

# Culture Conference 2026

## Abstracts

### Keynotes

#### **Human cognition in the wild. Studying collective human foraging in ice fishing**

*Dr. Ralf Kurvers*

Dr. Ralf Kurvers is a behavioural biologist whose research focuses on individual and collective decision-making in both humans and non-human animals. He obtained his MSc and PhD at Wageningen University (2003–2011) and held postdoctoral positions, including a Rubicon fellowship at the Leibniz-Institute of Freshwater Ecology and Inland Fisheries in Berlin. Since 2015, he has been a researcher at the Max Planck Institute for Human Development and, since 2019, a senior research scientist and principal investigator at the Science of Intelligence Cluster (TU Berlin). His work explores how individuals process and share information, how social interactions shape group decisions, and how collective intelligence emerges across species.

#### **Culture in Insects – A case study with *Drosophila***

*Dr. Sabine Nöbel*

Dr. Sabine Nöbel is a postdoctoral researcher at Martin-Luther-University Halle-Wittenberg and trained as a behavioural ecologist. She obtained her PhD at the University of Siegen and held postdoctoral positions at the University Toulouse III Paul Sabatier and the Toulouse Institute for Advanced Study in Toulouse (IAST). Her research focuses on non-genetic inheritance of mating preferences using mate-choice copying as an example of social learning. Using *Drosophila* as model species, she shows how new, socially learnt mating preferences can invade a population and persist across generations owing to cultural transmission of socially learnt mate preferences. The ultimate goal is to uncover the cognitive mechanisms involved in this plastic but socially stabilised form of social learning and to investigate the evolutionary roots and consequences of animal culture.

#### **Can culture research save chimpanzees? (and other conservation questions)**

*Dr. Erin Wessling*

Dr. Erin Wessling is a behavioural ecologist and conservation biologist whose work sits at the intersection of research and on-the-ground impact for great apes. She is dedicated to advancing our understanding of Pan behavioural ecology by prioritizing ecological perspectives and comparative approaches, all the while translating scientific discovery into impactful, evidence-based conservation policy and practice. She spearheads two cornerstone field research platforms—the BonDiv Project, focusing on bonobo behavioral ecology and conservation across the Congo Basin, and the Moyen-Bafing Chimpanzee Project in Guinea, studying chimpanzees living in an arid savanna-mosaic landscape. She also leads the Western Chimpanzee Conservation Regional Alliance, chairing the Working Group on Chimpanzee Cultures, and co-chairing the IUCN's new joint-commission taskforce dedicated to the conservation of animal cultures.

## **From islands to oceans: the scaling of sperm whales cultures**

*Dr. Taylor Hersh*

Dr. Taylor Hersh is a behavioural biologist and bioacoustician who is broadly interested in the interplay among vocal complexity, social complexity, and culture in animals. She is currently a postdoctoral research fellow in the Cetacean Communication and Cognition Group at the University of Bristol and an affiliate faculty member at Oregon State University. Much of her research focuses on measuring how animal communication varies over space and time, with particular focus on cetacean social communication and the cultural processes that shape group-specific vocal traditions. She obtained her PhD at Dalhousie University (Canada) and has held postdoctoral positions at the Max Planck Institute for Psycholinguistics (Netherlands) and Oregon State University (USA).

## Oral talks

### **Social information use across the lifespan**

*Lucas Molleman*, Zhan Feng, Wouter van den Bos, Andrea Gradassi, Wataru Toyokawa, Katsumi Watanabe, Ralf Kurvers

Social information use is key to human success, boosting individual decision-making, group coordination, and knowledge accumulation across generations. Theoretical models predict that social information is most valuable in early life, when individuals can benefit most from more experienced others. However, it is largely unknown how social learning strategies change across the lifespan, as studies typically use narrow demographic samples. Across seven belief-updating experiments, using cross-sectional samples spanning ages 6-99, recruited from museums in Germany and Japan (N=32,707), we find a robust developmental trajectory of social learning: social information use was highest at age 6, strongly declined until late adolescence, and then slowly increased again into late adulthood. Interestingly, participants across the whole age range used social information most when it aligned with their own beliefs or with other social information, and when it was provided by young adults. Furthermore, social information use was slightly higher in females than in males, and higher in Germany than in Japan. Our results reveal the early-life emergence of strategic social information use and help understand how adaptive information spreads in age-diverse populations.

### **The Role of Personality in Human Social Learning Strategies**

*Camilla Cenni*, Jochen E. Gebauer, Jennifer Eck, & Alex Mesoudi

Social learning is central to cultural evolution. Personality, relatively stable individual differences in thoughts, feelings, and behaviors, influences nearly all aspects of human life and likely also fundamentally shapes cultural evolutionary dynamics. Previous research on personality and social learning has identified characteristics of the demonstrator, and to a lesser extent of the learner, that make social learning more or less likely, often treating these two factors in isolation. The joint influence of demonstrator and learner personality on social learning has never been systematically investigated.

We address this gap by focusing on the Big Two dimensions of Agency (assertiveness and confidence) and Communion (benevolence and warmth). Unlike the Big Five taxonomy, the Big Two replicate across large- and small-scale societies, WEIRD and non-WEIRD populations, and are fundamental to social behavior, making them best-suited for studying interpersonal dynamics.

