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From Dogs to Frogs: A Summative Content Analysis Spanning Four Decades of Scholarly Contributions to Anthrozoology

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ABSTRACT

Academic interest in human–animal interactions steadily started to gain momentum in the 1970s, and “anthrozoology” was coined in 1990 to describe the study of human interactions with other animals. However, the scope and focus have shifted and expanded over the past four decades. We sought to identify themes and trends and produce a holistic picture of how the field is evolving by examining the scholarship published in academic journals. A summative content analysis was performed on 19 international journals dedicated to the study of anthrozoology/human–animal studies (HAS) or focused on some aspect of human–animal relations (such as critical animal studies or animal law). From these journals, 4,023 research papers published between 1984 and 2023 were retrieved. Based on the title, abstract, and keywords, these were coded for categories of animals that were the primary focus or the main research beneficiaries. Categories were broadly coded by animal utility, including companionship, wildlife in natural habitats, zoo exhibits or circus performers, research subjects, farmed commodities, education, sport, service, or occupying liminal spaces, and non-specific. The latter was reserved for articles concerning human attitudes or perceptions of animals more generally. How species and classes are represented over time within and across coded categories and journals were examined, alongside trends in regional focus (e.g., US versus European-based authorship institutions). The results show that despite species focus having shifted across time and journals, companion animal species, charismatic megafauna, and anthropocentric relationships remain the common focus of anthrozoological scholarship. Recommendations for species and topics in need of further anthrozoological attention are provided. Most pertinently, this study concludes with a discussion of the need to address the deficit in representation within international research.

KEYWORDS

Anthrozoology; content analysis; human–animal interaction; human–animal studies; scholarship

The lives of humans and other animals have been intertwined since the dawn of humanity (Bulliet, 2005). Historically, many human cultures have possessed considerable knowledge and understanding of the more-than-human beings they lived alongside and coexisted

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with (see Geroux, 2019; McGinnis et al., 2019; Mullin, 1999; Nicholas, 2018). However, the systematic study of the ways in which humans relate to and think about members of other species, and vice versa, only became recognized as a Western academic pursuit in the latter part of the twentieth century (see Bradshaw, 2017; Herzog, 2016; Mullin, 1999; Mullin & Shir-Vertesh, 2013; Shapiro, 2020). The field was fertilized by support from the USA National Institutes of Health (NIH) in the mid-1980s to bring together researchers from multiple disciplines interested in the study of human–animal interactions (HAI) in relation to human health and wellbeing (McCune et al., 2014). Academic reports presenting the health and psychological benefits of interacting with companion animals ultimately led to the birth of anthrozoology as we know it (the scientific and scholarly study of human–animal interactions). From what originally began as a study of relations in terms of human use-value emerged a more comprehensive study of human interactions and relations with other animals (Bradshaw, 2017; Szydlowski, 2021; Tobias & Morrison, 2016; Wells, 2019).

The establishment of two major academic journals in the field, namely *Anthrozoös* in 1987 and *Society & Animals* in 1993, was instrumental in shaping the field (Herzog, 2016). *Anthrozoös* was established following the success of the 1986 International Human–Animal Bond Conference in Boston, USA (Rowan, 2012). The International Society of Anthrozoology (ISAZ) was formed following a gathering of interdisciplinary researchers at the 1990 “Waltham Symposium on Pets, Benefits & Practice” in Harrogate, England (ISAZ, n.d., n.p.). It was at this meeting that the term “anthrozoology” was proposed by John Bradshaw and subsequently adopted by peers to describe the study of human relations with other animals (Bradshaw, 2017). Despite the early focus on companion animals and animal-assisted therapy, ISAZ founders sought to “promote academic, scientific and scholarly research into all aspects of human–animal interactions and to foster interaction between researchers in this area on an international basis” (ISAZ, n.d., n.p.).

As an interdisciplinary field, HAS/anthrozoology encompasses and overlaps a broad range of disciplines (Hamilton & Mitchell, 2018; Herzog, 2016; Mullin & Shir-Vertesh, 2013). Thus, much of the early literature, as well as ongoing contributions to the field, are published in a wide range of journals, a list of which can be found on the Animals & Society Institute (ASI) website. While some journals listed by ASI are broader in their scope, others focus on specific areas of human–animal relations, such as animal law or ethics, a phenomenon that shows the growing interest in human–animal relations across disciplines. The “Animal Turn” entered scholarly discourse in the early 2000s and refers to the recognition by scholars in the humanities and social sciences that their research can, and in many cases should, encompass or emphasize relations with more-than-human animals (Cederholm et al., 2014; Haraway, 2008; Ingold, 2013; Pedersen, 2014; Ritvo, 2007). However, these studies do not necessarily use the term anthrozoology. Collado et al. (2023) performed a bibliographic analysis on studies retrieved from Scopus to look at the co-occurrence of terms with anthrozoology, human–animal studies (HAS), and critical animal studies (CAS); they reported a 60% overlap in shared terms between the latter two. Conversely, the same degree of co-occurrence was not found between anthrozoology and HAS or CAS (Collado et al., 2023). This may reflect the disciplinary homes and trends of the journals the studies were published in, but it

also suggests some polarization and divergence, particularly in relation to critical animal studies.

Our vision for anthrozoology strives to be less anthropocentric than the human use and benefit focus of the human–animal interaction studies that have typically dominated the field. The school of anthrozoology to which we subscribe advocates for the reframing of anthrozoology as “Symbiotic Ethics” by adopting approaches that recognize all animals as ethically significant beings and respect them as autonomous subjects and beneficiaries (Badman-King, 2021; Hurn & Stone, 2023). This approach promotes “an understanding of trans-species interactions that have some meaningful, practical application and ultimately improve the lives of our research subjects” (EASE, 2016, n.p.). This echoes the anthropological cultural shift of the latter part of the last century, whereby researchers began engaging with their research subjects and collaborating with the community members from the cultures they were studying (Colwell, 2016; Morell, 1994). It also reflects attempts to decolonize ethnography by moving away from practices that treat people as objects of study and more toward participatory, engaged, or activist research that leads to empowerment and social change (Alonso-Bejarano et al., 2019). Is this the direction anthrozoology/HAS is taking and are the different strands within the field/sub-field(s) fragmenting, diverging, or coming together? We addressed this question by examining peer-reviewed papers published in key journals that identify themselves as focusing on human interactions, perceptions, or relations with other animals.

Methods

Ethical approval was not required for this study, which is an analysis of published scholarship.

To obtain a longitudinal overview of the field of anthrozoology since its emergence, we selected journals based on scope (those which claimed to focus on topics specifically related to human–animal interactions). We included 19 journals that, as of December 2023, were featured on the Animals and Society Institute (ASI) website (<https://www.animalsandsociety.org/human-animal-studies/human-animal-studies-journals/>, see Table 1). The journals we include in our analyzes cover a range of disciplinary approaches toward anthrozoological scholarship. Of the 19 selected journals, 17 publish exclusively English articles. *Trace* also publishes manuscripts written in Finnish or Swedish, and *Relations* accepts articles in Italian (Table 1). Owing to our own language limitations, only papers written in the English language were included in our study (however, this only excluded from our analysis eight articles in Finnish and two in Swedish published in *Trace*).

This study focused on primary research articles and peer-reviewed essays. We omitted book reviews, conference reports, article commentaries, editorial introductions, and advertisements (such as calls for contributions). An additional 22 papers were subsequently removed during the coding as they were not directly about animals (14 solely environment-focused articles published in *Relations*, six in *JARNL*, one in *Humani-malia*, and an article on plant sentience in *ASent*). In total, 4,020 articles were included in our study (Table 1).

Content analysis covers a range of methods that seek to “provide knowledge and understanding of the phenomenon under study” (Downe-Wamboldt, 1992, p. 314).

Table 1. List of journals included in the analysis.

