

Anthropomorphizing Wildlife in Communications: A Literature Synthesis with Implications for Wildlife Management and Conservation

Lucy Chalgren
Colorado State University

Katie M. Abrams
Colorado State University

Paige Nankey
Colorado State University

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Anthropomorphizing Wildlife in Communications: A Literature Synthesis with Implications for Wildlife Management and Conservation

Abstract

Anthropomorphism, the attribution of human characteristics to non-human entities, presents both opportunities and challenges for professionals communicating about animals across wildlife management, agricultural, and natural resource contexts. While scientific communication traditionally avoids anthropomorphizing animals, questions arise about when such approaches might benefit conservation education and stakeholder engagement. This narrative literature review synthesized research on anthropomorphism in wildlife communication through iterative searches across multiple databases, examining how Indigenous knowledge systems, natural resource interpretation practices, and anthropomorphic messaging affect public attitudes and behaviors toward animals. Research demonstrates that attributing emotions to animals consistently increases compassion and pro-environmental behaviors, while attributing complex cognitive abilities produces more variable outcomes. Anthropomorphic communication can foster empathy and conservation support but may also lead to unrealistic expectations about animal behavior and opposition to necessary management practices. The benefits and drawbacks of anthropomorphism in wildlife communication could be useful, too, for agricultural communicators and extension professionals who face similar challenges in balancing scientific accuracy with effective stakeholder engagement. We provide practical guidance for implementing thoughtful anthropomorphic messaging in animal communication contexts, particularly for natural resource and wildlife management.

Keywords

Wildlife conservation, anthropomorphism, communication, interpretation, natural resources management

Authors

Lucy Chalgren, Katie M. Abrams, Paige Nankey

Introduction

Many organizations involved in natural resource management and stewardship aim to conserve resources for current and future generations. While the references to "generations" often center on humans, it raises questions around stewarding the generations of more-than-human species as well. Wildlife conservation requires managing complex relationships between humans and other species. Approaches range from direct species management within protected areas to co-stewardship initiatives with local and Indigenous communities (U.S. Department of the Interior, 2023).

Conservation efforts are often limited by financial resources despite numerous ecological threats (Echols et al., 2019), making effective communication a more cost-efficient approach that is gaining recognition for garnering public support (Ibbett et al., 2021). Communication, education, and immersive experiences are often used with the goal of inspiring an ethic of deep care and stewardship among various stakeholders. Part of inspiring people to care deeply often involves anthropomorphism—ascribing human characteristics and behaviors to non-human entities. However, some natural resource management responsibilities and best practices for wildlife (e.g., euthanasia, permitting take/hunting) arouse cognitive dissonance at best, and, at worst, extreme contention with threats of harm or violence (Yellowstone National Park Service, 2023). Wildlife management encompasses diverse contexts from protected natural areas to urban environments, captive facilities, and agricultural landscapes, each presenting unique communication challenges around anthropomorphism.

Similar tensions exist within agricultural contexts, particularly in animal agriculture, where land grant university extension services and industry professionals debate or offer conflicting guidance regarding the appropriate use of anthropomorphic communication (Abrams & Meyers, 2012; Specht & Buck, 2014; Jenkins et al., 2020). The parallels between wildlife management and agricultural practices offer important insights for both fields because each navigates the complex terrain of human-animal communication. However, research in these areas has largely developed independently, with limited integration across wildlife, agricultural, and cultural knowledge systems. Indigenous Knowledge Systems (IKS) have long understood human-animal relationships through kincentricity and reciprocity (Martinez et al., 2023), yet practitioners navigating anthropomorphic communication in wildlife and agricultural contexts have limited guidance that considers these frameworks.

Understanding anthropomorphism's effects requires grounding in established communication theories. From a framing perspective (Entman, 1993), anthropomorphism represents a frame that emphasizes human-like qualities while de-emphasizing biological or ecological aspects. Narrative persuasion theory (Green & Brock, 2000) explains that anthropomorphized stories facilitate transportation and identification, reducing counterarguing. Construal level theory (Trope & Liberman, 2010) provides insight into why anthropomorphism may be effective: by emphasizing similarity, it reduces psychological distance between humans and wildlife, increasing concern and motivation for conservation. The elaboration likelihood model (Petty & Cacioppo, 1986) further explains that anthropomorphism can engage audiences through emotional appeals (peripheral route) or thoughtful consideration of genuine similarities (central route), with implications for how durable resulting attitudes will be. These theories show

that anthropomorphism is a complex persuasive strategy with predictable psychological effects, not just a simple tactic. These communication theories provide an analytical framework to explain some of the findings in the literature review, while IKS offer critical alternative epistemologies that both complement and challenge Western theoretical assumptions about human-animal relationships.

This literature synthesis discusses how anthropomorphizing species in communication strategies can aid or complicate wildlife management, particularly for those involved in protected species management and protected areas. We begin with a review of IKS as a foundation that has long influenced human communications and understanding of wildlife. The bulk of this piece then focuses on anthropomorphism: what it means, different ways in which it manifests in contexts relevant to organizational communication, its effects on people's attitudes, and implications for wildlife management. Finally, an overview of natural resource interpretation reveals the philosophies and common approaches baked within how most institutionalized or government wildlife management organizations and zoos/aquariums communicate with and educate publics about wildlife. While focused on wildlife contexts, the findings may also hold relevance for agricultural communication and extension when dealing with livestock communication as they navigate similar ethical and practical considerations.

Method

This review was conducted by three researchers with backgrounds in environmental communication (both informal and formal), wildlife biology, and conservation biology. We would like to acknowledge that our perspectives are shaped by Western academic training. We recognize Indigenous communities have deep, longstanding relationships with species and landscapes central to the issues examined in this paper. IKS offers critical perspectives on human-animal relationships that Western academic training does not fully equip us to represent. With this in mind, we approached the IKS literature with care and humility and made a concerted effort to honor these worldviews throughout our synthesis.

