

Ethologists in the Kindergarten: Natural Behavior, Social Rank, and the Search for the “Innate” in Early Human Ethology (1960s-1970s)

Jakob Odenwald*

Summary: During the 1970s, ethologists at the German Max Planck Institute for Behavioral Physiology in Seewiesen started a series of research projects at several regional kindergartens in search of natural predispositions in human behavior. This so-called “Kindergarten Project” became one of the pillars of research activity at the newly founded *Forschungsstelle für Humanethologie* (Research Center for Human Ethology) where Irenäus Eibl-Eibesfeldt and a team of researchers set out to explore new fields of research for the discipline of ethology. Taking the research project conducted by biologist Barbara Hold on ranking behavior among kindergarten children as a vantage point, this paper explores the shift in ethology from animal to human behavior which occurred during the 1960s and 1970s. It analyzes how human ethologists coped with the methodological, conceptual, and ethico-political challenges which arose from crossing the human-animal divide. This article thus sheds light on the hitherto unwritten history of human ethology as it was developed at the MPI since the late 1960s.

Keywords: behavioral biology, human ethology, human-animal divide, Barbara Hold, Irenäus Eibl-Eibesfeldt, childhood, biological determinism, ranking behavior

In 1973, Konrad Lorenz, Nikolaas Tinbergen, and Karl von Frisch were awarded the Nobel prize “for their discoveries concerning organization and elicitation of individual and social behaviour patterns.”¹ The prize was, as Richard Burkhardt has argued in his seminal study on the history of ethology,

J. Odenwald

Universität Zürich, Historisches Seminar, Forschungsstelle für Sozial-und Wirtschaftsgeschichte

E-mail: jakob.odenwald@fsw.uzh.ch

© 2022 The Authors. Published by Wiley-VCH GmbH. This is an open access article under the terms of the Creative Commons Attribution Non-Commercial NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

¹ “The Nobel Prize in Physiology or Medicine 1973,” The Nobel Prize, online: <https://www.nobelprize.org/prizes/medicine/1973/summary/> (accessed 31 March 2021). See also: Burkhardt 2005, esp. 447–449; Taschwer and Föger 2003, esp. 225–240.

“testimony to how much the ethologists had accomplished” since the disciplines foundational years at the beginning of the century. However, it also showed that “an era” had come to its end.² Lorenz had recently retired from his post as director of the German *Max-Planck-Institut für Verhaltensphysiologie*³ (Max Planck Institute for Behavioral Physiology), Tinbergen would follow a year later. Not only did this mean a change of personnel, but new methods and perspectives would establish themselves in the field of behavioral biology over the course of the 1970s. In 1975, Edward O. Wilson’s “sociobiology,” most famously, positioned itself as the new paradigm challenging the ways biologists had previously thought about behavior.⁴

While a changing of the guard was slowly taking place in the international field of behavioral research, a young biologist named Barbara Hold had just started working on her doctoral thesis on ranking behavior among children at the MPI’s newly founded *Arbeitsgruppe Humanethologie* (Working Group for Human Ethology). Irenäus Eibl-Eibesfeldt, who had been an associate and student of Lorenz since the late 1940s, led the team which had set to explore new fields of research for the discipline of ethology. Only five years later, the Working Group was granted the status of an independent *Forschungsstelle für Humanethologie* (Research Center for Human Ethology). In the application for this more permanent post, Eibl-Eibesfeldt explicitly referred to his teacher and argued that ethology

has entered a new and crucial phase. Over the past two decades, it has tested the concepts coined by Konrad Lorenz [...] and thus has now developed working hypotheses that could contribute to a better understanding of human behavior.⁵

For Eibl-Eibesfeldt, Hold, and the other members of the team, the future of their discipline laid in the study of humans.

Historians of science have studied the history of classical ethology⁶ from multiple perspectives and with different methodological approaches.⁷ Recently, particular scholarly emphasis has been placed on the scientific and popular success of biological theories of aggression during the 1960s, focusing primarily on the United States.⁸ The question of what happened to the discipline after its peak during the 1960s and early 1970s, however, is still largely unaddressed.

² Burkhardt 2005, on 446.

³ Henceforth: MPI.

⁴ On the changes in the field of behavioral biology during the 1970s see: Burkhardt 2005, esp. 461–464; Milam 2019, esp. 235–276. See in this volume: Stuhmann 2022; Milam 2022; Dhein 2022. On the debates surrounding “sociobiology” see: Segerstråle 2000; Segerstråle 2012.

⁵ Irenäus Eibl-Eibesfeldt, “Das Anliegen,” ca. 1970, Archiv der Max-Planck-Gesellschaft (Boltzmannstraße 14, 14195 Berlin, Germany) [henceforth: AMPG], Institutsbetreuung, II. Abt., Rep. 66, 4412. All German sources quoted in this article were translated by the author.

⁶ See on the complex history of the term “ethology”: Schurig 2011; Schurig 2014.

⁷ See: Benson 2016; Borrello 2010; Burkhardt 1999; Burkhardt 2005; Kaufmann 2018; Kruuk 2003; Munz 2011; Munz 2016; Röell 2000; Sailo 2018; Taschwer and Föger 2003; Taschwer 2000; Taschwer 2002; Vicedo 2009; Vicedo 2012; Vicedo 2013; Vicedo 2018; Weidman 2011; Weidman 2012; Weidman 2021.

⁸ See most recently: Milam 2019; Weidman 2021.

This is especially true for the discipline's German branch and the history of the MPI after the retirement of Lorenz.⁹ With the appointment of Wolfgang Wickler as the new director, sociobiological approaches became increasingly important for many researchers at the MPI leading to a growing interest in genetics and the inner mechanisms of behavioral evolution. This is, however, only one part of the story. As the emergence of human ethology and its scientific and popular impact reflects, classical ethology did not come to an end. This article therefore sheds light on the hitherto unwritten history of human ethology at the MPI and contributes to a more complex and multifaceted history of behavioral biology since the 1970s.¹⁰ It explores how a group of ethologists, beginning in the late 1960s, reoriented their discipline by turning to humans as an empirical object of study. How did this shift of focus unfold? And what were the challenges which occurred in the process?

Ethologists had already theorized and speculated about human behavior long before the establishment of Eibl-Eibesfeldt's Working Group in 1970. Explaining human behavior was to many in the field the ultimate aim of animal research.¹¹ First and foremost, Lorenz himself had thought *with animals* about the position (and predicament) of humans in (natural) history at least since the 1950s. As historians of behavioral biology have shown, ethology and its scientific and popular success had long been based on the productive tensions of thinking anthropomorphically.¹² For example, in her study on Lorenz' famous greylag goose Martina, Tania Munz has argued that Lorenz developed "an animal with a unique biography" in order "to facilitate the extrapolation from animal to human behavior."¹³ Most notably, this kind of extrapolation can be found in Lorenz' 1963/1966 book *On Aggression* which after several chapters on animal behavior climaxes in two final parts titled "Ecce Homo!" and "Avowal of Optimism," both of which focus on human behavior and societal problems.¹⁴

What changed since the 1960s, however, was that humans themselves became the empirical object of ethological research: instead of using animals to think about humans, Eibl-Eibesfeldt, Hold, and others started to systematically *investigate humans as animals*. The issue of human behavior seemed particularly pressing to the ethologists at the MPI: The relevance of the new discipline, Eibl-Eibesfeldt argued in an internal memo, arose "from the unresolved problems of human coexistence" including "widespread tendencies such as

⁹ For the early history of the Max Planck Institute for Behavioral Physiology, see: Burkhardt 2005, esp. 345–361; Taschwer and Föger 2003, esp. 177–193.

¹⁰ See on Tinbergen and human ethology esp.: Vicedo 2018.

¹¹ This has been studied especially with a focus on the United States, see, e.g.: Sepkoski 2012; Borrello 2012; Milam 2019; Weidman 2011; Weidman 2012; Weidman 2021; Vicedo 2013;. For the German case, for which much further research needs to be done, see: Goschler and Kössler 2016.

¹² On anthropomorphism in general see esp.: Daston and Mitman 2005; Mitchell et al. 1996. For anthropomorphism in the behavioral sciences see: Benson 2016; Milam 2019; Munz 2011.

¹³ Munz 2011, on 410.

¹⁴ Lorenz 2002 [1996].

aggressiveness, striving for status and possession, territoriality, altruism.”¹⁵ Human ethology was thus expected to contribute to a better understanding of human nature not only by extrapolating from animal behavior but by robust empirical evidence. This shift, however, came with challenges and problems that animal ethologists had not yet faced: humans were no animals like any other, the researchers soon realized, and “working with humans,” Eibl-Eibesfeldt conceded in 1977, “is not at all easy.”¹⁶ The present article examines this uneasy transition from animal to human ethology. Hold’s research on ranking behavior among children serves as a lens through which the research interests, practices, and challenges that mediated the discipline’s crossing of the human-animal divide become visible.

