the difference in our research backgrounds. Sometimes it was really hard to work in an interdisciplinary project due to the lack of knowledge from different parts. The worst part was that the differences between our backgrounds was sometimes so huge that it could take time to even realize that we did not understand each other.

On the other hand, archaeologists know that one of the main problems in this type of project is the high level of uncertainty in our data and the lack of written sources.

What do you think are the next big questions to be tackled by the field of social learning and cultural evolution?

SC & MC: One of the big questions could be how complexity emerges or disappears in different societies and the reasons for this.

Another challenge that remains for Cultural Evolution is recognition. We think that it still needs to be accepted by all the disciplines it encompasses, as a valuable framework that can link together disciplines that are seen as separate, in the same way that Darwin’s theory of Evolution brought together all sciences of living organisms. And we hope that in the near future, the common view that “Nothing in Biology Makes Sense Except in the Light of Evolution” (Dobzhansky) will apply for Human Behavior and Social Changes.

María is about to complete her PhD at Universitat de Barcelona, Spain. Her research focuses on identifying dynamics of social learning processes in potters during Roman Empire, with the aim of understanding how individual potters acquired and transmitted technical skills.

Simon is finishing his PhD at Universitat Pompeu Fabra. He develops and tests models of cultural evolution to understand the impact of content dependent bias on evolutionary dynamics.

Both are working at Barcelona Supercomputing Center as part of the Epnet project.
The Baldwin Effect, Genetic Assimilation and Social Learning

by Nam Le

In 1896, the idea that learning can influence the evolutionary process was proposed by both Baldwin [1] (published in Nature Magazine) and Lloyd-Morgan [2] (published in Science Magazine), this was later named “The Baldwin Effect” by George Simpson in 1953 [3]. In the Baldwin Effect, the idea is an animal learns some skills, which later become innate or partially innate.

This superficially sounds Lamarckian but still can fit into a Darwinian framework. What is learnt in one generation is not passed directly onto the gene of the next generation. The Baldwin Effect works another way. Learning a new behaviour may provide adaptive advantage when the environment changes, modifying the evolutionary pathway of the organism. Learning generally involves cost. It is the cost of learning that generates selective pressure favouring individuals who can learn with minimum cost compared to others. If the environment is stable enough over a period of time, future evolution will favour learning that behaviour more quickly... and quickly to the point that the behaviour, or part of it, would be encoded in the gene pool. A similar idea was called Genetic Assimilation, proposed by the British biologist Conrad Hal Waddington [4] in his experiments to study epigenetics with drosophila. In general, genetic assimilation can be considered a sub-process through which the Baldwin Effect happens [5].

It is interesting that the idea of the Baldwin Effect was first discussed over 100 years ago, and then neglected for many years in mainstream biology, and even psychology, research. It gradually gained more attention following the classic paper by the British cognitive and AI scientist Geoffrey Hinton in 1987, entitled “How Learning Can Guide Evolution” [5] in which a computer simulation demonstrating the Baldwin Effect through genetic assimilation was presented. Since then, the effect has been investigated by a number of studies, mostly through computer simulations and in the field called Artificial Life (or ALife) – an interdisciplinary venue that studies natural life, its processes, and its evolution by recreating life-like systems through computer simulations, robotics, or biochemistry.

Why should we be interested in the Baldwin Effect?

One plausible reason is that the effect, if happens, helps explain why and how evolution can be directed by intelligent faculties which are also the products of evolution. This stresses the importance of phenotypic plasticity, or norms of reaction, in evolution. This means there are circumstances in which the phenotype is not just the passive product of the gene and environment, but plays an active role in directing the evolutionary pathway of the species, through some forms of learning or niche construction [7].

Another reason, more interesting to me, for studying the Baldwin Effect is that it is how learnt behaviour can become innate, or genetically assimilated. This helps explain why environmental information can be encoded in the gene of different species. This is even more interesting in explaining the evolution of intelligent faculties in humans: For example, how the human brain evolved to learn and adopt complex cultural information, and how human language evolved and later became part of human instinct.
Why Social Learning Matters?

Learning generally can be broadly classified into two types, namely social learning and individual (asocial) learning. Individual, or asocial, learning can be simply understood as learning when the learner directly interacts with its environment, e.g., via trial-and-error, without the presence of others. Social learning has been observed in organisms as diverse as primates, birds, fruit flies, and especially humans [8]. By social learning, we mean learning that is influenced by observation of or interaction with another animal, or its products. Although the use of social learning is widespread in many animal taxa, understanding when and how individuals learn from others is a significant challenge. Social learning is generally less time-consuming than individual learning, but relies on information produced by others. When the environment changes, information gained from others is likely to be outdated and socially-learnt information can become maladaptive (not adaptive). On the other hand, asocial learning through trial-and-error is costly, but capable of producing new information which is particularly valuable when the environment happens to change.