As described by Sukhera (2022), we employed an integrative narrative review allowing our approach to identify and synthesize diverse literature addressing anthropomorphism from multiple perspectives to offer a framework to advance understanding of wildlife communication efforts. Following the approach outlined by Green et al. (2006), we conducted iterative searches across multiple scholarly databases including Web of Science, PsycInfo, Communication and Mass Media Complete, and Google Scholar. Our search strategy consistently paired "anthropomorph" AND ("wildlife" OR "animals") with additional keywords through separate Boolean searches, including: framing, communication, attitude, message, psychology, and Indigenous studies. We included peer-reviewed articles, book chapters, and gray literature published through 2024. We employed both backward citation searching (examining reference lists of included articles) and forward citation searching (identifying articles that cited our included sources) to ensure comprehensive coverage of relevant literature (Wohlin, 2014).

This narrative review was guided by the overarching question: How can anthropomorphizing species in communication strategies aid or complicate wildlife management, particularly for those involved in protected species management and protected areas? More

specifically, we sought to examine: (1) how IKS approach human-wildlife communication and relationships in consideration of them as a foundational influence on human communications and understanding of wildlife; (2) the meanings, manifestations, and implications of anthropomorphism of wildlife for co-stewardship and management of species. ; and (3) the conventional approaches and philosophies applied by wildlife managers in their communications with stakeholders (i.e., interpretation and education) Rather than adopting a single theoretical lens, we integrate multiple perspectives—IKS, Western communication theories, and interpretation practice—to provide a comprehensive understanding of how anthropomorphism functions across diverse cultural and management contexts. We position IKS as foundational not as our analytical framework, but because Indigenous worldviews offer millennia-old insights into human-animal relationships that predate and inform contemporary Western approaches. This multi-perspective synthesis allows us to identify both culturally specific and universal mechanisms through which anthropomorphism influences conservation communication. Our goal was to synthesize these distinct bodies of literature to inform a conceptual framework (Sukhera, 2022) that can provide practical guidance for wildlife communication efforts.

Given the interdisciplinary nature of this topic, we deliberately cast a wide net to capture relevant literature from fields including conservation biology, environmental communication, psychology, anthropology, and Indigenous studies. Sources were selected based on their relevance to addressing our research questions rather than following exhaustive inclusion criteria. We prioritized literature that directly examined wildlife contexts, but when research was limited, we included studies related to broader animal use contexts such as research animals, agricultural animals, and captive animals for entertainment. We were particularly interested in identifying media and message effects experiments that empirically tested the impacts of anthropomorphized communication on human attitudes and behaviors toward animals. Literature searching occurred through an iterative process, until our guiding question could be answered. While this approach allowed us to capture diverse perspectives and synthesize knowledge across disciplinary boundaries, we acknowledge the limitations inherent in narrative reviews, including potential selection bias and the lack of systematic quality assessment procedures that characterize more structured review methodologies (Baumeister & Leary, 1997). The breadth of our search strategy, while comprehensive, may have resulted in the inclusion of sources with varying methodological rigor, and our synthesis represents the authors' interpretation of the literature rather than a quantitative meta-analysis. The vast majority of the sources came from journal articles and books due to the nature of databases selected. Grey literature includes government reports and materials as well as a summary of a scholarly seminar (TallBear, 2011). A summary of the 73 sources included is in Table 1.

Table 1*Source Type Distribution*

Source Type	Count	Percentage
Journal Articles	51	68.9%
Books	12	16.2%
Grey Literature	8	10.8%
Book Chapters	2	2.7%
Video from Government Agency	1	1.3%

These sources spanned from 1991 to 2024, with the majority published after 2010. The literature represented diverse disciplinary perspectives including conservation biology, environmental psychology, Indigenous studies, interpretation/environmental education, and animal welfare. Empirical studies employed varied methodologies: experimental designs testing message effects (e.g., Tam et al., 2013; Williams et al., 2021; Yue et al., 2021), surveys examining attitudes and emotional/cognitive attribution (e.g., Manfredo et al., 2020; Jacobs et al., 2023; Straka et al., 2022), and qualitative studies or piece on Indigenous knowledge systems and human-animal relationships (e.g., Todd, 2015; Kimmerer, 2013; Puniwai, 2020; Woodward et al., 2020). Additional sources included theoretical pieces on anthropomorphism (de Waal, 1999; Epley et al., 2007) and interpretation practice guidelines. Geographically, the context of the source material or studies were concentrated in North America with limited representation from Europe and Australia. Species examined skewed heavily toward charismatic megafauna, particularly large terrestrial mammals, with limited research on less charismatic species or conducted in real-world protected area management contexts.

Indigenous Knowledge Systems

In contrast to Western knowledge systems, Indigenous Knowledge Systems (IKS) are land-based and kinship-centric – recognizing interdependence, responsibility, reciprocity and respect for all life. Cosmologies and value systems necessitate “an ethic of deep care and stewardship” (Cajete, 2000, p. 65), which includes water, land and sky integrated into definitions of the living world. Co-stewardship and meaningful partnerships between Tribal nations and government agencies therefore require more than adopting the stories and storytelling of Indigenous cultures into contexts that are based on humans having dominion over the world instead of being one small part of it. Effectively bridging these worldviews requires a nuanced understanding of how personification of more-than-humans manifests differently across cultures. We highlight three important areas of inquiry for anthropomorphic story sharing to help inform co-stewardship efforts.

An important part of both cultural continuance and IKS is knowledge sharing across generations, which heavily relies on oral traditions (Cajete, 2000). Although historically overlooked in scientific literature, observations and documentation of data in stories, art and ceremonies have more recently been considered vital data for understanding challenging phenomena like land and sea management (Woodward et al., 2020). Beyond human storytelling,

many Indigenous peoples understand the more-than-humans speak, teach, and share knowledge through their own storytelling modes (Woodward et al., 2020). In their video “Our Knowledge, Our Way,” Australian Indigenous researchers talk about the way Country speaks through fires and wind (CSIRO, 2024). In Kānaka Maoli (Native Hawaiian) epistemology, ‘aumakua are family deities that can take shape of an animal, guiding with visions or warnings. In reciprocity that goes beyond transaction, the family respects, learns from, and cares for, all individuals of that species that the ‘aumakua embodies, creating a long-term kinship with that species (Puniwai, 2020). Indigenous stories like these are not metaphorical or mythical but a knowledge system that provides insights to Western science about more-than-human animacy (TallBear, 2011).