Barbara Hold was among the first members of Eibl-Eibesfeldt’s Working Group which she joined in 1971 after graduating from the University of Mainz with a degree in biology. Her research, which earned her a doctoral degree in 1975,¹⁷ was part of the Center’s “Kindergarten Project,” which over the course of the 1970s and 1980s comprised several subprojects on different forms of human behavior.¹⁸ While Eibl-Eibesfeldt was mostly engaged in his pet project, the “Cross-cultural Long-Term Study” (“Kulturvergleichende Langzeitstudie”) of indigenous societies in Africa, Southeast Asia, and South America,¹⁹ Hold found her object of study in several kindergartens in and around Munich. There, she used comparative ethological methods, which had proved useful in animal ethology, to study the formation of social hierarchies among human children. After she had completed her doctorate, she conducted further comparative studies in similar facilities in Italy, Japan, and among children of the !Gwi San people in the Kalahari desert.²⁰ During the 1980s she became an active member of the internationally organized human ethology scientific community. In 1984, she was elected member of the Executive Board of the International Society for Human Ethology,²¹ and in 1986 she co-hosted the “5th International Conference on Human Ethology” in Tutzing.²² Even though her research never gained the same amount of scientific impact or popular interest as Eibl-Eibesfeldt’s Lorenzian-style and often controversial monographs on human behavior, Hold nevertheless became a key figure in the

¹⁵ Irenäus Eibl-Eibesfeldt, *Das Anliegen*, ca. 1970, AMPG, Institutsbetreuung, II. Abt., Rep. 66, 4412.

¹⁶ Irenäus Eibl-Eibesfeldt to Edmund Marsch, 25 April 1977 (file entry), AMPG, Institutsbetreuung, II. Abt., Rep. 66, 4356, p. 52. The correspondence quoted in the following pages is comprised in this file.

¹⁷ Hold 1975. See also: Hold 1976a and b; Hold-Cavell 1992; Hold-Cavell and Borsutzky 1986.

¹⁸ I owe many thanks to Klaus Stanjek and Karl Grammer who gave me insights that I could not have gained through archival research into the “Kindergarten Project” in private correspondence.

¹⁹ “Kulturvergleichendes Langzeit-Forschungsprogramm und Humanethologisches Filmarchiv,” Humanethologisches Filmarchiv der Senckenberg Gesellschaft für Naturforschung, online: <http://www.humanetho.de/de/Archiv.html> (accessed 3 February 2022). See the observations and reflections from the perspective of media studies in: Hediger 2017.

²⁰ Hold 1980; Hold-Cavell et al. 1986.

²¹ Hand et al. 1984.

²² Schiefenhövel et al. 1985.

formation of human ethology at the MPI. What Hold's and Eibl-Eibesfeldt's projects had in common was their joint search for "natural predispositions" in the human behavioral repertoire or as Eibl-Eibesfeldt called it with reference to Lorenz, the "innate abilities" of "the pre-programmed human."²³

Hold's research provides an instructive case study because it sheds light on the work of one of the lesser-known actors – of which there were many – in the development of behavioral biology and the formation of human ethology during the 1970s.²⁴ Above all, her research is elucidating because it allows us to uncover the methodological, conceptual, and ethico-political challenges, which human ethologists faced during the formative phase of the discipline. This article proposes three distinct perspectives on the early history of human ethology and advances three main arguments: The first part explores the development of ethological methodology and how it was challenged by humans as objects of research. My argument here is that the child, which was considered closer to nature than adult humans, played a crucial part in the ethological transition toward the study of human behavior. The second part focuses on conceptual challenges: by contextualizing Barbara Hold's research on ranking behavior within the history of the biological notions of social hierarchy since the 1920s, I argue that the idiosyncrasies of human social behavior necessitated conceptual adaptations and opened up spaces for theoretical innovation. Finally, the third part argues that by turning to humans ethologists were confronted with new ethical and political challenges that reflected the controversial scientific and cultural standing of human ethology since the 1970s.

1. Towards Human Ethology: Naturalizing the Child

When Hold joined Eibl-Eibesfeldt's team at the MPI in 1971, she became part of a scientific discipline that was still in the making. Only four years earlier, in 1967, Eibl-Eibesfeldt and marine biologist and filmmaker Hans Hass had published two journal articles that became foundational to their vision of human ethology.²⁵ Both papers focused on a methodological problem: on joint expeditions, the two researchers had realized that their interest in ethologically observing humans confronted them with problems that did not arise when researching non-human animals. Unlike the common toad (*Bufo bufo*), for example, whose mating behavior Eibl-Eibesfeldt had studied in his dissertation at the University of Vienna,²⁶ humans changed how they acted as soon as they

²³ See, e.g.: Eibl-Eibesfeldt 1973a.

²⁴ See similar attempts to make the many actors and especially women in behavioral biology visible: Burkhardt 2005, esp. 414–446; Haraway 1989; Milam 2019, esp. 133–142. See more generally on gender and the history of science: Haraway 1988; Milam and Nye 2015; Oreskes 1996.

²⁵ Eibl-Eibesfeldt and Hass 1967a and b.

²⁶ Eibl-Eibesfeldt 1949.

realized that they were being observed or filmed.²⁷ A technical trick would solve the problem, Eibl-Eibesfeldt and Hass argued: a mirror lens attached to a movie camera, oriented to the side, was designed to make the filmed person believe that she or he remained unobserved, while the observer only pretended to film something else. The footage of what Eibl-Eibesfeldt and Hass confidently called “natural behavior”²⁸ obtained in this way could afterwards be analyzed and interpreted ethologically.²⁹

This technological solution to the methodological challenge, however, was only one of at least two vantage points for the formation of human ethology. Before the researchers at the *Forschungsstelle* systematically studied the behavior of what they called “bushmen societies” around the world, ethologists had already shifted their focus to newborns and young children. The human child was at the center of early attempts to apply ethological methods to the study of humans. Hold’s dissertation on social hierarchies among kindergarten children was therefore situated in a research field that had only recently turned to children as objects of ethological research. To understand what ethologists like Hold hoped to gain by this shift of focus, her research for the “Kindergarten Project” is to be contextualized within these broader tendencies in ethology since the early 1960s. Similar to Donna Haraway, who has famously argued that primates “occupy the border zones” between nature and culture,³⁰ ethologists construed the child as a liminal object between the two poles in order to get glimpses into the evolutionary past of humankind.³¹

Before ethologists turned to the study of humans themselves, it was mostly Anglophone psychologists and psychoanalysts who were interested in ethological theories for their work on humans. British child psychiatrist John Bowlby successfully adapted ethological methods and theories for his research on mother-infant relationships since the 1950s.³² Encouraged by the scientific and cultural success of Bowlby’s ethologically based attachment theory, ethologists started to “invade the human sciences”³³ during the 1960s. Among the first was British ethologist Nicholas Blurton Jones at the Department of Growth and Development at the Institute of Child Health, University of London. In

²⁷ Historians of science and proponents of human animal studies have amply demonstrated that non-human animals, too, cannot be simply conceptualized as passive objects of observation. Instead, the active and mutable role of non-human actors in the history of science has been emphasized, on the role of animals in the history of ethology see esp.: Munz 2011; Benson 2016. See in this volume: Bolman 2022; Gräfe 2022.

²⁸ Eibl-Eibesfeldt 1967b, on 477.

²⁹ Eibl-Eibesfeldt and his staff made use of this technology primarily for their long-term project on the cross-cultural study of human behavior, which resulted in over 800 hours of film material, see Hediger 2017.

³⁰ Haraway 1989, on 1.

³¹ See for the genealogy of this kind of reasoning within the context of scientification since the 18th century and in particular within the context of the “child study movement” at the end of the 19th century: Eßer 2014. See for the broader cultural context in 20th century Germany: Gebhardt 2020.

³² See esp.: Vicedo 2013.

³³ Tinbergen 1972, on viii.

1963, he launched a pilot study at a London nursery school as “an attempt to apply ethological methods of observation and interpretation to the behavior of normal children.”³⁴ When Blurton Jones published some first findings in an anthology edited by Desmond Morris in 1967, he argued that “one can study human behaviour in just the same way as Tinbergen [...] and others have studied gulls.”³⁵ In 1972, Blurton Jones himself edited an anthology of ethological studies of child behavior to which Tinbergen contributed a foreword. Nikolaas Tinbergen, who together with his wife Lies had recently started to study early child autism,³⁶ reminded his readers of his criticism of Lorenz’s *On Aggression* and Desmond Morris’s *The Naked Ape*, which had recently appeared and whose “extrapolation to Man” he found “not sufficiently substantiated.” But he noted approvingly that “a growing number of young ethologists have themselves begun to collect factual information about Man’s behaviour, using ethological methods.”³⁷ In Tinbergen’s eyes, the contributions to Blurton Jones’ anthology were “a beginning to construct a human ‘ethogram,’”³⁸ that is, a complete catalogue of all human behaviors. In Germany in the meantime, Eibl-Eibesfeldt had started to observe children born deaf and blind in 1966 to study the development of facial expressions.³⁹ When he found the same patterns of facial expression at the Institute for the Blind in Taipei in 1972, he confidently concluded that the “hypothesis that human facial expressions are learned can be considered refuted by the study of the deaf-blind.”⁴⁰

Neither did all ethologists who turned to the human child as their new object of study from the 1960s onward share the same epistemological interests, nor were they motivated by the same goals. The examples of Tinbergen and Eibl-Eibesfeldt help to analytically distinguish two ethological perspectives on the child: one pragmatically, the other theoretically oriented. These two perspectives were not mutually exclusive, nor were Tinbergen and Eibl-Eibesfeldt exclusively positioned towards one or the other.⁴¹ They do, however, indicate the dual function that the child played for ethological research at the time: Tinbergen, on the one hand, argued in his foreword that ethological research on children would yield important contributions to medicine and psychology.⁴² By explicitly integrating the emerging field of child ethology into an interdisciplinary research framework from which practical pedagogical and therapeutic measures could be expected, Tinbergen continued his previous efforts to promote the ethological approach within a broader

³⁴ Blurton Jones 1967, on 347.

³⁵ Ibid., on 347.

³⁶ Burkhardt 2005, on 445. See also: Vicedo 2018.

³⁷ Tinbergen 1972, on viii.

³⁸ Ibid.

³⁹ Eibl-Eibesfeldt 1973b.