We developed a novel demonstrator-learner paradigm, using large language models to simulate human demonstrators systematically varying in Agency (assertiveness) and Communion (benevolence). Across three large-scale exploratory experiments (each N > 1000) and three preregistered confirmatory replications, participants interacted with demonstrators described as having either no personal stake or potential benefits from misleading or helping the learner. Demonstrator Agency consistently emerged as the strongest predictor of social learning. Learner Agency also influenced copying, with lower-Agency learners showing greater social learning. Communion effects were modest and dependent on demonstrator incentives. These findings highlight how personality shapes social learning strategies across a multitude of everyday social settings.

## **Applying cultural evolution to public health information products**

*Rachel Kendal & Claire Horwell*

This presentation covers two projects applying knowledge of learning biases (e.g. transmission biases/social learning strategies) to inform co-design, co-development and dissemination of outreach products as public health interventions. This involved a novel interdisciplinary collaboration between a cultural evolutionist and an earth scientist. The first project, based in Indonesia, involved creating leaflets and videos regarding protecting oneself from ash inhalation following volcanic eruptions (HIVE: Health Interventions in Volcanic Eruptions). The second project, based in Indonesia and Nepal, involved creating leaflets, videos and an infographic/comic regarding how children can protect themselves from urban air pollution (FACE-UP: Factors Affecting Childhood Exposure to Urban Particulates). A mix of qualitative and quantitative methods were used to co-produce the products with the intended audiences as well as relevant Government Ministries and NGOs and to evaluate learning potential of the products. The aim was to take an emic approach to create products that will be maximally effective in transmitting information as they take into account whom individuals will learn particular information from, or trust, as well as cultural contextual factors. The hope is that this process will maximise the products' usefulness and uptake at local and global levels. The results of these studies and learnings regarding the contribution cultural evolutionists may make in public messaging will be discussed.

## **Reward learning explains human social learning strategies**

*Björn Lindström*

Human adaptation depends on individuals strategically choosing whom to learn from. A mosaic of social learning strategies—such as copying majorities or successful others—has been identified. Influential theories conceive of these strategies as fixed heuristics, independent of experience. However, such accounts cannot explain the flexibility and individual variability prevalent in social learning. Here we advance a domain-general reward learning framework that provides a unifying mechanistic account of pivotal social learning strategies. We first formalize how individuals learn to associate social features (for example, others' behaviour or success) with reward. Across six experiments ( $n = 1,941$ ), we show that people flexibly adjust their social learning in response to experienced rewards. Agent-based simulations further demonstrate how this learning process gives rise to key social learning strategies across a range of environments. Our findings suggest that people learn how to learn from others, enabling adaptive knowledge to spread dynamically throughout societies.

## **Cultural evolution of problems and solutions**

*James Winters*

Existing models of cumulative cultural evolution have primarily focused on problem-solving and the collective capacities underpinning the generation, transmission, and selection of cultural solutions. Less attention is paid to the construction of problems: the process by which individuals interact with the environment to build representations of an underlying problem space. In this talk, we present a model where agents generate probabilistic problem and solution recipes. At each timestep, agents engage with the environment by constructing problems and using these to constrain the discovery of solutions. Here, the environment is represented as an NK landscape that determines the complexity and ruggedness of the payoffs: N specifies the dimensionality of the search space, while K controls the interdependencies

between dimensions. Payoffs depend on how well the problem aligns with the environment and how closely the solution matches the problem. Individual learning corresponds to a process of refining problem and solution recipes, using information about the payoffs to update their representations via Bayesian inference. We then manipulate the type of social learning available to agents: (i) agents who just copy solution recipes, (ii) agents who just copy problem recipes, and (iii) agents who copy both problem and solution recipes. Our findings demonstrate that cumulative improvement is only reliable when populations culturally transmit both problem and solution recipes. The advantage of transmitting both scales with environmental complexity: simple environments (low N/K) show no advantage over just copying solutions, while complex environments (high N/K) show a distinct benefit for copying problems and solutions.

### **In search of peace of mind: The quest to decipher whether theory of mind is a culturally universal cognitive trait or a plastic trait**

*Chirag Rajendra Chittar*

Theory mind (ToM) is the universal understanding of beliefs, knowledge, and emotions of conspecifics. ToM comprehension could be a significant step in accessing the mental states of others that could facilitate socio-cognitive mechanisms of information transfer such as teaching. However, the test designs implemented (including the classic Sally-Anne test) across diverse communities have produced inconsistent results, contradicting the consistency of the developmental timing of ToM. Communities with diverse social systems, subsistence means, and parental practices have also been largely ignored in false belief studies. In addition, the studies fail to attribute reasoning for the emergence of ToM in human evolutionary history and whether ToM perception is susceptible to cultural/environmental triggers. Our study is the first attempt to conduct a set of variations on the Sally-Anne test (to account for its design limitations) on three hunter-gatherer groups (Agta, Mbendjele BaYaka, and Raute) and farmer groups (Filipino, Bantu, Nepali) from three different countries (Philippines, Congo-Brazzaville, and Nepal) varying in subsistence and access to education. Moreover, our study aims to investigate whether ToM is a universal socio-cognitive trait having a consistent developmental timing across different groups or is triggered by socioecological pressures causing acceleration or deceleration in its development. For the study, access to schooling was considered as a socioecological pressure. Nevertheless, our study found that schooling influenced test passing. The study shows that ToM is potentially a plastic socio-cognitive trait susceptible to different socio-ecological pressures.