Secondly, IKS recognize that non-humans are their own beings, with their own intentions and life worlds (Kimmerer, 2013). Stories can help us explore shared characteristics with non-humans and highlight the interdependency of all life (de Waal, 1999). At the same time, IKS allows a unique place for humans that can include cultivation, harvesting, and managing forests, for example (Woodward et al., 2020). Although we are inclined to interpret other species' behaviors through a human lens (Jürgens et al., 2022) to help understand natural phenomena (Jürgens, 2017; Holmberg, 2022), IKS reminds us we are not the main characters in the story of the world. Such a view might interpret human interaction through hunting and fishing as disrespectful, where the ethics of killing another human being are extended to killing other sentient beings. This is a form of anthropomorphism that, although there are often specific food or harm taboos because of the relationship between humans and more-than humans, generally does not exist within IKS. Taking or harvesting life can be ethical and respectful human behavior and happen within cultural protocols like avoiding taking more than needed (Duer et al., 2018; Todd, 2015; Root-Bernstein et al., 2013). Many Indigenous cultures in North America also teach careful interaction with non-human species. For example, in a co-developed curriculum between Window Rock United School District #8 and Arizona Fish and Game Department (1998) addressing the relationship of Dine' people and wildlife, stories teach not harming bears in any way because they are close relatives. Such teachings place humans in relationship with all life in contrast to colonial frames of dominion over resources (Curley, 2021). Sustainable co-stewardship recognizes not only treaty rights of hunting, fishing and gathering, but the importance of ethical knowledge around the processes of harvesting based in IKS. For example, Todd (2015) describes human-fish relations of the Inuvialuit of Paulatuuq, Canada as reciprocal and respectful. Fishermen understand that fish, as non-human persons, can express their agency by refusing to bite the bait or even avoid nets.

Along with the challenges of bridging vastly different worldviews, practical applications of understanding land-based knowledge cannot be universalized or taken out of context. Uniqueness of the localized IKS, cultures, environment and geography has much to offer partnerships to expand scientific knowledge (David-Chavez, & Gavin, 2018). The storytelling process facilitates discourse around the localized knowledge systems of a particular place and time (de Silva & Hunter, 2021; David-Chavez & Gavin, 2018). While sharing of Indigenous stories can lead individuals to consider their own interactions within places and with wildlife (Silko, 1981; Fernández-Llamazares & Cabeza, 2017), it must be done within cultural protocols and inclusion of cultural continuance through new story creation that carry tradition as much as ancestral stories. Northern Cree educator Cora Weber-Pillwax (2001, p.156) notes Indigenous stories are not simply for entertainment, and “no one tells a story without intent, without

purpose.” They may be shared at certain times and for certain occasions. Protocols are also in place to protect knowledge within communities and when and how knowledge may be shared outside the community.

Although Indigenous stories vary widely, they can relate a profound sense of place, and some studies suggest the values conveyed through these narratives may inspire proactive conservation behaviors (Singh et al., 2010). From a communication theory perspective, Indigenous storytelling exemplifies narrative transportation (Green & Brock, 2000), which is a process where audiences become absorbed in stories, reducing counterarguing and increasing identification with characters. These stories emerge from epistemologies where animals are recognized as genuine persons with agency. This suggests that the most powerful anthropomorphic communication comes from worldviews that genuinely recognize non-humans as thinking beings rather than from strategically crafted persuasive messages. Additionally, construal level theory (Trope & Liberman, 2010) provides insight into why kinship-based framing of human-animal relationships may be so effective: by positioning animals as relatives, Indigenous worldviews reduce social distance, moving wildlife from psychologically distant to proximate.

Because stories and their protocols and contexts are very specific, they cannot be taken out of context of community (Weber-Pillwax, 2001). This suggests creating collaborative space in which local Indigenous worldviews can be shared through storytelling could benefit conservation communication strategies for agencies, even though storytelling and anthropomorphism are typically discouraged in the reporting of Western science research (Duderstadt et al., 2021). Effective communication requires both creating meaningful collaborations and is an outcome of those collaborations that are built for longer-term relationship building (David-Chavez & Gavin, 2018). Efforts to integrate these perspectives in ethical ways are imperative, though the onus is likely to remain unfairly upon communities to educate around protocols and limitations for sharing out IKS (Cooks, 2020). Indigenous and non-Indigenous ways of understanding anthropomorphism, relation to non-human life, as well as what makes up effective communication presents both challenges and possibilities for agencies wishing to form meaningful partnerships and co-stewardship of park lands.

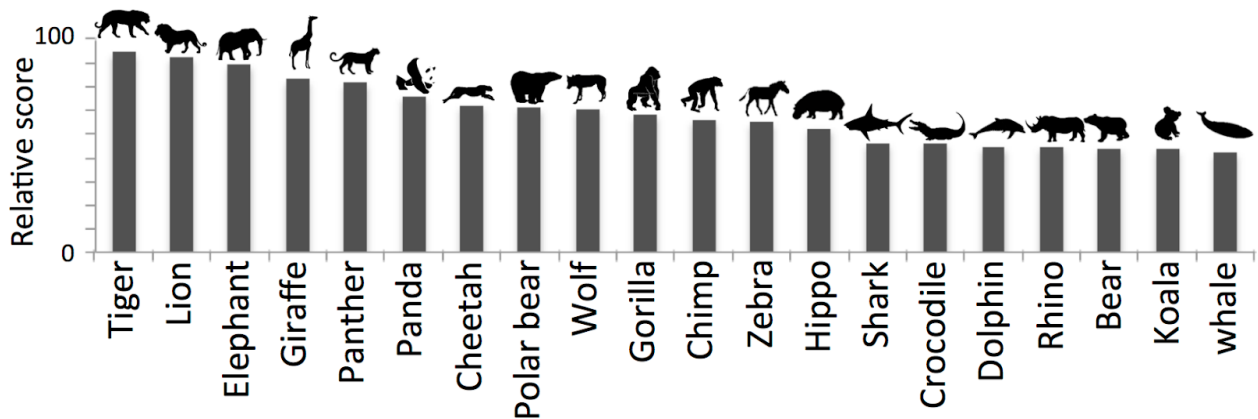
Anthropomorphism

When considering how past messaging has portrayed wildlife to the general public, a common occurrence has been to humanize wild animals through the process of anthropomorphism. Anthropomorphizing refers to linking human attributes and characteristics to those that are not human (Chan, 2012). de Waal (1999) argues that anthropomorphism is inseparable from the relations we share with wildlife, as humans have been analyzing animal behaviors for centuries as a means to survive. Attributing animals with human-like qualities exposes exactly how closely related animals, specifically mammals, and humans are to each other (Andrianova, 2021). Previous research has found that individuals are more likely to become invested in animals they are more genetically related to, which, by extension, tend to be the animals most commonly anthropomorphized today (Driscoll, 1995; Eddy et al., 1993; Gomez-Melara et al., 2021; Harrison & Hall, 2010; Martín-Forés et al., 2013; Martín-López et al., 2007). Similarly, the Western public often identifies large, terrestrial mammals as the most

