Lastly, ethnographic research often follows grounded theory rather than a strict predefined research question. Thus, the process is iterative, whereas grounded theory is adjusted to the actual field situation, which can be observed. Along with this, the research questions are reformulated, and data collection depends more on the ethnographer's intuition. It is also based on sensory attention, experience, and a partial perspective, as well as mediations between field, discourse, and practice.

5.5. *Participant* Behaviour Observation

To consider multispecies observational apparatus from a methodological perspective, I conclude with a rather speculative play on the terminology of the formal methods of observation. In doing so, I aim to highlight the agencies of observation at stake. For this, I refer to my own participant observation, which I juxtapose with the behavioural observation study of the biologists.

Both research methods engage with observational settings and are thus bodily techniques that can be advanced and extended by technologies, as previously discussed. While one focuses on an observation method that engages with the research subject by participating, the research subject does not define the nature of the involvement, but instead describes the focus of the observation, the behaviour. In relation to what I have discussed earlier, I argue that, in both cases, a (sensory) involvement and (bodily) interaction between the observer and observed is occurring, even though these are based on different prerequisites. One is a human–human interaction between the biologists and me, the ethnographer, while the other is a human–non-human interaction between the biologists and the birds. Each interaction has different agencies.

I tentatively conclude by suggesting that the biologists' observations should be called *participant* behaviour observations. This term emphasises that the observation situation is not one that can be encountered in nature *as it is* but is one triggered by the biologists' manipulations of the birds' environment. Viewing the observational setting from this perspective also emphasises that – as discussed in the sections on sensory alignment – not only do the biologists have power over the birds, but the birds' behaviour also impacts the observations they trigger, and what can be turned into data and how.

This is where biology could learn from anthropology: The effect of the researcher's presence is something that is very well reflected in anthropology but still a blind spot in natural scientific research. Only recently, it seems, have scientists started to reflect on human involvement or experience as part of scientific knowledge production.[32] Ecofeminists such as Haraway and Barad have attempted to thematise this for decades by referring to knowledge production in the natural sciences (Haraway) and quantum physics (Barad), and how observational settings are a question of entanglements, as indicated by the well-known double-slit experiment in quantum physics.[33] I do not aim to question the objectivity of the data with this, but rather how it is constructed and rendered. My claim is in favour of a

32
Kohn, *How Forests Think,* 140.

33
The double-slit experiment, first performed by Thomas Young in 1801, illustrates the wave-particle duality of light and matter. When shooting light with one wavelength through a two-slit screen, the two resulting light sources create interference but still display wave behaviour on the other side of the screen. However, when replacing the light source with a proton, which, according to Isaac Newton, displays particle behaviour, the result becomes more complex. When shooting it through the screen, the protons also create an interference pattern, proving their wave behaviour. Accordingly, through the experimental setting, the physical state of the proton seems to have changed. In addition, when adding a detector on one side of the screen (which could be imagined as an observer) and turning this detector on, the protons display particle behaviour. However, the way they shoot through the two slits regularly alternates, which suggests an agency outside of human perception. Interestingly, when turning the detector off, the particles again display wave behaviour. Most surprisingly, when turning the detector on after the protons have been shot through the screen, they display particle behaviour as well, putting the (human) notion of linear time into question.

more self-reflexive and transparent scientific process that reveals the specifics of research subjects' transformation into data.

The notion of the biologists participating in the birds' activities for the brief period of data collection draws on the nature–culture divide, which is usually represented in the sciences. Illustrating how the lifeworlds of birds and biologists overlap during fieldwork allows for conceptualisation of a different kind of human–non-human relationship, one that departs from traditional notions of objectivity.[34] Rather than considering the scientist as neutral and external to the research setting, this shift in how the relationship is represented is necessary to shift the relationship between the natural world and the human world, as it is performed in the Anthropocene. Biologists, such as those in my case study, have the capacity, knowledge, and power to make these entanglements visible. However, they obscure those alignments in the results and thus also do not reflect on them. A shift is necessary in what is considered *objective* to create a shift in human–nature relationships, which are entangled rather than detached.

Lastly, I started this monograph by discussing the role of the visual as a practice of data collection from my design-informed perspective. And, indeed, it occupies a great deal of these practices. While my initial interest was sparked by the visual archival material I had access to, outlining data collection solely through the lens of vision – as the primary sensory practice – is ultimately insufficient. Accordingly, as I have attempted to discuss in this chapter, biological fieldwork is not only a matter of visual attention. It is the immersion in the field through holistic sensory perception, including the auditory realm and touch. The visual is a significant aspect that usually becomes evident in the results and which is also the most privileged sense in nat-

34
Vanessa Manceron, *Wild and Wonderful: An Ethnography of English Naturalists,* trans. Michael Taylor (HAU, 2025), https://press.uchicago.edu/ucp/books/book/distributed/W/bo239333429.html.

ural sciences and Western knowledge production. When examining the practices of data collection, scholars must extend their attention beyond the visual to other sensory and bodily practices to create more complex accounts of how knowledge is produced in the natural sciences. The following chapter describes the final stage of knowledge production practices as observed in my evolutionary biology case study.

