

Exploring domestic cat welfare: Gaps, challenges, and the role of zoosemiotics in feline well-being

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Abstract. This article investigates the welfare of domestic cats by adopting a zoosemiotic perspective. It gives a broad picture of animal welfare in general and contextualizes studies conducted on cats within this, revealing differences in research foci compared to dogs. However, the main focus lies on the complexities of human–cat relationships and societal perceptions, which belong to the realm of ethological and anthropological zoosemiotics. Thus, we emphasize the importance of an integrated approach in comprehensive welfare assessments. Key factors such as increased human–cat interaction, societal constraints, and subjective experiences emerge as significant influences on cat welfare. Collaboration between veterinarians and behaviourists is encouraged, alongside with increased education of cat caregivers. Taking this line is supported by information gathered from interviews we conducted with Czech cat behaviourists. The article suggests a paradigm shift in research methodologies, proposing the use of zoosemiotic theories to comprehend alloanimal agency in general and cats' agency in particular to enhance their well-being. The study's goal is to identify the existing gaps and controversies in cat welfare literature (e.g. contradictions in devising best keeping conditions, insufficient education concerning cat welfare) by analysing relevant and recent studies in this field. Additionally, we aim to improve understanding of cat welfare as a complex phenomenon, and, with the help of zoosemiotics (umwelt theory and critical anthropomorphism), promote a comprehensive approach to the welfare of household cats in human-dominated environments.

Keywords: cat welfare; human–animal interactions; zoosemiotics; cat behaviour

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Introduction

Cats have become one of the most popular species to keep as pets (Assis, Mills 2021; Vojtkovská *et al.* 2020), which has given rise to several issues that need to be tackled in relation to cat welfare as we demonstrate by analysing the existing literature. Ensuring a healthy and happy life for cats is a responsibility for pet guardians, veterinarians, and society as a whole. The conditions that cats are kept in deserve attention (see e.g. Foreman-Worsley, Farnworth 2019) since they shape the environments that cats inhabit. Additionally, the dynamics of human–cat relationships (see e.g. Evans *et al.* 2019) include much of the social communication for household cats, as humans constitute the primary social partners for cats.

Despite the popularity of cats as pets, there are fewer studies pertaining to cat welfare than there are studies on dogs (we will address the possible reasons for this in the following section). Here, we would like to stress that assessing the welfare of any alloanimal³ is a fundamental aspect of evaluating the adequacy of their living conditions in the broadest sense (i.e. involving physical environment, social relations, needs, *etc.*). However, it is important to remember that the origins of alloanimal welfare, i.e. “Five Freedoms” (see e.g. Mellor 2016; Mäekivi 2018), were more about moral issues than scientific research in the past (Fraser *et al.* 1997). Today it is understood that social constraints must also be taken into account when thinking about the welfare of both humans as well as pets (Broom, Johnson 2019: 32). There is an ongoing debate between the emic and etic points of view on faring well when discussing welfare in relation to alloanimals who are, to a lesser or greater extent, under human control, management, and influence. This implies that other beings’ welfare is always mediated by human understandings, which leaves the door open to anthropocentric and anthropomorphic elements that may infiltrate the subject matter of evaluating welfare of other species. The issues of interspecific communication between humans and cats, mediation and the relation between alloanimals’ subjective experiences and external (observer-centric) interpretations make this topic relevant for zoosemiotic inquiry.

As our interest lies in those domestic cats that share a household with humans, our literature review focuses on them. We will not discuss feral, laboratory, free-roaming, or even shelter cats. Although all of these groups share some fundamental principles of alloanimal welfare (such as basic physiological and social needs), their environments, lifestyles, and interactions with humans vary fundamentally. Human perspectives on cats may also vary depending on the group to which the alloanimal belongs. Due to the diversity of cat groups, we can think of them as

³ Any animal besides human animals (Anderson 2020: 177).

having different “cat cultures” (Alger, Alger 1999). Our article considers the specific human–cat culture that develops in a domestic environment (see, e.g. Jaroš 2021). For this purpose we analyse cat welfare to find existing gaps and controversies in our scientific knowledge. Also, we examine zoosemiotic theory as a possible means to provide a better assessment of the welfare of cats and also as an aid for creating an environment for cats that will not just eliminate suffering but will also make their lives “worth living” (Mellor 2016). Despite the fields’ great compatibility, zoosemiotics is underdeveloped within welfare studies. Still, understanding the intricacies of alloanimal communication systems and the ability to interpret their behaviour can provide valuable insights into their subjective experiences, contributing to a more comprehensive assessment of alloanimal welfare.

Given these considerations, we aim to explore cat welfare from a broader perspective. First, we study how cat welfare has been tackled in scientific literature so far and what the shortcomings in providing good welfare for domestic cats seem to be. We propose that the weaknesses we find are most likely the result of an inability to account for all the different aspects that come into play when dealing with welfare issues, as this is a complex topic. Our second question concerns the ways in which zoosemiotics can help overcome such shortcomings. Since zoosemiotics is concerned with every aspect of animal (including human) communication, we believe we can offer a comprehensive framework in addressing problems that arise in granting cats good welfare; zoosemiotic theory can provide insights into interspecies communication to obtain a better understanding of the experiences and needs of domestic cats.

After dwelling deeper into the concept of ‘welfare’, we shall give an overview of what has been previously researched under the label of ‘cat welfare’, and bring up the similarities and differences with studies on dogs, the second most popular household pet. In doing so, we can draw attention to controversies and gaps in knowledge and approaches to cat welfare and provide insight into these issues. Additionally, in autumn 2023 we carried out three qualitative semi-structured interviews with Czech cat behaviourists,⁴ and we will use the knowledge gathered

⁴ The semi-structured interview questions were categorized into six groups: inquiries regarding (1) the behaviourist’s occupation; (2) their connection with cats; (3) their understanding of welfare; (4) their relationship with owners; (5) relationships with catteries; and (6) relationships with veterinarians. The selection of interviewees was based on their online presence and referrals from other interviewees. The interviews were conducted in person and had a duration ranging from 45 minutes to 1.5 hours. The interviews took place in October and November 2023. The interviews were conducted in the Czech language, recorded, transcribed, and subsequently translated into English. To obtain more comprehensive information, please reach out to jana.tajchmanova@uhk.cz.

from them to support and illustrate some of our arguments in the article, especially by providing the behaviourists' view on cat welfare. Finally, we will employ zoosemiotic theory (especially umwelt theory and critical anthropomorphism) to open up further avenues in cat welfare studies.

1. Alloanimal welfare

We shall not delve into the history of alloanimal welfare since there is an abundance of literature covering that aspect (see, e.g. Favre 2021; Mellor *et al.* 2020; Broom, Johnson 2019; Broom 2011). However, we need to point out that, till today, there is no commonly-agreed-upon definition of alloanimal welfare (see, e.g. Stamp Dawkins 2021). Instead, there exist diverse approaches, e.g. physical well-being or biological functioning, in which fitness and physical health are the main focus; natural behaviour expression that considers being able to fulfil the scope of one's species-specific behaviours as central; and an affect-based approach, where alloanimal's own feelings of positivity or negativity in relation to a given context are seen as paramount (see, e.g. Veit, Browning 2021; Stamp Dawkins 2021; Vojtkovská *et al.* 2020). We can observe a variety of criteria proposed for assessing alloanimal welfare, and we have previously argued (Mäekivi 2016) that concentrating solely on one criterion can result in a narrow and incomplete understanding of the overall well-being of alloanimals. For example, physical health does not guarantee the presence of optimal mental well-being in alloanimals; natural behaviour can lead to physical harm and stress (e.g. fighting for a female); alloanimals themselves might enjoy activities that prove to be harmful in a longer perspective, such as eating high-calorie foods that can lead to obesity and health problems. The zoosemiotic paradigm allows us to combine the subjective perspective with objective perspectives by being interdisciplinary and facilitating the analysis of how cats perceive and communicate in their environments, leading to a more comprehensive understanding of their well-being.