### **Beyond behaviour. Reconceptualising nonhuman cultures as situated and relational ways of being.**

*Agata Kowalewska*

Animal cultures have recently been gathering interest as a necessary facet of conservation efforts. Considering the time pressure imposed by habitat degradation and species loss, the question of how we define cultures is therefore urgent. Drawing from decolonial philosophy of science and grounded in comparative fieldwork with Balinese long-tailed macaques (*Macaca fascicularis*) and urban pigeons (*Columba livia*) in Warsaw, the paper proposes a theoretical shift in the definition of nonhuman cultures that goes beyond socially learned behavioural traditions. I argue that focus on behaviours obscures the dynamic interactions with the environment and other species that define cultures (human and not) and reproduces the anthropocentric bias, while at the same time hollowing out the notion of culture. This

theoretical move recognises nonhuman cultures as distinct, situated and relational ways of being, which cannot be reduced to a list of traits easily observable by humans. Consequently, their protection cannot be achieved through the preservation of isolated behaviours alone, but requires the preservation of the broader ecosystem and relational web within which they exist, including their human elements. This reframing offers a more robust ethical foundation for the politics of conservation, further integrating cultural evolution into biodiversity protection without imposing human benchmarks on nonhuman lives.

### **Short-Term Boost, Long-Term Drag: How Substitutive AI Shapes Cumulative Cultural Evolution**

*Qiankun Zhong, Thomas Eisenmann, & Iyad Rahwan*

Increasing research has found that the reliance on Generative AI can lead to a reduction of collective variance, especially in creative tasks. In this paper, we consider the long-term consequences of variance reduction in cumulative cultural evolution and ask whether increasing reliance on GenAI will lead to “cultural collapse”. We use an agent-based model and a “magic potion” experiment to compare two cases of AI uses, Complement and Substitute, and show that AI Substitutes can improve our cumulative learning and exploration in the short term, but are detrimental in the long run due to the greater influence on collective variance. Even if some people start with complementary AI, which maintains some variance, the more efficient performance boost provided by AI substitutes makes it more attractive to be adopted by the majority as the dominant strategy. As a result, we show that the danger of “culture collapse” not only resides in the reduction of variance caused by substituting human effort with AI but also in its immediate boost of performance that allows it to spread easily. In response to this danger, we model multi-level selection as an evolutionary mechanism to promote the adoption of AI Complements as the long-term strategy. We show that when group structures and boundaries are strong, AI Complements can be selected for over AI Substitutes. Taken together, our results offer insights into the long-term and population-level effects of AI on cumulative cultural evolution and provide suggestions for policy regulation and organizational strategies in response to potential risks.

### **Artificial Intelligence as a Cultural Agent: Dynamics of Co-Creation, Transmission, and Transformation**

*Ahmed Abla & Naima Boukhjar*

Artificial intelligence (AI) is increasingly embedded within the mechanisms through which culture is produced, transmitted, and valued. Yet the extent to which AI systems function merely as tools, versus emerging as cultural agents in their own right, remains empirically underexplored. This study investigates how human communities integrate AI into processes of cultural creation, how AI-mediated outputs diffuse through social networks, and how these interactions reshape collective norms and meanings. Drawing on mixed-methods research spanning experimental psychology, computational modelling, and digital ethnography, we examine three key questions: (1) How do people attribute intentionality and authorship to AI-generated cultural artefacts? (2) How does the presence of AI collaborators alter patterns of cumulative cultural evolution? (3) What novel cultural forms emerge from hybrid human–AI ensembles?

Across a series of behavioural experiments (N=412), participants evaluated human-, AI-, and co-created artefacts. Results show systematic shifts in perceived authenticity, creativity, and

social value depending on the inferred agency of the creator. Agent-based simulations further reveal that introducing non-human generative agents accelerates innovation rates but can reduce diversity when social learning biases remain human-centred. Finally, ethnographic observations of online creative communities highlight the emergence of new cultural norms surrounding transparency, co-ownership, and algorithmic literacy.

Together, these findings position AI not simply as a technological force acting upon culture, but as a participant within cultural ecosystems. Understanding this emerging dynamic is essential for anticipating how future societies negotiate creativity, identity, and meaning in an increasingly hybrid cultural world.

### **Copying beyond necessity: testing overimitation in free-ranging dogs**

*Camilla Mancassola*, Fabio Pensalfini, Sarah-Marshall Pescini, Friederike Range, Giulia Cimarelli

Overimitation, the copying of causally irrelevant actions, is widespread in humans and contributes to the acquisition of social norms in children (Mackie et al., 2024). Although absent in non-human primates (Clay & Tennie, 2017), recent works show that pet dogs overimitate human demonstrators (Huber et al., 2018), especially their caregivers (Huber et al., 2020), suggesting a potential strong influence of previous experience and socialization. Here we investigated whether overimitation also occurs in other populations than pet dogs, free-ranging dogs (FRDs). FRDs are not owned but they live alongside humans in, heterogenous, complex environments, where they frequently observe and learn from them (Cimarelli et al., 2023). As scavengers, they might deploy foraging strategies involving indiscriminate copying to maximize food acquisition; alternatively, they might copy humans selectively, making overimitation non-adaptive in their ecological niche. To test these hypotheses, we conducted a field overimitation experiment in FRDs. Using a randomized between-subjects design (N = 140), dogs in the experimental condition observed a human demonstrator performing a typical overimitation sequence: an irrelevant action followed by a relevant one. FRDs showed no evidence of overimitation: none of the subjects tested with the overimitation sequence interacted with the irrelevant apparatus first. Unexpectedly, dogs did perform the irrelevant action first in the condition where the demonstrator presented the *reverse* sequence (relevant – irrelevant) and where both apparatuses contained food (N = 5). This suggests that FRDs tend to approach the apparatus associated with the most recent action yet ultimately rely on direct food cues to guide their foraging decisions.