Full name	Standard abbreviation	Established	Publisher/affiliation	Country	Accepted languages	Focus	Papers included	% of total
Between the Species: A Journal for the Study of Philosophy and Animals	<i>Between Species</i>	1985	California Polytechnic State University	USA	English	Philosophy	266	6.6
Anthrozoös: A multidisciplinary journal of the interactions between people and other animals	<i>Anthrozoös</i>	1987	Taylor & Francis/International Society for Anthrozoology (ISAZ)	USA	English	Interdisciplinary	1,027	25.5
Society & Animals: Journal of Human–Animal Studies	<i>SOAN</i>	1993	Brill/Animals & Society Institute	USA	English	Interdisciplinary	699	17.4
Animal Law Review	<i>Anim. Law Rev</i>	1994	Lewis & Clark Law School		English	Law	160	4.0
Journal of Applied Animal Welfare Science	<i>JAAWS</i>	1998	Taylor & Francis/Animals & Society Institute	USA	English	Welfare science	715	17.8
Journal for Critical Animal Studies	<i>JCAS</i>	2003	The Institute for Critical Animal Studies (ICAS)	USA	English	Critical animal studies	151	3.8
The Journal of Animal and Natural Resource Law	<i>JANRL</i>	2005	Michigan State University College of Law	USA	English	Law	103	2.6
The Journal of Animal Law and Policy	<i>SJALP</i>	2008–2014	Stanford Law School	USA	English	Law	19	0.5
Humanimalia	<i>Humanimalia</i>	2009	Utrecht University	Netherlands	English	Humanities	152	3.8
Journal of Animal Ethics	<i>JAE</i>	2011	University of Illinois Press/Ferrater Mora Oxford Centre for Animal Ethics	USA	English	Ethics	137	3.4
Politics and Animals	<i>P/A</i>	2012	Lund University Libraries	Sweden	English	Politics	190	4.7
Animal Studies Journal	<i>ASJ</i>	2012	University of Wollongong/ Australasian Animal Studies Association (AASA)	Australia	English	Humanities	149	3.7
Human–Animal Interactions Bulletin	<i>HAIB</i>	2013	CABI/Human–Animal Interaction APA Division 17. Section 13	USA	English	Animal-assisted services	34	0.8
Relations: Beyond Anthropocentrism	<i>Relations</i>	2013	LED Edizioni Universitarie	Italy	English Italian	Environmental ethics	64	1.6
Sloth: A Journal of Emerging Voices in Human–Animal Studies	<i>Sloth</i>	2015–2020	Animals & Society Institute	USA	English	Student journal	25	0.6
Animalia: An Anthrozoology Journal	<i>Animalia</i>	2015–2022	Canisius College	USA	English	Student journal	22	0.5
Trace .: Journal for Human–Animal Studies	<i>TRACE</i>	2015	Finnish Society for Human–Animal Studies	Finland	English Finnish Swedish	Humanities	25	0.6
Animal Sentience: An Interdisciplinary Journal on Animal Feeling	<i>ASent</i>	2016	WellBeing International	USA	English	Sentience	23	0.6
People and Animals: The International Journal of Research and Practice	<i>PAIJ</i>	2018	International Association of Human–Animal Interaction Organizations (IAHAIO)	USA	English	Interdisciplinary	59	1.5

Although first developed as a quantitative method, content analysis has since been adapted to enable qualitative and contextual analysis (Kleinheksel et al., 2020). Content analyses have previously been performed on articles published by single journals, including two journals in the current study – *JAAWS* and *HAIB* (Buboltz et al., 1999; Palmer, 2023; Rousseau & Binfet, 2021). For each journal article within the datasets, the following information was recorded: journal name, article title, year the article was published, country of the corresponding author's institutional affiliation (or "Independent" if the scholar did not list an institutional affiliation), whether or not it was part of a special issue or thematic collection (labeled as "No" or the name of special issue documented), specified species or genera of focus (if specified in the abstract), and the code(s) for utility group (Table 2).

A central aim of our study was to determine how nonhuman animals are studied relative to their relationship with humans and how and why this may be changing. Thus, the study took a summative content analysis approach, which involves first coding and categorization, followed by the interpretation of the underlying context (Chrysochou & Festila, 2019; Hsieh & Shannon, 2005; Mayring, 2000). The summative phase refers to the process of interpretation and focuses on discovering the underlying meanings of the content (Hsieh & Shannon, 2005). Our data recording and coding method allowed entries for specific categories to be cross-referenced, retrieved, sub-coded, and analyzed thematically and qualitatively. The process of devising and refining the coding table revealed sub-themes that informed the interpretation of trends and identification of trends worthy of further study.

Rather than counting words or terms, qualitative content analysis seeks to classify large amounts of text into an efficient number of categories that represent similar meanings (Weber, 1990). The more subjective interpretation of text can be both a strength and a weakness of the method, but measures can be taken to ensure internal consistency amongst coders (Mayring, 2000). The first step entailed devising a coding table that could be meaningfully and practically applied to the large body of data. To this end, we first performed an initial phase of data familiarity in which two journals were randomly allocated to each principal investigator who read two abstracts from volumes and devised codes to describe how nonhuman animals were situated in relation to humans (used as labor, in allegory, kept for leisure or as commodities, living in their wild habitat, or captive wildlife, etc.). Subsequently, a first draft of the coding table was generated from group discussions and tested by all researchers on different journals via iterative phases of (1) independent coding and note-taking of any challenges assigning a given code, (2) conferring as a group to consolidate, revise, or refine codes, (3) cross-checking a subset of codes to identify definitional discrepancies, and (4) conferring as a group to clarify and finalize the coding criteria (Table 2).

Each article was coded for a utility group (Table 2), primarily based on the title, abstract, and keywords used. Where no abstract was available, the researcher read the last paragraph of the introduction and the conclusion section to determine the intended central focus of the paper. The researcher asked themselves what utility group (as defined in Table 2) the author(s) appear most interested in or could be considered the main research beneficiaries. In cases where a focus was not readily inferred, the researcher was permitted to read beyond the abstract and keywords (as the objective was to determine and code the main theme of the paper). Thus, while the abstract

Table 2. Coding book for utility group. Definitions and examples.

Shorthand code ^a	Definition	Examples
1. Pet	This code is for domestic companion animal species/ genera such as (dogs, cats, rabbits, hamsters, and goldfish) who are kept as companion animals or housed in an animal shelter awaiting rehoming. Not included are "outside" kept animals such as horses, pigs, or hens. This includes studies on animal welfare/wellbeing, human health, and wellbeing benefits of pet keeping. Relinquishment, rehoming, and volunteering in shelters are included here. This code is also used for generalized studies on "pet keeping." Even if a few data points might be from "Exotic" pets, unless these are a primary focus, the "Pet" category is used. Animal hoarding is also included here.	• Human benefits of pet keeping. • Companion animal behavior or welfare. • Animal shelter workers. • Relinquishment/adoption. • Dog bites. • Legal status and laws pertaining to companion animals. • Multispecies families/pet-parenting. • Animal hoarding.
2. Exotic	This code is for non-domesticated ("exotic") species or genera living within a household, or part of the exotic pet trade (being captured, transported, traded, etc.). The code is only used where explicitly or specifically focused on parrots, reptiles, or other "exotic" species being kept or traded as "pets" (or for private collections). Species included here are those that welfare organizations do not recommend as pets and the BVA considers "nontraditional companion animals." ^b Excluded are mentions of these species within a larger group composed mostly of "domestic" companion animal species. Includes behavior, welfare, trends, and trade in these species.	• Reptiles. • Parrots. • Mammalian wildlife species, such as civets, squirrels, primates, and hedgehogs are kept as pets. • Private aquariums or collections. • The exotic pet trade, including capture, transport, and trading.
3. Wildlife	This code is for wild animal species living in their natural habitat or kept in wildlife sanctuaries/ rehabilitation centers. The focus can be on the individual animals, the species, or the benefit derived from "nature" by humans. Also included are indigenous relations with the animals around them, including subsistence hunting and bushmeat. Papers about cats preying on wildlife would be co-coded with either "Pet" or "Liminal" (unowned).	• Conservation. • Human-wildlife conflict. • Human attitudes to, or benefit from "nature." • Wildlife tourism (safari, diving). • Sustenance hunting. • Stories or legends about wild animals.
4. Zoo	This code is for animals on exhibition for education or entertainment purposes. Includes petting zoos, safari parks (safari zoos), aviaries, aquariums, amusement parks, and circuses.	• Studies on the welfare of captive animals in these settings. • Human benefits (education or entertainment). • Attitudes toward zoos. • The roles of zoos in the conservation of species.
5. Lab	This code is for animals utilized for medical, behavioral, and cosmetic research. These animals are used in the study of behavior or biology or used as an educational tool (e.g., vivisection). Animals can be situated in labs, universities, or college research or educational programs (where learning from the animals, not with).	• Welfare of lab animals. • Relationships between caretakers/ researchers and lab animals. • Legal and ethical status, and activism specific to this utility group. • Analysis of attitudes toward animals used in research.
6. Farmed	This code is for any animal species (domestic or exotic) commodified by humans for their bodily products. This extends to domesticated farm animal	• Cultural, ethical, and animal welfare topics related to animal agriculture. • Farm animal sanctuaries.

(Continued)

Table 2. Continued.

