

A2

Active acquisition of ecological & social information in wild macaques



Oliver Schülke



Julia Ostner

Motivation

- Integrated models of curiosity highlight that information **novelty** and **complexity**, as well as an agent's levels of **uncertainty** play a role in triggering the drive for information acquisition.
- Selective attention during observational learning is understudied in non-human primates.

Preliminary work:

- Observational method proof of concept^{1,2} with captive macaques. Attention for agonism and grooming either involving a close affiliate or not (see Fig.1)

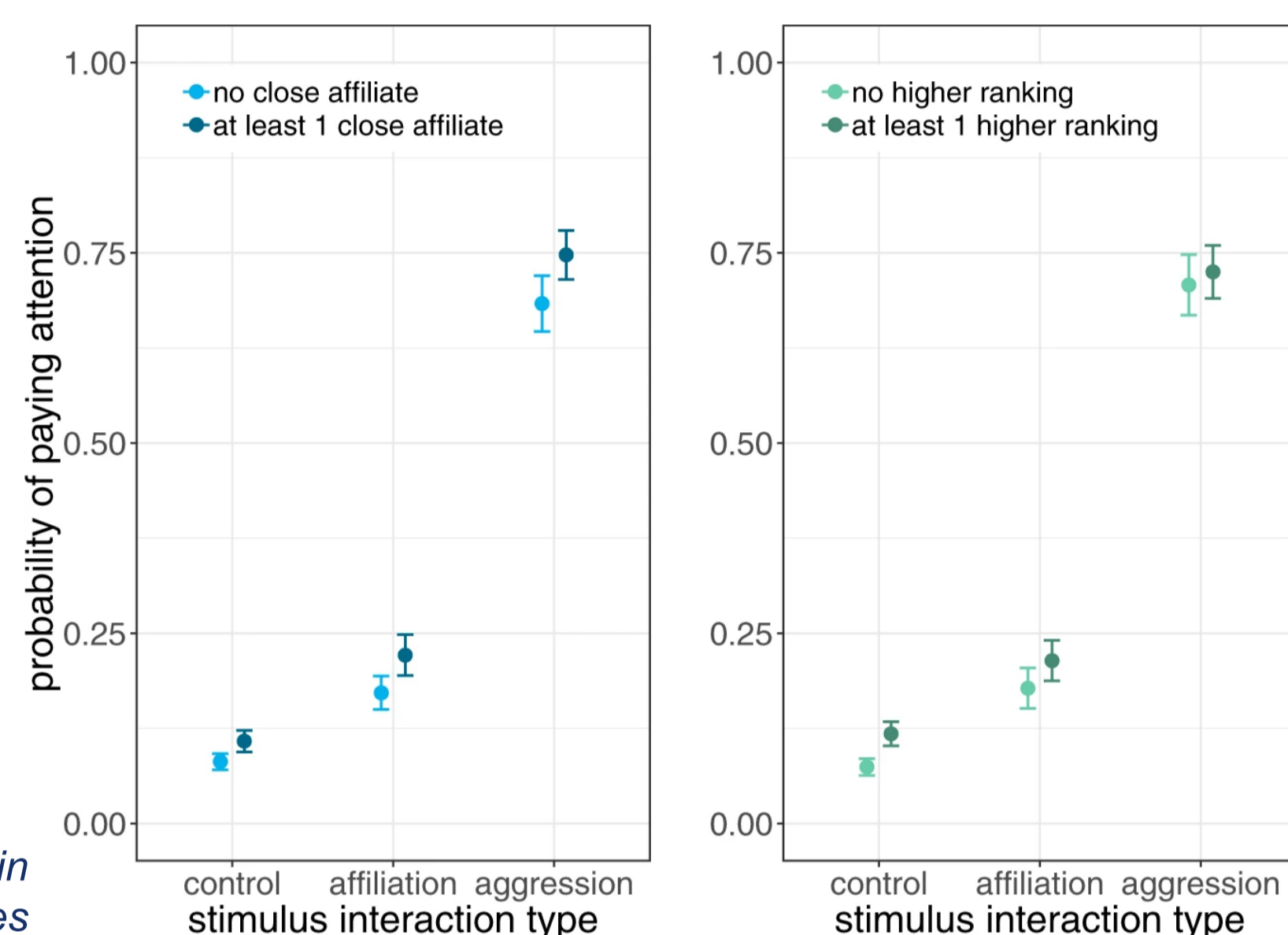


Fig.1: Selective attention in captive macaques

Objectives

- Assess differences in attention to foods and processing techniques when food items differ in novelty, complexity, and levels of uncertainty they generate?
- Identify the short and long term consequences of interindividual differences in curiosity about food
- By focusing on selective attention this project links to projects that ask **When are we curious?**
- With respect to the effect of curiosity on social learning, this project answers the question **Why are we curious?**

?

