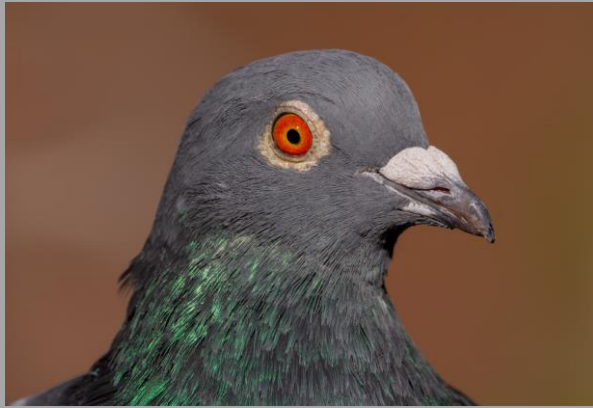




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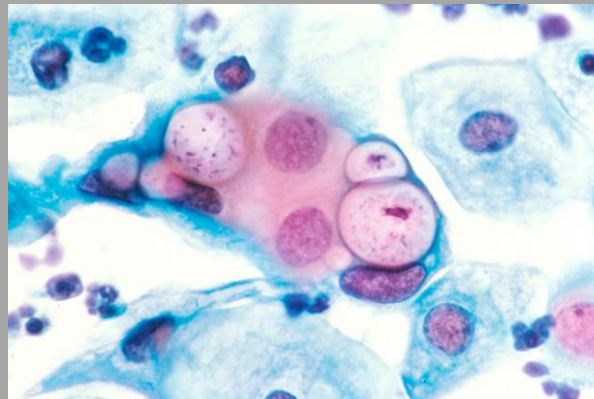
**Behavioural Ecology
and Ecophysiology**

University of Antwerp



Feral Pigeons (Antwerp)

- Disease transmission
- Movement ecology
- Urbanisation
- Individual variation



Infection dynamics in the Anthropocene
Tracking super spreaders and infection hotspots in
the urban jungle

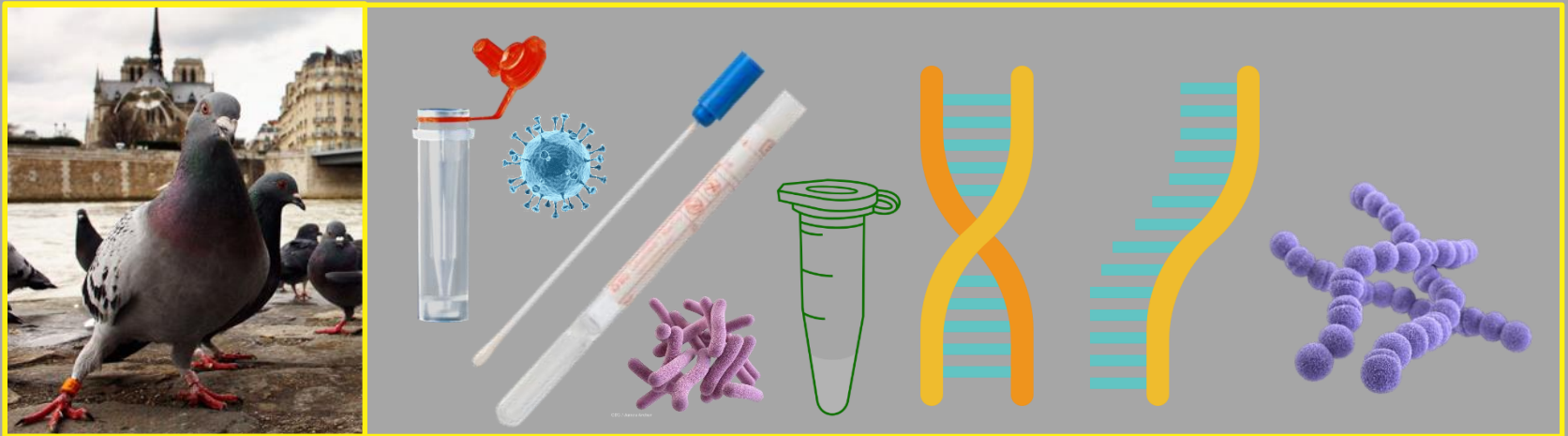
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in collaboration with EVECO

Spatial variation in disease prevalence in urban environments

Cities offer a lot of feeding opportunities for wildlife, but these are often not equally distributed throughout the city. Clustering of resources can lead to high local pigeon abundances and hence a high risk of disease transmission. The aim is to search for and find these infection hotspots.