⁴⁰ Eibl-Eibesfeldt 1973a, on 21–25.

⁴¹ On Tinbergen’s interest in human ethology see: Vicedo 2018.

⁴² Tinbergen 1972, on ix.

scientific landscape and coordinate the discipline's "balanced growth" since the 1950s.⁴³

In contrast to this pragmatic point of view, Eibl-Eibesfeldt's perspective on child ethology was primarily theoretical. In his approach, the child served as the cornerstone for the overarching argument that what Lorenz, in particular, had demonstrated with animals was also true for humans, namely, the existence of identifiable innate, and thus, universal abilities that were formed during our species' evolutionary past.⁴⁴ To Eibl-Eibesfeldt, this would be a striking argument against a behaviorist *tabula rasa* notion of human nature which he deemed dominant in scientific and political discourse at the time. Focusing on children seemed to be a methodologically viable way to counter this idea.⁴⁵ While the natural behavioral repertoire of adults was obscured by the many cultural influences of the industrialized societies they lived in, children – similar to the indigenous peoples Eibl-Eibesfeldt was mostly interested in – were considered to still be closer to nature. Newborns and children, in this sense, were conceptualized as research objects in the border zones of nature and culture. They became liminal objects in the transition of ethology from animals to humans and enabled the comparative reasoning across species boundaries that was central to the research done in the "Kindergarten Project."

Hold, too, emphasized the theoretical significance and political implications of her work. In the programmatic introduction to her dissertation, she positioned her research on social rank among children within the broader contemporary discussions over social change and the relative importance of nature and nurture.⁴⁶ Especially "leftist ideologues," she argued, would find "the solution to many social problems in the formation of a classless (= rankless) society." By equating the sociological category of class with a biological notion of rank, Hold opened up a discursive space in which ethology had the task to determine "whether humans can actually live in a rankless society" or "if they would not act against their nature, when such a plan was realized, and whether thereby new, more serious problems would arise."⁴⁷ In terms of concrete pedagogical advice, Hold remained rather vague. To her, the study of ranking behavior among kindergarten children was mostly a methodological necessity, since "adults are usually burdened by taboos, and the influences of culture show themselves most strongly in them."⁴⁸ However, she was certain that this unavoidable detour to the kindergarten would eventually provide a window into the natural basis of social hierarchies of all humankind.

For her dissertation, Hold had therefore selected three kindergartens with different pedagogical and ideological orientations in order to gauge the influence of various social factors. Ironically, it was the *Kinderhaus Schwabing* –

⁴³ Burkhardt 2005, on 5.

⁴⁴ See esp.: Eibl-Eibesfeldt 1970; Eibl-Eibesfeldt 1973a; Eibl-Eibesfeldt 1975.

⁴⁵ See on similar views in the writing of Tinbergen: Vicedo 2018, esp. 205–210.

⁴⁶ On the nature versus nurture debate see esp.: Keller 2010. For the German context of the debate after 1945 see: Goschler and Kössler 2016.

⁴⁷ Hold 1975, on 1.

⁴⁸ *Ibid.*, on 23.

a kindergarten committed to progressive, non-authoritarian education – that proved to be “very beneficial” to her research. There, as Hold noted, natural behavior was most easily observed because “the children were not subject to any regulations and were thus free to play all morning.”⁴⁹ The naturalness of the observed behavior, however, was not necessarily certain, and required a careful approach. Environmental determinants were still looming everywhere, and the processes of social learning had already left their marks on the children. The window to humankind’s evolutionary past which Hold and other ethologists had hoped for was still blurred.

The human ethologist’s presence itself posed a particular threat to the “natural order” of the kindergarten, as Hold reflected in her dissertation. She recounted that, during her observations, she was regularly approached by her “research objects” and asked what she was doing. What to the parents and kindergarten teachers may have seemed like a completely natural reaction to the arrival of a stranger was primarily a methodological problem for Hold: her presence was not supposed to interfere with the formation of a natural order among the children; under no circumstance should the researcher herself appear as part of the social hierarchy. Therefore, equipped only with pen and paper, she moved as little as possible and tried to avoid any form of interaction with the children. Rather than making eye contact and directly staring at the children, she only looked at them “as if by coincidence.”⁵⁰ Her efforts were successful, Hold claimed: “I was soon ignored by the children,” she reported, as was evidenced by the fact that the children “did forbidden things in my presence in the absence of the kindergarten teacher.”⁵¹

While for Hold’s dissertation these techniques of self-restraint seemed sufficient to uphold the fragile naturalness of the child’s behavior, the researchers decided that technological upgrades were necessary for the continuation of the “Kindergarten Project” after Hold had earned her PhD in 1975. A hidden video system should enable the researchers to observe the children without being physically present at all. As in the case of the angled lens, that Eibl-Eibesfeldt used for his studies of indigenous societies, technology should again ensure the naturalness of the children’s behavior.

2. Finding Complicated Hierarchies: From Aggressive Dominance to Social Leadership

At the center of Barbara Hold’s research was the question of how social hierarchies among children were built and which similarities to other non-human animals could be identified. She was not the first to study social differences in biological terms, hence, she could rely on a rich body of theoretical and empirical material from animal ethology and its neighboring disciplines. As ethologists in the 1960s turned to humans as their new objects

⁴⁹ Ibid., on 30.

⁵⁰ Ibid., on 32.

⁵¹ Ibid.

of research, not only methodologies, but also concepts of animal ethology were challenged by the idiosyncrasies of the human species. The kindergarten children observed by Hold were not the same as the Lorenzian geese which had been essential to the theoretical foundation of ethology during the first half of the 20th century. While in the case of John Bowlby's attachment theory, some concepts like "imprinting" proved to be useful, others did not. One of the concepts that the ethological study of humans challenged was the biological notion of rank itself, which had been understood as an outcome of aggressive dominant behavior. To Hold this seemed too simplistic and would not fit the behavior she observed in the kindergarten. Informed by new findings in primatology, she investigated social hierarchies in a new way: new social roles like "initiators" and "organizers" entered the realm of biology and took the place of the "aggressive oppressor" at the top of the hierarchy. To understand the conceptional challenge and the theoretical shift it instigated, I will trace the history of the biological notion of rank from Hold's research during the 1970s back to the early 1920s, when Norwegian zoologist Thorleif Schjelderup-Ebbe (1894–1976) laid the conceptual foundations for the biological study of rank.

Schjelderup-Ebbe studied zoology at the University of Oslo and completed a doctorate on the "social psychology of the domestic chicken" at the University of Greifswald in 1921.⁵² His dissertation brought forward a specific notion of social rank that substantially influenced subsequent biological research on "social dominance" and hierarchies among animals. Chickens fought for their food, Schjelderup-Ebbe observed, by pecking at others with their beaks, which often led to injuries, sometimes severe. He also noted that not all individuals were equally exposed to attacks by other members of the flock. Some were more combative, while others shied away from the pecking out of fear or a sense of inferiority. Additionally, the number of attacks would decrease significantly after a few days, allowing feeding to proceed in a much more peaceful manner. The most aggressive chickens had won preferential access to food. By taking the distribution and direction of these attacks as indicators, Schjelderup-Ebbe described different patterns of social hierarchies – relatively stable "pecking orders" ("Hackordnung") in which " α -chickens" were exercising "despotism" over other "chickens living in the same society."⁵³ These "pecking orders," Schjelderup-Ebbe argued, were highly complex systems of reciprocal dominance and submission. Males were more likely to dominate females, while older chickens were more likely to dominate younger ones.⁵⁴ Schjelderup-Ebbe concluded, that the tendency toward social stratification

is in the blood of the chickens, and that – when the time has come for it to develop – it shows itself in the young animals, whether they have been segregated from the older ones all their lives or not. In other words, this tendency is based on heredity, not on imitation.⁵⁵

⁵² For biographical information see: Nilsen 2009; Price 1995.

⁵³ Schjelderup-Ebbe 1922, on 237.

⁵⁴ Schjelderup-Ebbe 1922, on 243–244; Schjelderup-Ebbe 1923, on 83–84.

⁵⁵ Schjelderup-Ebbe 1922, on 237.

During the following years, Schjelderup-Ebbe extended his observations to different species of birds and mammals.⁵⁶ Subsequently, the 1930s and 1940s witnessed an increased interest in animal social order among European and American animal and comparative psychologists.⁵⁷ Notably, in his early publications Lorenz identified patterns of social dominance among jackdaw colonies. He furthermore found that, with regard to mating behavior, males chose females who were ranked lower than themselves.⁵⁸ Even though he warned not to over-generalize Schjelderup-Ebbe's findings on chickens to all birds – let alone all animals –, ⁵⁹ he would later explain in a letter to Schjelderup-Ebbe in 1955 that his studies had greatly influenced his own work.⁶⁰ While Lorenz worked on the conceptual foundations of ethology,⁶¹ behavioral researchers especially in the United States pursued different methodologies for the study of social dominance while sticking to the basic conceptual framework: at the University of Chicago, a group of biologists associated with Warder C. Allee investigated the role of androgens in the development of social hierarchies. At the same time, social psychologist Carl Murchison started to apply statistical methods to analyze the relative importance of different anatomical characteristics as predictors for individual positions within a social hierarchy. During the following decades, these early attempts to quantify and mathematically model the phenomenon of social dominance in biological terms found their heirs mostly in the United States, where they contributed significantly to the elaboration and differentiation of the concepts “social dominance” and “social hierarchies.” By applying mathematical methods, researchers like Nick Collias (1943), H. G. Landau (1968) and Ivan Chase (1974) measured the relevance of different determinants such as weight, age, and group size and highlighted the importance of social factors like previously experienced dominating behavior.⁶²

By the time Hold studied the ranking behavior and hierarchies among kindergarten children, “the ubiquity of social dominance in the animal kingdom” had been “thoroughly documented.”⁶³ Even though researchers had entered the field with new methodological approaches, Schjelderup-Ebbe's studies of the 1920s were still highly influential to researchers across disciplinary boundaries. In 1975, an anthology of “benchmark papers” on social dominance republished Schjelderup-Ebbe's 1922 paper.⁶⁴ Two aspects of

⁵⁶ See, e.g.: Schjelderup-Ebbe 1924; Schjelderup-Ebbe 1925; Schjelderup-Ebbe 1935.

