NVG 2014 Abstracts

Talks

Els Atema (University of Groningen)
Arie J. van Noordwijk (NIOO-KNAW, Wageningen)
Simon Verhulst (University of Groningen)

Handicapping great tits: the effects of carrying extra weight on telomere length

Shorter telomeres may indicate that an organism experienced higher levels of oxidative stress. Hence, telomere shortening rate can potentially be used as a proxy for "life stress". We experimentally manipulated "life stress" in free-living male great tits, by giving birds a small weight to carry around a whole year long. We compared three treatments: heavy backpacks (same weight as a geo-locator), light backpacks (control for possible effects of the harness) and controls without backpacks. We studied the effects of increased workload on survival, reproduction and telomere length.

Sietse de Boer

Behavioral Physiology

University of Groningen

Battling aggressiveness by sniffing oxytocin: Feat or fiction?

Neeltje J. Boogert:
School of Psychology and Neuroscience, University of St. Andrews, UK
Damien R Farine:
Edward Grey Institute of Field Ornithology, University of Oxford, UK
Karen A. Spencer:
School of Psychology and Neuroscience, University of St. Andrews, UK

Developmental stress predicts social network position

Social associations, as captured by social network analysis, can have major fitness consequences. But how do developmental factors affect later social network positions? We increased levels of the avian stress hormone corticosterone (CORT) in nestling zebra finches, and measured their later foraging associations in free-flying aviaries. CORT-chicks had weaker associations to their parents than control chicks, foraged with more flock mates and were less choosy with whom they foraged, resulting in central network positions. These findings emphasize how development can drive social dynamics.

Trine Brilde

Department of Bioscience - Genetics, Ecology and Evolution

Aarhus University

The evolution of allo-maternal care and social organization in spiders

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The nutritional and hedonic value of food modulates reproductive behaviors in Drosophila melanogaster females

The social and nutritional environments of females limit reproductive output as they need males for fertilization and food to support offspring production. Here we show that Drosophila melanogaster females mate more often as the number of males in their social environment increases, but this effect is conditional on the presence of food. Yeast, a food essential for egg production and offspring survival, and sugars, an important calorie source for adults, increase mating rate and fecundity. Information about availability of these foods is composed of both hedonic (the tasting or smelling of a

Wouter Halfwerk
Smithsonian Tropical Research Institute and Behavioural Biology, University of Leiden

To get chicks you need bucks, but frogs get too much bang for their chucks

Animals evolved signals to attract mates, but production typically involves additional cues received by multiple sensory system and species. Male tungara frogs call from puddles and either produce simple or complex calls. Complex calls have added elements know as 'chucks' that are energetically costly, but preferred by female frogs. Unfortunately, calling generates water ripples that travel throughout the puddle and are being used by eavesdroppers such as rival males or predators to locate the caller. I will address the environmental and morphological constraints that force frogs to take the

Mariam Honarmand, Freie Universitaet Berlin, Germany
Katharina Riebel, Leiden University, The Netherlands
Marc Naguib, Wageningen University, The Netherlands

Conditions during adolescence affect male song learning and female preferences in zebra finches

There is strong evidence that learning contributes to variation in sexually selected traits and preferences. For birdsong, poor conditions in early life affect song and female song preferences. Here, we show in zebra finches, Taeniopygia guttata, that nutrition and social conditions also later in life, during adolescence, affect male song learning and female song preference development, providing new insights into the sources of variation in sexually selected signals.

Bin-Yan Hsu, Cor Dijkstra, Ton G.G. Groothuis
Behavioural Biology, Centre for Behaviour and Neurosciences, University of Groningen

Thyroid hormones: Ignored hormone-mediated maternal effects

The thyroid hormones T4 and T3 have an important function in among others regulating growth and metabolism. Bird eggs contain THs of maternal origin, but their effect on the chick has not yet been studied at all. . In this study, we measured T3 and T4 and subsequently elevated T3 and T4 concentrations in freshly-laid pigeon eggs. We found that elevated TH levels substantially enhanced hatching success but not metabolic rate, and lowered body mass around fledging time. The results open a new field of hormone-mediated maternal effects in egg laying species.