Thus, the welfare of alloanimals extends beyond the realm of any single discipline; it is a multifaceted concern with scientific, ethical, economic, and other dimensions. Therefore, addressing this issue requires a synthesis of conceptual and methodological knowledge. While natural sciences play an important role in enhancing alloanimal welfare, contributions from the social sciences and humanities are equally vital. These fields provide insights into the dynamics of human–alloanimal interactions within society and are essential in devising tangible solutions to attain the goals of alloanimal welfare (Lund *et al.* 2006: 38). We believe that zoosemiotics (as developed by Martinelli 2010) has a lot to offer

here: ethological zoosemiotics can contribute to the study of intra- and interspecies communication, and anthropological zoosemiotics can account for how the manner in which humans care for alloanimals, including cats, is influenced by culturally and non-scientifically based opinions. Moreover, the representations of other species influence the way we communicate with them: for example, if a caregiver holds the belief that a cat is an unsocial animal, they may be deterred from interacting with the animal frequently, thus also impoverishing the cat's social environment. However, if a human guardian perceives the cat as an equivalent to a child, the cat may receive too much unwanted attention and physical contact, leading to stress.

2. Cat welfare

The fact that cats are popular home pets suggests that there are numerous issues related to cat welfare; however, the topic is not as well covered as it ought to be: “The well-being of many pet cats falls short of what it should be – perhaps because their welfare does not grab headlines in the way that dogs’ welfare does, or perhaps because they tend to suffer in silence” (Bradshaw 2013: xxii). This does not imply that no research has been done in this field. Early research on cat welfare focused on the physical needs of cats and veterinary care, which was important in establishing the basic standards of cat care, and subsequently there has been an increasing focus on their emotional and social needs (Casey, Bradshaw 2007). This has led to a shift in focus towards better understanding of cat well-being.

Some studies have looked at the relationship between cats’ environment and housing and their welfare (e.g. Assis, Mills 2021; Grigg, Kogan 2019; Stella, Cronney 2016; Stella *et al.* 2014); others have examined how stress manifests in cats (e.g. Finka, Foreman-Worsley 2022; Zhang *et al.* 2022; Stella, Cronney 2019); still others have focused on the behaviour and welfare of cats (e.g. Henning *et al.* 2023; Atkinson 2018; Heath 2007); and because cats live in human households, the relationship between humans and cats has also been examined in relation to cat welfare (e.g. Finka 2022; Finka *et al.* 2019; Adamelli *et al.* 2005). The various themes mentioned here, although slightly different in focus, nonetheless share some common ground. For instance, the interaction between humans and cats, as well as the environment produced for them, can both impact the behaviour and stress levels of cats. While focusing on different aspects, each of these directions ultimately aims to promote the well-being of cats.

The main conclusions of these studies support the idea of environmental enrichment. This means that an environment that is enriched with various

elevated hiding and resting places, as well as opportunities for mobility such as climbing and running, tends to promote increased participation in activities such as eating, grooming, resting, and exploring (Stella, Croney 2016). Thus, even if a cat lives in a small apartment, the quality of the environment is far more important than the quantity of the space (Hediger 1964: 71). However, some researchers find that many cats who live in private homes may not be getting enough environmental enrichment. This is especially true when it comes to interactive forms of enrichment, like playing with a human caregiver, rather than static forms of enrichment such as cat toys (Grigg, Kogan 2019). Research on families with several cats emphasizes the significance of providing sufficient resources (e.g. litter boxes, separate feeding and resting areas) for each cat to prevent aggression, which is the most extensively studied component in such households (Foreman-Worsley, Farnworth 2019). However, a more recent analysis has discovered that there is no significant association between the quantity of cats in a home and their well-being (Finka, Forman-Worsley 2022). This challenges the previous belief that the cat group size in a home is tied to their well-being. It suggests that other factors may play a more important role in determining the welfare of cats, indicating the need for further research in this area.

Cats often experience stress from environmental changes, inter-cat fighting, inadequate human–cat relationships, and the incapacity to express highly driven behaviour patterns. Stress increases cat urine marking and aggressiveness and can also cause obsessive disorders like over-grooming. (Amat *et al.* 2015). House soiling, inter-pet fighting, animosity toward humans, unfriendliness, fearfulness, and destructive behaviour are the most prevalent stress-related behaviours, with aggressiveness and soiling being the major reasons cats are given up (Stella, Croney 2016) or even euthanized (Foreman-Worsley, Farnworth 2019). In fact, behavioural problems have been the primary focus of studies pertaining to cat welfare, with several books dedicated to the topic in the last decade (see, e.g. Bradshaw 2013; Rodan, Heath 2015; Atkinson 2018; Braastad *et al.* 2022). The human–cat relationship is also discussed in this context, since cat behaviour is primarily related to and observed by the caregivers. Understanding the dynamics of human–cat relations is important in addressing stress-related behavioural patterns, since the relationship can either contribute to the development of such issues or reduce stress and promote overall well-being for both parties involved. Not surprisingly, spending more time with cats is good for their well-being (Foreman-Worsley, Farnworth 2019: 5). Additionally, caregivers who are less knowledgeable about cats' species-specific behaviour, such as pouncing and scratching, are more likely to give up their cats (Stella, Croney 2016). Also, cat caregivers who hold certain misconceptions and think that taking care of cats

costs a lot are more likely to punish their cats by hitting, yelling, or spraying them with water when the cats do not behave in a way that pleases them (Grigg, Kogan 2019).

The research on cat welfare has made some progress, as this brief overview demonstrates, but there is still much work to be done. According to the following sources, there is still a long way to go: “Often, however, cats’ needs are inadequately met in homes” (Stella, Croney 2016: 1); “The impact of an indoor lifestyle on feline behaviour and welfare is little explored and poorly understood” (Foreman-Worsley, Farnworth 2019: 1); “[T]here is no consensus on the best way to house them” (Assis, Mills 2021: 2); “[T]here are still major gaps in the public’s general understanding of their social behaviours and related needs” (Croney *et al.* 2023); “Although cats’ popularity as pets rivals that of dogs, cats are little studied, and people’s abilities to read this apparently ‘inscrutable’ species have attracted negligible research” (Dawson *et al.* 2019: 519), “Despite the popularity of cats as pets, the overall level of knowledge in feline behaviour appears limited and nowhere near as widespread as the increasing general awareness of canine behaviour” (Atkinson 2018: 11), and “Cats have simply not grabbed the attention of scientists as dogs have” (Bradshaw 2013: xxii). Regarding zoosemiotic literature, the situation is even less promising. There are only a few articles that discuss alloanimal welfare matters (for instance, Cerrone 2020 and Mäekivi 2018 – both deal with alloanimals in zoological gardens), and even fewer that focus on pets (e.g. Dydynski, Mäekivi 2021) and specifically on cats (Jaroš 2021).⁵ We hope that this article is an additional step towards filling this gap, and we will delve deeper into the zoosemiotic perspective after examining the disparities in research on the welfare of dogs as compared to cats, and scrutinizing the role guardians play in cat welfare research.