⁵⁷ See, e.g.: Allee 1931; Allee 1934; Masure and Allee 1934. See on Leo Pardi's study of ranking among wasps during the 1940s and 1950s: Caniglia 2015.

⁵⁸ Lorenz 1931.

⁵⁹ Lorenz 1935, on 130. See also Burkhardt 2005, on 169–170.

⁶⁰ The letter from Lorenz to Schjelderup-Ebbe is cited by Schjelderup-Ebbe's son in an interview with John Price for the *Human Ethology Bulletin* in 1995, see: Price 1995, on 3.

⁶¹ Burkhardt 2005, esp. 127–186. See also Taschwer and Föger 2003, esp. 62–77.

⁶² See, e.g.: Chase 1974; Collias 1943; Landau 1968; Rashevsky 1959. For a comprehensive research overview covering the time from the 1920s to the 1970s see: Gauthreaux 1978, esp. 18–21.

⁶³ Gauthreaux 1978, on 21.

⁶⁴ Schein 1975.

his conceptual framework remained particularly important: firstly, social hierarchies were regularly conceptualized as a system of privileges over resources like food, territory, or mating partners. Secondly, social hierarchies were understood as a product of aggressive acts or threatening behavior. This conceptual link of rank and aggression was further fostered by the publication of Lorenz' *On Aggression* (1963/1966) and Robert Ardrey's *The Territorial Imperative* (1966) which – as controversial as they were – triggered an increased scientific and popular interest in biological explanations of aggression and violence.⁶⁵ In 1975, Edward O. Wilson, too, brought the aggressive dominance model into his “New Synthesis” by – after crediting especially Schjelderup-Ebbe for his pioneering work – focusing on “forms of dominance behavior mediated by aggression and inferentially based upon natural selection at the level of the individual.”⁶⁶

As Hold reflected in her dissertation, despite the success of the aggressive dominance model, research findings – mostly by primatologists – had brought empirical material to the study of the biology of rank that had complicated the field from the start.⁶⁷ While the direction of aggressive and submissive behavior functioned as reliable indicators for hierarchies among lower animals, serious conceptual difficulties appeared as soon as the framework was applied to the more complex social organization of primates. Different proposals on how to identify ranking patterns more accurately were controversially discussed: the privilege to food, the quantity of copulations, the social relations during mutual skin care, etc.⁶⁸ While some indicators could successfully be applied to the study of some animal societies, the fact that none of the proposed rank indicators could be used across species boundaries turned out to be a particularly serious problem, because it was precisely from the comparative perspective that researchers hoped to gain insights into the fundamental biological basis of social order.

Hold was confronted with similar problems. Earlier studies by Blurton Jones had shown that “dominance says nothing useful or instructive about the social organisation” among young children.⁶⁹ Sociopsychologists, furthermore, had argued since the 1930s that hierarchies among kindergarten children were based on a plurality of factors with aggressive behavior being only one of them; taking initiative and the ability to influence others' opinions were considered equally if not more important.⁷⁰ Hold had taken note of these findings. To succeed in her transition to the biological study of humans, she therefore saw the need for a new and more complex framework for the study of social rank. And she found it in the concept of “attention structure.”

⁶⁵ See esp.: Milam 2019.

⁶⁶ Wilson 1975, on 282.

⁶⁷ Wilson recounts several of these complications in Wilson 1975, on 281–282. On the history of postwar primatology see: Haraway 1989; Langlitz 2020, esp. 25–101; Milam 2019, esp. 41–59.

⁶⁸ For an overview of different concepts of ranking behavior discussed at the time see: Gautheraux 1978; Wilson 1975, esp. 281–282.

⁶⁹ Blurton Jones 1967, on 351.

⁷⁰ See, e.g.: Hanfmann 1935; Meri 1949. These are also discussed in Hold 1975.

In 1967, primatologist Michael R. A. Chance brought forward a new solution to the problem of the adequate identification of ranking patterns: instead of relying on the “diversity of features associated with rank,” he proposed to shift the focus towards the “underlying mechanism which holds the society together.”⁷¹ A way to achieve this goal was to detect what Chance called the “attention structure” of a group. “Rank order and the cohesiveness of a [...] group therefore,” he argued, “arises [sic] out of the persistent attention of subordinates for the more dominant individuals.”⁷² For Chance, aggression, access to food, or any other feature of rank discussed at the time, were not “fundamental to the establishment of rank order relations.”⁷³ Attention structures, on the other hand, were, since they could be found in “all the rank ordered behaviour reported.”⁷⁴ Many human ethologists took up Chance’s notion of rank euphorically as it came with the promise of a new comparative paradigm for the biological study of social hierarchies among humans and across species boundaries.

Hold was among the first to do so: in her dissertation and follow-up publications,⁷⁵ she argued that the concept of “attention structure” was much better suited for the study of humans because it made visible “different styles of leadership”⁷⁶ that were relevant to the formation of human social hierarchies. Her studies showed that in all observed groups high ranking within the attention structure correlated significantly with behaviors like initiating, organizing, and protecting, while aggressive behavior was predominantly linked to individuals on the second rank. Her findings echoed what primatologists had already shown for many primate societies. Hold found further similarities: “Similar to most primate groups (macaques, baboons, gorillas, chimpanzees, etc.), the male members of children’s groups are generally superior in rank to the females”;⁷⁷ a single exception found in one kindergarten group confirmed the rule. When it came to the function of rank orders, she reasoned that the hierarchies she had identified not only diminished the level of in-group aggressiveness, as ethologists like her mentor Eibl-Eibesfeldt had argued for a long time, but also lead to an increased capacity for collective action and cooperation.⁷⁸

During the 1970s and 1980s, a growing number of human ethologists started rethinking and researching social order in terms of Chance’s attention structures. This shift from aggression to attention allowed for a twofold widening of sight which seemed more appropriate to many ethologists for the specifics of their newly found research object: first, it strongly emphasized the fact that high ranking individuals often not only had specific privileges but

⁷¹ Chance 1967, on 505–506.

⁷² *Ibid.*, on 518.

⁷³ *Ibid.*

⁷⁴ *Ibid.*, on 516.

⁷⁵ Hold 1976a and b; Hold 1975.

⁷⁶ Hold 1975, on 4.

⁷⁷ *Ibid.*, on 55.

⁷⁸ *Ibid.*, on 178–179.

were also expected to fulfill certain tasks; secondly, it directed the human ethologists' view towards the many forms of behavior that were linked to the formation and stabilization of social hierarchies: initiating and organizing group activities, mediation in case of in-group conflict, and representing the group in front of others were conceptually integrated without fundamentally ignoring aggressive behavior as a relevant variable among others.

It would be misleading, however, to assume that "attention structures" simply replaced the traditional aggressive dominance model of social ranking. While human ethologists at the MPI and elsewhere embraced its theoretical productivity, it was also subject to harsh criticism by some of ethology's most eminent authorities.⁷⁹ However, the boom of the concept exemplifies that the field of biological behavioral sciences was on the move in the 1970s – a shift, however, that is not adequately described by the emergence of one single new paradigm. Researchers like Hold, who still understood themselves as ethologists, tried to find new avenues of inquiry for their discipline even though the "great men" of classical ethology had left the center stage of active research.

3. Dissenting Animals: Human Ethology in Contested Territories

While ethologists crossed the human-animal divide, they also entered new territories of ethical, legal, and political concerns. As Hold and the researchers of the "Kindergarten Project" had to learn the hard way, humans would not only react "unnaturally" if observed but could actively resist the ethologists' gaze. In April 1977, Eibl-Eibesfeldt wrote to the General Administration of the Max Planck Society that there were "unfortunate troubles with the Kindergarten Project."⁸⁰ What had happened?

A few days earlier, one of the parents at the *Kinderhaus Schwabing* had sent an angry letter to the Society's Directorate. The father informed the executives of the *Max-Planck-Gesellschaft (MPG)* that a majority in the parents' body was going to oppose the installation of a permanent video system, and the continuation of the whole research project.⁸¹ In a letter to Eibl-Eibesfeldt, the father also looked back to the beginning of Hold's research in 1971. She had pursued her dissertation, he claimed, only on the basis of "a non-binding agreement with one of the kindergarten teachers" but "without the knowledge of the parents."⁸² The conflict finally escalated after the parent board's final decision, when one of Eibl-Eibesfeldt's doctoral students confronted a group of parents and claimed that the *MPG* "would sue the kindergarten for 20.000 DM if the parents would not revoke their vote."⁸³ Eibl-Eibesfeldt tried to

⁷⁹ For a general overview of the criticism of the concept see: Schubert 1983.

⁸⁰ Irenäus Eibl-Eibesfeldt to Edmund Marsch, 25 April 1977 (file entry), AMPG, Institutsbetreuung, II. Abt., Rep. 66, 4356, p. 52. The correspondence quoted in the following pages is comprised in this file.

⁸¹ H. Seinfeld to MPG-Generalverwaltung, 21 April 1977, p. 50–51.

⁸² H. Seinfeld to Irenäus Eibl-Eibesfeldt, 22 April 1977, p. 270.

