## Baerends Presentation

### Life in a Noisy World: How Animals Use and Respond to Sound

**Andy Radford**

*Behavioural Ecology, School of Biological Sciences, University of Bristol*

The world is full of sounds arising from a variety of sources. In this talk, I will explore how the behaviour of animals is influenced by their acoustic environment. I will begin by considering the use of vocalisations to mediate both cooperative acts and conflict situations. I will then discuss how sounds produced by other species, including the noise generated by our own activities, can affect wildlife. Finally, I will suggest how we might mitigate the impacts of anthropogenic noise and use sounds to help with ecosystem restoration.

## Dobberke Presentation

### Geographic variation in social behaviour and species interactions – is it time to move beyond our study sites?

**Rose Thorogood**

*Helsinki Institute of Life Science, University of Helsinki*

One of the requirements for conducting high-quality behavioural biology experiments in the field is choosing a good study site with lots of individuals that are easy to find. But does this provide us with the full picture of why individuals vary and how behaviour evolves? In this talk I'll present work exploring how social interactions drive information use and affect individual responses to selection pressures and discuss why we need to move beyond 'easy' study sites to understand how changing ecological environments and social behaviours might affect species interactions in the future.

## Keynote Presentations

### Sounds of emotion: Exploring vocal emotions and auditory enjoyment in animals

**Buddhamas Pralle Kriengwatana**

*Department of Biosystems, KU Leuven*

Can animals express "happiness" through sound, and do they enjoy listening to sounds? Animal vocalizations have long been considered a means of communicating emotions, but recent advances in emotion frameworks and sound analysis have deepened our understanding of how emotions are vocally encoded in birds and mammals. Animal emotions are typically measured along two dimensions: valence (positive or negative) and arousal (high or low excitement). While acoustic correlates of arousal are consistent across species, how emotional valence is encoded remains less understood. Animals also respond emotionally to vocal and non-vocal sounds, yet it is not clear what and when listening induce positive emotional states and any evolutionarily significance this response

could have. In this talk, I will present our ongoing research on vocal emotional expression in birds, explore their potential enjoyment of sounds, and discuss how this might have shaped behaviors like avian courtship songs.

## Understanding the roots and fruits of our primate brain: How can it help us tackle future challenges?

**Karline Janmaat**

*Department of Cognitive Psychology, Leiden University; ARTIS Amsterdam Royal Zoo; Institute of Biodiversity and Ecosystem Dynamics, University of Amsterdam*

Humans are primates and equipped with traits that can help us find fruit. We have hands that can grasp to climb trees and feel the ripeness of fruit, eyes that can see through the canopy to spot them, and a nose that can smell ripe fruit from a hundred meters away. In addition, we have the cognitive abilities, to make mental representations, and help us acquire widely distributed and hidden fruit. In this presentation, I discuss how behavioural studies and detailed ecological knowledge can inform us about the cognitive traits that humans and our closest relatives use to find food to eventually better understand the evolutionary roots of our cognition. A prerequisite for such a comparative study is to know the fruits of the primate brain - the extent of each species' cognitive ability - which likely develops differently depending on the environment. Because we doubted whether WEIRD people are the best population to inform us on the extent of human's cognitive capacities we investigated the foraging cognition of contemporary hunter-gatherers, the BaYaka, in the Republic of Congo. I will discuss evidence of their exceptional orientation abilities, their botanical knowledge as well as their perception of, and use of music during foraging. Tropical forests are disappearing at a rapid rate, which has large consequences for our climate, biodiversity, and planetary health. With these forests, we also lose yet undiscovered knowledge of the evolutionary origin and function of our cognition and resulting behaviours, making their conservation even more important. I will end with a sum up of cognitive traits that we share with our closest relatives and explain why I think that a better understanding of the roots and fruits of our primate brain could help us deal with future challenges.

## The role of behavioral traits in shaping emergent properties in ecology and evolution

**Thomas Blankers**

*University of Amsterdam*

Behavioral traits mediate interactions among organisms of the same kind, such as e.g. in sexual interactions, as well as among organisms of different kinds, such as e.g. in predator-prey or host-microbe interactions. Behaviors therefore directly contribute to the emergent composition of groups of individuals at widely different scales: from social, sexual pairs to complex biological communities. Behaviors also allow organisms to select their (social/abiotic/etc) environment based on how they and their offspring (will) perform in such an environment Behavioral traits thereby influence the exposure of an organism's phenotype to natural selection. Drawing from examples on my research on sexual communication and host-microbe interactions in the context of speciation and community

evolution, I will argue that behavior and behavioral plasticity are of foundational importance in these emergent ecological and evolutionary phenomena.

# Oral Presentations

## Round-the-Clock Monkey Monitoring: Automated Video monitoring of group-housed macaques

**Tim-Joshua Andres**[1], Edwin J. C. van Leeuwen[1]

[1]*University of Utrecht*

Recent advancements in computer vision have significantly transformed the analysis of behaviour, allowing for detailed and remote monitoring of animals while being less invasive and more scalable. We present an instance segmentation model designed for use at the Biomedical Primate Research Centre (BPRC) to detect, track, and identify group-housed long-tailed macaques using a multi-camera monitoring system. This model facilitates automatic, continuous (24/7) tracking of animals in their enclosure and provides high-resolution behavioural data. We explore the potential applications of this technology in colony management, including monitoring feeding and nocturnal activity on a group level. The results underscore the potential of adapting existing tools to automate monitoring of primates living in captivity and enabling continuous long-term monitoring. Scaling such systems fosters the potential to gather more comprehensive datasets and refining husbandry and research.

## Ultrasonic serenades

**Cynthia Bom**

*Vrije Universiteit Amsterdam*

Crickets emit a wide range of frequencies, some extending into the ultrasonic spectrum. While most studies focus on the intraspecific effects of these sounds, few explore the cross-taxa impact of the created soundscape on insectivorous bats reliant on ultrasonic echolocation to capture their prey . Since sensory environments are known to have strong potential for structuring animal behaviour and distribution, we intend to (A) map the ultrasonic environment created by Tettigoniidae species, and asess their contributions across spatiotemporal gradients, and (B) investigate if these ultrasonic chorusses degrade the foraging habitat for aerial hawking bats by distracting and/or masking their calls, thus carving out an enemy reduced space for flying insects to exploit. Via acoustic monitoring across seasons and habitat types, and through playback experiments, we will elucidate the contribution of ultrasonic insect chorusses to the acoustic environment and how this affects bat foraging.

## Understanding the unique predation strategy of a stalking predator (lionfish, *Pterois miles*)

**Davide Bottacini**[1], Carien Noordman[1], Victor Renaud[1], Marije Ridder[1], Emil Bathow[1], Alexander Kotrschal[1]

[1]*Behavioural Ecology Group, Wageningen University and Research*

Predation strongly shapes animal evolution. Lionfish are voracious predators and highly invasive marine fishes; native to the Indo-Pacific Ocean, they colonised the Western Atlantic Ocean and Caribbean and, more recently, the Mediterranean Sea. Lionfish are among the most effective predators and this partly explains their success as invaders. Lionfish stalk their prey with flared pectoral fins until they reach a distance that allows them to strike and catch them within a fraction of a second. The mechanisms preventing prey to react to a slowly approaching lionfish and flee from it remain enigmatic. We tested the hypothesis that lionfish avoid detection through camouflage by background matching. We also investigated the function of the jets of water that lionfish blow at their prey while approaching them. We conclude that blowing jets of water at their prey increases lionfish hunting success. Further investigation is needed to understand what determines lionfish background preference.