Most work studying the Baldwin Effect focuses on individual learning by trial-and-error [5], [11]. When social learning comes in, the story would be more interesting as to how the Baldwin Effect occurs. Assume that one adaptive behaviour is found in the population, if social learning is permitted it will propagate that adaptive behaviour through the population very quickly. Some questions can be asked as to whether that behaviour, or part of it, could become innate in future generations? More interestingly, it is the cost of learning that triggers genetic assimilation of learnt behaviour. If the cost of social learning is less than that of individual learning, what would genetic assimilation look like in the presence of social learning? Which type of learning triggers more genetic assimilation?

If social learning is said to be a form of information-parasitism, social learning can only transmit behaviour if it exists, whether it was learnt via asocial learning or produced by genetic recombination. Before the Baldwin Effect can occur via social learning, the adaptive behaviour, which is expected to be assimilated, must be preserved in the population over generations. Nevertheless, if the cost of social learning is less than asocial learning, social learning will be favoured by natural selection more than asocial learning. There have been quite a few studies showing that if too much social learning is used, a population can become maladaptive as asocial learning gradually vanishes and there is no way to seek for a novel adaptive behaviour as the environment changes [9].

Here I posit that it would be very interesting to investigate the Baldwin Effect through the prism of social learning, or more precisely, through the lens of learning strategies – the combination of asocial and social learning in some manner, probabilistic or deterministic. Recent works via computer simulations say that a learning strategy can also result in the Baldwin Effect. In [6], each learning agent adopts a simple strategy is implemented as follows: Learn socially when the demonstrator is still adaptive, otherwise learn individually. When social learning is less costly than asocial learning, the above learning strategy was
shown to trigger genetic assimilation more slowly and preserve more plasticity than asocial learning [6]. It is interesting to see that the Baldwin Effect through social learning favours the gene to learn an adaptive behaviour, rather than the gene to encode part of that adaptive behaviour, which is what has been found with asocial learning [5]. This has the obvious effect that the population with more plasticity will be more adaptive when the environment changes in the future. In similar studies it was shown that if social learning is much less costly than asocial learning, and if there is no rule governing each learning agent to learn strategically, then the Baldwin Effect cannot occur as asocial learning is gradually replaced by social learning over generations. Therefore the population has no way to preserve the adaptive behaviour until the Baldwin Effect would be able to occur [10]. The population with more plasticity will be likely to have higher average fitness in the future.

What has been shown so far informs us that there exists a scenario, with the presence of social learning, in which the Baldwin Effect occurs differently from the canonical genetic assimilation process, promoting more plasticity to facilitate future learning. This finding is, of course, domain specific since the fitness landscape used in [6] and [10] is quite extreme - a “Needle-in-a-hay-stack” - the landscape in which there is only one correct, or adaptive, behaviour, and all the others are maladaptive. I would like to see if this finding can be generalised into different domains, and even more complex environmental scenarios. If the same or similar observation can be made, this could contribute to the explanation of behavioural repertoires and the evolution of intelligent faculties in humans. If the Baldwin Effect occurs through human cultural niche construction processes [7], this can help explain how the human brain evolved to be better at learning in the changing cultural world, and more intelligent human agents are more plastic agents rather than those with much genetic control.

The computer simulation in [6] though simple, can be considered a computer model in which three adaptive systems, namely evolution, learning, and culture, are allowed to interact with each other. Learning, both asocial and social, is the medium to trigger the gene-culture coevolutionary process, and the Baldwin Effect was presented as a way that cultural information can be encoded in the gene pool of the population. ALife simulations can be an interesting way to study social learning and cultural evolution. We also can take into account cognitive faculties when studying the evolution of learning and culture by including Artificial Neural Networks as a simple learning machine. Theory, mathematical modeling, and ALife approaches can benefit and complement each other in search of the understanding of social learning and culture, and the nature of knowledge in general.

REFERENCES

Nam Le is doing his PhD at the Natural Computing Research & Applications Group, UCD Dublin. He has brought interests including evolutionary and neural computation, cognitive science, and evolutionary psychology. nam.lehai@ucdconnect.ie
Kate Cross uses haikus to distil the essence of a talk and then tweets them into the world for everyone to enjoy. We ask her about this creative form of science communication.

by Marco Smolla and Rachel Harrison

Cultured Scene: The haikus are a creative way to express thoughts in a very short form. How did you come up with the idea to use haikus to summarise presentations? Is it a way for you to remember the most important details of a talk?