charismatic species, which leads to them being frequently anthropomorphized in the media (Albert et al., 2018; see Figure 1).

Figure 1

Twenty of the Most Charismatic Animal Species (Albert et al., 2018)



One goal of anthropomorphism is to blur the differences between humans and nonhumans (Castellano, 2018) in a way that can be used to emotionally invest individuals in a specific cause. Zoos and conservation organizations have been doing this successfully for decades, as they name individual animals in their care and lean into the narrative that surrounds these individual ambassador animals. In some instances, zoos have raised thousands of dollars for conservation efforts as they auction off the honor of naming a newborn animal (Wilkinson, 2023). One of the most prominent, and arguably prevalent, examples of how naming a wild animal can contribute to the shift of human attitudes and behaviors around conservation issues, is the story of P-22, a mountain lion in Los Angeles. Many animals given identification but not a pet- or human-like name can still become anthropomorphized. Even though P-22 was named by the researchers tracking his movements in the area for over a decade, it gave him a unique identity and character in the minds of the public. Paired with the narrative as a lone mountain lion in a highly urbanized landscape, P-22 became the ‘poster puma’ for habitat fragmentation and lack of connectivity to his home range (Wilkinson, 2023). One of the largest urban wildlife crossings in the United States is now on track to be completed in 2025, to aid urban wildlife movements over a hazardous 10-lane freeway in Los Angeles.

The use of anthropomorphism has effectively influenced public perception in the past, especially when human-like animal characters are implemented in marketing and advertising efforts (Grasso et al., 2020). As far as language is concerned, the Western language largely puts humans in the agent position, while nature is seen more as an object to be possessed or owned by the agent/human (Harré et al., 1999; Milstein, 2011). As time has progressed, there has been an association between modernization and an increase in the anthropomorphizing of animals (Gomez-Melara et al., 2021; Manfredo et al., 2020). Modernization has led to more occurrences of anthropomorphism, leading to more positive behaviors and behavioral intentions towards wildlife (Gomez-Melara et al., 2021).

In many instances, the use of animals in storytelling has been to serve as a metaphor for human behavior (Andrianova, 2021). These types of narratives have also been used to connect audiences to conservation related issues facing animals, along with increasing empathy for wildlife and the environment (Pimentel & Kalyanaraman, 2022). However, some examples of animals in narratives have uncovered potential issues. The Walt Disney company is well known for anthropomorphizing animals, sharing an idyllic natural world free of disease, starvation, and predation (de Waal, 1999), which is unrepresentative of the real world (Grasso et al., 2020). Narratives are not the only form of media that animals become anthropomorphized.

Effectively used as brand mascots in advertising efforts (Grasso et al., 2020) anthropomorphized animals often take center stage in conservation campaigns (Albert et al., 2018). These animals with human-like characters can help establish a strong brand identity with favorable associations (Dotz & Morton, 1996; Fournier, 1998; Grasso et al., 2020). However, not all attempts at employing a brand mascot have been successful. For example, some researchers examining the Smokey the Bear mascot are still unsure if the character is less effective because of the ranger's uniform he wears or because the uniform undermines bear conservation messages (Root-Bernstein et al., 2013). While it can be easy to anthropomorphize animals, there are many different levels or forms to consider (see Figure 2), and it needs to be done with careful thought for the intended impact (see also Grasso et al., 2020).

Figure 2

Representation of the Different Elements of Anthropomorphism and the Related Editing of Nonhuman Species (Root-Bernstein et al., 2013)



Forms of Anthropomorphism

Anthropomorphism manifests in different ways, each holding their own implications for wildlife communication efforts. de Waal (1999) identified three distinctions in how humans attribute characteristics onto animals that can inform how we should approach human-wildlife communication efforts. The first, is anthropodenial which occurs when humans are viewed completely separate from nature, thereby ignoring or denying the similarities we share with animals (de Waal, 1999). This type of messaging creates false dualities between humans and animals, wherein animals are positioned as incapable of having similar experiences or emotional responses to events. From an IKS perspective, anthropodenial fails to recognize agency, communicative practices, and emotional complexities more-than-humans share with us (Kimmerer, 2013; TallBear, 2011; Todd, 2015; Woodward et al., 2020).

In contrast to denying animal characteristics, anthropocentric anthropomorphism places human characteristics onto animals in ways that center human perspectives, where confusion about animal behavior can occur (de Waal, 1999). For example, referring to lions as “kings of the jungle” imposes not only human monarchy structures onto animals, but also misrepresents their actual habitat as they primarily inhabit savannas and grassland ecosystems. This framing is unsurprising given that Western perspectives and language largely position us humans as agents while any other facet of nature are objects to be possessed or owned (Harré et al., 1999; Milstein, 2011).

In contrast, animalcentric anthropomorphism acknowledges both similarities and difference between humans and animals while centering the animal’s own perspective and natural behaviors (de Waal, 1999). While de Waal (1999) identified this as the most appropriate form of anthropomorphism, IKS have held and practiced these understandings since time immemorial, recognizing animals as their own beings with their own intentions and life worlds (Kimmerer, 2013). An example of animalcentric anthropomorphism would be describing how bears are fiercely protective of their cubs acknowledges their maternal behavior without imposing inappropriate human social structures. IKS grounded in kincentricity and reciprocity demonstrate why animalcentric approaches are essential; they maintain respectful relationships with animals rather than treating them as objects or resources.