2.1. Cat welfare research compared to dogs

As we can see from the sources quoted, the available literature predominantly focuses on the welfare of dogs over cats. Since there is a lack of scientific studies, perceptions and interpretations of cat behaviour are often more negative or

⁵ However, cats have gained some attention in (not welfare-related) semiotic literature. Besides Filip Jaroš’s work (see, e.g. Jaroš 2016, 2018) the best-known paper is probably Thomas Sebeok’s article titled “What do we know about signifying behavior of the domestic cat (*Felis Catus*)?” (Sebeok 2001[1994]). In the article, the cat rather serves as a case study for a general discussion on alloanimal behaviour, but it is interesting that Sebeok brings out the same issue that we are emphasizing: “I purposefully cast the title of my essay as an open-ended question: what do we know about signifying behavior in the domestic cat? The disappointingly pungent answer is: very little” (Sebeok 2001: 94).

ambivalent as compared to those associated with dogs, suggesting, for example, that cats are less social and less trainable than dogs (Croney *et al.* 2023). This information was confirmed in an interview with one of the behaviourists, Kateřina Štiblická, who also mentioned that cats are typically perceived as more independent and self-centred creatures, whereas dogs are typically thought of as amiable and loving family companions. Nevertheless, limited research suggests that cats may have a notable ability to form social connections and exhibit responsiveness (see Turner 2017; Vitale Shreve *et al.* 2017). However, there are dissenting opinions that argue “cats are not as socially sophisticated as dogs” (Bradshaw 2013: 156). Caregivers tend to agree with statements such as “cats are independent” and “have fewer social needs than other animals” (Bir *et al.* 2016: 184). These viewpoints may make it challenging to meet the needs of cats on a personal, social, or environmental level according to Croney *et al.* (2023), who claim that empirical research on the social behaviour of cats does not support these statements. Based on our interviews with cat behaviourists, cat behaviour and cats’ needs are generally misunderstood. Still, some studies claim that in comparison with dogs, cats exhibit fewer abnormal behaviour patterns linked to emotional distress, which is primarily attributed to cats’ lower emotional dependence on humans and their greater freedom (Webster 2022). In any case, cat caregivers seek professional help for behavioural problems more rarely than dog caregivers (Atkinson 2018: 12).

Cats differ from dogs in other ways as well: for instance, cats are more territorial and, unlike dogs, they inhabit the dual roles of hunters as well as prey. As Martina Načeradská (2018)⁶ notes, “A cat is basically a schizophrenic; it hunts for a while, and then it is afraid. It’s in its nature.” While dogs have the opportunity to explore various environments during walks, indoor cats are confined to the limited space of their caregivers’ homes. Thus, it is our responsibility to provide them with an environment tailored to their daily explorations and specific needs, which can help prevent behavioural problems. A recent review of cat welfare studies (Foreman-Worsley, Farnworth 2019: 5) found that human influence in a cat’s social environment may have a more significant impact on their welfare and behaviour than interactions with other cats. We should also note that unlike dogs, cats have undergone less intense selection for domesticated traits and retain behavioural traits close to their wild ancestors, such as a preference for solitude, territoriality, and burying faeces and urine (Foreman-Worsley, Farnworth 2019: 2). While dogs were selectively bred to improve both behavioural and physical

⁶ See <https://wave.rozhlas.cz/nemaji-vodu-ani-zradlo-je-jim-jedno-rika-o-mnozirenske-mafii-veterinarka-martina-7199236>.

traits, cats were bred solely to improve their physical traits, so breed-related behavioural disparities are likely to be greater in dogs than in cats (Atkinson 2018).

Due to an inadequate understanding of feline behaviour and characteristics, there is a greater number of myths about cats compared to those concerning dogs (see also Cronney *et al.* 2023). In her interview, Štiblická gave examples of the misconception that cats are easier to handle than dogs, the belief that pregnant women cannot continue caring for their cats, the assumption that cats purr only when they feel happy, or the myth that cats can see in complete darkness. Considering these myths and little understanding of cats, concerns about cat welfare appear to be quite justified.

2.2. Caregivers in cat welfare research

Even with the realization that human–cat relationships affect cat welfare more than cat–cat relationships, an overview article (Foreman-Worsley, Farnworth 2019: 5) claims that there is more research into cat–cat relationships than cat–human relationships. Furthermore, the existing research centres on adults, while cat–child interactions remain underexplored. Diverse socio-cultural, geographical, relational, and individual factors play their roles in shaping human perceptions of cats. However, a constant factor that surfaces is the association between cat welfare, the ways in which humans interpret cats' behaviour and needs, and the ways cats act as a consequence. According to a behaviourist (Načeradská), what often is most challenging is convincing humans to change their attitudes and actions so that alloanimals can thrive.

Various studies show that it is common among cat caregivers to perceive feline companions similarly to family members. Some humans tend to treat pets under their care as if they were their own children (Arahoiri *et al.* 2017; Bouma *et al.* 2021; Bir *et al.* 2016; Grigg, Kogan, 2019). Interviews with cat behaviourists support this, but they also reveal that in addition to cats being perceived as little humans, they may also be seen as completely wild and independent, or somewhere in between. Research pertaining to this issue from the point of view of cats also gives ambiguous results: some studies state that cats can and do have secure attachments to their caregivers, but others disagree (Atkinson 2018: 50). Caregivers' perception of their cat as a “child” *versus* “wild” holds huge importance in human–cat communication styles: e.g. cats who are handled for at least half an hour per day exhibit more confidence and are friendlier than those who are handled for 15 minutes (Atkinson 2018: 71). Moreover, people who spend several hours a day interacting with their cats report having less frequent issues with them (Heidenberger 1997). Adoption is a common starting point for the bond between

cat and human as caregivers seek out cats with friendly and playful personalities (Travnik *et al.* 2020). In general, cats with high agreeability and low neuroticism make caregivers more satisfied (Evans *et al.* 2019).

In addition to the cats' sociability and extroversion, the caregivers' character qualities are also an important consideration which influences the dynamics of the relationship. For example, higher caregiver agreeableness about cats is tied to higher levels of caregiver satisfaction; cats who have caregivers with higher conscientiousness are less fearful, aggressive, avoidant, and more gregarious; and caregiver extroversion has been shown to be linked to free outdoor access for cats (Finka *et al.* 2019: 2). The issue of allowing cats unrestricted access to outdoor environments presents a notable inconsistency in the existing literature. Specifically, there is no consensus on whether granting cats the freedom to roam outside at their own discretion is truly advantageous for them. According to one study (Foreman-Worsley, Farnworth 2019), indoor cats have nearly twice the number of behavioural problems compared to cats that are allowed outdoors, but a different study (Grigg, Kogan 2019: 18) found that behavioural problems are more frequently reported in cats that are allowed outdoors than in cats that are kept fully indoors. These kinds of discrepancies make it difficult to evaluate cats' welfare and whether caregivers are providing a necessary social and physical environment for their pets.