## Comparison of aggression frequencies and patterns between chimpanzees (Pan troglodytes) and bonobos (Pan paniscus) in zoo settings

**Emile Bryon**[1], Tom Roth[1], Jonas Torfs[2,3], Edwin J. C. van Leeuwen[1,4], Nicky Staes[2,3]

[1]*Animal Behaviour and Cognition, Department of Biology, Utrecht University;* [2]*Behavioural Ecology and Ecophysiology Group, University of Antwerp;* [3]*Centre for Research and Conservation, Royal Zoological Society of Antwerp;* [4]*Department for Comparative Cultural Psychology, Max Planck Institute for Evolutionary Anthropology, Leipzig*

Differences in aggression between bonobos (Pan paniscus) and chimpanzees (Pan troglodytes) have hitherto been depicted in terms like the “peaceful” bonobo, with socio-sexual intragroup behaviours and amicable inter-group contacts, and the “violent” chimpanzee, with coalitionary intra-group killings and warlike inter-group conflicts. Yet, recent ambiguity in findings begs for more standardized comparisons of human’s closest relatives. We conducted a comparative analysis on twenty-two groups of zoo-housed chimpanzees (9 groups, N=101) and bonobos (13 groups, N=88) and found no evidence for species differences regarding aggression rates. The Pan species only differed in sex-based aggression patterns, as male-to-female aggression was more pronounced in chimpanzees, while female-to-male aggression was more common in bonobos. These findings offer novel insights for understanding the evolutionary roots of aggression and inform future captive population management strategies.

## Signalling in the city – the effects of urbanisation on insect anti-predator strategies

**Emily Burdfield-Steel**[1], Daphne Jillings[1], Rachel Engelkes[1], Larissa Hijzelendoorn[1], Sterenn Efflam[1], Jona van Delft[1]

[1]*University of Amsterdam*

Urban environments represent a stark challenge for many animal species, altering not only abiotic factors such as noise, light, and chemical composition, but creating very different communities and species assemblages than rural habitats. These changes are all likely to impact the effectiveness of anti-predator signalling, including aposematism (the use of conspicuous signals to advertise

unprofitability to predators). Using a combination of field experiments and large-scale monitoring data we found that urbanisation may act as a filter – disproportionally impacting brightly coloured lepidopteran species – and that this may, in part, be explained by reduced predator avoidance of aposematic colours in urban areas. Finally, using newly emerging techniques in both metabarcoding and AI image analysis we are starting to examine this question from a predator, as well as a prey, perspective to truly understand how urbanisation impacts predator-prey interactions.

## The effects of light pollution on migratory three-spined sticklebacks

**D. M. Crowley**[1,2] , H. Slabbekoorn[1,2], C. Tudorache[1,2]

*[1] Institute of Biology, Leiden University; [2]Bioclock consortium*

Light plays a key role in the functioning of many behavioural and physiological patterns in fish. However, light follows daily and seasonal rhythms in which the duration and intensity changes, meaning fish must rely on the biological clock's "connection" to the external environment to interpret and respond to changes. Dependency on rhythms raises concerns for the impact of light pollution on the biological clock as it may disrupt these rhythms, negatively impacting behaviour and physiology. This is concerning for migratory fish as natural cues related to migration may be masked, influencing energy expenditure and migration success. Using field and lab studies, we investigate the short-term consequences of light on swimming physiology and behaviour of three-spined sticklebacks.

## Artoo-Detoo: What imitating a Star Wars droid reveals on allospecific vocal imitation in parrots and starlings

**Nick C.P. Dam** [1,2], Henkjan Honing [3,4], Michelle J. Spierings [1,2,5]

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Vocal imitation is a hallmark of complex communication in animals, yet the mechanisms driving species differences remain poorly understood. We compared imitation accuracy between nine parrot species and European starlings based on imitation of monophonic and multiphonic sounds, produced by the Star Wars droid R2-D2. We demonstrate, for the first time, that differences in syrinx anatomy, rather than cognitive or perceptual capacities, underlie species-specific variation in imitation accuracy. Contrary to traditional expectations, smaller-brained parrots outperformed larger-brained species in monophonic sound imitation. These findings challenge assumptions that brain size is directly linked to imitation accuracy and offer insights into the evolution of complex communication. We used citizen science to create a uniquely large dataset of species imitating the same source, demonstrating the powerful potential of this approach to broaden research in comparative cognition and vocal learning.

## Don't scream when you see sharks! Reducing visitor noise in a public aquarium

**Jozefien Demuynck**[1], Hans Slabbekoorn[1], Stephan Lugthart[2], Demi Kuhne[1], Ionica Smeets[1], Pedro Russo[1]

*[1]Leiden University; [2]Blijdorp Rotterdam Zoo*

Man-made noise can affect animal physiology and behavior. In public aquariums, elevated background noise is often present due to pumps and filtration systems, but visitors are another source of noise potentially impacting animals. On the other hand, elevated noise levels may also negatively affect the visitors' experience, including noise caused by visitors. Mitigation strategies could be in place at zoos and public aquariums to reduce negative visitor behavior, yet their effectiveness is often understudied. In this study, the effectiveness of 4 different types of signage and the use of an audio message was tested in reducing visitor noise at the Oceanium of Rotterdam Zoo. Decibel meters were installed to measure ambient in-air noise levels. Additionally, surveys were conducted to ask visitors about their experience. Data analysis is still ongoing, but preliminary results indicate that signage was not effective in reducing visitor noise, and it even may have had an opposite effect.

## Variation and Flexibility in the Thermoregulatory Behavior of Temperate and Tropical Adult Moth (*Lepidoptera*) Communities

**Ella Kennedy**[1], Wouter Halfwerk[1], Liliana D'Alba[2], Matthew Shawkey[2]

*[1] Vrije Universiteit Amsterdam; [2]Ghent University*

Moths (*Lepidoptera*) are a diverse and widespread group of animals that encounter a range of environmental conditions, with their ecology and behavior influenced by a changing climate. Most moth species are nocturnal and generate heat endothermically prior to take-off and during flight. Warming up is typically necessary, as their muscles must be sufficiently warm to contract at the higher speeds and with the greater force needed for flight. This study investigates variations in behavior related to heat generation and cooling rates in temperate and tropical moth communities sampled across the Netherlands and Barro Colorado Island, Panama. We also examine how these communities adapt their warming strategies in response to artificially varied ambient temperatures. This research provides insights into the variability and flexibility of thermoregulatory behaviours and enhances our understanding of how adult moths adapt to diverse and changing environmental conditions.

## Peering into the unknown: an indicator for social learning of food processing tasks in Chimpanzees

Lotte L. Koot[1], Edwin J. C. van Leeuwen[2], Caroline Schuppli[3], Bryndan O. C. M. van Pinxteren[1], Jorin Veen[4], Kavel C.D. Ozturk[1], Karline R.L. Janmaat[5,6]

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When peering, animals gaze towards another individual, within a close range that enables detailed observation of the actions performed. Peering behaviour is observed in multiple primate species and is validated as an indicator for social learning in orangutans (Pongo spp.). However, detailed data on peering behaviour of chimpanzees (Pan troglodytes), especially in the foraging context is missing, as well as an understanding of its function. Here, a total of 561 feeding bouts of chimpanzees in ARTIS Zoo were analysed, showing heightened peering probabilities towards chimpanzees eating novel food items, relative to familiar food items. Additionally, a Network Based Diffusion Analyses showed that peering decreased the latency of exploring the precise act of leaf-swallowing. Furthermore, peering probabilities were higher towards dominant individuals. Our study adds to the growing evidence that peering can be used as an indicator for social learning, but may also serve other functions.