Shorthand code ^a	Definition	Examples
	species (e.g., pigs, goats, hens) kept as companion animals or in sanctuaries. Includes vegan studies, laws, and attitudes toward animal agriculture.	- Relationships with farm animal species. - Some animal activist analysis (specific to the use of animal products).
7. Sport & leisure	This code is for any animal used in sporting or hobbyist activities. Including large (outdoor) animals kept as companions (such as horses and donkeys). Also includes the victims of blood sports.	- Fishing and hunting for sport (not sustenance). - Dog fighting. - Equestrian sports. - Horse, donkey, camel, and elephant riding in a nonwork context. - Companion horses and donkeys.
8. Liminal	This code is for animals occupying spaces without human permission (including ambiguous urban animals such as pigeons, foxes or birds that are loved and/or despised). Those transitioning between states of being (rewilding of captive animals) or displaced by human activities. Included here are those considered “monstrous” or chimeric creatures, including species being bred for the purpose of de-extinction.	- Urban foxes, pigeons, cockroaches, or rats. - Free-living (feral, street, stray) cats and dogs. - Cats living in maintained colonies. - Interactions with street animals. - Rewilded animals (captive animals returned to the wild). - Resurrection/de-extinction. - Chimeras and “monstrous” creatures.
9. Service	This code is for animals utilized by humans for labor or specific societal roles. Including those identified as emotional support animals and used in animal-assisted services.	- Beasts of burden. - Police horses and dogs. - Guide dogs. - Therapy or assistant animals (including emotional support animals). - Animals brought into or kept in schools to help children learn or to feel at ease. - Animals brought into hospitals etc., (animal-assisted services).
10. Non-specific	The code is for articles not explicitly focusing on a particular utility group. Rather the focus is on animality, humane education, or human attitudes or beliefs toward animals in general (not one of the predefined groups).	- Attitudes toward animals (in general). - Humane education (unless specific to a group of animals). - Generic religious beliefs or philosophical positions (not about specific groups). - Stories or literature that is broad in its inclusion of most of the other utility groups.

^aWhile we recognize that there are issues surrounding terms such as “Pet” and “Exotic,” these shorthand coding terms function to encapsulate a broad group, explained in columns two and three. The terms listed in the first column are used in this context simply to facilitate coding and are explored and problematized in the discussion.

^bFor a definition by the British Veterinary Association (BVA) of nontraditional companion animals, see: <https://www.bva.co.uk/take-action/our-policies/exotic-pets-non-traditional-companion-animals/>

was used to ascertain which utility group(s) corresponded to the author(s)’ primary focus, a more holistic informed approach was permitted where the abstract was lacking or absent. Furthermore, because the researchers were often more familiar with certain papers they had engaged within their own studies and research, knowledge beyond the abstract was unavoidable. Where deemed appropriate, a paper was assigned to more than one group (but only if both groups appeared to be a

major focus). To avoid bias toward brief mentions of something that was not intended as primary focus, due to familiarity or special interests of the researcher, certain articles were flagged for a second opinion from other researchers. Likewise, articles that did not neatly fit into any of the codes were flagged for group coding (several researchers conferring and agreeing on the best fit).

To examine more closely the animal classes represented within and across our utility group codes, papers were also assigned to one or more animal classes: Amphibians, Birds, Fish, Invertebrates, Mammals, or Reptiles. Papers with no discernable focus or animal class bias were coded as “Generic.” We then examined how the six animal classes were represented across the utility groups and vice versa and examined the special issues and thematic collections to consider how they might reflect growing interests in, or represent attempts to boost neglected areas. We recognize that some of the articles coded as “Pet” and placed in the “Mammalian” category may include data on other non-mammalian companion animals. However, if an article was generically about “pet keeping” we coded it simply as “Pet.” The “Exotic” code was reserved for abstracts that were explicitly about N companion animal species or wild animal species kept as pets (see [Table 2](#) for a full description).

Researcher consistency was initially tested by comparing how each researcher coded for a subset of articles from each journal. Discrepancies were identified and discussed, and the definitions were refined or revised before being applied to whole datasets (as described by Mayring, 2000). In total, all researchers had at least 16% of their coded data randomly cross-checked by another researcher to ensure greater than 95% agreement of codes. The discrepancy between primary and secondary coders mostly occurred for articles that did not neatly fit into the preassigned categories, and subsequent discussions revealed the rationale behind different choices. These disputed articles were assigned their final code by a consensus from three or more researchers. Overall, 26% of the data was double-checked and agreed on by two or more coders. The remaining 74% has a predicted error rate of less than 5%.

Results

Animal Utility

Overall, articles coded as “Pet” predominated, followed by “Non-specific” ([Figure 1](#)). “Pet” and “Non-specific” were the most prevalent research focuses during the late 1980s and 1990s and have continued to increase exponentially during the last two decades ([Figure 2](#)). From 2012, there were increases in the proportion of total “Farm,” “Wildlife,” and “Liminal” coded articles being published. From 2014, and again in 2018, the proportion of “Service” articles increased. The latter coincides with the debut of *HAIB* and its focus on human–animal interactions involving assistance and service animals (Palmer, 2023). Following an increase in attention in the mid-1990s, due to the founding of new journals focused on law and critical animal studies, there has been a modest but sustained interest in “Lab” animals. Conversely, an exponential rise in the “Wildlife” and “Farmed” coded articles occurred from 2012 ([Figure 2](#)), correlating with a shift in focus amongst the newer journals.

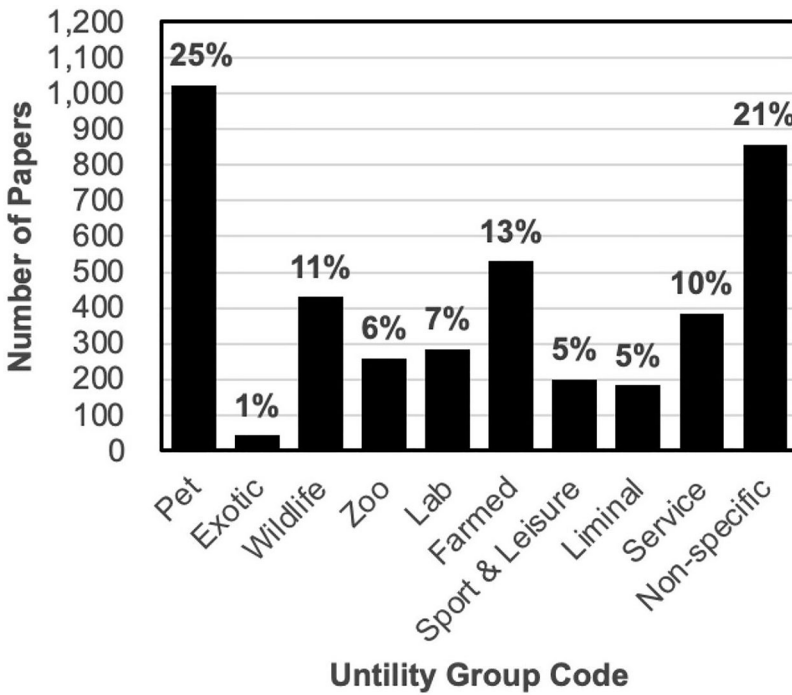


Figure 1. Number of coded papers for each utility group. Number of papers published between 1985 and 2023 by the 19 Journals (listed in Table 1) that fall into each utility group code (see Table 2). Percentages of the total ($n = 4,020$) are shown above. The sum of percentages exceeds 100% because some papers were coded to more than one utility group.

We also noted that since its first issue in 1987, *Anthrozoös* has predominantly published papers assigned to the “Pet” code (44% of all *Anthrozoös* papers were coded as “Pet,” and for each year since its founding, “Pet” has comprised the largest portion of annual contributions to the journal). *SOAN* and *JAAWS* show similar patterns to *Anthrozoös*, although overall their percentages coded as “Pet” were lower (24% and 25%, respectively). We also noted that some of the newer journals (established post-2009) appear to be publishing a much lower portion of studies focused on companion animals. This is unsurprising, given the more focused scope of some of the journals included in our study (Table 1). However, we wanted to examine how trends might differ within newer or specialized journals as these may provide insight into growing areas of interest. Furthermore, we wanted to determine if trends within the generalized and long-running journals (namely *Anthrozoös*, *SOAN*, and *JAAWS*) had changed during the last decade.