What factors influence curiosity for ecological and social information in the natural environment of wild infant and adult Assamese macaques?

Methods

- Long-term field site at Phu Khieo Wildlife Sanctuary, Thailand
- Observational study on peering and sniffing behaviour of cohorts of infant Assamese macaques (~35 births per year March-June)
- Botanical work to track seasonal emergence of different foods, i.e., changing novelty over time (~200 plant species)³
- Record food handling technique & quantify handling time for different food items in adults and record extraction success in infants to measure technique complexity and individual's level of uncertainty (Fig. 2)
- Track individual growth with Parallel-Laser-Photogrammetry (Fig 3)⁴
- Through 3rd RTG cohort track survival over 8-9 years

Hypotheses:

- Individuals will be more attentive toward novel and complex information or stimuli that generate high levels of uncertainty
- Level of demonstrated curiosity will be consequential for learning and for physical development

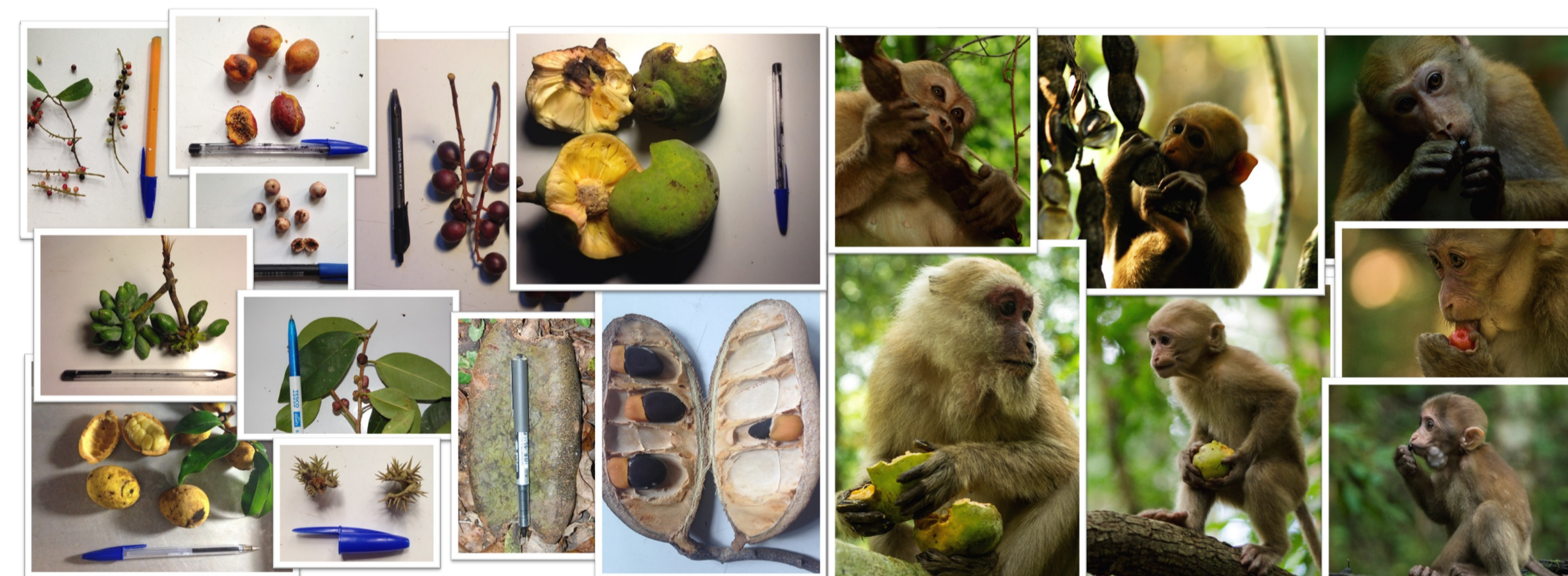
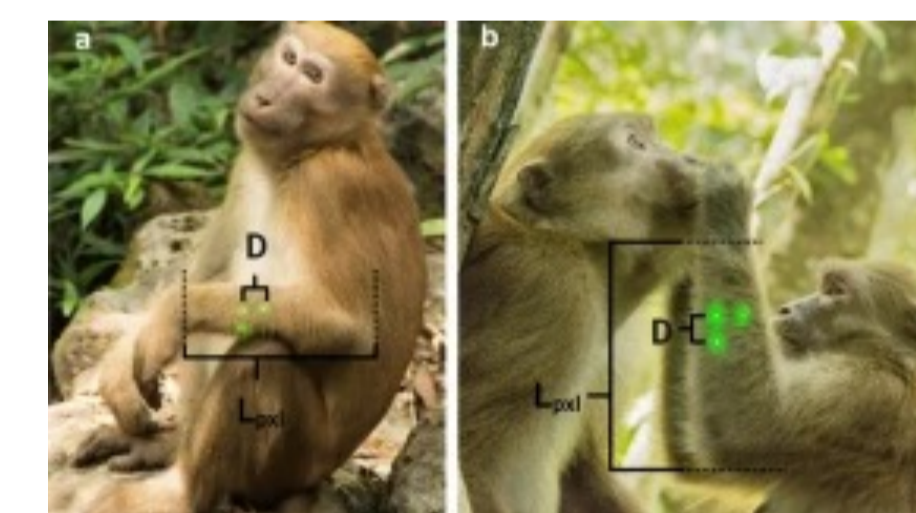