## Socio-ecology drives adaptive social foraging dynamics in the wild

**Alexander Schakowski**[1], Dominik Deffner, Raine Kortet, Petri Niemelä, Marwa Kavelaars, Christopher Monk, Maria Pykälä, Ralf Kurvers

*Center for Adaptive Rationality, Berlin*

Overcoming the challenges involved in foraging for a broad omnivorous diet are among the main drivers of the evolution of human cognition. However, research on human foraging has largely overlooked the mechanisms driving decision–making in the wild. Inspired by biologging methods from animal ecology, we equipped large groups of human foragers during ice fishing competitions with GPS and cameras to quantify their spatial position, behavioral states, social environment and foraging success. Analyzing over 500 foraging trips and 15,000 spot choices, we disentangle the role of personal and socio–ecological information on spatial and inter–temporal choice, showing that social information affects spatial search but not patch–leaving decisions. Tracking individuals across environments reveals stable inter–individual differences in foraging behaviors and adaptations to environmental gradients.

## Despotism enhances cooperation in macaque societies

**Jorg Massen**[1], Tonko Zeilstra[2], Tom Roth[1], Edwin van Leeuwen[1], Debottam Bhattacharjee[3]

[1]Animal Behaviour & Cognition, Utrecht University; [2]Cognitive Psychology, Leiden University; [3]Centre for Animal Health and Welfare, City University of Hong Kong.

The interdependency hypothesis for the evolution of cooperation brings together recent data on enhanced cooperation among individuals interdependent at the group-level, in for example cooperative breeders, and among individuals interdependent at the dyadic level, in for example hierarchical societies. Yet comparative data to test this premise are so far lacking. Here, we report on a study on cooperative and prosocial tendencies of >100 individual macaques, living in 10 different groups, and importantly from 6 different macaques species that vary in their degree of despotisms. We find that prosociality motivates cooperation, and that despotic species cooperate more. Further, our data suggest that among the despotic species cooperation is more specific than among egalitarian, centred around only a few partners. Agent-based models back up these restricted relations, yet also highlights better stability in these hierarchical societies, which may explain the enhanced cooperation.

## The Bare Necessities: Creating social networks of long-tailed macaques (*Macaca fascicularis*) using a minimal amount of domain-specific data

**Arja Mentink**[1], Ronald Poppe[1], Edwin van Leeuwen[1]

[1]*Utrecht University*

The analysis of social networks (SN) provides important information on both wild and captive populations, because they reveal patterns of interactions, relationships, and social structures within groups. Currently, creating SNs often requires manual observations, which comes with several limitations. We explore the use of AI methods and limited manual labelling to automatically generate a SN of a group of long-tailed macaques from video data.

Our results show that an accurate detection model (MAP50 > 90%) can be trained with as few as 500 training instances. While identification accuracy is higher than chance (F1-score = 0.25 > 0.08) after training on 6,345 instances, more data are needed to create SNs automatically. Nevertheless, we showcase that with a better model this automation approach is possible.

This study contributes to automatic monitoring of macaques housed in captivity, which allows us to detect changes in the SN more readily which can have positive welfare consequences.

## Emotionally arousing software hacking is socially learned in long-tailed macaques

**Connor Proudfoot**[1], Paula Escriche Chova[1], Dian Zijlmans[1], Eythan Cousin[1], Tom Roth[1], Edwin de Laat[1], Edwin van Leeuwen[1], Sophie Waasdorp[2]

[1] *Utrecht University;* [2] *Biomedical Primate Research Centre, Rijswijk*

In humans, emotions underpin many behaviours and culture, yet their influence on cultural dynamics in non-humans remains largely theoretical. To better understand the evolution of human culture, it is crucial to investigate how emotion influences social learning in non-human primates. Here we document the diffusion of a novel touchscreen manipulation by long-tailed macaques, who learn to hack the software. Network-based diffusion analysis revealed touchscreen hacking was learned through observation. Thermal imaging revealed elevated emotional arousal immediately after a crash, indicated by increased nasal temperatures, a marker of autonomic nervous system activation. Our results emphasise the importance of studying the social learning of behaviours that trigger emotional arousal, providing novel insights into the origins of human socio-cultural behaviours. With evidence in distantly related primates, this phenomenon may have deeper evolutionary origins than previously recognised.

## Fruitful connections: a multi-site exploration of the impact of fruit availability and age-sex class on orangutan (Pongo spp.) sociality

**Tom S. Roth**[1] , Maria A. van Noordwijk[2] , Serge A. Wich[3] , Caroline Schuppli[2]

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Food availability fluctuates over time and space, and consequently animals may adjust their group size to reduce competition. Furthermore, costs of competition may vary between individuals, depending on their age-sex classes. Orangutans, who are primarily solitary but occasionally form temporary associations, provide an intriguing case for studying this phenomenon: their arboreal lifestyle results in high travel costs and they often experience fruit scarcity. Our study combines daily focal data from three Sumatran (Ketambe, Sikundur, Suaq) and one Bornean site (Tuanan). Initial analysis of daily party size data with zero-altered gamma models suggests a positive association between fruit availability and probability of party formation in all sites except for Suaq. Moreover, sociality differs between age-sex classes, although these differences seem to vary between sites too. These preliminary findings imply that orangutans adapt their social behaviour to local fruit availability.

## Social complexity and communicative repair: a comparison across three primate species.

**Anne Marijke Schel**[1], Stephanie Kordon[2], Axelle Bono[3], Juliette Aychet[4], Alban Lemasson[5],

*[1]Utrecht University; [2]Durham University; [3]Zurich University; [4]University of Paris Nanterre; [5]University of Rennes*

Animals living in complex social societies face relatively high levels of uncertainty that may require specific communicative strategies. One is the use of communicative repair through persistence and elaboration. Although both are forms of self-initiated repair in response to communicative failure, elaboration is considered the more flexible and cognitively complex form expected to occur more in complex social societies. We investigated communicative repair in the intraspecific gestural communication of three captive primate species differing in social complexity: rhesus macaques, long-tailed macaques, and red-capped mangabeys. Compared to the macaques, the mangabeys showed higher levels of repair, but no differential use of persistence and elaboration. Our results show that communicative outcomes are more uncertain in more complex social societies. However, they do not support the idea that more cognitively complex forms of repair are more prevalent in such societies

## From individual differences to speciation: Personality-dependent timing of maturation as a mechanism for reproductive isolation?

**Alexander A. Schlatmann**[1] & Marion Nicolaus[1]

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While the emergence of personality variation is well understood, its eco-evolutionary implications remain unclear. We investigated how personality variation may contribute to speciation by testing the link between personality differences and reproductive timing. If associated, these traits could drive assortative mating and reproductive isolation. We conducted an experiment on three-spined sticklebacks adapted to different environments (land-locked resident and anadromous populations, isolated for ~55 generations). Males of known personality were exposed to two temperature

treatments, and their sexual maturation was monitored over three weeks. Our results will reveal how individual and population differences in activity and aggression correlate with differences in nuptial colouration and the timing and flexibility of sexual maturation. This study fills a critical gap in understanding how personality-linked differences in maturation may promote assortative mating upon secondary contact.