Description of tasks:

- Catching and sampling of feral pigeons in the City of Antwerp
- *DNA/RNA extractions, PCR, Sequencing*
- *Analysis of the spatial distribution of the disease*

Individual variation in disease transmission – linked sociability?

Individuals that are more social might interact with more conspecifics and occupy more central positions in the network so they might more likely transmit the disease. Here the aim is to identify and characterize these superspreaders.

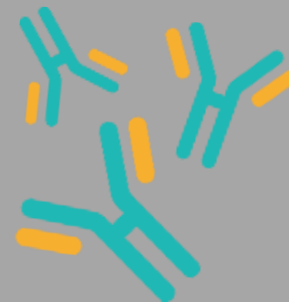


Description of tasks:

- Behavioral experiments and observations in the wild
- Catching and marking pigeons
- Video analysis

Immunity: not all pigeons will be equal

Becoming infected as well as the intensity of infection will depend on how well the immune system is functioning. Yet how and why differ individuals in immunity if that is such an important trait?



Description of tasks:

- Catching and sampling pigeons
- *Analysis of immune parameters*
- *Analysis of infection status*



Lesser black-backed gulls (Zeebrugge)

- Parental cooperation
- Foraging ecology
- Early development
- Individual variation





On the spot: how to establish a territory?

- High breeding density areas are characterized by a higher breeding success. This suggests that there is a high level of competition to get and maintain these territories.
- By combining time lapse photography, behavioral observations and field experiments (manipulations of breeding density), we aim at understanding:
 - 1) how gulls invest their time to successfully establish a territory, offspring care and self-maintenance,
 - 2) how social interactions shape the acquisition and maintenance of territories, and ultimately
 - 3) relating those aspects to reproductive success

Description of tasks: Possibility to do fieldwork with wild seabirds (about 1 day per week during March and April). The rest of the year the work will be based at CDE. The student will receive support with statistical analysis.

Contact: wendt.mueller@uantwerpen.be



Canaries (CDE)

- Parental care
- Conflicts of interest
- Early development
- Cognition

Flexibility of seed preferences in canaries



Summary:

- Canaries show great individual variation in seed preferences.
- Surprisingly, some canaries show preference for seed types they have very little prior experience with.
- Question: how flexible are individual canaries in their seed preferences (and how does the introduction of new seeds affect this)?

Only IP: available for max. 2 students

Description of tasks: Food choice experiments and analysis of video recordings, very limited statistics

Location and timing: CDE (video analysis can be done at home), timing is flexible

Contact: tim.andries@uantwerpen.be or wendt.muller@uantwerpen.be

Neglectful food provisioning in abusive female canaries



30-40% of female canaries start to **abuse** their chicks between day 14-19 by **plucking the feathers** of their own nestlings before fledging, and this has a negative effect on the nestling's weight.

Could maternal physical abuse be part of a broader life history strategy? Are abusive females allocating food differently within (high vs. low quality offspring) or among (current vs. future offspring) broods? And what is the role of the male in this scenario?

Description of tasks: Parental provisioning tests (hunger manipulations, video recordings, marking the chicks, and weight measurements) and video analysis. The student will also receive support with statistical analysis of the data.

Location and timing: CDE, data collection in March-April (IP or MT)

Contact:

Clara.GarciaIco@uantwerpen.be or wendt.muller@uantwerpen.be

Impulse control in abusive female canaries



30-40% of female canaries start to **neglect** their chicks or **pluck the feathers** of their own nestlings before fledging.

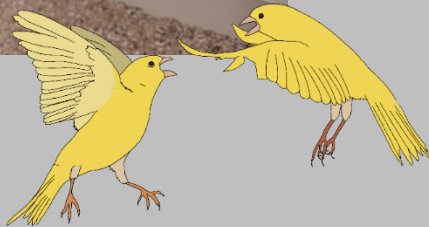
Could maternal abuse/neglect behaviour be part of a more aggressive behavioural phenotype with **impulsivity control deficits**?