Still, there is a general consensus that there is a notable deficiency in basic knowledge about caring for their pets among many cat caregivers (Croney *et al.* 2023; Grigg, Kogan 2019; Finka *et al.* 2019; Stella, Croney 2016; Howell *et al.* 2016) and interviews with behaviourists partially seem to support the studies. For example, even if there is a relatively solid understanding of cat nutrition (as said by Klára Nevečeřalová), adapting their living space to meet the specific needs of cats can be demanding for some caregivers (as stated by Štiblická), as is finding dedicated time to play with their cats (as acknowledged by veterinarian and behaviourist Načeradská). It is also stated that caregivers face challenges in interpreting their pets' behaviour (Mariti *et al.* 2017; Grigg, Kogan 2019), e.g. they may interpret aggression as play (Atkinson 2018: 45). An interviewee (Načeradská) stated that one of the most common issues regarding behavioural problems is that caregivers tend to address a problem only when it directly impacts them. Nevertheless, research shows that caregivers who have better knowledge of cats' behaviour and form a stronger bond with their pets report fewer behaviour issues (Grigg, Kogan 2019). Thus, we may conclude that "[l]oving animals is not enough. If we are to do right by them, we need to understand them" (Webster 2022: 131).

2.3. The role of cat behaviourists in cat welfare

The interviews conducted with cat behaviourists (Štiblická, Načeradská and Nevečeřalová) help us investigate the importance of feline/cat behaviourists (also known as ‘cat psychologists’ or ‘cat trainers’) in a holistic approach to cat welfare. Two primary categories of such experts were identified by the interviewees: veterinary behaviourists and non-veterinary behaviourists. Veterinary animal behaviourists ask caregivers questions about the cats’ misbehaviour, their own response, and alloanimal management. During the consultation or referral, a veterinarian must rule out medical causes of behavioural issues. Cat behaviourists’ goals are similar to those of comparative psychology (or ‘animal psychology’). This field is based on psychology and biology. Comparative psychology seeks to understand alloanimal behaviour and its cognitive, emotional, and motivational processes (Yermolenko, Orotal 2021). Cat behaviourists study cats’ minds and meet their biological needs. This suggests that their work aligns with comparative psychology experts’ goals of providing cat caregivers with accessible explanations for the behaviour of their feline companion.

Since cat behaviourists are rare in the Czech Republic, caregivers often only visit veterinarians. Cat caregivers mostly are aware of what a veterinarian does but do not know the content of a behaviourist’s work. Low awareness of this profession causes mixed reactions to these experts. Cat behaviourists say that some caregivers do not understand the content of their work. Načeradská states in her interview:

The work of a cat behaviourist is typically undervalued by the public, despite being equal in importance with veterinary medicine. The likely reason for this discrepancy is that this type of profession is not very widespread here. A surgeon’s profession is considered highly significant, whereas individuals engaged in understanding the mental aspects of animals are perceived as inferior.

Why not welcome any cat welfare awareness effort, especially if it furthers cat behaviour knowledge? The best solution seems to be collaboration between a veterinarian and a cat behaviourist. Some clinics use veterinarians and cat behaviourists to evaluate their patients physically and psychologically. One of the interviewees (Štiblická) stated that a cat behaviourist need not be a veterinarian, but they must know their patients’ physiology and anatomy. Many veterinarians are too busy to study alloanimal psychology in detail, so they focus mostly on their physical health (as stated by Načeradská). This emphasizes the collaborative need between veterinarians and behaviourists. However, this is not the only collaboration needed: below, we shall discuss how zoosemiotics might help in aiding cat welfare.

3. Zoosemiotics, cats and alloanimal welfare

It is a well-known fact in zoosemiotics that every animal (including human) has its own distinct *umwelt*, which refers to the collective range of perception and interaction with their surroundings. *Umwelt* consists of functional circles (the relations that an organism has with objects and other subjects), and the four main functional circles are food, partner (sex), enemy, and physical medium (Uexküll 1982: 33). When considering household cats, it is evident that not all functional circles may be present. In countries where neutering and sterilization of cats are common, cats may have no sexual partners, but they can have social partners which can be either humans or other pets of the same or different species. When a cat is kept indoors without other pets and has a mutually positive relationship with their caregiver, they have no enemies either.⁷

However, the absence of functional circles does not mean that the life of a cat is not “worth living” if we account for the subjective experiences of the cat. According to Uexküll (1992: 383), each individual exists within a personal realm consisting solely of subjective experiences. The *umwelt* of an animal is closely linked to their species, their physiological abilities, modes of communication, and range of signals. Additionally, *umwelt* is impacted by factors such as the animal’s age, gender, particular temperament, and health. In the context of domesticated alloanimals like cats, breed also becomes a relevant factor since cats are often bred with specific physiological or behavioural traits in mind. One example of this is Oriental breeds, such as Siamese cats, who nurse their offspring for a longer period of time compared to other breeds. When the offspring are weaned at two months, they are more likely to develop stereotypical behaviours such as suckling (see Bradshaw *et al.* 1997). Cats have several ethograms available (e.g. see UK Cat Behaviour Working Group 1995). While essential for mapping the species’ behavioural repertoire, these do not offer context for the behaviour. However, context is important in analysing any communication scenario. For example, in a social situation (with another cat or a human) a cat may roll over and expose their belly – this may be an indication of trust or submission (but seldom an invitation for a belly-rub), and it is necessary to determine the meaning of this behaviour based on its context, which is one of the main aspects in zoosemiotic inquiry.

Consequently, the scope and nature of communication with an alloanimal and the ways in which a communication situation can unfold depend on the

⁷ We would like to add that the absence of adversaries is also consistent with good welfare. Engaging in territorial disputes or competition for mates with other cats may be normal for the species, but it can lead to physical harm and stress, ultimately reducing the quality of life (see also Mäekivi 2016).

above-named individual factors. Even though this recap may seem trivial, from the number of behavioural problems that household cats exhibit it is evident that these zoosemiotically based factors are often not considered by humans who have cats under their care (as mentioned above, there is a lack of knowledge among caregivers about cats' species-specific behaviour, accompanied by several misunderstandings). By considering a cat's sensory organs, habits, relationships, personal dispositions, etc. we can examine the world from a cat's point of view and make informed estimations about what is meaningful and relevant to them while being reflected in their behaviour, thus providing a more emic perspective that helps us map and assess their welfare comprehensively. The emic perspective is consistent with umwelt analysis, as both see alloanimals as active agents with distinct characteristics.

This does not mean that we automatically agree with an affect-based approach to alloanimal welfare, but through the synthesis described above we try to find a way to devise an interaction context that caters to the specific umwelt of the alloanimal. An oversimplified and informal example of this would be the case in which a household cat has a habit of nibbling on a toxic plant. From a purely emic standpoint we could assert that the cat's emotions can be positive (for example, the cat may enjoy the flavour or sensation it experiences after consuming the plant). According to the theory of natural behaviour, cats' habit of nibbling on plants is normal and a component of their ethogram. The physical health approach, however, suggests that this activity is harmful. Instead of keeping the plant to cater to the cat's wants or simply removing the plant to avoid the cat's illness, we could see whether the cat has a meaningful relation with that specific plant, or is in need of a plant to nibble on in general, or if the nibbling could, at the given moment, be substituted with another meaningful activity. We must consider the cat's perspective in order to provide options that allow them to exercise their agency. Adding or removing objects for environment enrichment does not *per se* guarantee an enhanced environment for the cat. The crucial factor is the cat's interaction with these objects, i.e. whether these are meaningful in their umwelt.