## Aggressiveness is repeatable in hand-raised greylag goose (*Anser anser*) goslings

**Danyang Shi** [1], Andrew C. Katsis [2,3], Sonia Kleindorfer [2,3]

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Animal personalities, defined as consistent among-individual behavioral differences, are the result of life-history trade-offs and have important fitness implications. While much personality research has focused on adult animals, juveniles are often overlooked. Here, we investigated whether aggressiveness is a consistent trait in greylag goose (*Anser anser*) goslings across time and contexts. We quantified aggressiveness across gosling development using a combination of experimental (mirror simulation test) and observational (agonistic interactions) approaches. We found that both measures of aggressiveness were significantly repeatable over time, although there was no significant correlation between these two measures. Our results suggest that personality traits are present even in early development and highlight the importance of considering juvenile-specific behavior and ecology when designing personality experiments.

## Do migration strategies predict responses to a novel environment in noctule bats?

Theresa Schabacker [1,2], Sofia Rizzi [3,4], Tobias Teige [5] , Uwe Hoffmeister [6] , Christian C. Voigt [2], **Lysanne Snijders** [2,7]

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The decision to migrate impacts both individual fitness and ecosystem connectivity, yet we know very little about the behavioural correlates of migration strategies. Studying such correlates is the first step to identifying the behavioural causes and consequences of migration. Here, we took advantage of a partially migratory species, the common noctule bat, and a unique measure of acoustic exploration to test potential correlations between migration strategy and small-scale emergence and exploration. We found that local individuals were likelier to enter a novel environment than migrants and that migration strategy did not predict acoustic exploration. This is the first study examining novel environment responses and migration in bats and reveals contrasting

behavioral correlates of migration compared to other taxa. Our research, therefore, highlights the importance of including more non-model species in the study of the causes and consequences of animal migration.

## The evolution of between-sex bonds in primates: a conceptual framework

**Elisabeth H.M. Sterck**[1,2], Catherine Crockford[3], Julia Fischer[4,5,6], Jorg J.M. Massen[1,7], Barbara Tiddi[8], Susan Perry[9], Cédric Sueur[10], Oliver Schülke[5,11,12], Julia Ostner[5,11,12]

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In large primate groups, social bonds among males and females are found. Bonds may allow individuals access to crucial resources and services that cannot be taken by force and are therefore subject to leverage. We use theoretical considerations to explore when sources of leverage over the opposite sex lead to between-sex bonds. We predict leverage over the other sex when 1) the receiver benefits on average more than the provider, 2) receivers cannot share the resource, and 3) the resource is rare and valuable. We expect bonds 4) when long-term targeting of the same partner yields benefits. We argue that a female's main source of leverage is mating access, whereas males mainly exert leverage over females in terms of protection of females and offspring. Bonds between the sexes are expected in a limited number of circumstances. While a systematic test is hampered by the dearth of data on species lacking between-sex bonds, the available data are consistent with our conceptual framework.

## Evaluating wildlife rehabilitation: Do recovered gulls thrive when returned to nature?

**Tine Uytterschaut**[1], Reinoud Allaert[1], Luc Lens[1,2], Frederick Verbruggen[1,3]

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As human activities expand into wildlife habitats, interactions between humans and wildlife are increasing, often with negative consequences for wildlife. Wildlife rehabilitation provides temporary care for injured animals, preparing them for reintroduction to their habitats. However, questions about its effectiveness remain, necessitating evaluation of these resource-intensive efforts. This study compares survival rates of color-ringed rehabilitated Herring and Lesser Black-backed Gulls with wild individuals from a nearby population using a Burnham joint model. Although survival probability was significantly lower for released individuals, the effect size was small, with survival rate differences of less than 2% beyond the first three months post-release. By providing critical

insights into survival outcomes, this research emphasizes the value of rehabilitation as a conservation strategy that can contribute positively to preserving wildlife populations in human-dominated landscapes.

## Is it about information? What drives individual differences in exploration behavior?

**Dimphy van Boerdonk**[1], Filippa Erixon[2], Melanie Dammhahn[1]

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Exploration is one of the most widely studied animal personality traits and is assumed to help animals familiarize themselves with the environment or gather information. The behaviour is often measured by movement within a novel environment, but the link with information gathering is not always clear, as several other factors also influence movement behaviour. We aimed to disentangle interactions with information from other drivers of movement within a novel environment. A total of 76 bank voles (Myodes glareolus) were allowed to explore a multicell maze two times for 15 min. Bedding in two central cells served as a potential non-novel source of information. We assessed time investment in informative, non-descript or outer wall cells, incorporating their relative safety. Though safer cells were preferred; more time was spent in informative cells compared to other central cells. Thus, under equal safety, information does have an impact on explorative movement and time investment.

## Preferences of fast- and slower-growing broilers for different light intensities and spectra

**Malou van der Sluis**[1], Jerine A. J. van der Eijk[1], Tomas Izqierdo Faria[1], Dennis E. te Beest[2], Stephanie Melis[1], Ingrid C. de Jong[1]

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Our current knowledge of broiler preferences for different light intensities and spectra is limited. Therefore, we investigated the preferences of fast- and slower-growing broilers for a combination of light intensities (15 and 100 lux) and spectra (blue or green), by providing all four combinations in a choice test setup. We observed that both the fast-growing and the slower-growing breed showed a preference for bright, green light during the daytime in the first week of life. Later in life, the slower-growing breed showed a preference for low intensity light, regardless of spectrum, which was also reflected in a higher feed intake in the dimmer lit conditions at that point. In the brighter light conditions more active behaviour was observed, whereas in the dimmer light conditions more inactive behaviour was seen. The results of this study can provide input for functional lighting programs for broilers that meet the birds' preferences, and hereby potentially improve broiler welfare.

## A mosaic of mutualism between people and honeyguide birds

**Jessica van der Wal**

*African Honey-hunting Research Network*

In parts of Africa, wax-eating birds called greater honeyguides (*Indicator indicator*) cooperate with humans by leading them to wild bees' nests. Humans use tools and fire to harvest the honey, making beeswax accessible to the birds. Only few African cultures still rely on this mutualistic relationship, and those that do show striking cultural variation in their behaviours. Honeyguides learn how to respond to these behaviours, suggesting a process of cultural coevolution. To understand this dynamic, I lead a pan-African collaborative effort to document the remaining honey-hunting cultures. Early-career researchers local to the regions interview honey-hunters to understand their practices and the reasons for the mutualism's decline. Understanding the contemporary range of human cultural variation relevant to honeyguides sets the stage for further field experiments to test how this shapes cultural variation in honeyguides, and thus the cultural biodiversity of an interspecies cooperation.

## Nest-site selection and nest predation in a tropical passerine in relation to food, friends, and foes

**Arne van Eerden**[1,2], Jan Komdeur[1], David Richardson[4,5], Hannah Dugdale[1], Martijn Hammers[1,6]

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What determines where a bird builds its nest within a territory? Nest-site selection is a crucial determinant of avian reproductive success. However, the environmental and social factors that influence nest-site selection and predation risk remain poorly understood. Optimal nest positioning may depend on a balance of factors such as nest predation, food availability, extra-pair mating opportunities, and interactions with neighboring conspecifics. This study investigates how these factors affect nest-site selection and nest survival in the Seychelles Warbler, a facultative cooperative-breeding passerine. By exploring the interplay of these factors, this research sheds light on the key drivers of choosing a nest-site. One finding that struck us the most is that nest-site selection is conditional on the presence of ‘helpers’ at the nest.