Description of tasks: behavioural response tests on female canaries (aimed at impulsivity and aggression) and video analysis. The student will also receive support with statistical analysis of the data.

Location and timing: CDE, data collection in January-February and/or May (IP)

Contact:

Clara.GarciaCo@uantwerpen.be or wendt.muller@uantwerpen.be



Great and blue tits (CDE)

- Animal personality
- Urban ecology
- Individual variation
- Cognition



Causes and consequences of female aggression in wild blue tits

Female blue tits are more aggressive than males. But individuals differ in their relative levels of aggression. What are the causes and consequences of increased aggression, on a behavioural, cognitive and fitness level?

- Location fieldwork: Campus Drie Eiken
- Fieldwork timing: March – Early June (MP or IP)
- Description of tasks:
 - Performing observational aggression tests on wild females
 - Conducting nestbox checks
 - Performing behavioural or cognitive tests
- Contact: Robin.vanlersel@uantwerpen.be; marcel.eens@uantwerpen.be



Aggression vs Innovation: Alternative strategies in wild blue tits?

Aggression **grants access** to resources. Less aggressive females may compensate by being more **innovative**. In the **preceding year**, data was gathered on the **problem-solving ability** of blue tits. Using available videos and data, you will be able to **link** an individual's ability to '**solve**' a problem to **aggression** and **discover** if individuals employ **alternative strategies**.

- Location: Campus Drie Eiken
- Description of tasks:
 - Scoring observations on problem-solving ability using **BORIS** (Behavioral Observation Research Interactive Software)
 - Coding and interpreting avian behaviour
- Contact: Robin.vanlersel@uantwerpen.be;
marcel.eens@uantwerpen.be



Maternal programming of offspring social phenotype



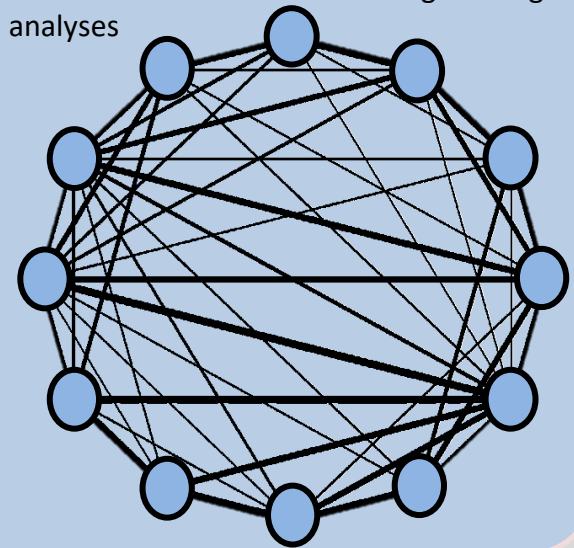
Early life environment, including the position in the **family social network**, has long-term **effects on the future fitness** of individuals. Mothers can **prepare their offspring to thrive better under specific conditions**.

Could **nestlings' social phenotype** be **programmed for a particular family size**? How much depends on the **expected family size** and how much on the **actual family size**?

Description of tasks: elaboration of matrixes of interactions between nestlings through observation of video recordings for posterior analyses using a social networks approach. The student will also receive support with statistical analysis of data.

Location and timing:
CDE, end November-February
(IP or MP possible)

Contact:
alejandra.garciaanton@uantwerpen.be
or wendt.muller@uantwerpen.be





Nightjars (Limburg and Antwerp)

- Foraging ecology
- Migration
- Light pollution



Topic 1: What is the impact of nocturnal light on daily activities in European Nightjars?

Topic 2: What is the impact of nocturnal light on daily activities in European Nightjars?

Description of tasks: Helping with fieldwork (e.g. capturing and tracking of nightjars, downloading data from light sensors [topic 1], making all-sky photographs, tracking nightjars [topic 2]) and analysing new and existing datasets on nightjars' song activity.