Jeroen Hubert
Behaviour group, Leiden University

Behavioural response of European seabass to artificial sound exposures in an outdoor setting

The amount of anthropogenic sound in aquatic environments has increased over the last decades. To determine its impact on fish behavior, it is important to study the influence from different sound features. Earlier research showed that sounds which differed in temporal structure resulted in different behaviour recovery times. We followed-up on these results in semi-natural conditions to enable the sound to propagate more comparable to the far field and enable the fish to behave more naturally. Therefore we built a big floating pen in which we exposed groups of four seabass to artificial sound.

Arne Iserbyt, Marcel Eens & Wendt Müller
Biology - Ethology Group
University of Antwerp

Sexually antagonistic selection in canaries not generated by testosterone-related intra-locus sexual conflict

The hypothesis of an intralocus sexual conflict (ILSC) assuming different optimal testosterone (T) levels for males and females, has recently been questioned. Here, we applied a full-sib (brother/sister) comparison to continue this debate. We show that sibling fitness is negatively correlated, indicating sexually antagonistic selection (SAC) and that T levels of brothers and sisters were positively correlated. However, T levels could not explain the fitness variation between siblings, contrasting the ILSC hypothesis. The mechanism(s) underlying SAC yet remain to be identified.

Paul Koene
Wageningen UR Livestock Research, Netherlands

Weaning age in parrots: relations with brain size, intelligence and welfare

According to recent Dutch rules parrot babies should be raised by their parents and stay with their parents until they are independently eating, i.e. without parent support. Many species of parrots exists of which many are kept as pets. To set limits on weaning ages per species a method is developed to predict weaning age for each species. Data on weaning and many other characteristics of parrot species were collected. Weaning ages correlated strongly with many species characteristics, i.e. length, weight, clutch size and even lifespan. Weaning ages of parrot species are estimated based on d

Veronika Laine (Animal Ecology; NIOO-KNAW), Gábor Herczeg (Eötvös Loránd University, Hungary), Takahito Shikano (University of Helsinki, Finland), Johanna Vilkki (MTT Agrifood Research Finland), Juha Merilä (University of Helsinki, Finland), Craig Primmer (University of Turku, Finland)

The genetics of behavior in nine-spined sticklebacks (Pungitius pungitius)

We explored the genetics of behavioral traits with the aid of QTL analyses and the correlation between individual heterozygosity and behavior in nine-spined stickleback (Pungitius pungitius) individuals originating from four populations in two contrasting environments. Significant QTL were detected and contrasting correlations with behaviour were observed when using physiological gene and random markers. The results found lay the foundations for fine mapping and provide a starting point for identification genes for the behavior differences between marine and pond nine-spined sticklebacks.

M. Laturney, S. Roessingh, J.C. Billeter
Behavioural Biology, University of Groningen

Love stinks: Chemical mate guarding in Drosophila

Males often use strategies to prevent their mates from future infidelities. For example, male Drosophila transfer the anti-aphrodisiac cis-vaccenyl acetate (cVA) to females during copulation via the ejaculate. We show that females dump this ejaculate after mating, resulting in the loss of 90% of cVA. Surprisingly, after dumping females remain unattractive compared to virgins indicating that cVA is not a mate guarding pheromone. With use of pheromonal bioassays and sensory receptor mutants, we show that other chemicals are responsible for the decrease in post-copulatory attractiveness.

Edwin J. C. van Leeuwen; Josep Call; Daniel B. M. Haun
Psychology, University of Jena

Individual and social information usage in children and chimpanzees

Human societies are characterized by more cultural diversity than chimpanzee communities. Since reliance on social information is a pivotal characteristic of culture, we investigated individual and social information reliance in children and chimpanzees. We presented subjects with a reward-retrieval task on which they had collected conflicting individual and social information of equal accuracy in counterbalanced order. While both species relied mostly on their individual information, children but not chimpanzees searched for the reward at the socially demonstrated location more than at a ran

Frédéric Méry
Laboratoire Evolution, Génomes et Spéciation, CNRS Gif sur Yvette, France

Drosophila social interactions: environmental and genetic variations

Bibiana Montoya
Evolutionary Ecology, Universidad Nacional Autónoma de México

The greener the better

When biparental care and low extra-pair paternity is present sexual traits indicating phenotypic and genetic quality are expected. We evaluated whether gular color, in courting brown booby males, is related to direct or indirect benefits to females. Colorful rearing fathers attended longer the nest and had chicks with more body mass increase. colorful genetic fathers had chicks with more structural growth. Females with colorful mates laid smaller eggs, and chicks from larger eggs begged more to mothers. Gular color provides reliable information on mate genetic quality and parenting abilities.