## Neophobia across social contexts in juvenile herring gulls: A Registered Report

Reinoud Allaert[1,2], Sophia Knoch[1,3], Luc Lens[1,2], **Frederick Verbruggen**[1,2,3]

*[1]Centre for Research on Ecology, Cognition and Behaviour of Birds, Ghent University; [2]Department of Biology, Ghent University; [3]Department of Experimental Psychology, Ghent University*

Neophobia, the fear or avoidance of the unfamiliar, is typically assessed by exposing individuals to unfamiliar objects when they are alone. However, in social species, the presence of conspecifics can influence neophobia. In this Registered Report, we investigated the degree of neophobia in different social contexts in a highly social species, the herring gull (HG). We hypothesised that the distribution of neophobic responses would change in a group context, but how much and in what direction

would depend on the social mechanisms at play. We found that HGs tested in groups ate faster than when they were alone, especially when a novel object was placed behind the food (vs. a control object). This suggests that neophobia in HGs is reduced in a group context, in line with the risk dilution hypothesis. This shows that social context plays an important role in shaping neophobic behaviour in juvenile HGs, possibly allowing for more efficient exploration and engagement with the environment.

## Poster Presentations

### A bat's-ear view: how sensory information streams govern behavioural transitions in the wild

**Leonie Baier**[1,2], Sebastian Mortensen[1], Rachel Page[2],Peter Madsen[1],Laura Stidsholt[1,3]

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Echolocating bats rely on auditory input to control motor output and meet their behavioural objectives. We test the hypothesis that the Central American frog-eating bat Trachops cirrhosus, which switches between foraging modes when challenged in the lab, selectively applies this same flexible strategy in the wild. With a self-logging sound and motion tag, we record both outgoing calls and incoming echoes as well as associated behaviours, taking the perspective of wild bats as they hunt within their natural environment. We present the first direct observations of these bats (n=20) performing aerial and ground captures in flight and from perches, applying both echolocation and eavesdropping modes. We further show that these bats are highly efficient predators with capture success rates of up to 80%. Their exceptional foraging strategy critically relies on high prey densities, raising concern for a future when those dwindle in the increasingly compromised ecosystems of the Anthropocene.

### Who comes first? Inter- and intra-sexual competition at food resources in the great tit (*Parus major*)

**Lily Broos**[1,2], Eva Serrano-Davies[1], Remon Kraakman[3], Robin Kroone[4], Xinrui Wang[1,2], Kees van Oers[1,2]

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In winter, bird activity at supplementary feeders rises, intensifying competition within and between sexes. This competition affects food access, yet resource type can also influence competition intensity. Birds may adopt different foraging strategies, like targeting lower quality resources to reduce competition. However, while competition-foraging interactions are well-studied within males, data between sexes and on females remain limited. Using a population of great tits, we investigate how intersexual competition affects intrasexual dominance rankings and food-quality choice under varying resource conditions. First, 4 smart-feeders containing food of 2 qualities are provided at 6 feeding stations. Then, to reduce intersexual competition, we provide sex-specific access to both food qualities. By assessing choices for high- and low-quality resources in both contexts, this study

will enhance our understanding of how competition shapes dominance and affects resource access across sexes.

## Functional Consequences of Sea Turtle Hybridization

**Celie Liesa**[1], Dr. Snijders Lysanne[1], Dr. Bosse Mirte[1], Prof. Dr. Naguib Marc[1], Dr. Christianen Marjolijn[1], Dr. Torres Vilaça Sibelle[2]

[1] *Wageningen University & Research,* [2]*University of Ferrara*

Sea turtles are keystone species, supporting the ecosystem services of their habitat, and as such they have been the subject of many conservation efforts. Recently, interspecific hybridization has been observed more often, raising questions about its effect. While hybridization may promote genetic diversity, and increase their adaptive potential, it could also disrupt functional roles and, ultimately, result in species loss. This project will investigate hybridization rates and how hybridization might affect sea turtles' keystone role in two breeding sites. We will use a complementary combination of nest monitoring, genetic analysis, stable isotope analysis and behavioral assays to assess hybridization frequency, and changes in their functional role and fertility. Our project aims to shed a light on the role of hybridization in endangered species ecology and provide essential tools and knowledge for future research and the management of sea turtles.

## Does behavioural innovation promote population expansion in great tits: behavioural and epigenetic mechanisms

**Xiaomei Chi**[1,2], Barbara M. Tomotani[3], and Kees van Oers[1,2]

[1] *Netherlands Institute of Ecology (NIOO-KNAW), Wageningen,* [2]*Wageningen University & Research (WUR),* [3]*The Arctic University of Norway (UiT), Tromsø*

Anthropogenic changes, such as human settlement expansion and climate change, rapidly alter environments. This causes shifts in species distribution, such as range expansion. Adapting to new environments offers challenges to organisms, and certain traits may aid range expansion, yet what are the key traits remains unclear. Additionally, epigenetic mechanisms like DNA methylation and histone modifications, could reveal how environments shape gene expression and traits. We are conducting a common garden experiment to assess the genetic and environmental background of behavioural and epigenetic differences between populations. By integrating these approaches, we aim to uncover mechanisms driving population expansion in great tits.

## In vivo microscopy to track the neural substrate for auditory vocal memory in songbirds

**Massimiliano Coscia**[1], Sanne Moorman[1]

[1]*University of Groningen*

Human infants acquire speech through exposure during a sensitive period when their brain is highly plastic. Zebra finches are among the few other species in the animal kingdom that share vocal

learning abilities; they learn their tutor's song during a sensitive window and retain it for life. This makes them ideal for studying the neural mechanisms underlying long-term memory. In songbirds, the nidopallium caudomediale (NCM), analogous to human Wernicke's area, encodes tutor song memories. However, it is unclear if NCM neurons maintain a stable memory engram or undergo representational drift, as seen in other areas like the olfactory cortex and hippocampus. We used in vivo calcium imaging with head-mounted miniscopes to track NCM neuron activity across days in awake zebra finches, revealing how neuronal ensembles respond to the tutor song over time. This study offers insights into neural plasticity and memory maintenance in local circuits.

## Group differences in social tolerance in captive rhesus macaques: a cultural influence?

**Eythan Cousin**[1], Giacomo Jervis[1], Tom Roth[1], Edwin van Leeuwen[1]

[1]*Utrecht University*

Our understanding of the evolutionary roots of non-human primates' social plasticity has been limited by species generalisations. But recent efforts showed the presence of inter-group variation in their social behaviours. Whether those differences are adaptations to ecological pressures or cultural processes remains unclear. So, there is a need for intergroup comparison of social behaviours in controlled settings to disentangle the ecological influences on sociality from potential cultural ones. Filling this gap, we tested the social tolerance of 10 groups of captive rhesus macaques with similar demographics and housing conditions in a standardised cofeeding tolerance test. Our results show group-level differences in tolerance, irrespective of age structure, group size, or relatedness. We conclude that rhesus macaques' sociality is flexible beyond mere environmental adaptations, which suggests the presence of a potential 'social culture' pervading macaques' life.