Journals established post-2009 have a lower percentage of their papers coded as “Pet” compared with *Anthrozoös*, *SOAN*, and *JAAWS* during the same period (Figure 3). Amongst the 10 journals established post-2009, 44% and 46% of articles published in *HAIB* and *PAIJ*, respectively, were coded as “Pet,” comparable to *Anthrozoös* during the same period. However, *Humanamaila* (12%), *ASent* (9%), *ASJ* (7%), *Trace* (4%), *JAE* (3%), *Relations* (2%), *P/A* (0%), and the two student journals, *Sloth* (3%) and *Animalia* (12%), published significantly fewer articles focused on companion animals. Amongst the post-2009 established journals,

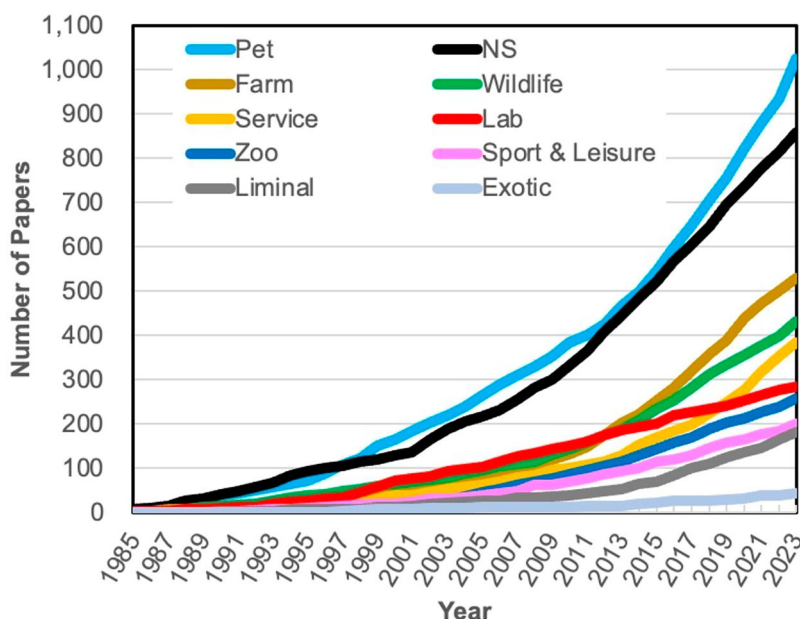


Figure 2. Number of papers accumulating over time for each utility group. An accumulative number of papers published over time (1985–2023) by the 19 Journals (listed in Table 1) that fall into each utility group code (see Table 2).

there was also a marked increase in the proportion of articles coded as “Non-specific,” which are represented by a focus on philosophical and legal debates about animal rights, consciousness, and so forth, as well as broad studies of attitudes toward animals and humane education. There was also more of a focus on the “Farmed” and “Service” groups amongst the newer journals, and a marked decrease in the “Zoo” group (Figure 3).

Some papers were co-coded to two or more utility groups. For most of the utility groups, co-coding accounted for less than 2% of the total for each code. A notable exception was that 11% of the “Liminal” codes overlapped with “Wildlife” (Table 3), which is explained by multiple papers concerned with discussing the effects “feral” animals have on wild species such as the predation of wildlife by free-roaming cats. In such cases, both the prey species (“Wildlife”) and the cats (“Pets”) were central to the paper.

The overlap of “Wildlife” and “Sport & leisure” or “Wildlife” and “Farmed” codes was often represented by papers that focused on the impact of either “Farmed” or “Sport” animals upon wildlife or the human–nature relationship. Just over 4% of the “Zoo” coded papers were co-coded as “Wildlife,” which were accounted for either by papers on the behavior of captive versus non-captive wildlife or those concerned with the roles of zoos in species conservation (Table 3). Similarly, the overlap in “Service” and “Pet” can be attributed to the joint role some individuals play as both a companion animal and a therapy or service animal. The overlap in “Lab” and “Farmed” co-coding can be explained by papers focused on animal rights or activism centered on these groups specifically, rather than all animals. However, the overlap of “Lab” and “Zoo” tended to be behavioral/welfare papers centered on primates or primate–caretaker relationships.

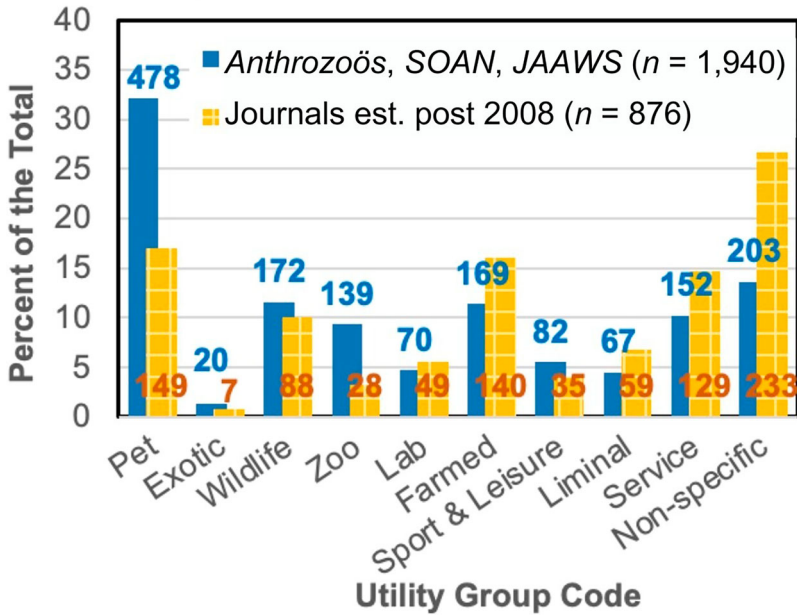


Figure 3. Comparison of *Anthrozoös*, *SOAN*, and *JAAWS* papers published post-2010 to those from 10 journals established post-2009. The y-axis indicates the percentage of papers published post-2010 for each utility group shown on the x-axis: blue represents the percentage relative to the total for *Anthrozoös*, *SOAN*, and *JAAWS* papers combined ($n = 1,490$) and yellow the percentage relative to the journals established post-2009 combined ($n = 876$). Actual counts are indicated by the bars representing the utility groups shown on the x-axis.

Table 3. Distribution of co-codes for each utility group.

	Pet ($n = 1,023$)	Exotic ($n = 43$)	Wildlife ($n = 433$)	Zoo ($n = 258$)	Lab ($n = 284$)	Farmed ($n = 530$)	Sport & leisure ($n = 201$)	Liminal ($n = 183$)	Service ($n = 385$)	Non-specific ($n = 858$)
Pet	100%	4.7%	2.8%	0.4%	2.5%	4.2%	3.0%	3.8%	3.4%	0.8%
Exotic	0.2%	100%	0.2%	0.4%	0.7%	0%	0%	0.5%	0.3%	0%
Wildlife	1.2%	2.3%	100%	4.3%	1.1%	3.6%	5.5%	11.5%	0%	0.5%
Zoo	0.1%	2.3%	2.5%	100%	2.8%	0.6%	1.0%	1.1%	0%	0.1%
Lab	0.7%	4.7%	0.7%	3.1%	100%	2.3%	2.0%	1.1%	0.5%	0.5%
Farmed	2.2%	0%	4.4%	1.2%	4.2%	100%	2.5%	2.2%	1.0%	0.6%
Sport & leisure	0.6%	0%	2.5%	0.8%	1.4%	0.9%	100%	0.5%	0.8%	0%
Liminal	0.7%	2.3%	4.8%	0.8%	0.7%	0.8%	0.5%	100%	0.5%	0%
Service	1.3%	2.3%	0%	0%	0.7%	0.8%	1.5%	1.1%	100%	0.1%
Non-specific	0.7%	0%	0.9%	0.4%	1.4%	0.9%	0%	0%	0.3%	100%

Animal Classes

Figure 4 shows the number of papers assigned to each of the six animal classes. The numbers exceed 4,020 owing to some papers being focused on more than one group.

Overall, mammals are featured in 56% of the 4,020 papers in the dataset (Table 4). Over 99.9% of the “Pet”-coded papers were assigned to the mammalian category. This is due to

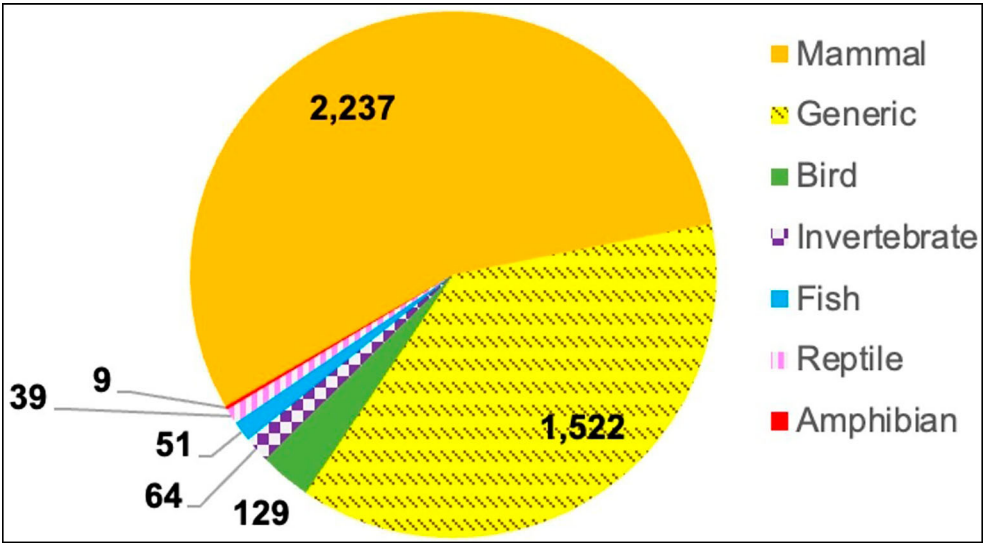


Figure 4. Representation of animal classes. Pie chart of the six basic animal classes represented across 4,020 journal articles.

