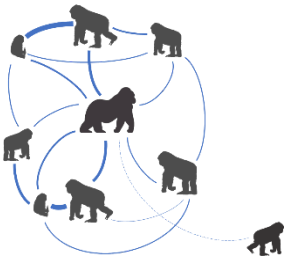
University of Zurich[UZH]



PhD position using mountain gorillas as a study system to examine the evolution of flexible dispersal patterns

Topic: The predictors and consequences of dispersal in a flexible social system

The PhD student will use long-term data from the Dian Fossey Gorilla Fund, collected on mountain gorillas in Rwanda to quantify gorillas' large-scale society. To do this they will use data on inter-group encounters, inter-group communication, kinship, movement patterns and group compositions across more than 20 years. They may also employ additional field methods e.g. acoustic monitoring, to further understand these inter-group relationships. They will then examine how this wider society influences a) females' decisions to disperse between groups and b) the process of integration into a new group, using social network analysis and fecal glucocorticoid measures. They will then fit this into a broader framework examining the costs and benefits of dispersal, whether individuals can maximise their fitness by making optimal dispersal decisions, and the physiological mechanisms that underpin these decisions (see description of wider project below).

This position provides an opportunity to work with one of the largest and most detailed datasets on the behaviour of a wild ape. Through working closely with experts in both ape and human social behaviour, and by combining long-term data with intensively sampled physiological data they will be well positioned to investigate research questions at the intersection of biological anthropology, psychology, animal behaviour and conservation. The ideal candidate should have a background in one or more of these areas and enthusiasm for developing expertise in the others. The PhD student will receive training in Social Network Analysis, GIS analysis, fecal hormone extraction, fecal hormone assays and scientific writing. They will also have opportunities to visit, work with and learn from collaborators in the USA (in Dr Stacy Rosenbaum's Lab at University of Michigan) and in Rwanda (at the Dian Fossey Gorilla Fund). They will work closely with Dr Robin Morrison on their project but be part of a wider team within Prof. Andrea Migliano's Human Evolutionary Ecology group, including an incoming cohort of 5 PhD students on Prof. Migliano's COLLABORO ERC project.

Supervisors: Dr Robin Morrison and Prof. Andrea Migliano

Location: Human Evolutionary Ecology Group, Department of Anthropology, University of Zurich, Switzerland

Timescale: 4-year PhD beginning around September 2023

Funding: 4-year scholarship starting at CHF 47,040 with annual increase (~CHF 1,500) CHF 5,000 for conference attendance, CHF 8,000 for fieldwork/collaboration costs

Eligibility: Applicants from all countries can apply. A masters' degree in a scientific field and English proficiency at CEFR C1 or higher are required. Due to the timeframe of the wider project and its funding, the position must be full time.

Candidate profile:

- Good quantitative skills and the ability to handle large datasets (e.g. in R, python etc.) or basic knowledge of quantitative methods and R and the capacity and enthusiasm to develop them further.
- Interest in social evolution and animal behaviour and an enthusiasm for hypothesis-driven research using data from long-term studies of wild animals.
- Good scientific writing skills and proficiency in English (an official language at the University of Zurich).
- Teamwork and collaborative skills – you will be working with an international team of researchers based across Switzerland, Rwanda and the United States.
- Degree in Biology, Biological Anthropology, Zoology, Psychology, Natural Sciences or any scientific related field.
- Master's degree in a scientific discipline.

Any one of these would be a bonus (but is not a requirement – please don't be put off applying if you do not have experience in any of these):

- Field skills, particularly experience studying animal behaviour in the field.
- Lab skills, particularly in running hormone assays.
- Knowledge of bioacoustics, particularly experience in acoustic monitoring of wild animals.
- Experience working with long-term behavioural datasets from a wild social animal.

Applications should be submitted to Robin Morrison at evosoflex@gmail.com and include:

- CV
- Cover letter detailing your motivation for applying to the position, and how you fit the candidate profile (max 800 words)
- Names and contact details for two referees (e.g. masters supervisor). They will only be contacted at the shortlisting stage.