## BCS of pet and assistance dogs

**M. de Kort**[1], E. van Erp[1]

[1]*HAS green academy, Den Bosch*

The use of assistance dogs for a range of emotional and physical disabilities has become a common sight. While previous studies have focused on the welfare of pets and working dogs used in other fields, not much is known about the well-being of assistance dogs and how it is influenced by their tasks. The current study strived to get an overview of the welfare of assistance dogs in the Netherland, starting with comparing body condition scores (BSC) of assistance dogs with pet dogs. Besides BCS measurements also activity of the dogs was recorded, results will be presented later. A total of 72 dogs were monitored for this study, 36 assistance dogs and 36 pet dogs. Both the pet dogs and assistance dogs had an average BCS of 5.6, which indicates an over-ideal weight. Besides BCS, it would be interesting to measure the daily food-intake of the participating dogs to see if there are differences that could explain the current results.

## Impact of Water and Road Traffic Noise on migratory fish Spawning: twaite shad in the Belgian Scheldt river

**Lisa Dörner**[1], Max de Koning[2], Kees te Velde[1], Ine Pauwels[3], Hans Slabekoorn[1]

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Twaite shad (*Alosa fallax*) are an anadromous species. Water pollution and dams built in the 19th century caused a drastic decrease in shad populations. Anthropogenic noise has also increased. During spawning, female fish are chased by male fish, with loud splashing. Masking of the splashing through anthropogenic noise could reduce attraction of males and overall spawning success. Based on multi-year observations at the river Scheldt, we hypothesize that spawning is interrupted by passing boats and does not occur within a certain perimeter around noisy bridges. To investigate the impact of boat passage and bridges on shad spawning, simultaneous in-water and in-air recordings of shad splashing were collected at two bridge sites. Splashing will be correlated with boat sounds, AIS-vessel data, and road traffic. This will yield insights into potential effects of water and road traffic on shad spawning and offer potential measures to relief the ecological impact of anthropogenic noise.

## Longitudinal Study of Hair Cortisol Changes in Response to Maternal Loss and Transition to Siblinghood in Rhesus Macaques (*Macaca Mulatta*)

**Paula Escriche Chova**[1], Jacqueline Wubben[2], Dian Zijlmans[1], Sophie Waasdorp[1,2], Anne Marijke Schel[1], Jorg JM Massen[1], Liesbeth Sterck[1,2]

*[1]Animal Behaviour & Cognition, Utrecht University, [2]Animal Science Department, Biomedical Primate Research Centre, Rijswijk*

Early-life stress disrupts the functionality of the hypothalamic-pituitary-adrenal (HPA) axis in nonhuman primates, yet its long-term effects remain understudied. Our research examines the long-term effects of two early-life stressors, maternal loss and Transition to Siblinghood (TSS), on the cortisol levels of young rhesus macaques. As both maternal loss and TSS can result in decreased maternal support and care, and, consequently, lead to elevated stress levels, we expect that orphans will show higher levels of hair cortisol compared to non-orphans across the years. Hair cortisol concentrations (HCCs) in ±150 rhesus macaques will be analyzed to assess HPA activity from infancy to early adulthood. By comparing HCCs between orphans and non-orphans, and additionally examining the impact of sibling arrival, this study will increase our understanding of how early life stressors caused by mother-infant disruptions, affects long-term physiological outcomes.

## Investigating the Maintenance of Alternative Reproductive Tactics in *Tetranychus urticae* males

Koen Freerks[1], Martijn Egas[1]

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Rapid environmental change necessitates predictive models of ecological and evolutionary responses, which can be effectively tested in species that display polymorphisms. Our project investigates the eco-evolutionary dynamics of male two-spotted spider mites (*Tetranychus urticae*),

which exhibit alternative reproductive tactics (ARTs): fighter and sneaker tactics. Unlike other species where ARTs are linked to morphological differences, these tactics are behaviourally distinct yet morphologically identical. To understand how these tactics are maintained, we are establishing selection lines of fighters and sneakers. By employing advanced behaviour quantification tools, we can determine the behavioural phenotypes of individual males, enabling artificial selection for fighter and sneaker traits. Using these selection lines, we aim to manipulate and observe eco-evolutionary feedback loops, examining the influence of operational sex ratio, maternal effects, and genetics on ART dynamics.

## Behavioural effects of early-life adversities: could heightened aggression be adaptive?

**ClaraGarcia-Co,** [1,2,3], Ian Van Riel[1], Judith Morales[3], Frederick Verbruggen[2], Müller, Wendt[1]

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Parental behaviors like neglect and aggression toward offspring can have lasting effects on the offspring phenotype, significantly impacting brain function, behavior, and cognition. Although seemingly adverse, these effects are often seen as a form of adaptive intergenerational plasticity, potentially enabling those who experience early adversity, such as parental aggression, to better cope with harsh environments later on. If increased aggression leads to higher dominance and resource access, it could be adaptive in some contexts. This study examined how early maternal aggression affects aggression, dominance, and sociability in canaries. We tested 104 canaries, divided into 19 groups of varying social densities, using a social dominance test which involved competition for access to food. Our results show that individuals exposed to maternal aggression exhibited greater dominance, yet this was not linked to increased aggression nor reduced sociability.

## Near and dear? Guidelines for the treatment of (non-sentient) animal species.

**Saskia S. Arndt**[1], Franz Josef van der Staay[1], Vivian C. Goerlich[1]

*[1]Population Health Sciences, Animals in Science and Society, Animal Behaviour, Utrecht University*

Animal welfare concepts serve as a basis for guiding the treatment of animals, including in research. A key criterion in current definitions of animal welfare is sentience, which describes the ability to consciously experience negative and positive affective states. However, the vast majority of animal species - an estimated 95% of all known species - are (currently) thought to lack sentience and the ability to experience emotions. The ethical basis for guidelines on the appropriate treatment of non-sentient species remains to be determined. We discuss four potential options that could serve as guidelines, regardless of whether a species is proven to be sentient or non-sentient. We suggest that the concept of animal integrity is suitable for application to all species. In addition, we encourage future research on animal behaviour in species with greater phylogenetic distance from humans to further our understanding of sentience and consciousness.

## Building trust: The effect of familiarisation type on common marmosets´ training success and human preference

Julia Victoria Grabner[1], Anne-Marie Haag[1], Michelle Spierings[1,2], Thomas Bugnyar[1]

*[1] Department of Behavioral and Cognitive Biology, University of Vienna, [2]Animal Sciences, Institute of Biology, Leiden University*

Human-animal relationships are central to animal-welfare research. This study investigated if the type of familiarisation affects an animal´s preference for specific people and training success. We familiarised 15 common marmosets with 6 people, half of whom actively assisted with training, while the other half was passively present. We then tested the monkeys´ performance in a routine husbandry task and their choice from whom to take food. After a refamiliarisation phase with switched roles we repeated the tests.

We found that in the initial test the monkeys performed better with active trainers but showed no preference in the choice test. In the second test no significant difference between trainers was found. The results suggest that active familiarisation enhances training success in tasks involving risk but does not affect simple preference. The findings offer insights for optimal human-animal introductions, possibly improving training success and consequently animal welfare.

## Influence of lionfish (Pterois miles) predation on algal cover the Mediterranean Sea

**Ynze Kamstra[1]**, Davide Bottacini[1], Lea de Jong[1], Alexander Kotrschal[1]

*[1]Behavioural Ecology Group, Wageningen University*

The introduction of non-native species to an area can cause disturbances and new interspecific dynamics to occur in the targeted ecosystem. Around 10 years ago, lionfish (Pterois miles) started their invasion into the Mediterranean through the Suez-canal, and densities in established areas greatly exceed home-range densities in the Red Sea (150 indiv./ha compared to 25 indiv./ha). Allowing an increased ecological impact on Mediterranean ecosystems. Due to the recent spread, quantitative data of lionfish predation effects on the ichthyofauna is currently limited. Therefore estimating the direct impact of their predation on herbivore abundances and indirect effect on algal cover is difficult. To study these effects I compared herbivorous ichthyofauna abundances and algae cover on substrate through visual and photographic surveys between culled and control sites around Crete (Greece).