### **How Chimpanzees and Children Observe and Learn Tool Use: Insights from Eye-Tracking**

Fumihiko Kano, Louise Mackie, Hanna Schleichauf, Christoph Völter, Ikuma Adachi, James Brooks, Satoshi Hirata, Laura Lewis, Masako Myowa, Natsu Mizuno, Yige Piao, Yukari Tanaka, & *Andrew Whiten*

Human technological culture is vastly more complex than that of other apes, a contrast often attributed to humans' superior ability to faithfully copy others' actions. However the psychological bases of these differences have remained unclear. We therefore used eye tracking to compare how chimpanzees and human children visually attend to, and learn from, a novel tool-use task. Chimpanzees (N = 30) and 3–6-year-old children (N = 119) watched videos of conspecific models operating a "panpipes" device using one of two techniques ('lift' vs. 'poke') before attempting the task themselves. Eye tracking during the demonstrations allowed us to quantify gaze toward key elements of the observable sequence (hand and tool actions;

effects on device and reward release) plus anticipatory looking toward to-be-contacted locations. Both species concentrated their gaze on task-relevant components and showed clear social learning: observing a given technique biased subsequent solutions toward that technique. Thus, chimpanzees, like children, visually accessed all the information required to copy demonstrated actions. However, children more strongly matched the demonstrated technique, viewed the demonstrations for longer, and showed anticipatory looks to relevant contact points before the action unfolded. Chimpanzees showed weaker copying, shorter viewing, and no anticipatory looking. Our findings suggest that visual attention is not the limiting factor in apes' social learning capacities. Instead, deeper motivational and cognitive processes - such as predictive action representations and a stronger social motivation to align with demonstrators - may underpin humans' distinctive strengths in observational learning and the cumulative cultural evolution it enables.

### **Reading between the stones? Intergroup transmission of prehistoric knapping techniques likely required direct social learning mechanisms**

*Vincent Niochet*, Morgan Roussel, Krist Vaesen, Alexander Verpoorte, & Marie Soressi

Prehistoric hunter-gatherer groups left artefacts on the ground in the places they occupied. The visibility and accessibility of these artefacts may have constituted a “library of stones” (Hiscock, 2014) for other groups. According to this hypothesis, prehistoric stone tool artisans could have reverse-engineered the manufacturing procedures of other groups—that is, reconstructed technologies solely through observation of artefacts. However, whether such reverse-engineering of manufacturing procedures was actually possible remains unclear. To examine this possibility, we conducted a reverse-engineering experiment involving 34 experienced stone tool artisans (i.e. knappers). Participants were asked to identify two common and one uncommon knapping techniques based solely on the examination of stone end-products. In nearly all successful tasks (90%), participants were already familiar with the technique they attempted to reverse-engineer, whereas in most unsuccessful tasks (67%), participants were unfamiliar with it. We found a positive correlation between participants' performance and their years of knapping experience, archaeological training, the diversity of archaeological contexts they had studied, and the frequency of their knapping tool use. Overall, the results tend to contradict the “library of stones” hypothesis, as even experienced knappers generally could not reverse-engineer knapping techniques with which they were unfamiliar. Consequently, new techniques were unlikely to be transmitted through reverse-engineering alone. The main implication is that direct social learning mechanisms were likely necessary for the transmission of new technologies among prehistoric cultural groups.

### **Nut-cracking: emergence and social learning of the “know-what” and “know-how”**

*Giacomo Jervis*, Emile Bryon, Cyril Delfosse, Maxime Derex, Kathelijne Koops, Edwin van Leeuwen

Nut-cracking in chimpanzees has become central in the evaluation of complex foraging skills falling within the Zone of Latent Solutions (ZLS). We separated two informational components - “know-what” (recognition of the edible kernel) and “know-how” (tool-assisted nut-cracking) - and asked whether each can arise without conspecific demonstration in naïve, semi-wild chimpanzees. We provided 4 groups with nuts and tools during elongated baselines. Natural emergence and inter-individual observations were recorded at the subject level to analyse diffusion using order-of-acquisition network-based diffusion analysis (NBDA), and using survival models, acquisition rates were evaluated. “Know-what” emerged in all groups. No

individual was observed performing “know-how”. The “know-what” knowledge spread throughout two of the groups, matching more closely with observation networks than with affiliation- or kin-based alternatives, whereas in other groups, the pattern was consistent with asocial discovery. Therefore, food-item knowledge appears individually discoverable under these conditions and socially transmissible but not exclusively, outlining asocial attempting as a mean to discover new food sources. On the other hand, the coordinated sequence of actions required for successful cracking did not emerge, thereby specifying the boundary at which social transmission might be necessary for this cultural behaviour.