⁸³ H. Seinfeld to MPG-Generalverwaltung, 21 April 1977 (file entry), p. 50–51.

smooth the waters, and legal proceedings were prevented; but it was getting clearer that the cooperation with *Kinderhaus Schwabing*, where Hold had conducted most of her research, would not continue.

The conflict between the researchers and the parents of *Kinderhaus Schwabing* opens up a third perspective on Hold's research and the early history of human ethology. It sheds light on contemporary struggles over consent and research ethics, the authority of scientists in the field, and the political implications of biological notions of human nature in a broader societal context during the 1970s. Unfortunately, the reconstruction of the conflict is complicated by the fact that only the archives of the Max Planck Society hold records on the case since a water damage destroyed the archives of the *Kinderhaus* a few years ago. Taking this imbalance in source material into account, however, a tentative analysis of the correspondence between the angered father, the MPG legal department, and Eibl-Eibesfeldt, who took over communication as director of the *Forschungsstelle*, reveals various lines of conflict and references to contemporary public discourse.

In his response letter to the MPG's legal department, Eibl-Eibesfeldt lamented the parents' unwillingness to engage in an open dialogue. He concluded that he suspected the parents' reasons to be "irrational" and "absurd."⁸⁴ The parents' representative, on the other hand, highlighted again and again that the ethologists had not obtained what he described as mandatory parental consent.⁸⁵ An assessment of the MPG's legal department claimed to have found no litigable misconduct.⁸⁶ However, it had already anticipated such problems in advance and had pointed out this possibility to Eibl-Eibesfeldt and Hold.⁸⁷ Not least for this reason, two kindergarten groups had been formed, of which only the one whose parents had consented to the filming was to be recorded. The father, in turn, rejected Eibl-Eibesfeldt's account as "inaccurate"⁸⁸ since parents in both groups opposed the project. Furthermore, he complained that the parents had not been sufficiently involved in the decision-making process and that a group separation constituted an "interference with the pedagogical goals" of the *Kinderhaus*.⁸⁹

Based on the fragmented source material, it is difficult to assess the case from a legal standpoint. It remains unclear whether the researchers had indeed violated legal standards or acted unethically. In any case, the accusations made by the parents cannot easily be dismissed. They reveal a clash of differing notions of consent and transparency and indicate that the human ethologists had not planned for parental involvement in the research project. The failure of the cooperation thus reveals, first of all, the naivety with which the ethologists approached their newly found object of research. The human ethologists only became aware of the ethical and legal challenges posed by the

⁸⁴ Irenäus Eibl-Eibesfeldt to MPG-Rechtsabteilung, 21 April 1977, p. 57–58.

⁸⁵ H. Seinfeld to Irenäus Eibl-Eibesfeldt, 22 April 1977, p. 270.

⁸⁶ MPG-Rechtsabteilung to H. Seinfeld, 3 May 1977, p. 267–268.

⁸⁷ Irenäus Eibl-Eibesfeldt to MPG-Rechtsabteilung, 21 April 1977, p. 57.

⁸⁸ H. Seinfeld to MPG Generalverwaltung, 26 April 1977, p. 269.

⁸⁹ H. Seinfeld to Irenäus Eibl-Eibesfeldt, 22 April 1977, p. 270.

parents' demands when it was already too late. "The problem is," Eibl-Eibesfeldt noted in a letter to the legal department, "I will only ever be able to make a contract with the kindergarten that is general. The specific permission of the respective parents, on the other hand, I will have to obtain individually."⁹⁰ The conflict over individual consent that was at the heart of the parents' protest, points to broader cultural shifts that took place in West Germany since the late 1960s and in which social norms and values, but also power relations, were renegotiated in different social spheres. Historical scholarship has described the 1970s as a time of fundamental economic, social and cultural transformation,⁹¹ an "age of fracture,"⁹² a "decade of crisis,"⁹³ and of "unsettlement."⁹⁴ These changes also affected institutional science and its societal standing. Recent research in the history of science has drawn particular attention to the emergence of new forms of critique of science and the formation of alternative "counter-knowledge" in the context of the New Social Movements, which increasingly problematized hegemonic discourse strategies and power asymmetries in academia.⁹⁵ Science *from above*, as conducted by the human ethologists in the "Kindergarten Project," became the subject of criticism and resistance, at least locally, during the 1970s, as the case of *Kinderhaus Schwabing* indicates.

The source material suggests that, in addition to the issue of consent, there were other points of contention that had clouded the relationship between the human ethologists and the parents during the course of the project. In one of his letters, the father reminded Eibl-Eibesfeldt of an "inappropriate statement made by Mrs. Hold about our children"⁹⁶ the year before, from which it appears that parts of the parent body had already clashed with Hold before the issue of consent had come up. Eibl-Eibesfeldt also suspected further reasons for the rejection, which he attempted to preemptively refute in his reply to the father. Not only did Eibl-Eibesfeldt emphasize the specific benefit of the project for the improvement of child welfare, but he defended his scientific vision of human ethology in general. His plea especially revolved around the concept of "biological determinism," the controversial nature of which he suspected was the main reason for the parents' rejection. He tried to make clear that he was not to be seen as determinist but had taken "a mediating standpoint toward 'biological determinism' and milieu theory, and only oppose[d] those extreme milieu theorists who consider man to be equally easily

⁹⁰ Irenäus Eibl-Eibesfeldt to MPG-Rechtsabteilung, 21 April 1977, p. 58.

⁹¹ The 1970s have recently received a lot of scholarly attention, see particularly: Black 2009; Bösch 2012; Bösch 2013; Bösch 2019; Doering-Manteuffel and Raphael 2008; Doering-Manteuffel and Raphael 2011; Ferguson et al. 2011; Jaraus 2008; Kaelble 2010; Rodgers 2012; Sarasin 2021.

⁹² Rodgers 2012, on 3.

⁹³ Doering-Manteuffel and Raphael 2011, on 28.

⁹⁴ Sarasin 2021, esp. on 12–31.

⁹⁵ On the history of science and knowledge in the 1970s and 1980s see, e.g.: Güttler et al. 2016; Heymann 2018; Stadler et al. 2020.

⁹⁶ H. Seinfeld to Irenäus Eibl-Eibesfeldt, 22 April 1977, p. 270.

modifiable in all directions.”⁹⁷ In Eibl-Eibesfeldt’s eyes, it was not (or not only) the allegedly unethical behavior of his team members, but human ethology itself that met with disapproval from the parents.

Although it remains unclear whether the parents of *Kinderhaus Schwabing* had indeed voiced concerns about “biological determinism” and ethology’s approach towards human behavior, the fact that Eibl-Eibesfeldt believed it to be the case linked the events to contemporary popular discourses on ethology and human nature. In this sense, the parents’ resistance to the research project goes beyond the anecdotal; rather, it must be understood in the context of three developments that mark its specific societal context at the end of the 1970s.

Firstly, Hold’s dissertation itself contributed to the controversial debate over social inequality in Western Germany. Since the late 1960s, childhood had increasingly received broader attention as a site of reproduction of social difference and possible sociopolitical intervention.⁹⁸ The assertion of a biologically determined basis for social differences was, in this context, criticized by many contemporaries as a plea for maintaining of the unjust status quo.⁹⁹ Even though Hold did not address non-scientific audiences herself, her supervisor Eibl-Eibesfeldt repeatedly gave credit to her work in his popular writings, thereby placing Hold’s findings in an explicitly political context. In his 1976 popular introduction to human ethology, for example, Eibl-Eibesfeldt cited Hold to make an argument against the utopist idea of “self-government’ in our kindergartens” which, from an ethological point of view, would not lead to more social equality. Instead, and based on Hold’s findings, he claimed that social hierarchies and hence a certain degree of inequality were crucial to the functioning of society.¹⁰⁰ When Hold’s research was featured in two short articles by the Munich-based newspaper *Süddeutsche Zeitung* in 1979, her findings were clearly placed in this controversial context. “Not even in the kindergarten there is equality,” the newspaper’s readers learned: “As soon as the little ones have learned to speak and walk, the urge for status breaks through and forms a social hierarchy.”¹⁰¹ Furthermore, the newspaper reported that Hold proved that “managers, go-getters, but also outsiders and even wallflowers exist [...] already in kindergarten.”¹⁰²

Secondly, Eibl-Eibesfeldt’s defense of human ethology echoed scientific and popular sentiments about behavioral biology that had gained broader public attention since the 1960s. Historians of ethology have rightfully highlighted the importance of the discipline’s public engagement and popular writing for

⁹⁷ Irenäus Eibl-Eibesfeldt to H. Seinfeld, 21 April 1977, p. 54–56.

⁹⁸ See most recently: Kössler and Steuwer 2020. On the broader context of the nature nurture debate in Germany in regard of social inequality after 1945 see esp. the introduction to: Goschler and Kössler 2016.

⁹⁹ See, e. g., the instructive collection of source material in: Stadler et al. 2020, on 63–69.

¹⁰⁰ Eibl-Eibesfeldt 1976 on 53–55. See also: Eibl-Eibesfeldt 1975, on 105.

¹⁰¹ “Machtkämpfe im Kindergarten,” *Süddeutsche Zeitung*, 7 May 1979.

