

Corvid connections: how do social bonds influence stress, health, nutrition and cultural knowledge?

Supervisory team:

Lead supervisors: Dr Alex Thornton (University of Exeter), Dr Andrew King (Swansea University)
Dr Camille Bonneaud (University of Exeter), Dr Ines Fürtbauer (Swansea University)

Collaborators: Dr Paul Jerem (Vrije Universiteit Amsterdam)

Host institution: University of Exeter (Penryn), Swansea University

Submit applications for this project to the University of Exeter

Project description:

Like humans, many animals form stable social relationships between specific individuals. These relationships can be extremely beneficial: in humans and other primates individuals with strong relationships tend to be healthier and less anxious. However, there has been little research on other animals and it is not clear how the benefits of social relationships trade off against costs. For instance, spending time with social partners could improve immune function but also increase exposure to infections. Similarly, if you spend most of your time with particular partners you risk missing out on opportunities to learn valuable information from others. To understand these trade-offs and shed light on how and why social relationships evolve, this interdisciplinary project will study jackdaws living in their natural environments where they are subject to competition, predation and disease. Using a combination of state-of-the-art field experiments, non-invasive stress assays and physiological measures you will examine how variation in the strength of social relationships influences individual stress levels, health and the acquisition of food and knowledge.

Jackdaws are members of the large-brained corvid family that form enduring pair bonds embedded within dynamic social networks. Our fieldsites contain thousands of colour-ringed, RFID-tagged jackdaws, providing unique opportunities to quantify the strength of social bonds.

Bringing together the supervisory team's expertise in animal cognition and field experiments (Thornton), social relationships and networks (King), behavioural endocrinology (Fürtbauer) and disease ecology (Bonneaud) the project will determine how social relationships influence:

1. **Stress:** You will use non-invasive thermal imaging and hormonal assays to understand whether variability in short-term social interactions (e.g. co-feeding with partners) and long-term sociality measures mediate stress levels.
2. **Health: Parasite levels and immune function:** Using state-of-the-art biomolecular lab techniques you will quantify individual variation in the presence and intensity of various parasitic infections and immunocompetence.
3. **Food:** using automated feeders that record the identity of all visiting birds, you will test how the presence and identity of social partners alters the probability of displacement and changes food intake.
4. **Knowledge:** you will seed novel foraging innovations by training individual "demonstrators" to access automated feeders. You will then quantify the cultural transmission of the new behaviour and associated changes in social network structure to determine whether jackdaws can adjust their social associations to learn from knowledgeable individuals. Together, this work will provide important insights into social evolution, cultural transmission and health.