While there have been some positive outcomes associated with conservation and anthropomorphism, the purpose of using this technique in wildlife management contexts should not be to create fictional animal characters, but to instead stress that animals share many similarities with humans (de Waal, 1999). The process of anthropomorphizing animals should be viewed as a tool that can be implemented to help humans (or groups of humans) treat species not as objects (Epley et al., 2007), understand wildlife from their own perspectives (de Waal, 1999), and to aid in efforts to conserve them (Root-Bernstein et al., 2013). How people view and feel towards wildlife can impact the success of conservation messages and efforts.

This distinction between anthropocentric and animalcentric anthropomorphism aligns with dual-process models of persuasion (Petty & Cacioppo, 1986). Anthropocentric anthropomorphism, which projects human characteristics without regard for biological reality, operates through the peripheral route that relies on emotional appeals and heuristic processing. In

contrast, animalcentric anthropomorphism engages the central route by encouraging thoughtful consideration of genuine similarities and differences between humans and animals. This theoretical framing predicts that animalcentric approaches should produce more durable attitude change because they are grounded in substantive understanding rather than affective shortcuts.

Roles in Human Attitudes Toward Wildlife

Anthropomorphism has been shown to play a role in how people see potential relationships between humans and animals, which can be heavily influenced by experiences of individuals (Manfredo, 2020; Jürgens et al., 2022). Recent research has investigated the complex interplay between attributing emotional capabilities or higher cognition to non-human animals. For instance, multiple studies have found that when people perceive an animal as capable of experiencing emotions like happiness, fear, or suffering, they become more reluctant to approve of harm to that animal, even with agricultural, recreational, conservation management, or research uses (Potocka & Bielecki, 2023, Straka et al., 2022; Wang & Basso, 2019). Furthermore, emotional attribution fosters more environmentally conscious attitudes and behaviors (Jacobs et al., 2023). However, the story changes when examining the attribution of complex cognitive capabilities like logical reasoning, self-awareness, or long-term planning. Although ascribing such sophisticated mental capacities to animals does typically engender greater moral responsibilities in human minds, it does not produce the same pro-environmental effects as emotional attribution (Jacobs et al., 2023) and fails to reduce acceptance of using that animal for agricultural, recreational, or research uses (Herzog et al., 1991; Potocka & Bielecki, 2023). In sum, these nuanced empirical findings reveal that while attributing emotions to animals consistently leads to greater compassion and ecological concern, attributing higher intelligence does not guarantee similar outcomes.

The attitudes people hold towards certain animal species can also determine how people hear, see, and think about the environment (Bohner & Dickel, 2011; Echeverri et al., 2017), which can provide useful information on how to craft messages about the environment and ecosystems. Non-human entities are more likely to be anthropomorphized at greater volumes by specific people (Epley et al., 2007). For example, the way some animals are represented can influence an entire culture's attitudes towards those animals (Vrla et al., 2020) like that of the dominant and well executed, anti-wolf mythology in the Netherlands depicting wolves as "sharp-fanged beasts that preyed on children" (Preston, 2023). This narrative has made the recent resurgence and rewilding of wolf populations in 2019 a source of contention amongst wildlife biologists and Dutch farmers.

Childhood exposure to animal narratives can lead to children becoming emotionally attached to certain animals, which can influence adulthood attitudes (Henderson & Anderson, 2005; Andrianova, 2021; Cole & Stewart, 2014; Melson, 2003). The release of Walt Disney's, *Finding Nemo* introduced audiences to an important member of the coral reef community, the Clownfish (*Amphiprion ocellaris/percula*). The release of this film supposedly created a boom in aquarium trade markets, deemed the "Nemo Effect", as audience members wanted to bring Nemo home. Research found this perception to be inconclusive (Militz & Foale, 2017). While anthropomorphizing seems to be a universal practice, it does not always translate the same across cultures and social groups (Manfredo, 2020).

Interpretation: An Approach to Education and Communication

A common and critical practice by most institutionalized organizations (e.g., government agencies, zoos, aquariums, nature centers) for conservation work is interpretation and education. Interpretation has a long history within natural resource management, not only supporting organizational missions but also helping audiences care about natural resources. For this review, interpretation is defined as “is a purposeful approach to communication that facilitates meaningful, relevant, and inclusive experiences that deepen understanding, broaden perspectives, and inspire engagement with the world around us” (National Association for Interpretation, 2021, para. 2). Interpretation approaches are widely used across organizations involved in cultural, heritage, and natural resource education (Knudson et al., 2003).

Effective interpretation facilitates connections between audiences and the meanings behind what is being communicated, with the intention that audiences are stimulated enough to interact, think, and react to information (Ham, 1992; Tilden, 2009). One core component is the use of tangibles and intangibles. Tangibles are physically present elements that can be experienced through the senses, such as a grizzly bear. Intangibles are meanings or representations including “universal concepts” like life, family, love, and survival (Bacher et al., 2007). Educational materials often use anthropomorphized wildlife to connect with audiences by drawing comparisons between wildlife and these universal concepts (Brochu & Merriman, 2015), employing techniques that “bridge the familiar [i.e. human] with the unfamiliar [i.e., wildlife]” (Beck & Cable, 1998, p. 40).

Intangibles and “universal concepts” represent human attributions to natural environments —essentially how humans seek meaning in the world. Just as intangibles are central to effective interpretation, they are inseparable from anthropomorphizing species. For example, educational materials that refer to “papa bear” create assumptions that male bears take on paternal responsibilities, when they actually have no role in cub rearing. Anthropomorphizing species is essentially inescapable as part of how humans understand their surroundings (Epley et al., 2007). From guidebooks to modern exhibits and communications, descriptions of animal behaviors often rely on projecting human attributes onto other species through terms like “kingdom” and “society,” or through imagery depicting family groupings and individual animal personalities.

Interpretation represents applied framing theory (Entman, 1993) in practice. Interpreters select which aspects of wildlife to emphasize (the tangible), frame those aspects through human-relevant concepts (universal meanings), and thereby shape how audiences construct meaning from their experiences. Anthropomorphism becomes one of many interpretive frames available to practitioners. Effective interpretation also leverages construal level theory by making abstract conservation concepts concrete and psychologically proximate (Trope & Liberman, 2010). Rather than discussing species preservation in abstract terms (high construal), interpreters ground concepts in immediate, tangible experiences (e.g., a specific animal's behavior, a particular habitat feature) that audiences can directly observe and relate to (low construal), which may involve anthropomorphism as a frame. This movement from abstract to concrete reduces psychological distance and increases personal relevance.