Please feel free to reach out beforehand if you are unsure about whether to apply, have any questions or would like further information on the project.

Submission Deadline January 20th 2023

Information on the wider project:

The PhD funding comes from Robin Morrison's 4-year Ambizione Fellowship (2023-2027). This means that much of the project is already planned out but there is some flexibility surrounding which sections of the overall project the student works on. There should also be some space for the PhD student to develop a smaller project themselves based on their interests that fits the scope of the wider project.

The evolution of social flexibility: investigating the adaptive origins and mechanistic underpinnings of our flexible dispersal patterns.

Social environments can have major consequences for reproduction, health and survival. In societies with high social flexibility, individuals can shape their social environments through the social decisions they make, and these decisions can have major fitness consequences. Humans show exceptional variation in their social environments and a high level of social flexibility, dispersing between groups and forming new relationships across the lifespan. This capacity to disperse between groups across the lifetime is shared with a number of other social species. Despite this, extremely little is known about whether this element of social flexibility is adaptive.

Since social decisions can have such considerable fitness consequences, we would expect there to be strong selection on a mechanism enabling individuals to make decisions that maximize their fitness in complex social landscapes. However, whether this capacity to optimize social environments and increase fitness exists and the mechanisms by which this could occur remain unknown. We propose to address this problem by studying flexible dispersal patterns and the mechanisms underpinning them, in one of our closest evolutionary relatives: the mountain gorilla. Mountain gorillas show considerable social flexibility with around half of both males and females dispersing from their natal groups, and females dispersing multiple times throughout their lives. Like humans, their social groups also form part of a wider society. Individuals have varying levels of familiarity with the social and ecological environments of neighboring groups, based on the relationships that extend between groups and the extent to which their home ranges overlap. This familiarity may shape these flexible dispersal decisions and the process of integration within a new group.

Using long-term demographic data, fine-scale social data, health data and stress estimates from fecal hormone analyses, we aim to: 1. Identify the social correlates of fitness in mountain gorillas. 2. Test whether the flexibility to change social groups enables individuals to maximize their fitness. 3. Quantify the social relationships extending between social groups and examine how this broader social structure influences dispersal patterns. 4. Test whether social flexibility is mediated by the stress response. By investigating the fitness consequences and mechanistic underpinnings of how mountain gorillas flexibly change between social groups within their wider society, this project will shed light on the origins of our own highly variable and flexible society, and the evolution of flexible dispersal behaviors across animals more broadly.

Frequently asked questions

Do I need to already have my Master's degree before applying?

No - Following selection, the candidate for this position will need to enrol in the University of Zurich Life Sciences PhD program. For those that have not yet received their MSc or MPhil, they require you to obtain your degree within 6-9 months of applying to the program, provide a copy of your Bachelor degree and your latest academic transcript.

Do I need proof of my English language proficiency to apply?

No - proficiency in English will be assessed informally through the application process. If at the shortlisting stage we have any concern that language proficiency may hinder your ability to complete the requirements of the PhD program we may request evidence that you are already at or are working towards proficiency in English at CEFR C1 or higher.

Will I be able to work directly with gorillas?

The focus of this PhD will primarily be working with existing long-term data and fecal samples collected by collaborators in Rwanda. The student will have multiple opportunities to visit collaborators in Rwanda at the Dian Fossey Gorilla Fund Campus with a focus on learning how the data is collected and analysed, presenting their ongoing research to collaborators and providing training opportunities and mentorship for early career Rwandan scientists. Depending on the student's interests, we can work together to develop a proposal for a more extended stay in Rwanda (~4-6 months) either working in the hormonal labs at the campus or collecting data in the field with a possibility of working with the habituated mountain gorilla groups. Any research conducted in Rwanda would need to fit with the logistical requirements of the Dian Fossey Gorilla Fund and the Rwanda Development Board and be approved by both organisations. We therefore cannot guarantee at the outset of this project that fieldwork will be possible.