Jenny Ouyang - Princeton University, Max Planck Institute for Ornithology, Netherlands Institute of Ecology
Kees van Oers - Netherlands Institute of Ecology
Michaela Hau - Max Planck Institute for Ornithology

For better or for worse: hormonal similarity and pair separation in a freeliving songbird

Maintaining a pair-bond has adaptive value. Hormones are mediators of social behaviors and could be involved in the decision whether to stay with the same mate after a breeding season. We used free-living great tits (Parus major) to test if the hormone corticosterone was related to pair-bond longevity and reproductive success. Pairs with more similar baseline corticosterone levels and higher reproductive success were more likely to remain together after the breeding season. This study suggests that pair-bond longevity is related to endocrine similarity and reproductive success.

Theunis Piersma
Animal Ecology Group, University of Groningen & Department of Marine Ecology, NIOZ Royal Netherlands Institute for Sea Research

Towards a developmental ecology (e.g. of shorebird migration)

Katharina Riebel, Leiden University

Female SONGbirds

Birdsong is an important model for studies of sexual selection and animal communication both in behavioural ecology and cognitive neurosciences. In both fields, causes and consequences of the sexual dimorphisms in singing behaviour have been an important research impetus but have also sustained a predominant focus on male song. I will revisit several of the assumptions of the previous decades and discuss them against the background of the mounting evidence for female song and song preference learning. Our recent survey and ancestral state reconstruction of song prevalence in the basal oscine

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Have you got the guts? Effects of early-life microbiota on behavioural development in layer chicks

There is increasing evidence that composition of the gut microbiota during early life affects behavioural development of animals. In rodents, individuals raised in a germ-free environment were shown to be less anxious than control individuals. To date, these mechanisms have hardly been studied in laying hens, yet hold great promise from the perspective of optimizing early-life conditions to favour behavioural development. The aim of this study was to investigate the effect of the early-life microbiota on fearfulness and sociality in layer chicks.

Anne Marijke Schel: University of York (current: Utrecht University)
Simon W. Townsend: University of Zurich
Zarin Machanda: Harvard University
Klaus Zuberbuehler: University of Neuchatel
Katie E. Slocombe: University of York

Chimpanzee Alarm Call Production Meets Key Criteria for Intentionality

Determining intentionality of primate communication is critical to understanding the evolution of human language. Although intentional signalling has been claimed for great ape gestural signals, comparable evidence is lacking for their vocal signals. We presented wild chimpanzees with a python model and found that two of three alarm call types exhibited characteristics previously used to argue for intentionality in gestural communication. Our results demonstrate that certain chimpanzee vocalisations qualify as intentional signals, in a directly comparable way to many great ape gestures.

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2. Ministry of Science, Research and Technology, Guilan University, Iran.

Species differences in the behavioural response to sound exposure in captive fish

Underwater noise levels have risen dueto human activities and affect fish behavior under natural conditions.Vessels,pile driving,seismic surveys can be very noisy and fish have been reported to swim down the water column,aggregate in tighter groups or swim away from thesound source.However,we lack detailed information about species differences and about the detrimental consequences.We exposed zebrafish and cichlids to continuous and intermittent sound in an especially long fishtank with underwater speakers on each side.captive fish do show sound-dependent and species-specific response patterns

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Pauses aid acoustic string discrimination and chunk recognition by zebra finches.

Songbirds learning their song tend to copy "chunks" from one or more tutors' songs and combine these chunks into their own song. In the tutor songs, these chunks are often separated by pauses and a high co-occurrence of elements, suggesting these features affect chunking and song learning. We examined experimentally whether the presence of pauses and element co-occurrence affect the ability of zebra finches to discriminate strings of song elements. The results indicate that pauses in strings of song elements aid song discrimination and memorization of co-occurring element groups.