While interpretation increasingly incorporates objective scientific language, the use of storytelling and communication techniques to make the unfamiliar more familiar still facilitates anthropomorphism by enabling audiences to identify with animals as sentient beings. Research suggests such approaches increase visitor engagement and understanding (Moss et al., 2010). The empathetic connections formed through anthropomorphic interpretation have arguably been central to building conservation appreciation. This tension around anthropomorphism in wildlife communication may stem from conflicting principles: interpretation emphasizes emotional connection and storytelling, while wildlife management emphasizes objective study and evidence-based policy. However, even subtle anthropomorphizing can significantly impact human behavior (de Waal, 1999; Epley et al., 2007; Jürgens et al., 2022).

Implications for Wildlife Management Communications

Proactive management consists of strategies implemented to reduce human-wildlife interactions, which typically focus on managing human behaviors (Leong et al., 2016). Managing people, and their behaviors, can be an understandable frustration for a wildlife biologist. Most wildlife management higher education programs offer little, if any at all, training in the social sciences (Manfredo et al., 2019), which is a critical component in creating effective messaging for publics (Leong et al., 2016). With effective communication strategies, human behaviors can be potentially managed, aiding in the prevention of managing animal behavior. Management of animal behavior is considered as a last resort if human behaviors cannot be altered. Management of animals is limited, and difficult management decisions such as relocation, or euthanasia of animals are often surrounded in controversy (Leong et al., 2016). Communication surrounding wildlife management decisions, and objectives, is important for transparency between the managers and publics.

The use of anthropomorphism in communications offers an intriguing opportunity to align preferred human behaviors and wildlife management objectives. Anthropomorphic perceptions have also influenced how animal care practices are presented to the public across wildlife management contexts. In captive wildlife settings, zoos and aquariums have increasingly reframed animal training from entertainment-focused performances to health-focused 'husbandry behaviors' (Fernandez & Martin, 2021). Where animals were historically trained for entertainment, changes in public attitudes have led facilities to focus on training for husbandry techniques that explain to visitors why animals perform behaviors and what they are used for (Fernandez & Martin, 2021). This shift demonstrates how anthropomorphic concerns about animal dignity and purpose directly influence management practices, with facilities recognizing that visitors prefer seeing animals demonstrate natural behaviors rather than 'posed nicely' in artificial scenarios.

As with any other tool, anthropomorphizing has implications for wildlife managers. Potential positive implications include the development of empathy for wildlife (Chan, 2012) and recognition of wildlife as their own beings (Kimmerer, 2013) that deserve respect. Both implications are highlighted in the responses to a viral blogpost depicting the story of a sow (female bear) that lost her cub to a vehicle collision. The use of the anthropomorphic language "grieving mother and her child" (Yosemite Bear Team, 2021) was met with thousands around the world giving their condolences to the sow and calling upon other humans to behave better in

the homes of wildlife. Conversely, individuals who see animals as a part of their community may be opposed to more extreme management tactics like lethal control (Manfredo, 2020), and aversion tactics, which can be necessary for the safety of humans and wildlife.

Across diverse wildlife management contexts, professionals must balance multiple objectives including species conservation, habitat protection, human safety, and stakeholder acceptance of management practices. Management techniques aim to minimize human-wildlife conflicts that could lead to difficult decisions such as animal removal, relocation, or lethal control. Mainly, techniques aim to keep humans and wildlife apart, as human behaviors have been known to contribute to changes in animal behavior (Leong et al., 2016; Murray et al., 2016). Anthropomorphizing can lead to assumptions of tameness of wildlife, which could encourage more individuals to approach wildlife or snap a selfie (Leong et al., 2016). In extreme cases it could lead to the perception of wildlife “needing” assistance from humans. The case of the man in Yellowstone “helping” a bison calf catch up with their herd by placing it in his trunk and driving to find the herd comes to mind; subsequently Park staff euthanized the calf because the herd rejected it.

Benefits of Anthropomorphizing Wildlife

In the past, the act of anthropomorphizing nature was met with much criticism; however, scholars have come to find anthropomorphizing carries with it some benefits, especially when it comes to the promotion of conservation (Whitley et al., 2020). When used appropriately, anthropomorphizing should be encouraged (Chan, 2012) as existing research has shown that it can work to foster pro-conservation behaviors (Tam et al., 2013). Even though anthropomorphism can lead to an overestimation of similarities between humans and animals (de Waal, 1999), the act of making animals more human-like can also increase interest and concern for a species (Batt, 2009). In fact, a positive correlation has been found between the anthropomorphizing of nature and pro-environmental feelings among individuals (Apostol et al., 2013; Williams et al., 2021).

When people feel more connected to nature by way of anthropomorphizing, their behavioral intentions to act in a pro-environmental way, and their feelings towards environmental policies are also strengthened (Williams et al., 2021). Recently, researchers have begun to agree that anthropomorphism can improve the tendency of pro-social behaviors in individuals (Ahn et al., 2014; Yue et al., 2021). Anthropomorphism can even help to improve attitudes and empathy for species seen as non- or less charismatic (Chan, 2012; Wilkinson, 2023), indicating the significance this humanizing technique can hold for a wider range of species, not just a select few.

Anthropomorphism can also facilitate wildlife value shift and attitude changes towards wildlife management practices (Manfredo et al., 2020). The shift in values that typically occurs is from domination, where animals exist for human uses, to mutualism, where animals are a part of the larger community (Manfredo et al., 2020). Anthropomorphism can be a low-cost, but effective tool to engage people in environmental protection behaviors (Tam et al., 2013). While the benefits of anthropomorphizing seem to be extensive, the drawbacks of using this type of portrayal of animals also need to be examined to understand the potential negative implications.