Table 4. Utility group codes across animal classes.

	Generic	Mammal	Bird	Invertebrate	Fish	Reptile	Amphibian
Total (<i>n</i> = 4,020)	37.9%	55.6%	3.2%	1.6%	1.3%	1.0%	0.2%
Pet (<i>n</i> = 1,023)	0%	99.9%	0.4%	0.1%	0.1%	0.1%	0.1%
Exotic (<i>n</i> = 43)	18.6%	23.3%	37.2%	4.7%	7.0%	20.9%	4.7%
Wildlife (<i>n</i> = 433)	30.2%	49.2%	7.9%	6.0%	5.3%	3.5%	0.9%
Zoo (<i>n</i> = 258)	27.1%	63.2%	5.0%	1.6%	1.2%	2.3%	0.4%
Lab (<i>n</i> = 284)	49.3%	43.7%	1.1%	3.2%	0.7%	1.4%	1.1%
Farmed (<i>n</i> = 530)	54.7%	35.5%	7.5%	1.3%	1.7%	0.0%	0%
Sport & leisure (<i>n</i> = 201)	11.9%	81.1%	7.0%	0.5%	1.5%	0.0%	0%
Liminal (<i>n</i> = 183)	24.0%	63.4%	7.1%	3.8%	0%	2.7%	0%
Service (<i>n</i> = 385)	21.6%	77.1%	0.3%	0.3%	0.8%	0.5%	0%
Non-specific (<i>n</i> = 858)	89.7%	7.8%	0.5%	1.3%	0.7%	0.1%	0%

how we defined the “Pet” code and subsequently labeled those that did not mention a specific species/genus and/or were about companion animals as a generic concept as “Mammalian.” Only if the paper was focused on a non-mammalian species that would not fall under the “Exotic” code (e.g., a goldfish) would it be assigned to an animal class other than mammal. However, over half (577/1,023) of the “Pet”-coded papers were specifically about cats and/or dogs.

Table 5. Animal classes across utility groups.

	Pet	Exotic	Wildlife	Zoo	Lab	Farmed	Sport & leisure	Liminal	Service	Non-specific
Total (n = 4,020)	25.4%	1.1%	10.8%	6.4%	7.1%	13.2%	5.0%	4.6%	9.6%	21.3%
Generic (n = 1,522)	0%	0.5%	0.5%	4.6%	9.2%	34.8%	1.6%	2.9%	5.5%	50.6%
Mammal (n = 2,237)	45.7%	0.4%	9.5%	7.3%	5.5%	8.4%	7.3%	5.2%	13.3%	3.0%
Bird (n = 127)	3.1%	12.6%	26.8%	10.2%	2.4%	31.5%	11.0%	10.2%	0.8%	3.1%
Invertebrate (n = 64)	1.6%	3.1%	40.6%	6.3%	14.1%	10.9%	1.6%	10.9%	1.6%	17.2%
Fish (n = 51)	2.0%	5.9%	45.1%	5.9%	3.9%	17.6%	2.0%	0%	5.9%	11.8%
Reptile (n = 39)	2.6%	23.1%	38.5%	15.4%	10.3%	0%	0%	12.8%	5.1%	2.6%
Amphibian (n = 9)	11.1%	22.2%	44.4%	11.1%	33.3%	0%	0%	0%	0%	0%

Of the “Wildlife”-coded papers, 212/433 (49%) were mammals. And the top five named “Wildlife” genera were all mammalian: Dolphin (21), Wolf (21), Whale (13), Bear (13), and Elephant (12). Big cat species were the focus in 25 papers, and primates accounted for 23 “Wildlife” papers, of which nine were about great apes. Of the “Zoo”-coded papers, 162/258 (63%) were wildlife. Elephants (23) were the most featured animal for the “Zoo”-coded papers, and 22 concerned big cats (tigers, lions, leopards, jaguars, pumas, cheetahs). Marine mammals were featured in 15 papers, ten of which were about dolphins. Sharks were the focus of 11/51 (22%) of the fish-focused papers and all but one was coded as “Wildlife.” Of the 530 papers coded as “Farmed,” 188 (57%) focused on mammals (Table 4). Amongst these, cattle predominated (77), followed by pigs (53), and then sheep (20). Many of the “Farmed” codes that were assigned to “generic” were those concerning veganism and other human attitudes that indirectly impact members of species used for human consumption.

Of the 2,237 papers coded as having a mammalian focus, 46% were coded as “Pet” and the remaining were distributed across the utility groups, ranging from < 1% (“Exotic”) to 13% (“Service”) (Table 5). The largest percentage of bird-focused papers were coded as “Farmed” (32%), followed by “Wildlife” (27%). The bird-focused papers coded as “Farmed” all centered on poultry. The “Exotic” pet code consisted of 37% birds (Table 4), primarily parrots. The 5% of the “Zoo”-coded papers focusing on bird genera also referred to parrots, along with flamingos and penguins. Horses were the prominently covered species amongst the “Sport & leisure”-coded papers, where 56% (128/218) of horse articles discussed their utilization for leisure riding, companionship, or equestrian sports. A further 31% (68/218) were coded as “Service.” These were predominantly about horses involved in animal-assisted activities, although a few were focused on the historical role of horses in society as means of transport and labor.

Special Issues

Overall, just under 10% of articles (373/4,020) belonged to special issue collections. These were in one of 59 special issue collections, all published post-2007 (Figure 5, Table 6).

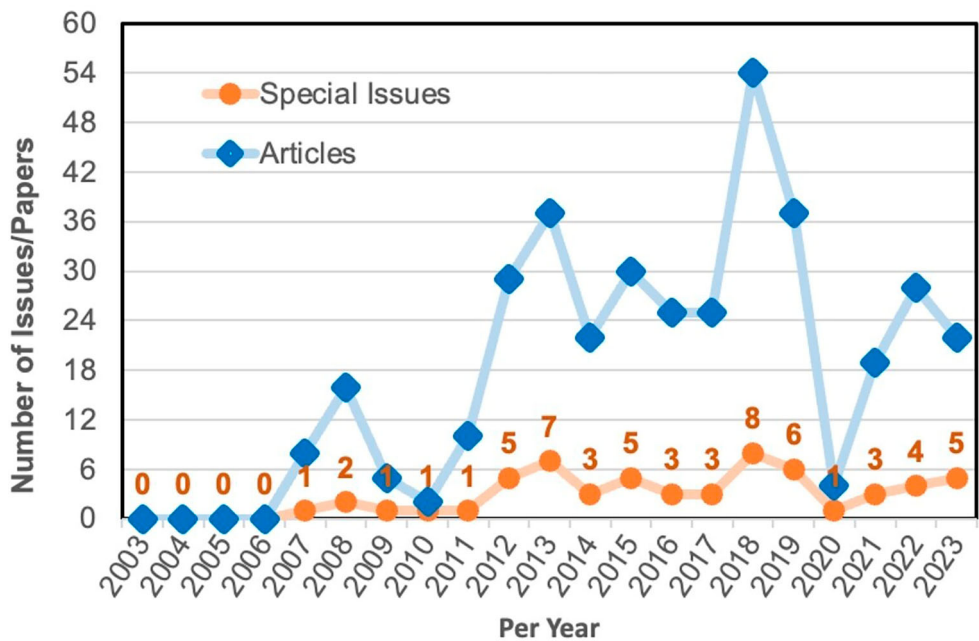


Figure 5. Special issue collections and articles. A number of special issue titles (orange) and articles published in special issues (blue) are shown for each year. A number of special issue titles are also indicated above each data point.

Table 6. Distribution of special issue (SI) articles across journals.

	Articles (2007–2023)	SI titles (2007–2023)	SI articles (2007–2023)	% SI articles (2007–2023)
Total	3,036	59	373	12
Between Species	115	3	21	18
Anthrozoös	683	2	17	2
SOAN	486	8	43	9
A-Law Rev	99	1	7	7
JAAWS	530	8	50	9
JCAS	130	5	26	20
JANRL	94	0		
SJALP	19	0		
Humanimalia	152	4	20	13
JAE	137	0		
ASJ	149	14	107	72
HAIB	190	3	18	9
Relations	64	11	64	100
Sloth	34	0		
Animalia	25	0		
P/A	22	0		
Trace	23	0		
ASent	25	0		
PAIJ	59	0		

Articles published in special collections made up 12% of articles published between 2007 through 2023 (Table 6). However, there was substantial variability between the 19 journals on how much they engaged in the “special issue” model of publishing.