Fig. 2: Examples of fruit (left) varying in complexity and being associated with different levels of uncertainty and (right) adults versus infants handling complex and simple food items

Fig. 3: Digital photogrammetry with parallel lasers projected onto the body part to be measured as a size standard allows for measuring growth as an outcome variable of inter-individual variation in curiosity.



Cross-project collaborations

- Direct comparison: effects of novelty, complexity and uncertainty are also studied for word learning in **B4**.
- Across cohorts of RTG students the project will track the survival of cohorts of subjects (**A3** and **B2**) shedding light on the link between early curiosity and later outcomes (**B3**, **B4**).
- Theoretical projects **C2**, **C3**, **C5** will provide predictions to be tested by the second and third cohort students in **A2**.

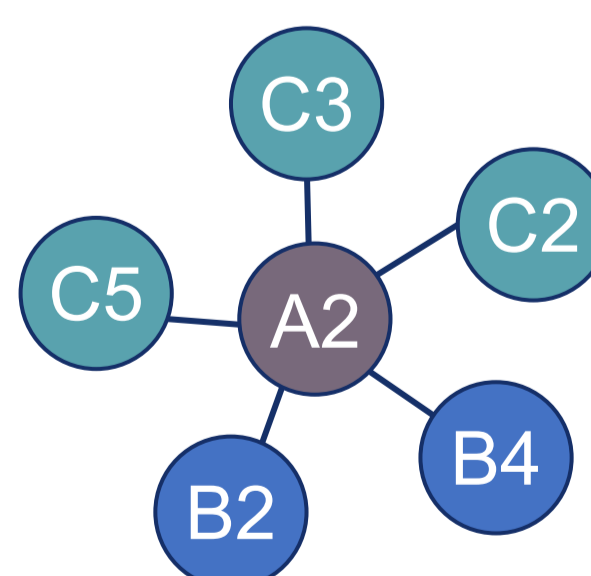


Fig. 4: Some key collaboration partners of doctoral researcher working on Project A2

Potential PhD projects

1. Observational learning of routine foraging skills in an integrated model of curiosity
2. Curiosity for social information across development
3. Association between early life curiosity and proxies of evolutionary fitness

References

1. Schülke, O., Dumdey, N. & Ostner, J. (2020). Selective attention for affiliative and agonistic interactions of dominants and close affiliates in macaques. *Scientific Reports*, 10(1), 1-8.
2. Cheng, J., Gerpott, F., Benson, A.J., Bucker, B., Foulsham, T., Lansu, T.A.M., Schülke, O., & Tsuchiya, K. (2022). Eye gaze and visual attention as a window into leadership and followership: A review of empirical insights and future directions. *The Leadership Quarterly*, 101654.
3. Heesen, M., Rogahn, S., Macdonald, S., Ostner, J. & Schülke, O. (2014). Predictors of food-related aggression in wild Assamese macaques and the role of conflict avoidance. *Behavioral Ecology and Sociobiology*, 68, 1829-1841.
4. Anzà, S., Berghänel, A., Ostner, J. & Schülke, O. (2022). Growth trajectories of wild Assamese macaques (*Macaca assamensis*) determined from parallel laser photogrammetry. *Mammalian Biology*, 102, 1497-1511.