## Personalities and Psittacosis: linking individual behavioural traits to disease transmission.

**Valentin Adrian Kiss**[1], Bram Vanden Broecke[2,1], Wendt Muller[1]

*[1]Behavioural Ecology and Ecophysiology, University of Antwerp, [2]Centre for Research on Ecology, Cognition, and Behaviour of Birds Ghent University*

Given the rapid rate of urbanization, we must recognize cities as unique habitats. Animals in urban environments must adapt their behaviours to navigate spatial variability and complexity. Behavioural traits can significantly influence disease dynamics in dense urban populations. We used Chlamydia psittaci and feral pigeons to explore the link between urbanization, behavior, and disease dynamics. We collected pharyngeal samples from 327 pigeons across 28 sites in Antwerp, Belgium, screening for C. psittaci using standard PCR. The prevalence of C. psittaci was about 22%, exhibiting a heterogeneous spatial pattern. To understand this variability, we will examine how individual behavioural traits such as exploration, boldness, neophobia, and sociality along with contact rates and social networks, influence disease transmission among urban pigeons.

## Wiping sides: Beak wipe lateralisation in zebra finches and budgerigars

**Maiolini Marco**[1,2], Varkevisser D. Judith[1,2], Spierings J. Michelle[1,2,3]

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Brain lateralisation increases humans and non-human animals' cognitive capacity, processing stimuli in only one cerebral hemisphere. Stimuli processed in a single hemisphere usually result in lateralised behaviours, executed preferentially on one side.

Even though lateralised behaviours are well-studied, comparative analyses can be challenging as different methods and behaviours have been used to address this topic. This is particularly prominent in birds, where there is a lack of behaviour that can be used to study the evolution of brain lateralisation.

Beak wiping is a common behaviour in the avian taxa which consists of wiping the beak on a surface to clean it, and it can start independently from the right or left side.

In this poster, we report lateralisation in the beak wiping of a songbird (T. castanotis) and a parrot species (M. undulatus), suggesting beak wiping as the perfect tool to study brain lateralisation evolution in birds.

## Do dogs know what humans believe? Preliminary results from an ongoing study

**Jori Noordenbos**[1], Laurens van der Molen[1], Bonne Beerda[1]

*[1]Behavioural Ecology Group, Wageningen University*

Theory of Mind (ToM), the ability to attribute mental states to others, exists in varying degrees across species. Dogs are highly attuned to humans and readily respond to our body language and attentive states, suggesting a potential for ToM towards humans. Here we investigated higher-order ToM in dogs, specifically their ability to recognize false beliefs in humans. Dog subjects (n=31) had to predict where an experimenter would search for a hidden object in a two-choice setup. The experimenter observed an initial hiding, but in false belief scenarios the object was replaced again out of the experimenter's view. Dogs still went to the object's current location in 38 out of 62 trials (Binomial $p=0.049$), ignoring the experimenter's false belief. They were more successful in true belief conditions where the experimenter knew the object's location (45 out of 62 trials, X2, $p<0.01$).

Further refinement of the procedure is ongoing, to clarify dogs' understanding of human mental states

## Examining three-dimensional illusions in predator-prey interactions.

**Zeke Rowe**[1], Wouter Halfwerk[1]

[1]*A-life, Vrije Universiteit Amsterdam*

In a three-dimensional world, animals rely heavily on depth cues to discern the location, shape, and alignment of objects, however the role of these cues in predator-prey dynamics are poorly understood. Some animals appear to exploit perceptual loopholes to avoid detection, using techniques like pictorial depth cues, such as shading, to create illusions that can deceive the observer's depth perception. Tropical moths, for instance, have evolved to mimic leaf litter in both shape and coloration, appearing to use darker and lighter regions on their wings to simulate the shading found on curved leaves. Here, we plan to determine whether such three-dimensional mimicry can provide a survival advantage and if such an advantage can be replicated by using colour alone in a two-dimensional object. These questions will be addressed using a predation experiment in which three-dimensional and two-dimensional 'moth-like' targets will be presented to wild avian predators which are familiar to leaf mimicking prey. We plan to video these 'predation' events to determine the predator community, the approach of the predator to the targets and the latency of attack between targets.

## Northbound tits, cooler personalities: exploring the roles of plasticity, local adaptation and latitude in behavioural differences between great tit populations

**Beau Strijker**[1,2], Xiaomei Chi[1,2], Barbara Tomotani[3], Kees van Oers[1,2]

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Populations can evolve in response to variation in environmental conditions, resulting in local adaptation and adaptive population divergence. However, the origin of behavioural differences between populations, their repeatability and the variation in correlations between behavioural traits (aka behavioural syndromes) remains poorly understood. To unravel this complex interplay between traits and to understand these syndromes, we aim to study the drivers of between-population differences in average behaviour, plasticity, consistency, and correlations between traits. Currently, we are conducting a common garden experiment in which we repeatedly expose 73 great tits, hatched from eggs of 9 populations across Northern Europe, to 6 behavioural tests. The results of this study will contribute to our understanding of the adaptive significance of personality differences and its influence on population divergence.

## Female Zebra Finches Prefer Songs of Males Raised with Female Interaction

**Jiangnan Sun**[1], Judith Varkevisser[1], Katharina Riebel[1]

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Social experience during development is crucial in shaping communication behaviors in many species. This study investigates the impact of female exposure on male song learning in zebra finches (Taeniopygia guttata) and its influence on song attractiveness to adult females. Results indicate that female zebra finches significantly prefer songs from males that had female companions during development over those from males raised without female interaction. This preference may be due to the enriched harmonic structure observed in the songs of socially-exposed males. These findings highlight the role of non-singing females in the vocal learning of songbirds and underscore the importance of social environment in the development of communicative signals.

## Foraging strategies, reproductive success and global change - a case study in Lesser black-backed gulls

**Loïc Trébignaud**[1], Mélibée Morel[1,2], Luc Lens[2], Eric Stienen[3], Frederick Verbruggen[2], Wendt Müller[1]

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Inter-individual differences in foraging strategies are common, and they are often associated with variation along the generalist-specialist continuum. Generalists feed on a wide range of different resources within the species' ecological niche, while specialists exploit a smaller range of resources within the niche. Specialists are therefore less flexible in the choice of resource and are supposed to be at greater risk when environmental conditions fluctuate or change. Their reproductive success may hence vary more among years. In this study, we investigated the relationships between foraging specialization and reproductive success using the Lesser black-backed gull (Larus fuscus) as a model species. We found a high specialization on a marine diet and a unexpected high homogeneity in resource use among individuals and years. This suggests that marine resources were predictable and the most profitable resource, at least in the years of our study, even though the amount of marine resources varied. Still, we observed a high marine specialization, which may be advantageous at current, but could present a risk under global and anthropogenic change scenarios, as specialists might struggle to adapt to alternative resources.