Those that did not publish special issues were the law journals, *JANRL* and *SJALP*, both student journals, *Sloth* and *Animalia*, the animal ethics/philosophical journals, *JAE* and *ASent*, the politics-focused journal, *P/A*, and the most recently established journals, *TRACE* and *PAIJ*. Conversely, articles published in *Relations* and *ASJ* were exclusively (100%) and predominantly (72%) defined by prescribed themes, respectively. It is worth noting that *ASJ* tends to thematically group articles post-submission, and not all collections represent strictly defined calls (although they do also put out specific calls). However, *Relations* actively seek out contributions within a given theme. The remaining articles belonging to special issues ranged between 2% (*Anthrozoös*) and 20% (*JCAS*), published between 2007 and 2023 (Table 6).

Amongst the special issue collections, the proportion of mammal-and reptile-focused papers was slightly lower, and generic and fish-focused papers slightly higher than for all articles combined (Table 7). However, almost a quarter of invertebrate-focused papers were in special collections. It is worth emphasizing that the overall number of invertebrate papers was low, and the increase was due to two special issues (see Boyde, 2019; Moore & Wilkie, 2019)

Despite the notable increased emphasis on invertebrates amongst the special issue papers, the overall trends in animal classes reflected those of the larger dataset. Therefore, we decided to look at the distribution of utility group codes among the special issue papers. Here, we found that “Pet”-coded papers accounted for 10% of papers (Figure 6) compared with 25% of all papers (Figure 1). Likewise, “Service”-coded papers fell from 10% to 2% within special issue papers. Conversely, the proportion of “Wildlife”- and “Farmed”-coded papers both increased by about half and “Liminal” doubled compared with all issues.

The nature of the special issues naturally defined how the papers included in them were coded (see Table 8 for special issue titles). Papers published in the 2008 special issue of *JAAWS*, “Equitation Science: The Application of Science in Equitation” (Goodwin et al., 2008), were all coded “Sport & leisure.” The 2009 special of *JAAWS*, “Animal Welfare and Epidemiology Across Species, Across Disciplines, and Across Borders,” focused on the US and welfare in the context of animal agriculture; all papers in this collection were coded as “Farmed” (Millman et al., 2009). Likewise, papers published in three collections published in *JAAWS*, arising from the 2011, 2014, and 2017 Detroit Zoological

Table 7. Representation of animal classes in special issue (SI) collections.

	Total (count)	% Total (n = 4,020)	SI (count)	% SI (n = 373)	SI as % of animal class
Total	4,020		373		9.3
Mammal	2,237	55.6	148	39.7	6.6
Generic	1,522	37.9	192	51.5	12.6
Bird	129	3.2	12	3.2	9.3
Invertebrate	64	1.6	15	4.0	23.4
Fish	51	1.3	6	1.6	11.8
Reptile	39	1.0	3	0.8	7.7
Amphibian	9	0.2	0	0	0

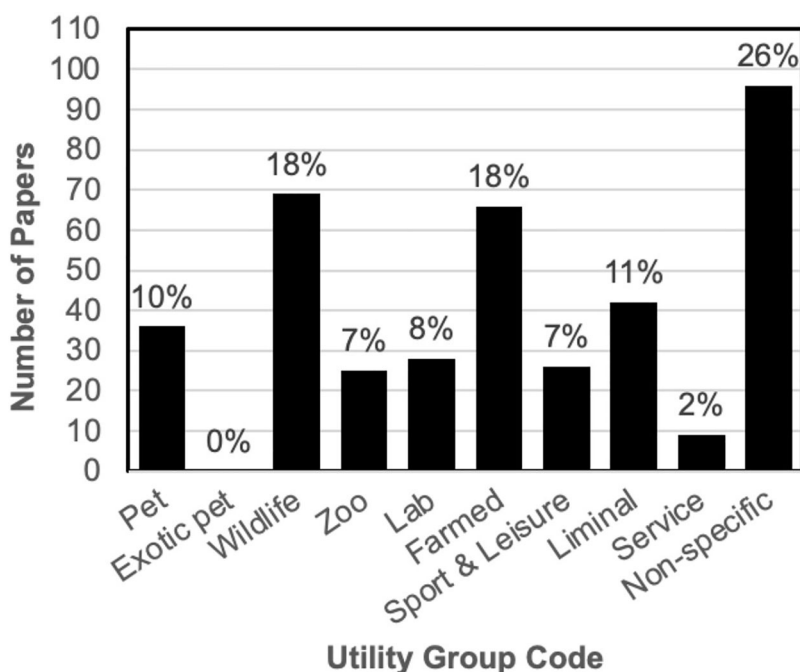


Figure 6. Representation of utility groups in special issue collections. Number of papers in special issue collections (see Table 6) that fall into each utility group (see Table 2). Percentages of the total ($n = 373$) are shown.

Society International Symposiums, were coded “Zoo” (Bennett, 2013; Kagan et al., 2015; Shapiro, 2018).

International Scholarship

Finally, we looked at the geographic distribution of “international” scholarship. Institutional affiliations were predominantly located in Anglo-European countries. The USA, UK, Australia, Canada, and New Zealand represented 71% combined. Forty-four percent of first authors were affiliated with a US institution, 11% were affiliated with a UK institution, 9% were affiliated with an Australian institution, and 7% were affiliated with a Canadian institution (Figure 7)

Almost all European countries were represented in the dataset, and 15% of contributions came from first authors affiliated with European institutions where English is not an official national language (e.g., excluding the UK and Ireland). The white areas in Figure 7(a) show countries where no first author affiliations are listed, most of which are in the Global South. Only 1.2% of papers originated from an African nation institution, and 60% (30/50) of those were from South Africa. South American institutions comprised 2% of the data, and 52% (43/83) were from authors affiliated with Brazilian institutions. Asian institutions contributed to 2.9% of all articles, primarily those located in China and India. Less than 1% of articles were from authors affiliated with Middle Eastern institutions, and 77% (24/31) of these were based in Israel.

Table 8. Special issue titles.

Special issue title	Articles	Journal	Year
Nonhuman Primate Behavior and Welfare	8	JAAWS	2007
Caring During Crisis: Animal Welfare During Pandemics and Natural Disasters	6	JAAWS	2008
Equitation Science	10	JAAWS	2008
Animal Welfare and Epidemiology Across Species, Across Disciplines, and Across Borders	5	JAAWS	2009
Finding Agency in Nonhumans	4	<i>Relations</i>	2010
Women of Color in Critical Animal Studies	2	JCAS	2010
Continental Philosophical Perspectives on Non-Human Animals	10	JCAS	2011
25th Anniversary	9	<i>Anthrozoös</i>	2012
Inquiries and Intersections: Queer Theory and Anti-Speciesist Praxis	4	JCAS	2012
Prison & Animals	5	JCAS	2012
Testing Times: A Symposium on the Ethics and Epistemology of Animal Experimentation	7	<i>Between Species</i>	2012
The Animals & Society Institute Fellowship: Catalyzing Work in Human–Animal Studies	4	SOAN	2012
Animals, Ethics and Law	6	<i>Between Species</i>	2013
Animals, Place and Humans	7	ASJ	2013
Archaeology and Human–Animal Studies	7	SOAN	2013
From Good Care to Great Welfare	4	JAAWS	2013
Inside the Emotional Lives of Non-human Animals	7	<i>Relations</i>	2013
Living With Animals and of Living With Their Deaths	4	ASJ	2013
Religious Slaughter	3	SOAN	2013
Animals in Place	5	SOAN	2014
Eco-Ability: The Struggle for Justice, With Focus on Humans With Disabilities and Nonhuman Animals	5	JCAS	2014
Minding Animals	11	<i>Relations</i>	2014
“Lived” Human–Animal Relationships	6	ASJ	2015
Advancing Zoo Animal Welfare Science and Policy	4	JAAWS	2015
Animals and Technoculture	5	<i>Humanimalia</i>	2015
Critical Animal Studies in the Asia-Pacific: Class, Culture, Gender and Identity	7	ASJ	2015
Wild Animal Suffering and Intervention in Nature	8	<i>Relations</i>	2015
Epistemology of Ignorance and Human Privilege	9	ASJ	2016
Insects	7	ASJ	2016
Past the Human: Narrative Ontologies and Ontological Stories	9	<i>Relations</i>	2016
Extinction, Encountering and the Exigencies of Forgetting	7	ASJ	2017
Food: Shared Life	10	<i>Relations</i>	2017
Sanctuaries	8	ASJ	2017
Breed	5	<i>Humanimalia</i>	2018
Calling for Change: Intersectionality and Advocacy	12	ASJ	2018
Energy Ethics: Emerging Perspectives in a Time of Transition	1	<i>Relations</i>	2018
Special Edition	7	HAIB	2018
The Dairy Industry	7	ASJ	2018
Tom Regan: In Memoriam	8	<i>Between Species</i>	2018
Tracking the Human–Wildlife–Conservation Nexus Across the Human–Animal Studies (HAS) Landscape	7	SOAN	2018
Zoos and Aquariums as Welfare Centres	7	JAAWS	2018
Decolonizing Human–Animal Studies	5	<i>Humanimalia</i>	2019
Human–Animal Interaction and Healthy Human Aging	8	<i>Anthrozoös</i>	2019
New Directions in Animal Advocacy	9	ASJ	2019
The Respect Extended to Animals: Studies in Honor and in Memory of Tom Regan	2	<i>Relations</i>	2019
The Silent Majority: Invertebrates in Human–Animal Studies	6	SOAN	2019
Twenty-Fifth Anniversary of Animal Law	7	<i>A-Law Rev</i>	2019
Animals: Freedom, Justice, Welfare, Moral Status, and Conflict Cases	5	<i>Relations</i>	2021
Critical Animal Studies Perspectives on Covid-19	7	ASJ	2021
Perceptual Encounters: “Sensing” the Field of Human–Animal Studies	5	SOAN	2021
Animal Ethics, Ethology, and Food Ethics	3	<i>Relations</i>	2022
Earth Day Collection	6	JAAWS	2022

(Continued)

Table 8. Continued.