Catharine Cross: I started tweeting conference haikus at EHBEA (under #ehbea2016 and #ehbea2017). I’d been inspired by Hanna Kokko who has haiku descriptions of her papers online (http://www.kokkonuts.org). It definitely helps me to focus and to remember a talk.

How are you doing it so fast? I think that many people might ponder quite some time about the phrasing.

I have always loved playing with words. I’ve been writing poems of various kinds since I was a kid (mostly terrible, lost to posterity, or both), so I’ve had a lot of practice. Also, sometimes I tweet them before I’m really happy with them, because it’s time for the next talk. I think live-tweeting a conference is a brilliant way to practice writing to a schedule!

Do you use haikus for other things as well? Or is this a conference only thing?

Sometimes I write them just for fun, or to summarise a paper of my own, or to vent about sexism in academia. It’s a very versatile form! There are quite a few people posting #sciencehaiku on twitter and I think it’s a great way write about science.

Is there a haiku you are especially proud of, or one that you’ve got a lot of responses to? (are they the same?)

I think my favourite from the last conference is this one, which described Nathan Nunn’s plenary on (among other things) the after-effects of slavery on people living in Africa now. I feared that a tweet-haiku might be seen as too glib a response for a talk on something so serious. But I’ve argued for a long time that we can – and should – use playful formats to talk about serious issues. So I did.

<table>
<thead>
<tr>
<th>SCHULZ</th>
<th>KIMBROUGH</th>
<th>NUNN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why am I so WEIRD? Is it all the church’s fault? Yes, because kinship</td>
<td>Bees make decisions As a whole population How to model this?</td>
<td>Damn, what went wrong here? Oh, colonialism (Again, and again)</td>
</tr>
</tbody>
</table>
HARRISON
Sperber’s predictions
About image transmission
Ruined by children

GARRUCHAGA
A state collapses
Drought, social tensions, or both?
(A cyclical thing?)

Olsen
I’ll rely on you
Because, well, I’m just like that
(Also ’cause you’re smart)

TO SELF
Well, that was a joy
Thanks to the organisers
See you in two years

ROBERTS
Hypotheses, please!
I’m making a database
And looking for gaps

MANNING
Long-term datasets
Rewrite the Neolithic
(Carbon-dating helps)

FERDINAND
Coevolution
Makes a system go places
It wouldn’t without

SHTULMAN
Seven-year-old kids
Can fathom evolution
(Schemas really help)

HOUSE
Do norms drive sharing
Within and between cultures?
It seems they do, yes

OPFER
What do students know
About natural selection?
EvoGrader knows

TO SELF
Two cultural groups
Industry and academe
Distinguished by dress

WARING
Food-buying co-ops
Are real-life public-goods games
And folk here give lots

GOLDBERG
How do I fit in?
Must I adopt your values?
No - just read the rules

LENGARE
Unfortunately
Anthropomorphism sucks
When teaching science

RENNER
Kids (and smart monkeys)
Prefer to copy winners
(Few monkeys are smart)

@KRISS_M_SMITH
Sorting by kindness
In hunter-gatherer camps
Seems not to happen

LENFESTY
Prestigious agents
Cause the formation of groups
In a doughnut world

WILLARD
Belief in karma
Might motivate doing good
(Or at least trying)
No 4 Cultured Scene

To Self
I'm excited now
I love a bit of violence
(Research-wise, of course!)

Wright
Inter-group learning
Allows trait recovery
When we're connected

@BONOBO_STYLE
Complexity?
Bah! Efficiency's where it's at
For chimpy culture

@BONOBOSTYLE
Inter-group learning
Allows trait recovery
When we're connected

@DAMIEANNADE
Copying others
Is helpful, but not required
For culture-y stuff

@CAMROBJONES
Will transmission chains
Accentuate positives?
No, just negatives

@CAMROBJONES
Copying others
Is helpful, but not required
For culture-y stuff

@LOTTYBRAND22
Prestigious people
Are influential and liked
(Like Mary Berry)

@LOTTYBRAND22
Copying others
Is helpful, but not required
For culture-y stuff

@SMOLLAMARCO
Get denser networks
By selecting for experts
Not jacks-of-all-trades

@SMOLLAMARCO
Prestigious people
Are influential and liked
(Like Mary Berry)

@PSMALDINO
Our niches vary
In myriad dimensions
So we vary, too

@PSMALDINO
Words for emotions
How do they cluster themselves?
Depends where you're from

Ferdinand (for Oduniyi)
Emotion words in
Chain letters and fairy tales
Get them transmitted

Lesage
What do kids believe
About the powers of god(s)
To make things happen?