¹⁰² “Der Manager bildet sich im Kindergarten,” *Süddeutsche Zeitung*, 5 May 1979.

its institutional and scientific success.¹⁰³ Ethology had become an integral part of the media and intellectual landscape of West Germany, but – and this is the crucial point – so had its critics. During the early 1970s, several books and articles were published that aimed at wider, non-scientific audiences and popularized the criticism that especially Lorenz’s vision of ethology had already faced among scientists since the 1950s.¹⁰⁴

It is also in this context that, thirdly, ethology has been more and more publicly associated with rightwing politics since the early 1970s. Shortly after the announcement of the Nobel prize in 1973, Lorenz’s ideological affinity to National Socialism had become the subject of a heated public debate in Germany and Austria. A “Studiengruppe für Sozialanthropologie” (Study Group for Social Anthropology) at the University of Vienna drew the attention of the German news magazine *Der Spiegel*, among others, to an incriminating text that Lorenz had published in 1940.¹⁰⁵ In this infamous article, Lorenz embraced the language of the National Socialists by writing about the “extermination of ethically inferior people” (“Ausmerzung ethisch Minderwertiger”). Since then, at the latest, Lorenz, Eibl-Eibesfeldt, and with them, the discipline of ethology were publicly accused of being the scientific stooges of right-wing politics.¹⁰⁶

Although it cannot be said with certainty whether the parents of *Kinderhaus Schwabing* adopted this position, their resistance to the ethological study of their children nonetheless played out in the contemporary context of these controversial debates. It was also in this context that ethologists learned that, in studying humans, they were not only encountering social animals, but political ones.

In organizational terms, however, the human ethologists had found a solution to the temporary failure of the “Kindergarten Project.” The video system was moved to another facility in the not-so-distant city of Starnberg where the project – funded by the German Research Foundation (*DFG*) – would continue with a long-term data collection phase during the following years. Similar problems over consent do not seem to have resurfaced in this context. Until Eibl-Eibesfeldt’s retirement in 1996, and even beyond, however, the main focus of the research at the *Forschungsstelle für Humanethologie* remained the “Cultural Comparative Long-Term Study” to which Hold also contributed.¹⁰⁷ The search for the “biological universals” among indigenous peoples in southern Africa (San, Himba), Southeast Asia (Eipo, Trobrianders), and South America (Yanomami) was based on the cinematographic collection and archiving of human behavior among the same families and neighborhoods over many years. For the time being, the history of this project remains largely

¹⁰³ Taschwer 2000; Taschwer 2002; Kaufmann 2018.

¹⁰⁴ See, e.g.: Plack 1973; Roth 1974; Wieser 1976. On the scientific critique during the 1950s see: Burkhardt 2005, on 383–403; Wunsch 2016.

¹⁰⁵ “Ausmerzung ethisch Minderwertiger,” *Der Spiegel*, 21 October 1973.

¹⁰⁶ For a nuanced overview of this debate see: Föger and Taschwer 2001, esp. 21–34; Kalikow 1983; Kalikow 2020.

¹⁰⁷ Hold 1980.

in the obscure. How consent and rejection were negotiated in these contexts, which were determined by other legal, political, and historical factors and power relations, remains a historically as well as ethically relevant question that calls for further research in the more recent history of ethology.

4. Conclusion

In 1993, a group of human ethologists, most of whom like Hold were students and colleagues of Eibl-Eibesfeldt, published a commemorative volume on the occasion of their mentor's 65th birthday.¹⁰⁸ The richly illustrated volume presented the short history of human ethology since the late 1960s as a scientific success story and recounted the lifetime achievements of Eibl-Eibesfeldt as its most prominent representative. Its title, *Im Spiegel der Anderen* (In the Mirror of Others), alluded to Lorenz's magnum opus, *Die Rückseite des Spiegels* (Behind the Mirror), which had been published 20 years earlier, the same year Lorenz, Tinbergen, and von Frisch were awarded the Nobel prize. Hold contributed a paper on "Ranking in Children and Adults" to the volume, in which she also revisited her research of the 1970s. She saw her central findings of that time largely confirmed by Eibl-Eibesfeldt's later cross-cultural work and further research in kindergartens by developmental psychologists.¹⁰⁹ Marginal glosses by the editor, Wulf Schiefenhövel, provided scientific and biographical cross-references between the various contributions, emphasized the scientific importance of human ethological research on rank, and particularly stressed its difference from sociobiology. Schiefenhövel argued that, instead of reducing rank solely to its function for the "currency" of genetic offspring, it had been Eibl-Eibesfeldt who had focused more on "proximate mechanisms." In the tradition of classical ethology, the editor summarized, he had shown that social hierarchies were essential for the successful coexistence of individual people because it was "setting limits to conflict and competition."¹¹⁰ In retrospect, human ethology – which the editor confidently placed alongside sociobiology as one of the "two main branches of science in evolutionary biology"¹¹¹ – had been a history of overwhelming success.

The anthology, in which the scientific and the biographical were closely tied together, presented a panorama of 25 years of human ethology that centered around Eibl-Eibesfeldt as the key scientific innovator, an astute researcher with a wide range of interests, and prolific author of popular science books. Read against the grain, however, the contributions also show the many scientists besides the discipline's leading expert who were involved in the project of reorienting ethology towards the study of human behavior. As this article has shown, human ethologists like Hold significantly advanced research

¹⁰⁸ Schiefenhövel et al. 1993.

¹⁰⁹ Hold-Cavell 1993.

¹¹⁰ Schiefenhövel 1993, on 95.

¹¹¹ *Ibid.*, on 92.

in the field and contributed to the empirical and theoretical formation of the discipline.

This article has proposed tentative avenues into the history of human ethology as it was developed at the *MPI*. Taking old's research on ranking behavior among children as the focal point on the early years of human ethology, this study has examined how, since the late 1960s and over the course of the 1970s, ethologists shifted their discipline's focus to new objects of research. From a matter of cross-species speculation, humans became the empirical object of ethological research. I have argued that crossing the animal-human divide was a complex and highly problematic process: humans confronted behavioral scientists with profound methodological, conceptual, and ethico-political challenges that significantly affected the formation of the discipline during the 1970s. I have made three arguments in this paper: firstly, the child functioned as a liminal research object and thus played a crucial part in ethology's transition from animals to humans. Secondly, human social behavior forced ethologists to reconsider their conceptual tools, which led, as I have shown exemplarily, to new biological notions of rank and social hierarchies. Third, the history of the parents' resistance to the "Kindergarten Project" at *Kinderhaus Schwabing* revealed that human ethology in the 1970s was situated in ethically, scientifically, and politically contested discursive contexts that extended beyond the boundaries of science. In this regard, the research interests that drove human ethologists and the conflicts and debates in which they were involved point to the specific historical contexts – scientific as well as societal – from which also the discipline's further history must be understood.

Acknowledgements

Open access funding provided by Universitat Zurich.

References

- Allee, Warder C., *Animal Aggregations: A Study in General Sociology* (Chicago: University of Chicago Press, 1931).
- Allee, Warder C., "Recent Studies in Mass Physiology," *Biological Review* 9 (1934): 1–48.
- Benson, Etienne S., "Naming the Ethological Subject," *Science in Context* 29, no. 1 (2016): 107–128.
- Black, Jeremy, *Europe since the Seventies* (London: Reaktion Books, 2009).
- Blurton Jones, Nicholas, "An Ethological Study of Some Aspects of Social Behaviour in Children in Nursery Schools," in *Primate Ethology*, ed. Desmond Morris (London: Weidenfeld and Nicolson, 1967), 347–365.
- Bolman, Brad, "Critical Periods in Science and the Science of Critical Periods: Canine Behavior in America," *Berichte zur Wissenschaftsgeschichte* 45, no. 1–2 (2022).
- Borrello, Mark E., "The Farmer, the Hunter, and the Census Taker: Three Distinct Views of Animal Behavior," *History and Philosophy of the Life Sciences* 32, no. 1 (2010): 3–19.
- Borrello, Mark E., *Evolutionary Restraints: The Contentious History of Group Selection* (Chicago: University of Chicago Press, 2012).