Special issue title	Articles	Journal	Year
Flourish	9	<i>ASJ</i>	2022
Outdoor Cats	6	<i>SOAN</i>	2022
Companion Animals: Grief and Loss	7	<i>HAIB</i>	2023
Critical Animal Studies in an Age of Extinction	8	<i>ASJ</i>	2023
Horses and Humans	5	<i>Humanimalia</i>	2023
Impact on Human and Animal Health and Welfare	4	<i>HAIB</i>	2023
The Importance of Language in the Relationships Between Humans and Non-Humans	4	<i>Relations</i>	2023

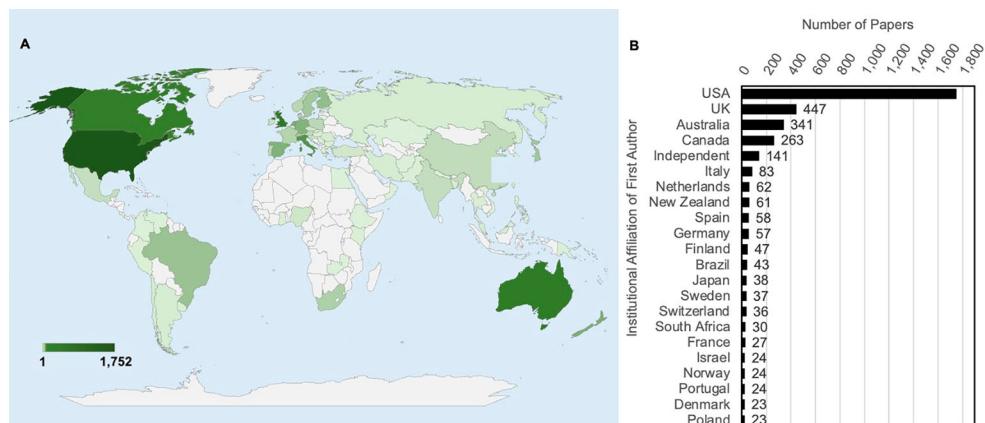


Figure 7. Lead author's institutional affiliations. (a) Dark green represents the highest number of publications from institutions within that country (USA, 1,752) and paler shades represent fewer publications. The white regions represent countries with zero articles. (b) Percentages of the countries that contributed more than 1% of the total articles ($n = 4,020$). Actual numbers are shown to the right of the bars.

Discussion

Our codes were based upon the position of nonhuman animals in relation to humans; for example, as companions, entertainment, sport, therapy, and food (Table 2). The "Service," "Farmed," and "Sport & leisure" codes were overtly about nonhuman animals in relation to human use/benefit, but all utility groups were grounded in the value of nonhumans to humans. Across the utility groups, papers were predominantly anthropocentric and focused on the benefits to humans, such as the positive (and less often, negative) effects of "pet-keeping" or the therapeutic nature of observing wildlife. More recent contributions take a post-humanist approach to understanding more-than-human cultures, communities, and families. Although beyond the scope of this study, future studies might explore how scholarship is shifting toward a less anthropocentric research perspective.

Papers coded as "Farmed" included a large portion of scholarship dedicated to animal rights, activism, abolition, sanctuaries, attitudes toward veganism, and companionship with domesticated farm animal species, rather than welfare in situ. Similarly, "Lab"-coded papers were more often exploring activism movements, ethical debates, or

attitudes toward animal tests. However, the bulk of the “Zoo” coded papers were pro-zoo and tended to be focused on human attitudes and behaviors. The “Wildlife”-coded papers also tended to advocate for the rights of wild species but with a clear bias in favor of more charismatic or threatened species. While the intrinsic value of individuals is often overlooked in conservationist literature, anthrozoology/HAS does engage with this concept to some extent. However, an anthropocentric perspective remains evident in the focus of nature’s role in human wellbeing and the preservation of species and ecosystems considered valuable by conservationists.

The papers coded as “Wildlife” and “Zoo” were most commonly centered on the megafauna regarded as charismatic animals and flagship species. The term “charismatic species” arose from the recognition that successful conservation programs depend on public support and that certain species are more likely to win public support in the Global North (Albert et al., 2018; Krause & Robinson, 2017). Charismatic flagship species possess qualities that “capture the imagination of the public and induce people to support conservation action and/or to donate funds” (Walpole & Leader-Williams, 2002, p. 544), and such revenue-boosting tactics are utilized by the wildlife tourism industry (including zoos) (Albert et al., 2018; Krause & Robinson, 2017; Mazzoldi et al., 2019; Skibins et al., 2013; Walpole & Leader-Williams, 2002). For example, tigers, pandas, whales, and elephants are amongst the megafauna adopted as flagship species by international conservation organizations to raise awareness in the Global North. Such economic strategies could explain charismatic species overrepresentation among anthrozoology scholarship. However, it is worth noting that in-situ communities may not hold the same equanimity toward these megafaunas as Westerners do, especially where human–nonhuman animal conflict exists (König et al., 2020).

The most frequently mentioned fish genus in the dataset was sharks, representing 21.6% of fish-focused papers. Sharks also feature as one of only two non-mammalian genera among the top 20 most popular charismatic species (Albert et al., 2018). Sharks were discussed within the context of wildlife tourism, conservation, human–wildlife conflict, and public attitudes toward them. Several scholars stressed the need to counter the media and entertainment industries’ perpetuation of negative shark stereotypes that fuel hysteria and fear around human–shark interactions (e.g., Hammerton & Ford, 2018; Mazzoldi et al., 2019). A paper published in *ASJ* discussed decolonization of the oceans and proposed “a shift in approaches to human attitudes and uses of the ocean, decentralizing the anthropocentric, reinstating the ecological kinship of species” (Hammerton & Ford, 2018, p. 270). This statement can be extended beyond the oceans to how we need to reevaluate our engagement with our environments and more-than-human animals.

“Wildlife” accounted for 26.4% of bird-focused papers (34/129), covering a broad range of genera. However, 31% of bird-focused papers (40/129) were coded as “Farmed,” which can be explained by looking more closely at the listed species or genera. Chickens and parrots comprised the most papers: 32.5% (42) and 8.5% (11), respectively. The “Farmed” papers were invariably about welfare or animal ethics, with a few addressing attitudes toward and relationships with companion hens. However, 54.7% (290/350) of the total “Farmed”-coded papers were classified as “generic” in terms of animal class. These addressed the moral and ethical issues of animal agriculture more broadly as well as engaging in and exploring attitudes toward veganism.

That the largest portion of papers in our dataset was coded as “Pet” was unsurprising given how the field has evolved from research concerning human relationships with companion animals. They also corroborate a bibliometric study, where companion animals also represented the greatest portion of human–animal interaction studies published between 1982 and 2018 (Yatcilla, 2021). A study of co-occurring terms in publications retrieved from Scopus found that anthrozoology and human–animal studies shared terms primarily associated with research related to companion animals (Collado et al., 2023).

The establishment of *Anthrozoös* in 1987 and subsequent founding of the International Society of Anthrozoology (ISAZ) in 1990 was spurred by reports that there were health and psychological benefits to interacting with companion animals (Herzog, 2016; Rowan, 2012). Although the early focus was on companion animals and animal-assisted therapy, the field strives to be more inclusive of the various contexts in which humans relate with other species (Podberscek, 2012). *Anthrozoös* now seeks to address “the characteristics and consequences of interactions and relationships between people and non-human animals across areas as varied as anthropology, ethology, medicine, psychology, veterinary medicine and zoology” (<https://www.tandfonline.com/journals/rfan20>).

SOAN is another prominent interdisciplinary journal that “publishes studies that describe and analyze our experiences of nonhuman animals from the perspective of various disciplines within the social sciences (e.g., psychology, sociology, anthropology, and political science), humanities (e.g., history and literary criticism), and the natural sciences (e.g., cognitive ethology, comparative psychology, and sociobiology)” (<https://brill.com/view/journals/soan/soan-overview.xml?language=en>). Nonetheless, the interest in relationships we have with companion animals and the therapeutic benefits to humans arising from interactions with nonhuman species remains a strong and growing area of study.