Elisabeth H. M. Sterck[1,2], Ellen Evers[1], Han de Vries[1], Berry M. Spruijt[1]
1. Animal Ecology, Utrecht University
2. Ethology Research, BPRC, Rijswijk

The EMO-model: an agent-based model of primate social behaviour regulated by two emotional dimensions

Agent-based models are a tool to investigate how animal behaviour results in group level patterns. Primates form long-term affiliative relationship, yet it is debated whether these depend on an individual's memory of partner-specific interactions. To explore this theoretically, we introduce the agent-based EMO-model. In this model, an individual's behaviour is regulated by its emotional state and its interaction history with specific individuals along two dimensions, anxiety-FEAR and satisfaction-LIKE. We compare the EMO-model with a control model. Both models generate reciprocal relationship.

Tom Tregenza
Centre for Ecology & Conservation, School of Biosciences, University of Exeter

Ageing and Chivalry in Wild Crickets

N. Zickert, A.G.G. Groothuis, R. Geuze, University of Groningen

What is behind the myths about handedness?

Handedness is ubiquitous among humans. Right-handers outnumber left-handers nine to one, bringing up interesting questions about this trait. A myth often found in the media is that left-handers are overrepresented in artistic disciplines but there is no striking evidence yet to prove or refute this. In literature there are several hypotheses about traits that seem to be correlated with left-handedness but there are not many studies using large study populations. We set out to launch a campaign asking left- and right handers to participate in an online study to address a selection of myths and hypotheses surrounding hand preference. This was implemented during the "weekend of science" in 2014. In my talk I will explain the main hypotheses that we aim to test.

Posters

Allert I. Bijleveld (a), Robert B. MacCurdy (b), Rich M. Gabrielson (c,d), John Cluderay (e), Anne Dekinga (a), Eric L. Spaulding (c), Sander Holthuijsen (a), Job ten Horn (a), Maarten Brugge (a), Emma Penning (a), Ying Chi Chan (a), Jan A. van Gils (a), David W. Winkler (d), and Theunis Piersma (a,f)
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b. Department of Mechanical and Aerospace Engineering, Cornell University, Ithaca, USA
c. Bioacoustics Research Program, Cornell Laboratory of Ornithology, Cornell University, Ithaca, USA
d. Department of Ecology and Evolutionary Biology, Corson Hall, Cornell University, Ithaca, USA
e. Marine Technology Electronics, NIOZ Royal Netherlands Institute for Sea Research
f. Chair in Global Flyway Ecology, Animal Ecology Group, University of Groningen, The Netherlands

Mechanistically connecting trophic levels: Negative density-dependence in prey causes predators to trade-off prey quantity with quality

Large prey standing stocks are supposed to attract and sustain many predators. Here, we present a study on the spatial distribution of an avian predator (Calidris canutus islandica) in relation to their bivalve prey (Cerastoderma edule), showing that predator intake rates declined at high prey densities due to negative density-dependence in prey quality. Resource-selection modelling revealed that knots indeed selected intermediate cockle densities where they could maximise energy intake rates while accounting for their phenotype-specific digestive constraints (indicated by gizzard mass).

Claire Duménil, David Woud, Jean-Christophe Billeter
Behavioral Biology Group, University of Groningen

Mothers understand: signaling of oviposition sites in Drosophila melanogaster

A future mother wants what is best for her progeny. She cares about food suitable for her child instead of herself. Flies do the same! Females lay eggs communally, which increases survival of their offspring. *Drosophila* aggregation is mediated by a pheromone called cis-Vaccenyl Acetate. This pheromone is transferred by males to females during mating. It is possible that mated females use this aggregation pheromone to call other females to a communal egg-laying site. We determined that: 1) Mated females spent more time on food patch richer in yeast, a favored food of *Drosophila* juveniles; 2) A food patch visited by a mated female becomes more attractive for egg laying to a naïve female, even in the absence of interaction with the first female. This indicates that mated females leave a signal attracting other females and promoting egg laying.