Alloanimal agency is highly important within the field of zoosemiotics, which acknowledges other species "as active participants in semiosis, that is, as interpreters of signs, and as being related to other animals and the environment" (Maran *et al.* 2016a: 10). By acknowledging alloanimal agency, we attribute value to qualitative aspects that are meaningful for them. Earlier writings (e.g. Hediger 1964[1950]; Turovski 2000) have recommended taking into account the agency and communicative capabilities of individual alloanimals. This inspires us to view alloanimal welfare as a topic that involves alloanimal agency. This viewpoint emphasizes the significance of taking into consideration the distinct experiences and requirements of every species. According to zoosemiotic theory, both the

caregiver and the cat are agents whose behaviour in different situations is affected by their own personal experiences (see e.g. Jaroš 2021). It is generally understood that sharing a household with pets is beneficial for humans' physical and mental health and social wellbeing (Wunderlich *et al.* 2021: 648). However, a positive life with felines may also depend on our ability to view cats as unique individuals – for example, some studies focus on how cats personally handle stressful situations (Stella, Croney 2019) – and on the temperament, personality, or character of the cat regarding their boldness, aggressiveness, friendliness, and sociability (Travník *et al.* 2020). Personalities in cats have been categorized using the “Feline Five” traits: neuroticism, extraversion, dominance, impulsiveness, and agreeableness (Litchfield *et al.* 2017). Given that cats are primarily brought into a household for the purpose of companionship (Downey, Ellis 2008), it is important to consider the compatibility between the personalities of the cat and the caregiver.

Ethological zoosemiotics is focused on understanding intra- and interspecies communication (Martinelli 2010) and the agency of alloanimals is essential in analysing human–alloanimal relationships. Thus, we believe that employing zoosemiotic methodology in welfare studies enables us to examine the living conditions and welfare of alloanimals within their specific social contexts by recognizing that alloanimals are active participants in their own lives. Since humans are the social partners for cats under their care, it is important to ask: “To what extent can humans communicate with cats and vice versa?” (Sebeok 2001: 96). Although we have some overlap in our *umwelten*, there is still a lot that needs to be learned, not only about the particular species (and breed), but also about the individual personalities. One approach is to utilize critical anthropomorphism, which has been established on the basis of zoosemiotic principles:

In addressing issues of possible mechanisms in behavior, especially mentalistic ones, I have advocated the use of a critical anthropomorphism in which various sources of information are used including: natural history, our perceptions, intuitions, feelings, careful behavior descriptions, identifying with the animal, optimization models, previous studies and so forth in order to generate ideas that may prove useful in gaining understanding and the ability to predict outcomes of planned (experimental) and unplanned interventions [...]. (Burghardt 1991: 73)

Thus, we need a comprehensive strategy in order to have meaningful communication with our cats and to grant them good welfare.

However, understanding the domestic environment as a hybrid environment (see Mäekivi, Magnus 2020) stresses the significance of recognizing “the complex intertwining of culture and biology in human–animal relations” (Maran *et al.* 2011: 2). In zoosemiotics, we also scrutinize the perceptions, attitudes, and

representations of alloanimals. This approach challenges the notion that the “line between semiotic processes in animals and their representation in human culture cannot be a defining border of zoosemiotics” (Maran 2014: 4). Investigating how alloanimals are represented holds a central place within anthropological zoosemiotics as it helps us point to the reasons behind our management and treatment of alloanimals under our care and explicates the connections between biological meanings and cultural interpretations.

Recognizing the significance of studying the representations of alloanimals in our culture also plays an important role in shaping our interactions with them. In a previous study (Dydynski, Mäekivi 2021), we examined how our perceptions of alloanimals influence our expectations for the relationships we can form with them. However, if these interactions do not align with our expectations, this can lead to frustration or even the decision to relinquish them. The issue, however, typically resides in the (erroneous) perceptions that give rise to expectations, or may also be based on the incompatibility of personality traits between individuals. Thus, semiotics provides us with a means to explore the practical implications of both denotative and connotative meanings associated with different species. Denotative meanings pertain to how alloanimals are portrayed and to our scientific understanding of them, encompassing fields such as biology and ecology (Maran *et al.* 2016b: 37). Alloanimal representations are contextualized within their cultural contexts through connotative meanings (Maran *et al.* 2016b: 37). Zoosemiotic literature also contains studies of the feeding situation between people and their pets (Mangano 2018) and on how pets and their relationships with people are shown on pet food packaging (Bartoletti, Cecchelin 2018). The latter research found that the human consumer is seen as mostly responsible and slightly inclined toward “vicarious hedonism”, while the alloanimal is seen as mostly affectionately dependent, slightly spoiled, and slightly independent (Bartoletti, Cecchelin 2018: 87–88). Thus, pets are to a certain extent transformed according to discourses we use, stories we tell of them, and cultural habits that they are a part of. From the review of previous literature we have concluded that studies on cat welfare are underrepresented and that there are numerous myths surrounding cats. So, these aspects need to be accounted for in our relationships with cats. We believe that by applying a zoosemiotic approach to human–cat communication we could further advance studies on cat welfare and help dispel myths.

We also need to remember that cats have their own perceptions of humans and our behaviour that we should consider in our interactions with them. To understand the significance of our actions to others, we must observe and interpret their behavioural responses, then adapt our behaviour accordingly. Understanding a cat’s *umwelt* can simplify the process of interacting with them.

By paying attention to these semiotic aspects, researchers can enhance our comprehension of the human–cat relationship, which is important in ensuring cat welfare. This deeper understanding can inform practices and interventions to address behavioural issues and strengthen the bond between cats and their human caregivers. Given the significance of studies concerning cat welfare and their implications for both cat–human and cat–cat interactions, the integration of zoosemiotics, including umwelt theory, in cat welfare research can significantly advance the field.

Conclusions

In terms of understanding and improving the welfare of domestic cats, zoosemiotic research provides a framework with novel insights into the intricate semiotic interactions between humans and cats, offering an approach to addressing the multifaceted aspects of cat welfare. By recognizing the importance of alloanimal agency in zoosemiotics, researchers will gain a better understanding of how cats navigate and interpret their surroundings, which informs strategies for improving their welfare. We have identified information gaps and contradictions associated with the cat welfare topic and explored the main aspects that influence the welfare of domestic cats sharing households with humans. Research on cat welfare has made some progress in understanding the physical, emotional, and social needs of cats. However, there is still much work to be done, as the well-being of many pet cats falls short of what it should be. The relationship between humans and cats also plays a significant role in cat welfare, with increased human–cat interaction and understanding of species-specific behaviours emerging as important factors. Stress is a major issue for cats, and it can lead to various behavioural problems. This is exactly where zoosemiotics can contribute: we propose that umwelt analysis and critical anthropomorphism can bridge the gap between human and feline perspectives, facilitating meaningful communication and interaction. By considering cats' subjective experiences and individual preferences, caregivers can tailor enrichment activities and environmental stimuli to cater to the cats' specific needs, thereby promoting their overall well-being. While household cats may lack certain functional circles (e.g. sexual partners due to neutering), their umwelt is not solely defined by these factors but also influenced by subjective experiences.

The research on cat welfare is not as extensive as that on dog welfare, and there are still several misconceptions and myths surrounding cats that contribute to a lack of understanding of their needs. Thus, we also stress the need to incorporate social constraints, cat representations and cultural perceptions into welfare research. This

can provide insight into the societal attitudes, biases, and norms that shape human–cat interactions. These connotative meanings are of interest to zoosemiotic study. Studying the representations in human culture of alloanimals in general and cats in particular helps us understand the reasons behind our treatment of alloanimals and shapes our interactions with them. This, in turn, makes it possible to promote a more nuanced understanding of alloanimal behaviour and welfare.