@JEREMYODUNIYI
Copying others
Is helpful, but not required
For culture-y stuff

@LEONIDTIOKHIN
Pre-registration
Sure, it'll slow you down, but...
That's good for science

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Write with us

What is it like being an early-career researcher? We want to hear your story.

Get in touch!
While conducting some highly scientific research in preparation for writing this article (read: googling the phrase “phd early career work life balance” and scrolling through the results while watching Making a Murderer Season 2 on Netflix) I was slightly alarmed to notice that the titles of many blogposts and news articles on the subject included phrases such as “is it possible?”, or simply consisted of the words ‘PhD work-life balance???.’ It didn’t fill me with confidence when embarking on writing an article giving tips for achieving work-life balance, to first read a number of articles suggesting that such a thing doesn’t exist.

So, given that work-life balance in academia is so elusive that some appear to doubt its very existence, how does one go about achieving it? I have some ideas of my own, but also took to Twitter to crowdsore some good tips.

Personally, I think one of the keys to achieving a balance between life and work is successfully separating the two. What does this mean? Try and keep your work out of your life – no evenings spent half-reading a new publication and half-watching Strictly Come Dancing with your flatmates or family. In the immortal words of Ron Swanson, “Never half-ass two things. Whole-ass one thing”. This advice holds especially true if one of the things you are half-assing is your leisure time.

If you have an office or desk at your research institution, use it, or find a cubicle in the library, or construct a designated work-space at home. A designated work-space can definitely be your kitchen table. It probably shouldn’t be your sofa or your bed. “But, Rachel!” I hear you cry, “I know
for a fact you wrote whole sections of your thesis in bed with Gilmore Girls on in the background!” Shhh. I’m older and wiser now. Do as I say, not as I did. Creating physical separation between your work and non-work spaces makes it far more likely that you’ll successfully leave work behind at the end of the day and take a proper break. It also makes it more likely that you’ll do work when you’re at work. If you find that you struggle to leave work behind, I find that making a list of tasks for the next day is helpful. About 10 minutes before leaving for the day, simply write down a list of things you’d like to achieve the next day - a paper to read, emails to reply to, an analysis to run - and leave it on your desk for the morning. Not only do I find that this helps me get off to a more purposeful start the next day (time to start ticking things off the list!), the act of writing out the list also seems to take some of the anxiety out of leaving work with tasks still unfinished.

Work-life separation came up repeatedly on Twitter. Juliet (@Hules_) suggests that you don’t reply to emails after 5:30pm on weekdays or at all on weekends – and both Juliet and Gemma (@gemmamackintosh) point out that Outlook can be adjusted using macros or settings to take it offline outside of work hours or block all notifications outside working hours. Juliet also highlights the flipside of this rule – putting your phone on do not disturb during the workday to reduce distractions. Liz (@LRRenner) recommends that you don’t spoil your holiday time by taking academic books along. As someone who has carried academic books, unread, around multiple countries over the last few years, I heartily agree. Grab something at the airport bookshop and relax.

Both Juliet and Liz also point out that, aside from promoting a better balance for yourself, following some of these tips for separating work and life can also help you to set a good example for others. Replying to emails from undergraduates (or others earlier in their career than you are) at 11pm on a Saturday sets two expectations – one, that you’re available at all times, and two, that it is normal for researchers to work at those hours. Of course, one of the benefits of being an early career researcher is that it may offer you greater flexibility in terms of working hours than other careers. If 11pm on a Saturday is your best time to reply to emails, add a short disclaimer – “My work pattern means that you might be receiving this email outside of standard working hours. I don’t expect you to reply outside of standard working hours; Monday-Friday, 9am-5pm”. You can also use apps like Boomerang to schedule emails; so even though you wrote your response at 11pm on Saturday, it won’t get sent until 9am on Monday. As Liz points out, your supervisor’s expectations can have a big impact on whether you can achieve a good balance. If you’re currently applying for PhD or postdoc positions, ask around and make sure that their expectations are reasonable and that they will work for you.

I once knew a PhD student whose supervisor strolled around the office at 9am each day to check
that everyone was there - that sort of structure and accountability might be just what you need, or it might sound like the stuff of nightmares. In either case, good to know in advance!

There's a lot more to be written on this subject, and I feel like I've barely scratched the surface.