- Bösch, Frank, "Umbrüche in die Gegenwart: Globale Ereignisse und Krisenreaktionen um 1979," *Zeithistorische Forschungen* 9 (2012): 8–32.
- Bösch, Frank, "Zweierlei Krisendeutungen: Amerikanische und deutsche Perspektivierungen der 1970er Jahre," *Neue Politische Literatur* 58 (2013): 217–230.
- Bösch, Frank, *Zeitenwende 1979: Als die Welt von heute began* (München: C. H. Beck, 2019).
- Burkhardt, Richard W., "Ethology, Natural History, the Life Sciences, and the Problem of Place," *Journal of the History of Biology* 32, no. 3 (1999): 489–508.
- Burkhardt, Richard W., *Patterns of Behavior: Konrad Lorenz, Niko Tinbergen, and the Founding of Ethology* (Chicago: University of Chicago Press, 2005).
- Caniglia, Guido, "Understanding Societies from Inside the Organisms: Leo Pardi's Work on Social Dominance in Polistes Wasps," *Journal of the History of Biology* 48, no. 3 (2015): 455–486.
- Chance, Michael R. A., "Attention Structure as the Basis of Primate Rank Orders," *Man* 2, no. 4 (1967): 503–518.
- Chase, Ivan D., "Models of Hierarchy Formation in Animal Societies," *Behavioral Science* 19, no. 6 (1974): 374–382.
- Collias, Nicholas, E., "Statistical Analysis of Factors which Make for Success in Initial Encounters between Hens," *The American Naturalist* 77 (1943): 89–115.
- Daston, Lorraine, Greg Mitman (eds.), *Thinking with Animals: New Perspectives on Anthropomorphism* (New York: Columbia University Press, 2005).
- Dhein, Kelle, "From Karl von Frisch to Neuroethology: A Methodological Perspective on the Friscean Tradition's Expansion into Neuroethology," *Berichte zur Wissenschaftsgeschichte* 45, no. 1–2 (2022)..
- Doering-Manteuffel, Anselm, Lutz Raphael, *Nach dem Boom: Perspektiven auf die Zeitgeschichte seit 1970* (Göttingen: Vandenhoeck & Ruprecht, 2008).
- Doering-Manteuffel, Anselm, Lutz Raphael, "Der Epochenbruch in den 1970er-Jahren: Thesen zur Phänomenologie und den Wirkungen des Strukturwandels 'nach dem Boom,'" in *Nach dem Strukturbruch? Kontinuität und Wandel von Arbeitsbeziehungen und Arbeitswelt(en) seit den 1970er-Jahren*, ed. Knud Andresen, Ursula Bitzegeio, Jürgen Mittag (Bonn: Dietz, 2011), 25–40.
- Eibl-Eibesfeldt, Irenäus, "Paarungsbiologie der Erdkröte (*Bufo bufo* L.)" (PhD thesis, University of Vienna, 1949).
- Eibl-Eibesfeldt, Irenäus, *Liebe und Haß: Zur Naturgeschichte elementarer Verhaltensweisen* (Munich: R. Piper & Co., 1970).
- Eibl-Eibesfeldt, Irenäus, *Der vorprogrammierte Mensch: Das Ererbte als bestimmender Faktor im menschlichen Verhalten* (Vienna: Verlag Fritz Molden, 1973a).
- Eibl-Eibesfeldt, Irenäus, "The Expressive Behaviour of the Deaf-and-Blind-Born," in *Social Communication and Movement*, ed. Michael von Cranach, Ian Vine (London and New York: Academic Press, 1973b), 163–193.
- Eibl-Eibesfeldt, Irenäus, *Krieg und Frieden aus der Sicht der Verhaltensforschung* (Munich and Zurich: R. Piper & Co., 1975).
- Eibl-Eibesfeldt, Irenäus, *Menschenforschung auf neuen Wegen: Die naturwissenschaftliche Betrachtung kultureller Verhaltensweisen* (Vienna: Molden, 1976).
- Eibl-Eibesfeldt, Irenäus, Hans Hass, "Neue Wege der Humanethologie," *Homo* 18 (1967a): 13–23.
- Eibl-Eibesfeldt, Irenäus, Hans Hass, "Film Studies in Human Ethology," *Current Anthropology* 8 (1967b): 477–479.
- Eßer, Florian, "Die verwissenschaftlichte Kindheit," in *Kindheiten in der Moderne: Eine Geschichte der Sorge*, ed. Meike Sophia Baader, Florian Eßer, Wolfgang Schröer (Frankfurt am Main: Campus Verlag, 2014), 124–153.
- Ferguson, Niall, Charles S. Maier, Erez Manela, Daniel J. Sargent (eds.), *The Shock of the Global: The 1970s in Perspective* (Cambridge: Harvard University Press, 2011).
- Föger, Benedikt, Klaus Taschwer, *Die andere Seite des Spiegels: Konrad Lorenz und der Nationalsozialismus* (Vienna: Czerny Verlag, 2001).

- Gautheraux, Sidney A., "The Ecological Significance of Behavioral Dominance," in *Social Behavior, Perspectives in Ethology*, vol. 3, ed. Paul Patrick Gordon Bateson, Peter H. Klopfer (Boston/MA: Springer, 1978), 17–54.
- Gebhardt, Miriam, *Die Angst vor dem kindlichen Tyrannen: Eine Geschichte der Erziehung im 20. Jahrhundert* (Munich: Deutsche Verlags-Anstalt, 2020).
- Goschler, Constantin, Till Kössler (eds.), *Vererbung oder Umwelt? Ungleichheit zwischen Biologie und Gesellschaft seit 1945* (Göttingen: Wallstein, 2016).
- Gräfe, Sophia, "Red Foces in the Filing Cabinet: Günter Tembrock's Image Collection and Media Use in Mid-Century Ethology," *Berichte zur Wissenschaftsgeschichte* 45, no. 1–2 (2022).
- Güttler, Nils, Margarete Pratschke, Max Stadler (eds.), *Wissen, ca. 1980*, Nach Feierabend: Zürcher Jahrbuch für Wissenschaftsgeschichte, vol. 12 (Zurich: diaphanes, 2016).
- Hand, Judith Latta, Barbara Hold-Cavell, Ian Vine, "Statements of New ISHE Board Members," *Human Ethology Newsletter* 4, no. 2 (1984): 1–2.
- Hanfmann, Eugenia, "Social Structure of a Group of Kindergarten Children," *American Journal of Orthopsychiatry* 5, no. 4 (1935): 407–410.
- Haraway, Donna, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," *Feminist Studies* 14, no. 3 (1988): 575–599.
- Haraway, Donna, *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (New York and London: Routledge, 1989).
- Hediger, Vinzenz, "Gene, Gehirne, Archiv: Über den Ort der menschlichen Natur im Humanethnologischen Filmarchiv," *Zeitschrift für Medien- und Kulturforschung* 8, no. 2 (2017): 11–28.
- Heymann, Matthias, "1970s: Turn of an Era in the History of Science?," *Centaurus* 59 (2018): 1–9.
- Hold, Barbara, "Soziale Rangordnung in Kindergruppen unter besonderer Berücksichtigung der rangspezifischen Verhaltensweisen" (PhD thesis, Ludwig Maximilian University of Munich, 1975).
- Hold, Barbara, "Attention Structure and Rank-specific Behaviour in Preschool Children," in *The Social Structure of Attention*, ed. Michael R. A. Chance and Ray R. Larsen (London: Wiley, 1976a).
- Hold, Barbara, "Rangordnungsverhalten bei Vorschulkindern," *Homo* 25 (1976b): 252–267.
- Hold, Barbara, "Attention Structure and Behavior in G/wi San Children," *Ethology and Sociobiology* 1 (1980): 275–290.
- Hold-Cavell, Barbara, "'Attention Structure' or 'Visual Regard' as Measurement of Social Status in Groups of Children," *World Futures* 35 (1992): 115–139.
- Hold-Cavell, Barbara, "Oben und unten: Rangordnung bei Kindern und Erwachsenen," in *Im Spiegel der Anderen: Aus dem Lebenswerk des Verhaltensforschers Irenäus Eibl-Eibesfeldt*, ed. Wulf Schiefenhövel, Johanna Uher, and Renate Krell (Munich: Realis Verlags-GmbH, 1993), 92–99.
- Hold-Cavell, Barbara, Doris Borsutzky, "Strategies to Obtain High Regard: Longitudinal Study of a Group of Preschool Children," *Ethology and Sociobiology* 7, no. 1 (1986): 39–56.
- Hold-Cavell, Barbara, Grazia Attili, Margret Schleidt, "A Cross-Cultural Comparison of Children's Behaviour during Their First Year in a Preschool," *International Journal of Behavioral Development* 9 (1986): 471–483.
- Jarausch, Konrad H., "Verkannter Strukturwandel: Die siebziger Jahre als Vorgeschichte der Probleme der Gegenwart," in *Das Ende der Zuversicht? Die siebziger Jahre als Geschichte*, ed. Konrad H. Jarausch (Göttingen: Vandenhoeck & Ruprecht, 2008), 9–26.
- Kaelble, Hartmut, *The 1970s in Europe: A Period of Disillusionment or Promise?* (London: German Historical Institute, 2010).
- Kalikow, Theodora, "Konrad Lorenz's Ethological Theory: Explanation and Ideology, 1938–1943," *Journal of the History of Biology* 16, no. 1 (1983): 39–73.
- Kalikow, Theodora, "Konrad Lorenz on Human Degeneration and Social Decline: A Chronic Preoccupation," *Animal Behaviour* 64 (2020): 267–272.