We had predicted mammals would be overrepresented, knowing the focus has historically been predominantly companion animals, namely cats and dogs, and considering that 80% of the most popular charismatic megafauna are mammalian species (Mazzoldi et al., 2019). However, we were surprised at how underrepresented the other animal classes were. We reported that only 1.6% of papers in our study were focused on invertebrates (Table 7). Similar to our findings, a scoping review of *Anthrozoös* and SOAN revealed only 2% of articles focused on invertebrates (Wilkie et al., 2019). A recognition of this underrepresentation by the editors of *ASJ* underpinned a call for papers that “invited animal studies scholars and artists to present work on insects – who, according to scientific data, comprise 75% of all animal species on planet Earth” (Boyde, 2019, p. viii). The papers published in this special issue provided insights into some of the insect communities and individuals (Boyde, 2019). Likewise, a special issue of SOAN, “The Silent Majority: Invertebrates in Human–Animal Studies,” was a call for contributions that focused attention on invertebrates (Moore & Wilkie, 2019). Bees were overrepresented amongst the invertebrates, accounting for 23.4% of invertebrate-focused papers (15/64). These included papers coded as “Farmed” (honeybees and pollinators) and “Wild-life,” representing the different relationships we have to bees as producers and commodities and reflecting our growing concerns at insect decline within the Anthropocene (Blüthgen et al., 2023; Wagner et al., 2021).

Attitudes toward animal utilization can be measured by the purpose and the cultural value placed on that species (Bradley et al., 2020). For example, there is greater public resistance when companion animal species such as dogs are used in medical research than pigs, with greater moral value being assumed for the former (Goñi-Balentziaga et al., 2022).

The least represented animal class was amphibians (Figure 4). Out of only 11 papers, five featured frogs. Unlike the papers about bees, several of which explored bee–human relations from a more-than-human perspective, the papers about frogs explored attitudes toward amphibians rather than relationships with them.

Special issues and the increase in newly established journals focusing on specific areas of anthrozoology/HAS represent both a growing interest in certain areas and a call to address the neglected topics or fields of study. Several special issue collections grew out of conferences or symposiums, which represent active areas of research focus and topics of interest. Five out of the eight special issues published in *JAAWS* were based on conference collections. Three of these collections arose from the 2011, 2014, and 2017 Detroit Zoological Society International Symposiums (Bennett, 2013; Kagan et al., 2015; Shapiro, 2018). The first special issue of *JAAWS*, “Nonhuman primate behavior and welfare,” was based on papers first presented at a session of the 2006 Animal Behavior Society annual meeting in Utah, USA (Koch, 2007). The 2008 *JAAWS* special issue, “Caring During Crisis: Animal Welfare During Pandemics and Natural Disasters,” was based on the 2007 symposium of the same name, held at the University of Guelph, Canada. The conference objectives were “(a) of raising awareness about how nonhuman animals and the people who care for them are affected during emergencies and (b) of sharing knowledge about how animal welfare may be addressed during these situations” (Millman, 2008, p. 85). The 2014 special issue of *Relations*, named “Minding Animals,” published a collection of papers first presented at the second Minding Animals Conference “Building Bridges between Science, the Humanities and Ethics,” held at Universiteit Utrecht, Netherlands in 2012 (Bennison et al., 2014). “Human–Animal Interaction and Healthy Human Aging” was a special issue of *Anthrozoös* inspired by the Gerontological Society of America (GSA), which, in 2016, developed a research focus on the benefits and potential risks associated with pets among older adults (Resnick & McCune, 2019).

Special issue collections can honor a prominent scholar, theoretical turn, or reflect current global events. For example, in 2018, *Between the Species* published a collection of papers dedicated to Tom Regan and the animal rights movement (Francione, 2018), and the 2022 *JAAWS* “Earth Day Collection” explored themes within “Human–Animal Relationships and Welfare in the Anthropocene: Pandemics, Climate Change, and Other Disasters,” building upon discourses arising during the COVID-19 global pandemic (Argent, 2022).

Special issues can be attempts to redress the balance by calling attention to neglected areas of research or challenging the status quo of research practice and culture. For example, *Humanimalia* published an issue titled “Decolonizing Human–Animal Studies,” and *JCAS* has given special attention to critical animal studies and intersectionality with race, gender, and disability (Geroux, 2019; Grubbs, 2012; Socha et al., 2014; Yarbrough & Thomas, 2010). Calls for inclusion in special issues have the potential to increase

contributions focused on a particular species, groups of species, or type of relationship. For example, 23% of the invertebrate papers (Table 7) were published in one of two special issues published in *SOAN* and *ASJ* (Boyde, 2019; Moore & Wilkie, 2019). This suggests that researchers are interested in human–relations with invertebrates. However, the question arises as to why they are not publishing in anthrozoological journals outside of special issues. Do these papers represent forays into anthrozoology/HAS from other fields, or are scholars interested in invertebrate–human interactions discouraged by the mammalian centric focus of the field? Does a lack of interest or a lack of inclusivity explain why human relationships with amphibians or fish are similarly overlooked by the field as a whole?

Increasing diversity amongst anthrozoology/HAS scholars, particularly those from the Global South and historically underrepresented or marginalized groups would help redress the balance and ensure a fuller range of more-than-human encounters receive attention. However, scholarship and the international research community are dominated by the Global North. This is true of all academic disciplines, and many international journals originated in the Global North (Englander, 2014). Seventeen of the 19 anthrozoology/HAS-focused journals included in our study are published exclusively in English (Table 1). Even the journals that accept submissions in another language publish primarily English language contributions. Of the 4,020 articles in our dataset, we found that 44% of the first authors were affiliated with a US institution, 11% were affiliated with a UK institution, 9% were affiliated with an Australian institution, and 7% were affiliated with a Canadian institution (Figure 7). Rousseau & Binfet (2021) previously reported articles published by *JAAWS* between 2009 and 2019 to be dominated by institutional affiliations in the USA, Australia, and England. Similarly, Wilkie et al. (2019) reported that 38% and 51% of first authors publishing in *Anthrozoös* and *SOAN*, respectively, were from institutions in the Americas (primarily the US and Canada). This does not necessarily mean that the authors themselves were native English speakers or that they were not collaborating with researchers from institutions located in the Global South.

It is worth noting that many of the more affluent universities, especially those located in Europe, encourage English proficiency amongst scholars and research students and seek to raise their international research profile by publishing in English (Englander, 2014). We speculate that journals and organizations that publish exclusively in a non-English language do not refer to themselves as “international” and that English is a prerequisite to international recognition. Although beyond the scope of the current study, it would be useful to determine how much scholarship does not get the attention it deserves because it has not been translated into English. By drawing attention to this, we hope to invite ongoing discussion, research, and initiatives to increase inclusivity and access to non-English language scholarship.

Limitations

Limitations of this study include the somewhat subjective nature of coding in relation to papers that did not neatly fit into our coding definitions. Although the methodology was designed to accommodate this, some of the abstracts invited wider alternative

interpretations than others. We also recognize our coding methods shaped the results to some extent; for example, how we identified generic pet studies as mammal-focused unless otherwise stated. In this study, we focused on 19 journals derived from the ASI website; however, we recognize that anthrozoology/HAS scholarship is published in a range of journals, covering disciplines such as anthropology, sociology, and philosophy, and fields such as tourism, environmental humanities, and media studies. Future efforts might explore anthrozoology/HAS published in broader journals. Furthermore, defining what is and what is not anthrozoology/HAS is not necessarily straightforward. Book chapters, theses, and conference proceedings are not part of this study, but the same coding method could also be applied to these in the future to gain insight into emerging areas of interest. As previously mentioned, our study focused exclusively on literature published in English. The limited global reach of non-English publications is a feature of the current state of academia, but researchers fluent in other languages might apply our methods to more-than-English scholarship to examine trends and active areas of research in underrepresented research communities.

Conclusion

We conclude that the field has been, and remains, heavily focused on human–animal interactions involving companion animals or companion animal species utilized in animal-assisted therapies. The field also remains mammalian-centric. Although newer journals appear to be broadening the focus to include relationships beyond those involving companion animals or rooted in human use/benefit, studies related to companion animals or companion animal species predominate. While we do not wish to undermine the importance of contributions to studies focused on human relationships with companion animals, anthrozoology/HAS promises to be so much more. Shapiro (2020) described some of the major influences shaping the state of the field, including more-than-human–animal rights, the Anthropocene, climate change, the worldwide decline in biodiversity and wildlife populations, political influences, and the disconnection between the humanities and the biological sciences. Indeed, we observed subtle shifts toward less anthropocentric, more posthuman ways of researching and thinking about human–nonhuman animal relations. We predict that continued engagement with such praxis as intersectionality and decolonization will foster understanding and respect for more-than-human animals.

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