We bring forth the importance of research into cat–human relationships and the need for more focus on cat–human interactions. The perception of cats as family members or wild animals varies among caregivers and can impact communication styles and the overall well-being of cats. The personality traits of caregivers also play a role in the dynamics of the cat–human relationship. There is a lack of consensus on whether granting cats outdoor access is beneficial to their welfare, and there is a general deficiency in basic knowledge about cat care among many caregivers. The interviews we conducted show that cat behaviourists are regarded important in promoting cat welfare, and that there is a need for collaboration between veterinarians and behaviourists. All in all, understanding and knowledge of cat behaviour are of high importance for providing proper care and ensuring the well-being of cats, and we believe that by combining ethological and anthropological zoosemiotics we can tackle the complexity of feline cognition, communication, as well as their representations. However, it is only through interdisciplinary collaboration that we can pave the way towards a future where cats thrive in hybrid environments.

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References

- Adamelli, Serena; Marinelli, Lieta; Normando, Simona; Bono, Gabriele 2005. Owner and cat features influence the quality of life of the cat. *Applied Animal Behaviour Science* 94(1/2): 89–98. <https://doi.org/10.1016/j.applanim.2005.02.003>
- Alger, Janet M.; Alger, Steven F. 1999. Cat culture, human culture: An ethnographic study of a cat shelter. *Society and Animals* 7: 199–218. <https://doi.org/10.1007/s10441-011-9123-3>

- Amat, Marta; Camps, Tomàs; Manteca, Xavier 2015. Stress in owned cats: Behavioural changes and welfare implications. *Journal of Feline Medicine and Surgery* 18(8): 577–586. <https://doi.org/10.1177/1098612X15590867>
- Anderson, Myrdene 2020. Narratology's growing pains: An ode to the alloanimal turn and post-humanism too. In: Owens, Geoffrey Ross; West, Donna E. (eds.), *Semiotics 2019: New Frontiers in Semiotics*. Charlottesville: Semiotic Society of America, 175–192. <https://doi.org/10.5840/cpsem20192>
- Arañori, Minori; Kuroshima, Hika; Hori, Yusuke; Takagi, Saho; Chijiwa, Hitomi; Fujita, Kazuo 2017. Owners' view of their pets' emotions, intellect, and mutual relationship: Cats and dogs compared. *Behavioural Processes* 141(3): 316–321. <https://doi.org/10.1016/j.beproc.2017.02.007>
- Assis, Luciana; Mills, Daniel 2021. Introducing a controlled outdoor environment impacts positively in cat welfare and owner concerns: The use of a new feline welfare assessment tool. *Frontiers in Psychology* 7: 1–14. <https://doi.org/10.3389/fvets.2020.599284>
- Atkinson, Trudi 2018. *Practical Feline Behaviour: Understanding Cat Behaviour and Improving Welfare*. Wallingford: CABI. <https://doi.org/10.1079/9781780647838.0000>
- Bartoletti, Roberta; Cecchelin, Giulia 2018. Pet food communication: Notes on the crisis of naturalism. In: Marrone, Gianfranco; Mangano, Dario (eds.), *Semiotics of Animals in Culture. Zoosemiotics 2.0*. Cham: Springer International Publishing AG, 73–90. https://doi.org/10.1007/978-3-319-72992-3_6
- Bir, Courtney; Widmar, Nicole J. Olynk; Croney, Candace C. 2016. The whole “Kitten”-caboodle: Perceived differences in veterinary and general population opinions regarding cat behavior and health. *Open Journal of Veterinary Medicine* 6: 177–192. <https://doi.org/10.4236/ojvm.2016.612021>
- Bouma, Esther M. C.; Reijgwart, Marsha L.; Dijkstra, Arie 2022. Family member, best friend, child or ‘just’ a pet, owners' relationship perceptions and consequences for their cats. *International Journal of Environmental Research and Public Health* 19(1). <https://doi.org/10.3390/ijerph19010193>
- Braastad, Bjarne O.; McBride, Anne; Newberry, Ruth C. 2022. *The Cat: Behaviour and Welfare*. Wallingford: CABI.
- Bradshaw, John W. 2013. *Cat Sense: How the New Feline Science Can Make You a Better Friend to Your Pet*. New York: Basic Books.
- Broom, Donald, M. 2011. A history in animal welfare science. *Acta Biotheoretica* 59(2): 121–137. <https://doi.org/10.1007/s10441-011-9123-3>
- Broom, Donald M.; Johnson, Ken G. 2019. *Stress and Animal Welfare: Key Issues in the Biology of Humans and Other Animals*. Cham: Springer Nature. <https://doi.org/10.1007/978-3-030-32153-6>
- Burghardt, Gordon 1991. Cognitive ethology and critical anthropomorphism: A snake with two heads and hognose snakes that play dead. In: Ristau, Carolyn (ed.), *Cognitive Ethology: The Minds of Other Animals*. New Jersey, London: Lawrence Erlbaum Associates, 53–90.
- Casey, Rachel A.; Bradshaw, John W. 2007. The assessment of welfare. In: Rochlitz, Irene (ed.), *The Welfare of Cats*. Cambridge: Springer, 23–46. https://doi.org/10.1007/978-1-4020-3227-1_2

- Cerrone, Mirko 2020. Keepers as social companions: Tactile communication and social enrichment for captive apes. *Sign Systems Studies* 47(3/4): 453–479. <https://doi.org/10.12697/SSS.2019.47.3-4.06>
- Croney, Candace; Udell, Monique; Delgado, Mikel; Ekenstedt, Kari; Shoveller, Anna Kate 2023. CATastrophic myths part 1: Common misconceptions about the social behavior of domestic cats and implications for their health, welfare, and management. *The Veterinary Journal* (300/302): 106028. <https://doi.org/10.1016/j.tvjl.2023.106028>
- Dawson, Lauren C.; Cheal, Jenna; Niel, Lee.; Mason, Georgia 2019. Humans can identify cats' affective states from subtle facial expressions. *Animal Welfare* 28: 519–531. <https://doi.org/10.7120/09627286.28.4.519>
- Downey, Hilary; Ellis, Sarah 2008. Tails of animal attraction: Incorporating the feline into the family. *Journal of Business Research* 61(5): 434–441.
- Dydynski, Jason M.; Mäekivi, Nelly 2021. Impacts of cartoon animals on human–alloanimal relations. *Anthrozoös* 34(6): 753–766. <https://doi.org/10.1080/08927936.2021.1926718>
- Evans, Rebecca; Lyons, Minna; Brewer, Gayle; Tucci, Sonia 2019. The purrfect match: The influence of personality on owner satisfaction with their domestic cat (*Felis silvestris catus*). *Personality and Individual Differences* 138: 252–256. <https://doi.org/10.1016/j.paid.2018.10.011>
- Favre, David 2021. *The Future of Animal Law*. Cheltenham: Edward Elgar Publishing. <https://doi.org/10.4337/9781839100635>
- Finka, Lauren R.; Foreman-Worsley, Rachel 2022. Are multi-cat homes more stressful? A critical review of the evidence associated with cat group size and wellbeing. *Journal of Feline Medicine and Surgery* 24(2): 65–76. <https://doi.org/10.1177/1098612X211013741>
- Finka, Lauren R.; Ward, Joanna; Farnworth, Mark J.; Mills, Daniel S. 2019. Owner personality and the wellbeing of their cats share parallels with the parent–child relationship. *PLoS ONE* 14(2): e0211862. <https://doi.org/10.1371/journal.pone.0211862>
- Foreman-Worsley, Rachel; Farnworth, Mark J. 2019. A systematic review of social and environmental factors and their implications for indoor cat welfare. *Applied Animal Behaviour Science* 220(104841): 1–10. <https://doi.org/10.1016/j.applanim.2019.104841>
- Fraser, David; Weary, Daniel M.; Pajor, Edward A.; Milligan, Barry N. 1997. A scientific conception of animal welfare that reflects ethical concerns. *Animal Welfare* 6: 187–205. <https://doi.org/10.1017/S0962728600019795>
- Grigg, Emma K.; Kogan, Lori R. 2019. Owners' attitudes, knowledge, and care practices: Exploring the implications for domestic cat behavior and welfare in the home. *Animals* 9(11): 978. <https://doi.org/10.3390/ani9110978>
- Heath, Sarah E. 2007 Behaviour problems and welfare. In: Rochlitz, Irene (ed.), *The Welfare of Cats*. Cambridge: Springer, 91–118. https://doi.org/10.1007/978-1-4020-3227-1_4
- Hediger, Heini 1964[1950]. *Wild Animals in Captivity: An Outline of the Biology of Zoological Gardens*. New York: Dover Publisher.
- Heidenberger, Eva 1997. Housing conditions and behavioural problems of indoor cats as assessed by their owners. *Applied Animal Behaviour Science* 52: 345–364. [https://doi.org/10.1016/S0168-1591\(96\)01134-3](https://doi.org/10.1016/S0168-1591(96)01134-3)