- Kaufmann, Doris, *Konrad Lorenz: Scientific persona, „Harnack-Plänckler“ und Wissenschaftsstar in der Zeit des Kalten Krieges bis in die frühen 1970er Jahre* (Berlin: Forschungsprogramm Geschichte der Max-Planck-Gesellschaft, 2018).
- Keller, Evelyn Fox, *The Mirage of Space between Nature and Nurture* (Durham/NC: Duke University Press, 2010).
- Kössler, Till, Janosch Steuwer, “Kindheit und soziale Ungleichheit in den langen 1970er Jahren,” *Geschichte und Gesellschaft* 46 (2020): 183–199.
- Kruuk, Hans, *Niko's Nature: The Life of Niko Tinbergen and His Science of Animal Behaviour* (Oxford: Oxford University Press, 2003).
- Landau, H. G., “Models of Social Structure,” *The Bulletin of Mathematical Biophysics* 30 (1968): 215–224.
- Langlitz, Nicholas, *Chimpanzee Culture Wars: Rethinking Human Nature alongside Japanese, European, and American Cultural Primatologists* (Princeton and Oxford: Princeton University Press, 2020).
- Lorenz, Konrad, “Beiträge zur Ethologie sozialer Corviden,” *Journal für Ornithologie* 79 (1931): 67–127.
- Lorenz, Konrad, “Der Kumpan in der Umwelt des Vogels: Der Artgenosse als auslösendes Moment sozialer Verhaltensweisen,” *Journal für Ornithologie* 83 (1935): 137–213, 289–413.
- Lorenz, Konrad, *On Aggression*, trans. Marjorie Kerr Wilson (London and New York: Routledge, 2002 [1966]).
- Masure, Ralph H., Warder C. Allee, “The Social Order in Flocks of the Common Chicken and the Pigeon,” *The Auk* 51, no. 3 (1934): 306–327.
- Meloni, Maurizio, *Political Biology: Science and Social Values in Human Heredity from Eugenics to Epigenetics* (London: Palgrave Macmillan, 2016).
- Merei, Ferenc, “Group Leadership and Institutionalization,” *Human Relations* 2, no. 1 (1949): 23–39.
- Milam, Erika L., Robert A. Nye, “An Introduction to Scientific Masculinities,” *Osiris* 30, no. 1 (2015): 1–14.
- Milam, Erika L., *Creatures of Cain: The Hunt for Human Nature in Cold War America* (Princeton and Oxford: Princeton University Press, 2019).
- Milam, Erika L., “Landscapes of Time: Building long-term Perspectives in Animal Behavior,” *Berichte zur Wissenschaftsgeschichte* 45, no. 1–2 (2022).
- Mitchell, Robert W., Nicholas S. Thompson, H. Lyn Miles (eds.), *Anthropomorphism, Anecdotes, and Animals* (New York: SUNY Press, 1996).
- Munz, Tania, “‘My Goose Child Martina’: The Multiple Uses of Geese in the Writings of Konrad Lorenz,” in *Historical Studies in the Natural Sciences* 41, no. 4 (2011): 405–446.
- Munz, Tania, *The Dancing Bees: Karl von Frisch and the Discovery of the Honeybee Language* (Chicago: University of Chicago Press, 2016).
- Nilsen, Håvard, “Thorleif Schjelderup-Ebbe,” *Norsk Biografisk Leksikon*, 13 February 2009, online: https://nbl.sn.l.no/Thorleif_Schjelderup-Ebbe (accessed 17 March 2021).
- Oreskes, Naomi, “Objectivity or Heroism? On the Invisibility of Women in Science,” *Osiris* 11 (1996): 87–113.
- Plack, Arno (ed.), *Der Mythos vom Aggressionstrieb* (Munich: List Verlag, 1973).
- Price, John, “A Remembrance of Thorleif Schjelderup-Ebbe,” *Human Ethology Bulletin* 10, no. 1 (1995): 1–6.
- Rashevsky, Nicholas, *Mathematical Biology of Social Behavior* (Chicago: University of Chicago Press, 1959).
- Rodgers, Daniel T., *Age of Fracture* (Cambridge/MA and London: Harvard University Press, 2012).
- Röell, David R., *The World of Instinct: Niko Tinbergen and The Rise of Ethology in the Netherlands (1920–1950)* (Van Gorcum: Assen, 2000).
- Roth, Gerhard (ed.), *Kritik der Verhaltensforschung: Konrad Lorenz und seine Schule* (Munich: Verlag C. H. Beck, 1974).

- Sailo, Annukka, "Contesting the 'Territorial Aggression Thesis' in Environmental Psychology, ca. 1965–1980," *Journal of the History of the Behavioral Sciences* 54 (2018): 198–214.
- Sarasin, Philipp, 1977: *Eine kurze Geschichte der Gegenwart* (Berlin: Suhrkamp, 2021).
- Schein, Martin W. (ed.), *Social Hierarchy and Dominance*, Benchmark Papers in Animal Behavior, vol. 3 (Stroudsburg/PA: Dowden, Hutchinson & Ross, 1975).
- Schiefenhövel, Wulf, Johanna Uher, Renate Krell (eds.), *Im Spiegel der Anderen: Aus dem Lebenswerk des Verhaltensforschers Irenäus Eibl-Eibesfeldt* (Munich: Realis Verlags-GmbH, 1993).
- Schiefenhövel, Wulf, "Begleittext 'EE,'" in *Im Spiegel der Anderen: Aus dem Lebenswerk des Verhaltensforschers Irenäus Eibl-Eibesfeldt*, ed. Wulf Schiefenhövel, Johanna Uher, Renate Krell (Munich: Realis Verlags-GmbH, 1993), 10–201.
- Schiefenhövel, Wulf, Barbara Hold-Cavell, Volker Heeschen (the organizing committee), "5th International Conference on Human Ethology: July 27–31, 1986 in Tutzing, West Germany," *Human Ethology Newsletter* 4, no. 6 (1985): 2.
- Schjelderup-Ebbe, Thorleif, "Beiträge zur Sozialpsychologie des Haushuhns," *Zeitschrift für Psychologie* 88 (1922): 225–252.
- Schjelderup-Ebbe, Thorleif, "Weitere Beiträge zur Sozialpsychologie des Haushuhns," *Zeitschrift für Psychologie* 92 (1923): 60–87.
- Schjelderup-Ebbe, Thorleif, "Zur Sozialpsychologie der Vögel," *Zeitschrift für Psychologie* 95 (1924): 36–84.
- Schjelderup-Ebbe, Thorleif, "Soziale Verhältnisse bei Säugetieren," *Zeitschrift für Psychologie* 97 (1925): 145.
- Schjelderup-Ebbe, Thorleif, "Social Behavior of Birds," in *A Handbook of Social Psychology*, ed. Carl Murchison (Worcester/MA: Clark University Press, 1935), 947–972.
- Schubert, Glendon, "The Structure of Attention: A Critical Review," *Journal of Social & Biological Structures* 6, no. 1 (1983): 65–80.
- Schurig, Volker, "Hundert Jahr Wissenschaftsbegriff Ethologie: eine kritische Bilanz," *Biologie in unserer Zeit* 41, no. 2 (2011): 92–94.
- Schurig, Volker, *Problemgeschichte des Wissenschaftsbegriffs Ethologie* (Rangsdorf: Basiliken-Press, 2014).
- Segerstråle, Ullica, *Defenders of the Truth: The Battle for Science in the Sociobiology Debate and Beyond* (Oxford: Oxford University Press, 2000).
- Segerstråle, Ullica, *Nature's Oracle: The Life and Work of W. D. Hamilton* (Oxford: Oxford University Press, 2012).
- Sepkoski, David, *Rereading the Fossil Record: The Growth of Paleobiology as an Evolutionary Discipline* (Chicago: University of Chicago Press, 2012).
- Stadler, Max, Nils Güttler, Niki Rhyner, Mathias Grote, Fabian Grütter, Tobias Scheidegger, Martina Schlünder, Anna Maria Schmidt, Susanne Schmidt, Alexander von Schwerin, Monika Wulz, Nadine Zberg (eds.), *Gegen | Wissen* (intercomverlag: Zurich: 2020).
- Stuhrmann, Cora, "'it felt more like a revolution.' How Behavioral Ecology succeeded Ethology, 1970–1990," *Berichte zur Wissenschaftsgeschichte* 45, no. 1–2 (2022).
- Taschwer, Klaus, "'Rendezvous mit Tier und Mensch': Wissenschaftssoziologische Anmerkungen zur Geschichte der vergleichenden Verhaltensforschung in Österreich," in *Soziologische und historische Analysen der Sozialwissenschaften*, ed. Christian Fleck (Opladen: Westdeutscher Verlag, 2000), 309–341.
- Taschwer, Klaus, "Von Gänsen und Menschen: Über die Geschichte der Ethologie in Österreich und über ihren Protagonisten, den Forscher, Popularisator und Ökopolitiker Konrad Lorenz," in *Wissenschaft, Politik und Öffentlichkeit: Von der Wiener Moderne bis zur Gegenwart*, ed. Mitchell G. Ash (Vienna: Wiener Universitätsverlag, 2002), 331–351.
- Taschwer, Klaus, Benedikt Föger, *Konrad Lorenz: Biographie* (Vienna: Paul Zsolnay Verlag, 2003).
- Tinbergen, Nikolaas, "Foreword," in *Ethological Studies of Child Behaviour*, ed. Nicholas Blurton Jones (Cambridge: Cambridge University Press, 1972), vii–ix.

- Vicedo, Marga, "The Father of Ethology and the Foster Mother of Ducks: Konrad Lorenz as Expert on Motherhood," *Isis* 100, no. 2 (2009): 263–291.
- Vicedo, Marga, "Cold War Emotions: Mother Love and the War over Human Nature," in *Cold War Social Science: Knowledge Production, Liberal Democracy, and Human Nature*, ed. Mark Solovey and Hamilton Cravens (New York: Palgrave Macmillan, 2012), 233–249.
- Vicedo, Marga, *The Nature and Nurture of Love: From Imprinting to Attachment in Cold War America* (Chicago: University of Chicago Press, 2013).
- Vicedo, Marga, "The 'Disadapted' Animal: Niko Tinbergen on Human Nature and the Human Predicament," *Journal of the History of Biology* 51, no. 2 (2018): 191–221.
- Weidman, Nadine, "Popularizing the Ancestry of Man: Robert Ardrey and the Killer Instinct," *Isis* 102 (2011): 269–299.
- Weidman, Nadine, "An Anthropologist on TV: Ashley Montagu and the Biological Basis of Human Nature, 1945–1960," in *Cold War Social Science: Knowledge Production, Liberal Democracy, and Human Nature*, ed. Mark Solovey and Hamilton Cravens (New York: Palgrave Macmillan, 2012), 215–232.
- Weidman, Nadine, *Killer Instinct: The Popular Science of Human Nature in Twentieth-Century America* (Cambridge/MA: Harvard University Press, 2021).
- Wieser, Wolfgang, *Konrad Lorenz und seine Kritiker: Zur Lage der Verhaltensforschung* (Munich: R. Piper & Co., 1976).
- Wilson, Edward O., *Sociobiology: The New Synthesis* (Cambridge/MA and London: Harvard University Press, 1975).
- Wunsch, Matthias, "Instinktverhalten bei Tieren: Die Debatte zwischen Konrad Lorenz und Daniel Lehrman," in *Methoden und Programme*, Philosophie der Tierforschung, vol. 1, ed. Martin Böhnert, Kristian Köchy, Matthias Wunsch (Freiburg and Munich: Verlag Karl Alber, 2016), 277–340.