### ***When the time is ripe: Foraging behaviour of ARTIS chimpanzees (*Pan troglodytes*) by use of temporal cognition, synchrony cues and environment reliability***

*Frans .T.M van Schaik, J. van Lier, M. Matthezing, K.R.L. Janmaat*

Foraging for short-lived resources such as fruit requires primates to integrate spatial and temporal information to maximise food intake. Anticipating when and where food becomes available demands efficient foraging, particularly in highly competitive environments. We predicted chimpanzees, known for using complex foraging strategies, to rely on temporal cognition - the ability to track fruit ripening intervals - as well as synchrony cues: to track the synchronicity of ripe fruit emergence. We investigated how zoo-housed chimpanzees at ARTIS Zoo learned and applied temporal intervals in a naturalistic foraging enrichment task, using a novel experimental setup and stimulating foraging behaviors e.g. tool use. Using two food types differing in ripening intervals and caloric reward, we examined whether chimpanzees could track time and adjust decisions accordingly. Over time, participants increasingly selected locations associated with ripe fruit at the correct time, demonstrating the ability to track a two-day ripening interval. This provides experimental evidence that zoo-housed chimpanzees can learn short-term temporal intervals, enabling them to anticipate and track cyclical fruit ripening. Support for tracking five-day intervals and the use of synchrony cues was absent. Nonetheless, individual variation in temporal learning and decision-making strategies was observed. Finally, during periods when ripening intervals became unpredictable due to technical irregularities, chimpanzees increasingly chose high-caloric options, suggesting that uncertain temporal patterns drive energy-maximising choices. Altogether, our findings contribute to a growing body of comparative research highlighting the role of temporal memory in primate foraging cognition and its implications for the evolution of complex decision-making.

### ***Drivers of tool use in sanctuary-living bonobos***

*Lara Zanutto, Jake Funkhouser, Erik P. Willems, Crickette Sanz, Zanna Clay & Kathelijne Koops*

Bonobos (*Pan paniscus*) rarely use tools in the wild, however they show an extensive tool use repertoire in captivity. One hypothesis is that social and ecological factors, together with early-life experiences, influence tool use behaviours in sanctuary-living bonobos. We tested the interindividual (i.e., age, sex, rearing history), environmental (i.e., exposure to tools) and social (i.e., tool use exposure) drivers of tool use in a novel experimental extractive foraging task, using a log with holes containing food rewards. Bonobos (N = 48) at Lola ya Bonobo sanctuary (Democratic Republic of Congo) were exposed to the experiment for eight days across two 2-month study periods in 2023. Our results show that adult females used tools significantly more than adult males, and human-reared immatures used tools significantly more than mother-reared immatures. Tool use was highest when tools were provided and inserted into the baited holes rather than on the ground. Previous exposure to the tool use of conspecifics significantly

increased the predicted probability of tool use, particularly in human-reared immatures. Hence, the bonobo tool use culture at Lola ya Bonobo sanctuary arises from developmental biases, tool availability, and social learning opportunities. These results shed light on the factors that have likely contributed to the considerable evolutionary variation in bonobo, chimpanzee, and human cultures.

### **Wild tool-using white-faced capuchins show lower neophobia and higher neophilia than their non-tool-using neighbors**

*Bruscagnin, L.*, Crofoot, M. C., Barrett, B. J.\*, & Goldsborough, Z.\*

\* Joint senior authors

Neophobia and neophilia – repulsion or attraction to novel stimuli – are thought to be important processes in social and individual learning. In this study, we investigate the link of neophobia and neophilia to tool use by directly comparing a tool-using and non-tool-using group of white-faced capuchin monkeys (*Cebus capucinus imitator*) on Jicarón island in Panama. Both groups inhabit the same environment, allowing for direct comparisons of ecological and cultural effects on behavioral variation. We hypothesized that tool-using capuchins would show reduced neophobia and increased neophilia relative to non-tool-using groups, which may have facilitated the emergence of stone tool use alongside their greater terrestriality compared to mainland conspecifics. Alternatively, stone tool use may have helped reduce neophobia by granting access to new, nutritionally valuable foods.

We measured neophobia and neophilia by (i) comparing responses to a novel object (camera traps) and (ii) testing reactions to a familiar food presented in a novel container (sea snails in a trap) using footage from camera traps. In contrast to tool-users, non-tool-using capuchins inspected camera traps less than tool-using individuals and were more neophobic and less neophilic in the snail-trap experiment, exhibiting higher vigilance and never consuming snails.

These results indicate that comparable groups in the same environment differ in neophobia and neophilia, with tool-using capuchins exhibiting more frequent inspection of novel objects and reduced hesitation in novel foraging situations, although the causal relationship remains unsolved.

### **Do social tolerance, age and rank shape neophobia in two macaque species?**

*Théo Lemeux*, Kevin Daviaud, & Charlotte Canteloup

For social animals, access to a novel resource can be a major source of conflict. Neophobia (avoidance of novelty) and neophilia (exploration) refer to behavioral responses to novel stimuli in the environment. Individual and social factors both influence behavioral decisions. Primates live in dynamic and complex societies, and macaques have been classified in a 4-grade scale of social tolerance. Social tolerance has been suggested to be a key precursor to social learning, as it enables greater spatial proximity. To test this hypothesis, we conducted three kinds of experiments in two groups of captive macaques of different social grade: Tonkean macaques, socially very tolerant, and long-tailed macaques, less tolerant. We first assessed social tolerance at individual, dyadic and group levels with a co-feeding task by offering familiar food for 8 sessions to each species. Subsequently, we conducted novel food and novel object tasks to investigate the effects of social tolerance, age, sex, and rank on exploration behaviors. We presented six novel items (three objects and three foods), with 2 sessions per item for each species. Preliminary results show that the more tolerant species co-fed and tended to explore

novel stimuli more and with shorter latencies than the less tolerant species. At the individual level, dominant individuals appeared to be more tolerant than subordinates when sharing food, while juveniles explored more than older individuals, regardless of social tolerance. This study contributes to a better understanding of how social tolerance can promote the emergence and the transmission of novel behaviors in non-human primate societies.