Practical:

- drivers licence required
- Study sites in Limburg and Antwerp
- Fieldwork: May - August
- Contact: ruben.evens@uantwerpen.be



Bonobos (Plankendael)



- Social Behaviour
- Stress
- Diet
- Individual variation





The gut-brain axis in zoo-housed chimpanzees (MP)

- **Abstract**

Gut microbes closely interact with host physiology and play an important role in the development and regulation of behavior and cognition, giving rise to a connection between the brain and the gut, also known as the gut-brain axis. This project aims to study this connection in chimpanzees.

Project information

AIM: Study the interaction between the gut microbiome and behavior of zoo-housed chimpanzees using a large multi-group population

WHERE: Include zoo-based observations of chimpanzees in a European Zoo (TBD) in summer-fall 2024. 2 weeks training in Antwerp Zoo + 8 weeks of observations abroad

YOU NEED: Own laptop to install observer software

REQUIRED: Fast and blind typing is CRUCIAL for success of this project

- **Contact person**

- Nicky Staes : nickystaes2@gmail.com
- Jonas Torfs: jonas.torfs@uantwerpen.be





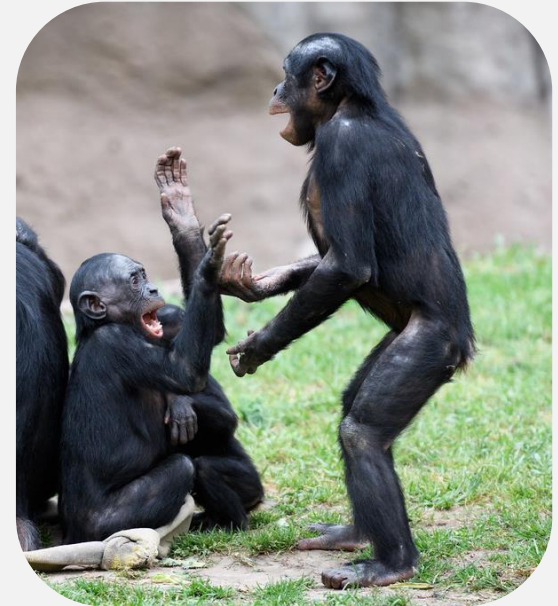
The social functions of positive emotions in bonobos (MP)

Summary: Positive emotions are important for the individual but may also hold social benefits to relationship quality accrued by experiencing and expressing positive emotions. For example, shared positive emotions may improve social bonds, but also de-escalate negative emotional interactions, such as aggression. This project aims to induce positive emotions in zoo-housed bonobos and investigate the impact on sociality.

Location and timing: Include zoo-based observations of bonobos in Zoo Planckendael (Mechelen) in summer-fall 2024. 2 weeks training + 6 weeks observations

Description of tasks: Design experiments to induce positive emotions and perform behavioural observations to test the influence on social dynamics in zoo-housed bonobos. Student needs own laptop to install observer software and fast and blind typing is CRUCIAL for success of this project

Contact: daan.lameris@uantwerpen.be





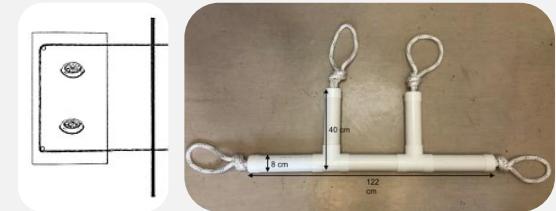
Cooperation across multiple Herpestidae species (MP)

Summary: Cooperative behaviors in animals provide valuable insights into the evolutionary processes that shape social interactions. Understanding how cooperation has evolved can shed light on the origins of sociality and prosociality in various species. Herpestidae species exhibit a wide range of social structures, from solitary to highly cooperative species, making them ideal subjects for studying the evolutionary roots of cooperation.

Location and timing: Student will need to travel to ZOO Planckendael and ZOO Antwerpen to run tests with the different species. Experiments and observations will be conducted over the summer of 2024 (July – September)

Description of tasks: Develop, implement and code cooperation paradigms with multiple Herpestidae species. You will conduct behavioral observations for which you need a laptop to install coding software.