There are as many ways of achieving a good work-life (or life-work) balance as there are people attempting to do so. Everyone has different goals and different commitments, and so what works for one person may not work, or may not be feasible, for the next. Still, I hope that some of these tips will work for you, or at least prompt you to think critically about your own work-life balance and make some intentional choices to achieve the best balance for you.

If you have some tips for achieving a good work-life balance, advice on other aspects of being an early-career researcher, or a question you'd like to see answered using the Wisdom of the Crowd, email me at journalsec2@eslsociety.org or drop me a tweet at @RachelAHarrison

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**Announcements**

**Fellowship call**

The Institute for Advanced Study in Toulouse (IAST), interdisciplinary Institute, welcomes applications from researchers from a large range of disciplines, including Evolutionary Biology. We seek candidates with a strong research background in their own discipline, but willing and able to develop research projects drawing on IAST’s substantial interdisciplinary resources, including particularly the proximity of strong groups in economics (Toulouse School of Economics, TSE). We are open to a variety of research methods, including theory, field and laboratory experiments, observational field work, and the analysis of large secondary data sets. All research interests relevant to the broad study of human behavior are welcome, but interests close to those already developed at IAST will be given special consideration, including theoretical models of evolution, the family, sexual selection, evolution of cognition. Anticipated start date: September 1st, 2019. For information and applications visit iast.fr/apply.
Announcements

14th Conference of the European Human Behaviour and Evolution Association, Toulouse, France

This conference brings together international researchers from the fields of human behavioural ecology, evolutionary anthropology, human genetics, cultural evolution, evolutionary psychology and paleoanthropology. The event will take place in Toulouse from April 23 – 26, 2019 at the University Toulouse 1 Capitole with an ambitious scientific program, welcoming over 220 participants and 6 international plenary speakers:

- Etienne DANCHIN (CNRS, France)
- Claudine JUNIEN (Faculté de Médecine Paris-Ouest, France)
- Daniel LIEBERMAN (Harvard University, USA)
- Richard MCELREATH (Max Planck Institute for Evolutionary Anthropology, Germany)
- Anne PUSEY (Duke University, USA)
- Jean TIROLE (Toulouse School of Economics, Université Toulouse 1 Capitole, France)

A pre-workshop will take place on April 23 on “Hybridization, Evolution and Behavior” (details on this event coming soon).

Abstract submissions and registration are now open at https://ehbea2019.sciencesconf.org.

14th Ecology & Behaviour meeting in Toulouse, France, 19-24 May 2019

The association “Rencontres Ecology & Behaviour” (AREB), founded in 2005 by a group of students, organizes each year an international conference on evolutionary biology, ecology, and animal behaviour. We planned to invite two speakers for each symposium. Fantastic researchers have already confirmed their presence:

- Intraspecific interactions: Charlotta Kvarnemo (Gotenburg University) and Elise Huchard (ISEM, Montpellier)
- Non-genetic heredity: Lucy Aplin (Max Planck Institute, Radolfzell) and Etienne Danchin (EDB, Toulouse)
- Molecular Evolution: Knud Jønsson (National History Museum of Denmark, Copenhagen) and Ludovic Orlando (AMIS, Toulouse)
- Cognition: Alice Auersperg (University of Veterinary Medicine, Vienna) and Audrey Dussutour (CRCA, Toulouse)
- Biodiversity facing global changes: Mike Bruford (Cardiff University) and Camille Parmesan (SETE, Moulis)
- Interspecific interactions: Camille Bonneaud (University of Exeter)
- Ecophysiology and ecotoxicology: Mathieu Giraudeau (MIVEGEC, Montpellier)

As usual, our association want to limit registration fees for all, and offer accommodation and lunch to all students exhibiting their work during the conference. // Abstract submission and registration will open in December! // Please visit the E&B 2019 conference website for updates: https://eb2019.sciencesconf.org. // Follow Ecology & Behaviour 2019 on facebook (@EcologyBehaviour2019) and twitter (@EcoBehav2019). We look forward to seeing you in the Ville Rose!
ESLR HANDBOOK
(EXERPT)

Societies
ISSD
CES
EHBEA
HBES
ISBE
ASAB
CogSci
PSGB
ISHPSSB

Conferences
EHBEA, Apr 23-26, Toulouse
HBES, May 29th–Jun 1, Boston
ASAB Easter Meeting, April 3-5, York
ASAB Summer, August 26-29, Konstanz
ESHE Meeting, September 19-21, Liège

Summer School
Complex Systems Summer School, Santa Fe
Diverse Intelligence Summer School, St Andrews