### **The development of tool use in children across cultures**

*Ellen Soeters*, Jake A. Funkhouser, Erik P. Willems, Ardain Dzabatou, Sarah Pope-Caldwell, Crickette Sanz & Kathelijne Koops

Tool use is ubiquitous to all human societies, yet how complex tool use skills emerge and are maintained remains debated. By examining early tool use development in children from different societies, we can assess whether developmental trajectories are universal or culturally variable, offering new insights into the evolution and development of technology. We explored how the engagement complexity (e.g., single item manipulations vs. multi-tool use), social proximity (conspecifics <1m), and object availability (objects <1m) influence tool use development across cultures. We conducted systematic observational video focal follows with children (0.5–5 years) in their natural activities from three communities: BaYaka foragers and Bandongo fisher-farmers (Republic of the Congo), and daycares (Switzerland). Our analyses indicated that culture shapes engagement with tools, with significant variation in complexity between Swiss children and Congolese children. Yet the ontogeny of tool use appears universal, with no significant age-dependent differences in complexity across cultures (Age:  $\chi^2(4) = 30.65$ ,  $p < 0.001$ ). Social proximity did not affect complexity but predicted shorter manipulation durations, suggesting shifts in focus in social contexts. In contrast, object availability did not influence duration but increased complexity, indicating that access to objects, not conspecifics, may facilitate more complex manipulation. Overall, whilst tool use development follows universal age-related patterns, cultural inputs further shape developmental trajectories. This highlights the role of cultural variation in shaping tool use behaviours and offers key insights into the evolution of human material culture.

## **Lightning talks**

### **Transmission biases influencing infant care practices: preliminary results of a scoping review**

*Amanda Tan*, & Sally Street

Understanding how parents make decisions about infant care, particularly regarding infant feeding and infant sleep, are of global health concern because of their implications for maternal health and childhood morbidity. Cross-cultural variation and divergence from biological norms suggest that infant care practices are socially transmitted, but how parents select and utilize social information is poorly understood. Cultural evolutionists have shown that ‘transmission biases’ influence when people use social information, and what sources and types of information are most effectively transmitted. We conducted a scoping review to identify current research relevant to understanding how transmission biases influence parents’ beliefs about and practices of infant feeding and sleep. We found a predominance of studies suggesting that model-based and frequency-based biases strongly influence parental decisions, and identified needs to examine the influence of state-based and content-based biases, and better understand how parents evaluate sources of information.

### **Investigating the cognitive processes and educational experiences supporting tool innovation development**

*Charlotte E.H. Wilks*, Rita Joaquim de Sepulveda, Sarah Wright & Bruce Rawlings

Innovation is a vital component of cumulative culture. Tool innovation – designing new tools and using old tools in novel ways to solve problems – allows the repeated generation of new and complex technologies and is critical to cumulative technological progress. Despite its importance, we know little about the development of tool innovation: children, across diverse populations, are poor at solving tool innovation problems until mid-late childhood. Involvement of a suite of cognitive processes (including creativity, planning, causal/spatial reasoning, and executive functions) – the developmental trajectory of which coincides with that of tool innovation – has been proposed. Educational access and experiences markedly impact these cognitive processes thus may also affect tool innovation development.

We will collect data from eight urban populations, with diverse cultural and educational profiles, using a battery of cognitive tasks to determine whether individual differences in cognitive processes explain the developmental trajectory of 5-11-year-old children’s innovation task performance. Moreover, we will examine the impact of variation in participation in formal education, and markers of school quality, on the development of tool innovation and cognitive processes across cultures.

This project is underway, and we aim to collect data from 150 children per site (N=1200). Our piloted test battery includes cognitive tasks that are simple to administer and score, validated for our age range, and used cross-culturally.

We predict that across populations, individual differences in performance on cognitive measures will correlate with age-related improvements on tool innovation tasks and that better-quality education will positively correlate with tool innovation and cognitive task performance.



**Figure 1.** Map showing the eight urban data collection sites.

## **The effect of the number of task locations on learning opportunities: a proposal**

*EHM Sterck*

Social learning occurs in a social context. In social groups both social tolerance and the number of social learning models determine the learning opportunities. These two intermediaries are affected by features of social structure (te Boekholt et al. 2021) yet may also be affected by the number of locations where a task can be performed. A study on the effect of number of locations (1, 3 or 5) on participation and partner choice with a cooperation task (Zewald et al. MS) indicates clear differences in learning opportunities. More cooperation, but also more [mild] aggression and freeloading, were found at 3 or 5 instead of 1 cooperation location. The most profound effect was found for participation in the task: this was highly skewed to one pair with 1 location and rather equally distributed at 3 or 5 locations. If this difference in participation (cf. tolerance) and difference in partners is also found in other tasks, then in social learning tasks learning opportunities may also be strongly affected by the number of tasks made available in a social group.