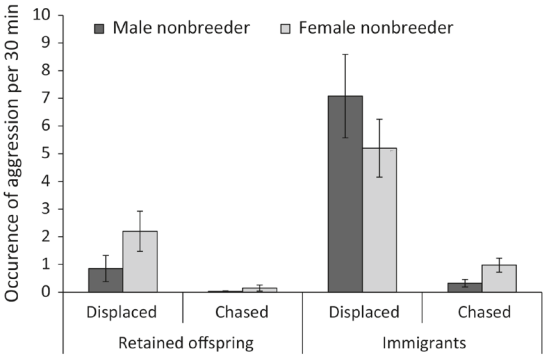

Fig. 3 Mean number of displacements and chasing events Siberian jay nonbreeders experienced during 30-min sampling observations (mean ± SE) in relation to nonbreeder sex and social relationship (retained offspring, immigrants). Female nonbreeders experienced more aggression than male nonbreeders, and immigrants experienced more aggression than retained offspring.

50 a

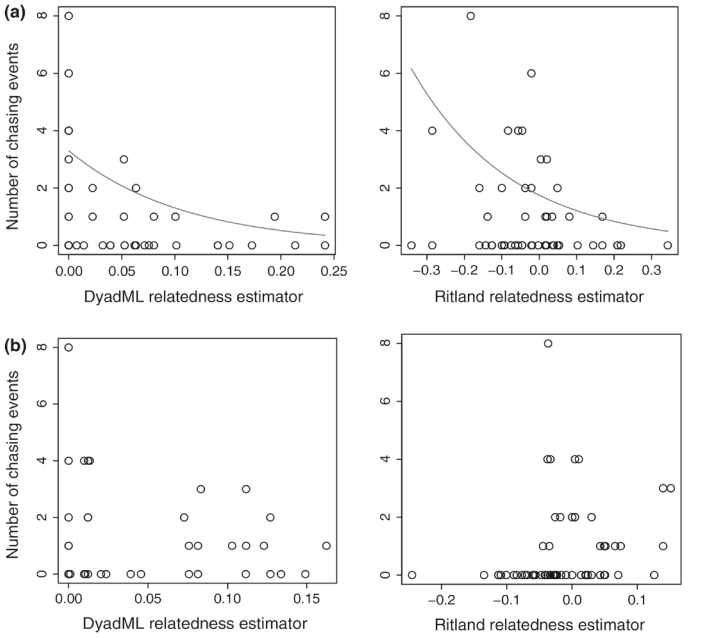

Fig. 4 Number of chasing events experienced by immigrants during 30-min sampling bouts in relation to (a) male breeder and (b) female breeder relatedness (DyadML, Ritland) between breeders and immigrants in the Siberian jay. More unrelated immigrants are exposed to significantly more chasing events.

50 b

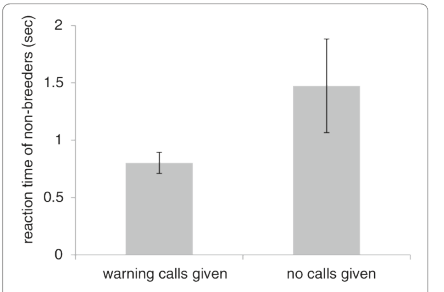

Figure 1 Effect of warning calls of Siberian jay breeders on the reaction time of non-breeders during simulated goshawk attacks. Non-breeders which received a warning call (N = 23 experiments) escaped faster to nearby cover than non-breeders which were not warned (N = 8 experiments). Data from two experiments were missing since the camera recording the whole set-up did not work properly.

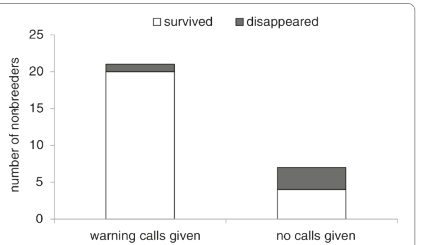

Figure 2 Influence of warning calls given by Siberian jay breeders during simulated goshawk attacks in autumn on subsequent winter survival of non-breeders (N = 28 individuals). Non-breeders living with breeders which warn (N = 21 individuals) had a higher over-winter survival than non-breeders which were not warned (N = 7 individuals).

51 a, b

Figure 50 a, b:
Screenshots of visualisations (graphs) of modelled data supporting the written account, from a paper published in *Molecular Ecology*.[35]

Figure 51 a, b:
Screenshots of visualisations (graphs) of modelled data supporting the written account, taken from a manuscript published in *Frontiers in Zoology*.[36]

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Michael Griesser et al., 'Fine-Scale Kin Recognition in the Absence of Social Familiarity in the Siberian Jay, a Monogamous Bird Species', *Molecular Ecology* 24, no. 22 (2015): 5726–38, https://doi.org/10.1111/mec.13420.

36
Michael Griesser, 'Do Warning Calls Boost Survival of Signal Recipients? Evidence from a Field Experiment in a Group-Living Bird Species', *Frontiers in Zoology* 10, no. 1 (2013), https://doi.org/10.1186/1742-9994-10-49.