Drawbacks of Anthropomorphizing Wildlife

While it may be tempting to lean on the positive implications of anthropomorphizing non-human entities, it is important to recognize this technique is not suitable for every situation (Yue et al., 2021). Using anthropomorphized animals in communications can spread misleading messages and lead to unpredictable outcomes for humans and wildlife (Grasso et al., 2020). People can begin to focus more on an individual animal, like in the case of P-22, rather than the entire species the messaging is supposed to represent (Grasso et al., 2020). Some research has also pointed out that there is still a lot we do not know about the mechanisms anthropomorphism uses to influence behavioral intentions (Yue et al., 2021).

Another potential drawback to the implementation of anthropomorphism is that being seen as human sometimes entails more than the specific traits associated to a non-human object. The use of anthropomorphism can set up expectations that non-human species should socialize in a human-like way, even though these species are not able to live up to these expectations (Root-Bernstein et al., 2013). Holding non-human species to certain social norms inappropriately can lead to conservation problems as well as a lack of support for conservation efforts (Root-Bernstein et al., 2013). While we may be able to apply human characteristics to any animal, we need to be careful when doing so as this could be irresponsible (Chan, 2012; Grasso et al., 2020). The more we can understand the role that anthropomorphism plays in the relationship between humans and wildlife, the better we can shape conservation actions and effective communications in the future (Manfredo et al., 2020).

We developed a visual aid and guide (see Figure 3) for using anthropomorphic communication with simple examples to help illustrate some recommendations based on a modification of de Waal's (1999) work. These ideas could be meshed with Indigenous approaches to communication and education as well with very careful consideration of audience interpretations that, when not Indigenous, may require additional explanation and some adaptation.

Figure 3

Guide to Anthropomorphizing Wildlife in Communication for Conservation

AVOIDING ANTHROPODENIAL

This reference sheet can be used to help guide anthropomorphic language in communications. Think of this guide in terms of a stop light with, **red signifying stop and reevaluate**, **yellow means to be cautious** and **green is a go!**

ANTHROPODENIAL

Humans are viewed completely separate from nature.

Example messaging: "Sows (female bears) do not grieve their lost cubs, like humans do for their children"

This messaging creates duality between humans and animals, by assuming animals are incapable of feeling similar emotions to humans, which we can not be certain of.

ANTHROPOCENTRIC ANTHROPOMORPHISM

Confusion between humans & animals, by placing human characteristics onto animals.

Example messaging: "A papa bear is also called a boar"

This messaging puts humans in the agent position by using the word "papa", placing assumptions that bears have similar social structures as humans.

ANIMALCENTRIC ANTHROPOMORPHISM

Understanding animals on their own terms.

Example messaging: "Sows (female bears) are fiercely protective of their cubs. From these protective behaviors it is easy to see why people may call their own mothers, mama bear!"

This messaging places animals in the agent position by acknowledging their normal behaviors and then connecting them to human understanding.

 **RECOMMENDED**

Modified from de Waal (1999)

Additional examples of messaging using **anthropodenial**, **anthropocentric anthropomorphism**, and **animalcentric anthropomorphism**

ANTHROPODENIAL

Humans are viewed completely separate from nature.

While Anthropodenial is not commonly used in messaging anymore, it is still important to be aware of what this messaging can do. Creating a dualistic relationship between people and wildlife could cause just as much harm as over anthropomorphizing. The goal of wildlife messaging should be to create positive relationships that result in respect for and understanding of wildlife rather than domination over wildlife.

ANTHROPOCENTRIC ANTHROPOMORPHISM

Confusion between humans & animals, by placing human characteristics onto animals. This comic by Phil Frank demonstrates anthropocentric anthropomorphism through the bears wearing hats and creates an assumption that bears will stop feeding on human food in fear of being "caught" by rangers.



ANIMALCENTRIC ANTHROPOMORPHISM

Understanding animals on their own terms.

This comic created for Yosemite demonstrates animalcentric anthropomorphism through the expressive faces and highlighting a defensive behavior the deer would perform when feeling threatened. This messaging allows humans to identify their own behaviors around wildlife.



Limitations and Areas for Future Research

The literature examining Indigenous knowledge systems and anthropomorphism remains largely theoretical, limiting our ability to provide concrete guidance on how traditional ecological knowledge can inform contemporary wildlife communication strategies. Indigenous approaches to co-stewardship have much to offer, and continued research exploring how Indigenous knowledge systems inform localized communication strategies using culturally relevant anthropomorphisms could guide the development of training programs and co-stewardship policies for wildlife managers. One step in this direction is Indigenous inclusion in studies, where oversampling due to small population size, and qualitative and/or Indigenous methodologies that examine impacts to Indigenous communities would provide data that is useful to Tribes as well as parks and protected areas. Additionally, while we identified anthropomorphism's potential benefits and drawbacks for wildlife management, the scarcity of studies directly measuring people's behavioral outcomes in natural settings constrains our understanding of how anthropomorphic messaging translates into actual conservation behaviors. While the literature demonstrates that audience members tend to positively respond to interpretive practices, future research is needed to understand how the inclusion of anthropomorphism within interpretation experiences facilitates audience attachment to conservation and wildlife management practices within parks and protected areas. Experimental testing of the three forms of anthropomorphism highlighted in our review could provide empirical guidance for practitioners and organizational communication policies. While this review primarily focused on wildlife contexts, future research should examine how these frameworks apply to animal agriculture communication, where similar tensions exist between fostering care and maintaining necessary management practices. Finally, a systematic review of message effects studies examining anthropomorphic communication impacts on attitudes and behaviors in wildlife management contexts is needed to provide more definitive guidance for practitioners.