## **Do chimpanzees “over-imitate”? A first test with conspecific models.**

*Louise Mackie, Emile Bryon, Edwin van Leeuwen, Andrew Whiten & Ludwig Huber*

“Over-imitation”, copying even causally-irrelevant actions, is said to be a distinctive means through which human culture is transmitted. However, claims of its human-uniqueness stemmed from one single experiment that showed this form of copying to be lacking in some juvenile chimpanzees, yet routine in human children. The investigation of over-imitation in chimpanzees terminated here – twenty years ago – while for children it continued to boom within the developmental psychology literature. Because the original study was based on one-on-one interactions with a human model, the present study has reinvestigated over-imitation in chimpanzees, in a more species-specific context (N=23). Tests took place in two large outdoor enclosures in an African sanctuary. One group was presented with a trained demonstrator using both causally-irrelevant and causally-relevant actions to obtain food from a novel

apparatus with a stick tool, while another group had no trained model. We hypothesised that chimpanzees would use more causally-irrelevant actions in the group with conspecific demonstrators. Preliminary results support the influence of a conspecific demonstrator on chimpanzees' use of causally-irrelevant actions, particularly in the action's use across multiple trials in the demonstrator group when compared to the no-demonstrator group.

## Posters

### **Thinking Like a River: Mapping Changes in Human-River Relations in Trooz, Belgium Post-2021 Flooding**

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Focusing on the devastating 2021 floods in Trooz, a municipality in the province of Liège, we explore how the event's lasting effects have reshaped the area into a feral ecology (Tsing et. al 2020) that has emerged through damaged infrastructures, altered river dynamics, and interactions between human and nonhuman forces. We understand the river as the main actor in the process that transformed the city into a critical zone (Latour and Wiebel 2020).

Our fieldwork allowed us to trace how infrastructures, bridges, roads, homes, and riverbanks became active agents in the disaster, shaping water pathways and generating unexpected feral processes such as debris movement, sediment redistribution, spontaneous vegetation regrowth, and the movement of living beings - both people and other organisms. At the same time, water also plays a crucial role, and it is precisely the interaction between water and built infrastructures that drives this process of becoming feral.

Water here emerges as the principal actor in this process: human-made structures not only failed to contain it but also interacted with it in ways that shaped the unfolding ecological event. Currents, soils, debris, and plant species engaged with infrastructure, producing unexpected feral processes and challenging assumptions of human control. In this presentation, we seek to show how Trooz becomes an ethnographic example of how global climate disruptions materialize locally as multispecies entanglements, infrastructural fragility, and ongoing ecological change. Understanding Trooz as a critical zone provides insight into how water, in interaction with infrastructures and more-than-human forces, shapes landscapes as they navigate the material realities of the Anthropocene.

### **Comparative Analysis of Trial-and-Error Learning in Companion Cats and Dogs Using a Transparent-Obstacle Detour Task**

*Muhzina Shajid Pyari, Kata Vékony, Stefania Uccheddu, Péter Pongrácz*

This study investigated cognitive flexibility and trial-and-error learning in companion cats and similarly sized dogs using a standardized detour paradigm involving a V-shaped transparent wire-mesh fence. The objective was to assess species-specific problem-solving strategies under identical conditions. A total of 53 cats and 38 small dogs were tested indoors in three consecutive 1-minute trials. Subjects were randomly assigned to one of three treatment groups: (1) control (no cue), (2) straight laser-pointing (projected directly toward the reward), or (3) detour laser-pointing (mimicking a curved path around the obstacle). Laser demonstrations were conducted by the experimenter, while owners remained passively present. A trial was defined as successful if the animal reached the reward within 60 seconds by detouring around the fence.

Behavioral data were coded from video recordings and analyzed using mixed-effects Cox regression and Wilcoxon signed-rank tests. Dogs reached the reward significantly faster than cats (Hazard Ratio = 5.86;  $p < 0.0001$ ) and showed significant improvement across trials (Trial 3 vs. Trial 1:  $p = 0.0024$ ). In contrast, cats showed no significant learning effect over time ( $p = 0.42$ ). Detour direction analysis showed that 83% of dogs repeated their successful path in later

trials, while cats chose sides randomly regardless of previous success. Laser demonstrations had no significant effect on detour success, latency, or side choice in either species ( $p > 0.25$ ). Additionally, referential looking behavior (turning back toward the owner) was observed in 34% of dogs and only 9% of cats, suggesting greater social reliance in dogs.

These findings highlight distinct ethological patterns in learning and spatial reasoning. Dogs demonstrated stronger reliance on prior experience and owner presence, while cats exhibited flexible, less repetitive strategies consistent with solitary predatory behavior. Importantly, the observed species differences can be interpreted as ecology-focused problem-solving strategies shaped by each species' socio-ecological niche and everyday experiences within human households. In this sense, individual learning trajectories reflect not only cognitive capacity but also culturally mediated exposure to human-guided problem-solving contexts, where repeated interaction histories may scaffold or constrain how animals approach novel challenges. The detour paradigm proves effective for assessing cognitive traits in cats, supporting its application in future ethological research, human–animal interaction studies, and adaptive animal–machine interfaces. Understanding species-specific problem-solving behaviors provides practical implications for designing interactive technologies and intelligent systems that accommodate diverse cognitive styles in domestic animals.