- Henning, Julia; Nielsen, Torben; Fernandez, Eduardo; Hazel, Susan 2023. Cats just want to have fun: Associations between play and welfare in domestic cats. *Animal Welfare* 32: 1–11. <https://doi.org/10.1017/awf.2023.2>
- Howell, Tiffani J.; Mornement, Kate; Bennett, Pauleen C. 2016. Pet cat management practices among a representative sample of owners in Victoria, Australia. *Journal of Veterinary Behavior* 11: 42–49. <https://doi.org/10.1016/j.jveb.2015.10.006>
- Jaroš, Filip 2016. Cats and human societies: A world of interspecific interaction and interpretation. *Biosemiotics* 9: 287–306. <https://doi.org/10.1007/s12304-016-9253-8>
- Jaroš, Filip 2018. Cat cultures and threefold modelling of human–animal interactions: On the example of Estonian cat shelters. *Biosemiotics* 11: 365–386. <https://doi.org/10.1007/s12304-018-9332-0>
- Jaroš, Filip 2021. The cohabitation of humans and urban cats in the anthropocene: The clash of welfare concepts. *Animals* 11(705): 1–14. <https://doi.org/10.3390/ani11030705>
- Litchfield, Carla A.; Quinton, Gillian; Tindle, Hayley; Chiera, Belinda; Kikillus, K. Heidy; Roetman, Philip 2017. The ‘Feline Five’: An exploration of personality in pet cats (*Felis catus*). *PLoS One* 12(8): e0183455. <https://doi.org/10.1371/journal.pone.0183455>
- Lund, Vonne; Coleman, Grahame J.; Gunnarsson, Stefan; Calvert Appleby, Michael; Karkinen, Katri 2006. Animal welfare science – Working at the interface between the natural and social sciences. *Applied Animal Behaviour Science* 97(1): 37–49. <https://doi.org/10.1016/j.applanim.2005.11.017>
- Mäekivi, Nelly 2016. Modelling *ex situ* animal behaviour and communication. *Biosemiotics* 9: 207–226. <https://doi.org/10.1007/s12304-016-9264-5>
- Mäekivi, Nelly 2018. Freedom in captivity: Managing zoo animals according to the ‘Five Freedoms’. *Biosemiotics* 11(1): 7–25. <https://doi.org/10.1007/s12304-018-9311-5>
- Mäekivi, Nelly; Magnus, Riin 2020. Hybrid natures – Ecosemiotic and zoosemiotic perspectives. *Biosemiotics* 13: 1–7. <https://doi.org/10.1007/s12304-020-09382-z>
- Mangano, Dario 2018. Forms of animality: The dog. In: Marrone, Gianfranco; Mangano, Dario (eds.), *Semiotics of Animals in Culture. Zoosemiotics 2.0*. Cham: Springer International Publishing AG, 55–72. https://doi.org/10.1007/978-3-319-72992-3_5
- Maran, Timo 2014. Dimensions of zoosemiotics: Introduction. *Semiotica* 198: 1–10. <https://doi.org/10.1515/sem-2013-0098>
- Maran, Timo; Martinelli, Dario; Turovski, Aleksei 2011. Readings in zoosemiotics. In: Maran, Timo; Martinelli, Dario; Turovski, Aleksei (eds.), *Readings in Zoosemiotics*. (Semiotics, Communication and Cognition 8.) Berlin: De Gruyter Mouton, 1–20. <https://doi.org/10.1515/9783110253436.1>
- Maran, Timo; Tønnessen, Morten; Magnus, Riin; Mäekivi, Nelly; Rattasepp, Silver; Tüür, Kadri 2016a. Introducing zoosemiotics: Philosophy and historical background. In: Maran, Timo; Tønnessen, Morten; Rattasepp, Silver (eds.), *Animal Umwelten in a Changing World: Zoosemiotic Perspectives*. (Tartu Semiotics Library 18.) Tartu: University of Tartu Press, 10–28.
- Maran, Timo; Tønnessen, Morten; Magnus, Riin; Mäekivi, Nelly; Rattasepp, Silver; Tüür, Kadri 2016b. Methodology of zoosemiotics: Concepts, categorisations, models. In: Maran, Timo; Tønnessen, Morten; Rattasepp, Silver (eds.), *Animal Umwelten in a Changing World: Zoosemiotic Perspectives*. (Tartu Semiotics Library 18.) Tartu: University of Tartu Press, 29–50.

- Mariti, Chiara; Guerrini, Francesca; Vallini, Viviana; Bowen, Jonathan E.; Fatjó, Jaume; Diverio, Silvana; Sighieri, Claudio; Gazzano Angelo 2017. The perception of cat stress by Italian owners. *Journal of Veterinary Behavior* 20: 74–81. <https://doi.org/10.1016/j.jveb.2017.04.002>
- Martinelli, Dario 2010. *A Critical Companion to Zoosemiotics: People, Paths, Ideas*. (Bio-semiotics 5.) Berlin, New York: Springer.
- Mellor, David J. 2016. Updating animal welfare thinking: Moving beyond the “Five Freedoms” towards “A Life Worth Living”. *Animals* 6(3): 21. <https://doi.org/10.3390/ani6030021>.
- Mellor, David J.; Beausoleil, Ngaio J.; Littlewood, Katherine E.; McLean, Andrew N.; McGreevy, Paul D.; Jones, Bidda; Wilkins, Cristina 2020. The 2020 Five Domains model: Including human–animal interactions in assessments of animal welfare. *Animals* 10(10): 1870. <https://doi.org/10.3390/ani10101870>
- Rodan, Ilona; Heath, Sarah 2015. *Feline Behavioral Health and Welfare*. St. Louis: Elsevier.
- Sebeok, Thomas A. 2001[1994]. What do we know about signifying behavior of the domestic cat (*Felis catus*)? In: Sebeok, Thomas A. (ed.), *Global Semiotics*. Bloomington, Indianapolis: Indiana University Press, 74–96.
- Stamp Dawkins, Marian 2021. *The Science of Animal Welfare: Understanding What Animals Want*. Northamptonshire: Oxford University Press. <https://doi.org/10.1093/oso/9780198848981.003.0002>
- Stella, Judith L.; Croney, Candace C. 2016. Environmental aspects of domestic cat care and management: Implications for cat welfare. *The Scientific World Journal* 6296315. <https://doi.org/10.1155/2016/6296315>
- Stella, Judith L.; Croney, Candace C. 2019. Coping styles in the domestic cat (*Felis silvestris catus*) and implications for cat welfare. *Animals* 9(6). <https://doi.org/10.3390/ani9060370>
- Stella, Judith; Croney, Candace; Buffington, Tony 2014. Environmental factors that affect the behavior and welfare of domestic cats (*Felis silvestris catus*) housed in cages. *Applied Animal Behaviour Science* 160: 94–105. <https://doi.org/10.1016/j.applanim.2014.08.006>
- Travnik, Isadora; Souza Machado, Daiana; Gonçalves, Luana; Ceballos Maria, Camila; Sant’Anna, Aline Cristina 2020. Temperament in domestic cats: A review of proximate mechanisms, methods of assessment, its effects on human–cat relationships, and one welfare. *Animals* 10(1516). <https://doi.org/10.3390/ani10091516>
- Turner, Dennis C. 2017. A review of over three decades of research on cat–human and human–cat interactions and relationships. *Behavioural Processes* 141(3): 297–304. <https://doi.org/10.1016/j.beproc.2017.01.008>
- Turovski, Aleksei 2000. The semiotics of animal freedom: A zoologist’s attempt to perceive the semiotic aim of H. Hediger. *Sign Systems Studies* 28: 380–387. <https://doi.org/10.12697/SSS.2000.28.20>
- Uexküll, Jakob von 1992. A stroll through the worlds of animals and men: A picture book of invisible worlds. *Semiotica* 89(4): 319–391. <https://doi.org/10.1515/semi.1992.89.4.319>
- UK Cat Behaviour Working Group 1995. *An Ethogram for Behavioural Studies of the Domestic Cat* (*Felis silvestris catus* L.). Hertfordshire: Universities Federation for Animal Welfare.