## Unravelling a social vulture's social structure

**Eva SJ van Dijk**[1], Eythan Cousin[1], Jade Zanutto[1,2], Jessica Smith[1], Jorg JM Massen[1,3]

[1] *Animal Behaviour & Cognition, Utrecht University,* [2] *Ecophysiology & Ecotoxicology, Sorbonne University, Paris,* [3] *Avifauna Bird Park, Alphen aan de Rijn*

Vultures have relatively large brains and a slow pace of life. Those of the Gyps genus are also highly social year-round and strongly reliant on conspecifics to locate carrion, making them an excellent taxon for investigating the role of social and ecological selective pressures on the evolution of avian

cognitive skills. However, little is known of Gyps vultures. To better understand the evolution of avian cognition, the complexity of their social system must first be mapped. We investigate the social bonds of a group of Rüppell's vultures (G. rueppellii) based on observational data on social proximity. Our first analyses show that different forces shape the social network during the breeding and non-breeding season as reproductive state and dominance rank shape individual connections only during the breeding season. With more data coming in, we hope to report the first results on the stability of the social networks and dominance hierarchy, including at least 1.5 breeding cycle.

## Emotional attention bias in Bornean orangutans

**Karlijn van Heijst**[1], Daan W. Laméris[2,3], Evy van Berlo[1,4,5], Tom S. Roth[1,6], Mariska E. Kret[1,7]

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Rapidly and automatically turning attention to emotional expressions may be advantageous for individuals of social species. Due to their semi-solitary existence, orangutans are an especially interesting species to study this implicit attention bias. A previous dot-probe study in zoo-housed Bornean orangutans found no evidence for an attention bias to socio-emotional scenes of conspecifics when contrasted with neutral scenes. In a follow-up study we will address two methodological limitations: The ecological relevance of the stimulus set and the suitability of dot-probe tasks for orangutans. Using a new, more ecologically valid stimulus set and eye-tracking as an alternative experimental paradigm, our aim is to investigate whether Bornean orangutans show an initial and/or sustained attention bias toward socio-emotional versus neutral scenes of conspecifics. We will present the previous dot-probe study, as well as the intended experimental paradigm of the follow-up eye-tracking study.

## Trade-offs between female-female aggression and innovativeness in a wild bird population

**Robin van Iersel**[1], Rianne Pinxten[1,2], Marcel Eens[1]

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Aggression can provide fitness benefits by granting access to essential resources like food and nesting sites. However, if aggression strongly determines fitness, less aggressive individuals could be at a disadvantage. Instead, variation in aggression may reflect alternative strategies; less aggressive individuals may compensate with other traits, such as innovative ability. This aligns with the 'necessity drives innovation' hypothesis, suggesting that individuals with lower aggression may rely more on problem-solving skills to secure resources. Despite the potential importance of innovation as an alternative strategy, the link between aggression and innovation remains underexplored. This study examines the connection between female-female aggression and innovative ability in the wild.

We assessed aggression via simulated territorial intrusions and measured innovative ability using a nest-box problem-solving task. Join us at our poster for a sneak-peek at our preliminary results!

## Chimpanzees copy non-adaptive behaviour from conspecifics

**Edwin J. C. van Leeuwen**[1,2,3], Emile Bryon[1], Alex Rogers[4], Aurore Balaran[3], Peggy Motsch[3], Jake S. Brooker[1,3,5]

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Studying animal culture has been insightful for understanding the complexities of knowledge transmission and tracing human culture's evolutionary origins. Most studies in this field have focused on material culture—behaviours that involve the use of tools and objects in ways that provide practical benefits. In 2014, we documented a tool-use tradition without discernible function in which chimpanzees copied inserting blades of grass in their ears from one persistent inventor. Now, over a decade later, we have observed an unrelated group of chimpanzees, where five out of eight individuals began wearing grass in their ears and six out of eight from their rectums. Neither of these behaviours were observed the other sanctuary groups (N=133). The transmission of these variants was facilitated by social learning, as evidenced with network-based diffusion analysis. We conclude that a non-human animal species socially learned non-adaptive cultural variants.

## Augmentative Interspecies Communication devices for intra-specific communication between dogs and humans

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Augmentative Interspecies Communication (AIC) devices, such as pet communication buttons, are widely advertised and discussed on social media. Supposedly, dogs can be readily trained to communicate their needs to owners by pressing buttons that produce recorded messages. We investigated the ease by which dogs learn to use a button to signal their need to go outside. Seventy-nine owners received a button and were instructed first to train their dogs to press it on command, then to place it by the door and press it each time they let the dog out. Owners reported progress biweekly. Nineteen dogs (27.5%) began using the button independently in the right context, suggesting some understanding of its function. The reliance on owner reports may have introduced bias, but some dogs seem prone to use the AIC buttons as communication tools, while others may do so after more extensive training. The findings provide insights for future research on AIC devices for pets.

## Copying of song rhythm and rhythmic parameters in zebra finches

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Rhythm plays an important role in different aspects of animal communication. Recent studies have highlighted the rhythmic patterns in the vocalizations produced by several animal species, both mammals and birds. For instance, intervals in zebra finch song have been shown to fit a metronome-like beat that is individually distinct. Many studies have demonstrated that zebra finch tutees copy the spectral content of their tutor's song, but less is known about possible copying of their tutor's rhythmic parameters. In this study we use a temporal interval analysis to find out whether tutees copy their tutor's rhythm.

## Is more always better? Investigating helper effects on nestling condition in an obligatory cooperative breeding bird, the Arrow-marked Babbler

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Cooperative breeding is a system where individuals help raise young from others' broods, a behavior contrary to evolutionary predictions of selfishness. The benefits of cooperative breeding are multiple, though effects vary between species, complicating our understanding of its evolution. In some species, cooperative breeding reduces individual reproductive costs, in others, it increases reproductive output. Another, more subtle effect is helper contribution enhancing offspring quality rather than quantity. We collected data on group size, nestling condition, and provisioning rates across 38 Arrow-marked Babbler breeding attempts, finding slight, non-significant increases in nestling condition and provisioning rates with group size. We suggest group living may benefit adult survival or provide other survival advantages in stable groups. Our findings emphasize the need to consider broader contexts when evaluating the benefits of larger group.

## The influence of habitat quality on personality in Great Tits (*Parus major*)

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As human activities continue to change natural habitats, animals are forced to adapt in order to survive. In such situations, behavioural responses are expected to play a significant role. Personality, defined as consistent behavioural differences between individuals, is closely linked with behavioural responses to habitat changes. However, little is known about how habitat quality variation and personality interact when individuals must adjust to environmental changes. To address this, we aim to explore behavioural and ecological pathways linking animal personality to habitat quality through a long-term study of great tits (Parus major). Our approach will combine extensive measurements of habitat characteristics with partial cross-foster experiments, and assess fitness outcomes for

exploratory behavior across varying habitat qualities. The project will provide novel insights into how spatial and temporal variation in habitat quality shape animal personality in a changing world.

## Predation shapes the evolution of collective behavior

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How animals move in groups is crucial under predation pressure. While the effect of predation on collective motion in natural populations is well resolved, an experimental test of how collective behavior evolves under predation is lacking. We used artificial selection lines that had been selected for predation survival over three generations to investigate the effects of predation on the evolution of collective behavior in guppies both with and without a simulated predatory situation. We found that several of the collective motion traits analyzed (polarization, alignment, nearest neighbor distance) were affected by predation selection and also changed in response to the presentation of a predator model with some unexpected interactions between selection for predation survival and simulated acute predation. Our results reveal how collective motion depends on both evolutionary and perceived predation pressure.