Contact: daan.lameris@uantwerpen.be; Jonas.verspeek@kmda.org





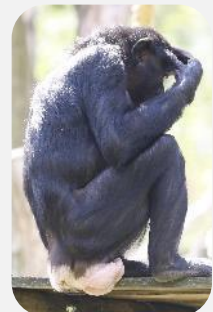
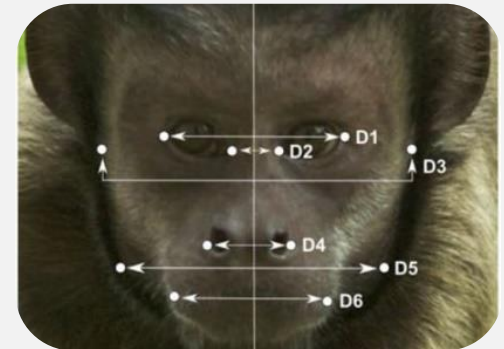
Facial and genital swelling symmetry in zoo-housed bonobos (MP or IP)

Summary: Body symmetry is believed to be an indicator of developmental stability and genetic fitness, with more symmetrical body features also being more attractive to conspecifics. The primate face is central in many social interactions and facial characteristics convey information about fertility, dominance and attractiveness. Bonobo females have distinctive genital swellings that likewise convey much of this information. The aim of this project is to apply measures for facial and swelling asymmetry to photographs of bonobos and relate them to inbreeding levels within the captive population.

Location and timing: Student will need to travel to ZOO Planckendael to take pictures of the bonobos.

Description of tasks: Take pictures of the bonobos to enlarge the existing collection of photographs, apply the measures of asymmetry to the photographs and relate them to available information about the level of inbreeding. Student needs photographic skills (and own camera) to take pictures of bonobos (often at larger distance).

Contact: daan.lameris@uantwerpen.be; Jonas.verspeek@kmda.org





Digital Mark Test to study self-awareness in great apes (MP or IP)

Summary: Recognising a reflected mirror image as 'self' (i.e., mirror self-recognition) is a hallmark of cognition and consciousness across species. The 'Mark Test' is a widely applied assay to study mirror self-recognition, but prone to some methodological flaws.

Location and timing: Student will need to travel to Zoo Planckendael and Zoo Antwerpen to run tests with the apes. Timing is flexible, but development of the test should preferably happen in January-February (IP) or over the summer of 2024 (MP) (July-August).

Description of tasks: Develop and test a novel Digital Mark Test for great apes for which you need a laptop to install software and develop filters. Experience in, or independent ability to learn creating Augmented Reality filters is **crucial**.

Contact: daan.lameris@uantwerpen.be; Jonas.verspeek@kmda.org





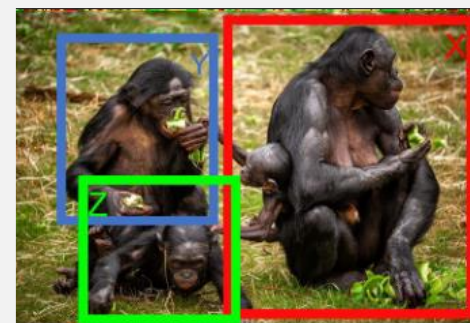
Automatic identification of zoo-housed bonobos (MP or IP)

Summary: Performing observational studies are time-consuming and therefore are often limited in either the amount of observed animals or the observed behavior. Automating the process of localizing and identifying individuals can be a large step towards automated behavioral studies. Studies show success in applying artificial intelligence as tool to identify primates, but are mostly trained using close-up images.

Location and timing: Student will need to travel to Zoo Planckendael to perform observational studies as benchmark of the algorithm. Observations are performed in summer-fall 2024. 2 weeks training + observations. Development and labelling of the data can be performed remotely.

Description of tasks: Develop and test an algorithm to localize and identify individuals for which you need a laptop to install software and perform algorithm training. A decent CPU, graphics card and enough memory are needed. Experience in, or independent ability to learn basic artificial intelligence is **crucial**.

Contact: Jonas.verspeek@kmda.org; simon.verspeek@uantwerpen.be;





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YOU !**