Jeroen N.A. Hoffer, Jacintha Ellers, Janine Mariën & Joris M. Koene
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Measuring sexual selection in a simultaneous hermaphrodite

The Darwin-Bateman paradigm predicts that hermaphrodites should experience stronger sexual selection via the male function. Using a simultaneously hermaphroditic pond snail, we show that male Bateman gradients are significantly positive while higher female mating success negatively affect the individual's male mating success. The latter is explained by negative effects of seminal fluid proteins on sperm transfer of the recipient.

Neeraj Kumar(1), Bonnie de Vries(1), Annie van Dam(2), Hjalmar Permentier(2), Manfred Gahr(3), Ton G.G. Groothuis(1).
(1) Behavioural Biology, Univ. of Groningen, NL; (2) Interfaculty Mass Spectrometry Center, University of Groningen, NL; (3) Behavioural Neurobiology, Max Planck Institute for Ornithology, Germany.

Hormone-mediated maternal effects: a potential role for the embryo?

In egg laying vertebrates, the level of maternal steroids in yolk at oviposition is assumed to be a context-dependent maternal signal to adjust the offspring phenotype. Some studies found a decline in the free steroids over incubation with an increase in supposedly conjugated forms, with one study owing this to embryonic metabolism. This opens up the possibility for an active role of the embryo in translation of maternal signal, but there is discrepancy in the literature. We will present data on early embryonic metabolism of maternal steroids in chicken analyzed using mass spectrometry.

Hans Slabbekoorn, Jaime Sierro Miguel, Javier Sierro Miguel
Department of behavioural biology, Institute of Biology, Leiden University

The role of syllable alternation during territorial contests in the common chiffchaff (Phylloscopus collybita)

Temporal and Spectral song parameters can teach us about bird intraspecific interactions. Some measures, like song rate have been proved to play a role in male-male interactions in the chiffchaff. Syllable alternation is a distinctive trait in this species and has not been studied before in the context of intraspecific communication. We exposed 21 males to alternating and monotonous playbacks and analysed their response. Our results show that males perceive differences in syllable alternation and suggest that it may play a role in male-male interactions whereas this role remains unclear.

Thomas Oudman (NIOZ), Vincent Hin (UvA), Jan van Gils (NIOZ)

The effect of food choice by red knots on prey populations

Red knots are medium sized migratory shorebirds that feed on bivalves. A large population winters in Banc d'Arguin, Mauritania. There, the main available bivalve prey is slightly toxic because it contains sulfide. However, this prey is much easier to digest than other available prey. As a result, red knots actively feed on a mixture of prey types, taking in account search time, digestibility and toxicity of prey. We compare population models with and without active food selection, to determine the effect of food selection behaviour by red knots on population dynamics of the prey species.

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Who is vocalising? Acoustic localisations of broadband clicks plotted onto video recordings of individual dusky dolphins (Lagenorhynchus obscurus) in New Zealand.

Broadband acoustic and video recordings were obtained from dusky dolphins (Lagenorhynchus obscurus) in New Zealand. Recordings were made using the 4-channel UDDAS (Underwater Dolphin Data Acquisition System). Echolocation clicks extended in frequency to the recording limit of 240 kHz and most recorded clicks had no energy in the human audio range. The calculated 3D positions of recorded clicks corresponded to positions of different dolphins on video. One occasion of coordinated feeding by dusky dolphins was recorded, where dolphins encircled and aggregated fish into a stationary bait ball.

Lysanne Snijders (a,b), Erica P. van Rooij (a), John M. Burt (c), Camilla A. Hinde (a), Kees van Oers (b), Marc Naguib (a)
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(c) University of Washington, Seattle, WA, U.S.A.

Networking with territorial songbirds

In several species personality differences correlate with differences in social behaviour. We here tested whether social network position is related to individual differences in exploration behaviour using a wild, territorial, personality-typed great tit population. By means of novel, large-scale, automated tracking we show that slower exploring males had less central social network positions. Yet they were overall not less active than fast explorers, suggesting that a less central social network position was not merely a consequence of lower activity. Hence, territorial individuals could be

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DNA methylation of dopamine receptor D4 is associated with personality traits in the great tits (Parus major)