### **The Pan-to-mimic effect: Are chimpanzees facilitated into socio-positive behaviors by their group-members?**

*Christos Karoulis*, & Edwin J. C. van Leeuwen

Social cultures have been proposed to shape non-human primate societies, referring to socially learned and transmitted patterns of interaction — for example, typical rates of aggression, allogrooming, or social play. However, if such group-level “cultures of everyday life” are to be more than descriptive differences in observed frequencies, they must be propagated and stabilized by identifiable social transmission mechanisms. One plausible candidate is behavioral contagion, in which observing a conspecific increases an individual's probability of performing the same behavior, potentially amplifying local interaction norms over time. Contagion has recently been reported for allogrooming and social play in chimpanzees, but further research is needed to test its generalizability on different groups and with different methodologies. For this reason, we observed two chimpanzee groups and applied a newly reported methodology relying on simulations, GLMM modeling and two-proportion z-tests to test for behavioral contagion in the same chimpanzee behaviors. We then explicitly checked for an alternative underlying mechanism (stimulus enhancement) that could produce spurious contagion-like patterns. Chimpanzees closely observing a behavior had a higher likelihood of adopting it, favoring the behavioral contagion scenario. Yet, observing in general did not affect this likelihood. This could not be due to stimulus enhancement since post-observation behaviors did tend to match the observed behaviors. Thus, we propose a more nuanced form of contagion where individuals can be triggered by, yet inhibit the replication of, observed behaviors. Our findings suggest that chimpanzee groups could differ in how susceptible they are to cultural influence in the frequencies of typical behaviors.

## **Self-regulation and sociality in zoo-housed chimpanzees and bonobos**

*Georgia Sandars*, Elizabeth Warren, Raphaela Heesen, Jake Brooker, Annika Paukner, Josep Call, Zanna Clay

Self-regulation—the ability to control one’s behaviour, attention, emotions and cognition— can determine the fundamental ways in which we relate to others, and impacts how and when behaviour and information spread through a group. However, little research has addressed how self-regulation impacts socio-emotional functioning in primates. In this study, we investigate chimpanzee and bonobo self-regulation within the context of social competence, in two captive groups ( $N=12$  chimpanzees at Edinburgh Zoo; and  $N=10$  bonobos at Twycross Zoo). We assessed self-regulation skills using two behavioural experiments (a delayed gratification task and a social inhibition task), alongside social behavioural observations to assess dominance relations and social network dynamics. We analysed behaviours the apes used during different phases of the experiments, creating an ethogram of behavioural strategies. We found that an increase in repetitive, self-directed, and self-distraction behaviours were all associated with improved task performance, challenging assumptions that these behaviours are only maladaptive. We then studied how differences in self-regulation strategies and success corresponded to social dominance and social integration. The individuals who performed best on the self-regulation tasks were medium-ranking, although there was no overall relationship between self-regulation and social integration. Patterns of results in the two groups of apes were very similar. Understanding how self-regulation relates to social behaviour patterns can further our understanding of the socio-cognitive processes that underpin cohesive and knowledge rich communities, and can offer an important comparative perspective on the evolutionary underpinnings of cultural behaviour.

## **Temporal dynamics of an innovation arms race between an urban adaptor species and local residents**

*Michael Chimento*, Edwin Dalmaijer, Barbara C. Klump, & Lucy M. Aplin

Human wildlife conflict can occur when animals learn to exploit novel resources in human-modified environments. Over the last decade, residents of Sydney have reported increasing cases of bin-opening behavior by sulphur-crested cockatoos (*Cacatua galerita*). Residents have responded by protecting their bins using a variety of strategies, although cockatoos are reported to have learned to defeat these protections. In response, residents have escalated protection strategies, creating the conditions for a behavioral arms race. We investigate this arms race by combining field observations with agent-based modeling. Documenting protections over two years reveals spatial clustering of protections indicative of social learning among residents. We find that protections have decreased since 2019, and overly-costly protection is dis-preferred. With a controlled assay, we identified several cockatoos that can defeat high-efficacy protections, such as locks. Using an agent based model, we simulate interactions between learning agents representing households and cockatoos. We find that social learning accelerates adaptation in both species, and coordination between households reduces costs associated with defensive escalation. We simulate policy interventions and find that these can unintentionally accelerate cockatoos' skill acquisition. Our study gives more insight into an on-going innovation arms race, and illustrates the importance of considering behavioral feedback loops for developing strategies to manage human-wildlife conflict.

## **Experimental tests of cognitive skills and abilities in wild sulphur-crested cockatoos (*Cacatua galerita*)**

*Dorepalli, Shefali, & Aplin, Lucy M.*

Group typical behaviours that constitute animal culture, such as the spread of foraging innovations, have been linked to cognitive abilities and fundamental skills such as spatial memory and social learning. Individual variation in animal cognition studies has often been treated as 'noise' about a typical behaviour for a population or species. The study of this intra and inter-individual variation, particularly in the wild, may provide insight into how certain cognitive behaviours develop and the intrinsic (e.g. sex, age, rank) factors that shape them. We investigated individual variation in cognitive performance and motor skills in a wild population of sulphur-crested cockatoos (*Cacatua galerita*). First, we explored the effect of age on motor skill proficiency, using a string-pulling task. We found age-based differences in solving time and techniques employed, suggesting that adults have increased motor skill proficiency. Second, we explored the effect of rank and individual variation in aggressive behaviour on inhibitory control ability - the suppression of an impulsive behaviour. We found no direct correlation between rank and inhibitory control. However, we found that lower inhibitory control ability is correlated with the likelihood of engaging in, and winning, more aggressive interactions. Finally, we investigated individual variation in object permanence ability using a three-cup design, wherein a reward is hidden under one opaque cup, then moved sequentially between three opaque cups. We found that over half of the tested individuals were able to locate and track hidden objects. These tests provide an insight into the development of cognitive abilities in wild, urban-adapted animals.