Conclusion

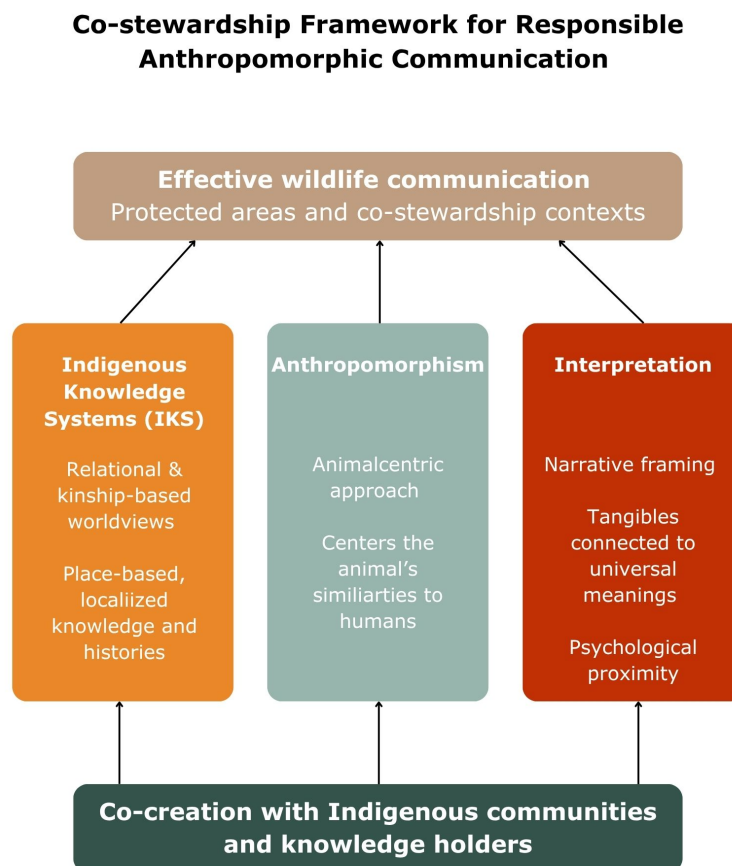
The management of animals, whether wildlife in protected areas, urban environments, captive facilities, or livestock in agricultural systems, and how that management is communicated presents parallel challenges across contexts. Both wildlife managers and agricultural communicators must navigate the complex terrain of human-animal relationships, where anthropomorphism serves as both a powerful tool for engagement and a potential source of complications. Evoking emotions through communication strategies, including narrative and anthropomorphic elements, can lead to positive changes in both conservation and agricultural contexts (Ballantyne et al., 2018; Buckley et al., 2020; Hughes, 2013; Monroe, 2003). Though, there are likely differences that should be examined with additional research.

Our synthesis connects anthropomorphism research with established communication theories: framing theory, narrative persuasion, construal level theory, and the elaboration likelihood model. These theories illuminate that anthropomorphism operates through distinct psychological mechanisms (reduced distance, narrative transportation, dual-route processing) with predictable outcomes. The distinction between anthropocentric (human projection) and animalcentric (recognizing genuine similarities) approaches suggests different persuasive

pathways. This theoretical framework provides practitioners with a foundation for strategic message design grounded in psychological mechanisms. While applied applications remain central to this work, the interconnected nature of wildlife communication in co-stewardship contexts warrants a broader conceptual foundation. Figure 4 presents the Co-stewardship Framework for Responsible Anthropomorphic Communication (CFRAC). CFRAC positions Indigenous co-creation as the foundation. From this foundation, three pillars inform communication practice: IKS—provides relational and place-based understandings of human-animal relationships, animalcentric anthropomorphism—centers the animal’s similarities to humans, and interpretation and education—provides the communicative mechanisms (i.e. narrative framing and psychological proximity) that reach diverse audiences. Collectively, these pillars offer a theoretical framework through which researchers and practitioners can conceptualize the relationships between IKS, responsible anthropomorphic messaging, and communication practice while recognizing that effective communication begins with inclusion of the people most deeply connected to the land and species in question.

Figure 4

Co-Stewardship Framework for Responsible Anthropomorphic Communication



Note. The Co-stewardship Framework for Responsible Anthropomorphic Communication (CFRAC) positions partnership with Indigenous knowledge holders as the foundation for effective wildlife communication in protected areas co-stewardship contexts is designed.

The empirical literature on anthropomorphism reveals patterns that anthropomorphism increases empathy and conservation concern. It also highlights important gaps. Much of the existing research relies on correlational designs or single-species examples, limiting causal inference about anthropomorphism's effects. Additionally, the literature is weighted toward charismatic megafauna, with limited empirical work on less popular species. Studies have not experimentally compared anthropocentric versus animalcentric framing approaches to test whether the theorized differences in message durability hold empirically. These gaps indicate that while the conceptual foundation for anthropomorphism's effects is strong, robust empirical testing of the mechanisms and boundary conditions is needed. Future research should employ experimental designs to test theoretical predictions and expand beyond the typical species and contexts.

If anthropomorphism is to be included in animal communication messages, whether in wildlife, agricultural, or extension contexts, there are ways to implement this approach so that both animals and people benefit (Root-Bernstein et al., 2013). For wildlife managers, interpreters, and agricultural communicators, our synthesis offers several evidence-based recommendations. First, when anthropomorphism is used, emphasize characteristics the animal genuinely possesses rather than projecting human attributes that distort biological reality; this animalcentric approach should produce more durable attitude change and reduce boomerang effects when management actions contradict messages. Second, frame anthropomorphic messages within broader ecological relationships rather than as isolated human-animal bonds to maintain support when individual animals must be removed for population management. Third, when working with Indigenous communities, recognize that their relational approaches to animals represent genuine alternative epistemologies, not simply strategic communication tactics to adopt. Fourth, evaluate message effectiveness beyond immediate emotional response to assess whether anthropomorphic appeals support or undermine long-term conservation goals. These recommendations are grounded in communication theory but require empirical testing across diverse contexts and species to determine optimal approaches for specific management scenarios.

Perspectives from Indigenous cultures and knowledge systems must be considered for both wildlife conservation and agricultural sustainability work. Indigenous peoples have maintained reciprocal relationships with animals across contexts and offer insights through their oral traditions and protocols. Long-term collaboration with local Indigenous communities could aid the creation of effective messaging that includes appropriate anthropomorphism while helping people establish a sense of responsibility toward animals.

Future research should investigate how anthropomorphism can be used alongside communication about larger conservation and agricultural sustainability goals when specific management and stewardship practices may create cognitive dissonance for stakeholders. Understanding these dynamics is crucial for natural resource communicators, agricultural extension professionals, and wildlife managers who must balance scientific accuracy, stakeholder acceptance, and effective engagement across the diverse landscapes where humans and animals interact. The challenges and opportunities identified in wildlife communication contexts offer valuable insights for agricultural and extension communication, just as agricultural communication research can inform wildlife management practices.

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