- Veit, Walter; Browning, Heather 2021. Extending animal welfare science to include wild animals. *Animal Sentience* 7(20): 1–4. <https://doi.org/10.51291/2377-7478.1675>
- Vitale Shreve, Kristyn R.; Mehrkam, Lindsay R.; Udell, Monique. A. R. 2017. Social interaction, food, scent or toys? A formal assessment of domestic pet and shelter cat (*Felis silvestris catus*) preferences. *Behavioural Processes* 141(3): 322–328. <https://doi.org/10.1016/j.beproc.2017.03.016>
- Vojtkovská, Veronika; Voslářová, Eva; Večerek, Vladimír 2020. Methods of assessment of the welfare of shelter cats: A review. *Animals* 10(1527): 1–34. <https://doi.org/10.3390/ani10091527>
- Webster, John 2022. *Animal Welfare: Understanding Sentient Minds and Why It Matters*. Bristol: Wiley Blackwell.
- Wunderlich, Nancy; Mosteller, Jill; Beverland, Michael B.; Downey, Hilary; Kraus, Karen; Lin, Meng-Hsien; Syrjälä, Henna 2021. Animals in our lives: An interactive well-being perspective. *Journal of Macromarketing* 41(4): 646–662. <https://doi.org/10.1177/0276146720984815>
- Yermolenko, Anastasiya; Orotal, Shinead (eds.) 2021. *What in the World is Canine and Feline Psychology?* Edmonton: Golden Meteorite Press.
- Zhang, Lingna; Bian, Zhaowei; Liu, Qingshen; Deng, Baichuan 2022. Dealing with stress in cats: What is new about the olfactory strategy? *Frontier of Veterinary Science* 9(928943). <https://doi.org/10.3389/fvets.2022.928943>

Zkoumání dobrých životních podmínek u domácích koček: Mezery, výzvy a role zoosémiotiky v kočičím welfare

Tento článek se zaměřuje na zkoumání welfare domácích koček a zahrnuje zoosémiotický přístup. Začíná nastíněním dobrých životních podmínek zvířat, následují kočičí studie, které odhalují rozdíly v pozornosti, která byla v rámci výzkumu věnována kočkám ve srovnání se psy. Hlavní důraz je však v článku kladen na složitost vztahů mezi člověkem a kočkou a s tím související společenská vnímání, což spadá do oblasti etologické a antropologické zoosémiotiky. Autoři článku zdůrazňují důležitost integrovaného přístupu při komplexním hodnocení welfare. Klíčové faktory, mezi které patří zvýšená interakce mezi člověkem a kočkou, společenská omezení a subjektivní zkušenosti, mají významný vliv na kočičí welfare. Článek upozorňuje na důležitost spolupráce mezi veterináři a kočičími behavioristy, stejně jako na nutnost rozšířit vzdělání v případech těch, kteří za kočky zodpovídají. To vše je podpořeno informacemi získanými na základě rozhovorů s českými kočičími behavioristy. Autoři článku navrhují změnu paradigmatu ve výzkumných metodologiích skrze použití zoosémiotických teorií k pochopení “alloanimal agency” obecně a konkrétně koček jako aktérů ke zlepšení welfare těchto zvířat. Cílem této studie je upozornit na existující mezery a kontroverze v literatuře ohledně kočičího welfare (například rozpory ohledně ustanovení nejlepších podmínek pro chov koček a nedostatečné vzdělání o welfare těchto zvířat) analýzou relevantních a současných studií v této oblasti. Autoři se také snaží o zlepšení porozumění kočičímu welfare jako složitému fenoménu a s pomocí zoosémiotiky (teorie umweltu a kritického antropomorfismu) chtějí podpořit komplexní přístup k welfare domácích koček žijících v prostředí ovládaném lidmi.

Kodukasside heaolu uurimine: lüngad, väljakutsed ja zoosemiootika roll kasside heaolus

Artiklis uuritakse kodukasside heaolu zoosemiootilisest perspektiivist. Antakse lai ülevaade loomade heaolust üldiselt ja kontekstualiseeritakse kassidega seotud uuringuid, tuues esile erinevused võrreldes koerI käsitlevate uurimustega. Peamine fookus on inimeste ja kasside suhete ning ühiskondlike arusaamade keerukustel, mis kuuluvad etoloogilise ja antropoloogilise zoosemiootika valdkonda. Seetõttu rõhutame mitmetahulise lähenemisviisi tähtsust heaolu hindamisel. Peamised tegurid, mis mõjutavad kasside heaolu, on inimeste ja kasside vaheline kommunikatsioon, ühiskondlikud piirangud ja subjektiivsed kogemused. Soovitame koostööd veterinaaride ja käitumisspetsialistide vahel, samuti tuleks enam harida kasside eest hoolitsejaid. Uurimust toetab teave, mille kogusime intervjuudest kasside käitumisspetsialistidega Tšehhi vabariigist. Artiklis soovitatakse uurimismetoodikate paradigmaatilist muutmist, pakkudes välja zoosemiootiliste teooriate kasutamise kasside agentsuse mõistmiseks, et parandada nende heaolu. Uuringu eesmärk on tuvastada olemasolevad lõugad ja vastuolud kasside heaolu puudutavas kirjanduses (nt vastuolud parimate pidamistingimuste väljatöötamisel, ebapiisav kasside heaolu puudutav haridus), analüüsides hiljutisi sellekohaseid uuringuid antud valdkonnas. Lisaks soovime parandada arusaamist kasside heaolust kui keerulisest nähtusest ning edendada zoosemiootika (omailmateooria ja kriitilise antropomorfismi) abil terviklikku lähenemist kodukasside heaolule inim mõjulistes keskkondades.