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Literary paths for posthuman exploration: The emotional contagion of embodied empathy

Abstract:

In posthuman creative writing, narrative techniques that explore non-human and human protagonists may limit the expression of posthuman ideas of dynamic interconnectedness and multispecies agency. Through discussions on how posthuman fiction writing portrays humans, their companion species and their embedded environments, this article investigates narratological devices like anthropomorphism for their ability to preserve the alterity of non-human experience while fostering empathy for companion species in the reader. This article explores new literary pathways for posthuman exploration using emotional contagion, a form of embodied communication. Emotional contagion may assist in the transmission of cross-species empathy to the reader while maintaining an appreciation of alterity in non-human subjectivity. Narrating embodied experience in literature allows an exploration of companion species through comparative experience, appreciating differences and celebrating similarities.

Biographical note:

Shelley-Anne Smith recently completed her doctorate at Deakin University. Her research explores non-human subjectivity using embodied mind studies to investigate the similarities and differences between human and companion species experiences. Her works include contributions to the emergent philosophy of temporal relativism that explores the hypothesis of a metaphysical objective present preceding perception owing to the time required for a body to process incoming stimuli.

Keywords:

Posthuman literature, non-human subjectivity, companion species, emotional contagion, empathy.

Introduction

Narrative techniques in posthuman texts that explore non-human and human protagonists may highlight the tensions between human and companion species relations, and provide avenues towards resolving these tensions. This article examines anthropomorphism and the use of bridging characters, and how these narratological devices may inspire cross-species empathy in the reader. These discussions investigate and address the challenges of respecting the alterity of non-human subjectivity in creative writing using analyses of creative fiction that explore these themes.

Delving into narratives that explore an ontological perspective focusing on embodied experience, this article investigates emotional contagion, which Akinrinade et al. (2023) hypothesise is an “ancestral form of empathy” (p. 1232) and that many “group living species” (p. 1237) experience it. In their study of the contagion of fear in zebrafish, Akinrinade et al. suggests that emotional contagion “enhances social cohesion” (p. 1232), establishes “social bonds” (p. 1232), and allows for the “rapid spread of fear among group members once a threat (e.g. predators) is detected” (p. 1232). Emotional contagion does not include awareness of a separation between the observer and the observed, and in this sense seems to align with posthumanism, where humans are repositioned as part of a dynamic milieu (in this case, of bodies), reliant on relationships for agency (Barad, 2007). This article explores the possibilities of speculative fiction that engages with embedded and embodied experience to encourage emotional contagion in the reader as a pathway towards increased interspecies connection and understanding.

Marchesini (2015) suggests that given the comparative experience of animal embodiment of humans and nonhumans, it is not unreasonable to suspect that companion species life forms may experience biologically comparable events. Scientific settings illustrate embodied similarity. For example, while Flecknell (1994) says that current mechanisms of pain measurement in companion species are insufficient, their research describes how markers of pain are “often based on uncritical anthropomorphic assumptions” (p. 222). These assumptions are based not only on behavioural similarities – for example, the guarding of an injured area – but also on neuronal and hormonal responses and brain activity (Carstens & Moberg, 2000; Descovich et al., 2019; Landa, 2012). These similarities in embodied experience suggest an opportunity to explore the companion species being through comparative experience, to appreciate differences and celebrate similarities, and to shift away from devices that cannot adequately preserve the alterity of non-human experience.

This article explores narratives that use descriptions of human bodies experiencing contemporary companion-species scenarios to promote emotional contagion within the reader, thus acknowledging the alignment of bodily experience and kinship. Analyses of contemporary writing, including Laura Jean McKay’s (2020) *The Animals in That Country* and Eva Hornung’s (2009) *Dog Boy*, reveal how embodied experience in literature may assist in promoting appreciation of non-human subjectivity. This literary venture explores a relational

subjectivity that utilises similarities in bodily experience to highlight the innate value of companion species.

Recognising that humanity exists in a continuum with other occupants of the biosphere, and that both human and non-human animals experience existence through material embodiment, companion species life forms may become “knowledge collaborators” (Braidotti, 2019, p. 49), shifting focus from autopoietic individuals to the relationships with which they are entangled. Repositioning humanity with respect to their companion species through literature requires attention to how stories narrate non-human and human animals and their environments. There are potent possibilities but also potential tensions with several commonly employed narrative devices. Creative writings that embrace the provocation of bodily experienced emotional contagion for the reader is capable of celebrating companion species subjectivity while simultaneously preserving the alterity of companion species experience.

Background

Challenges in non-human–human relations in literature mirrors societal tensions. Companion species are at once best friends and, at the same time, a zoonotic threat; individuals pamper them yet societies slaughter them in their millions (Arcari, 2020). There are inconsistencies with pronoun usage in the English language for non-human animals. Companion species are referred to as ‘that’ or ‘it’ unless there is a relationship between the non-human animal and a human animal – for example, if the companion species animal has a name projected onto them by a human (Krauthamer, 2021, p. 54). Contemporary ontologies of companion species subjectivity may need to be questioned and remade to resolve the relational tensions between humans and non-humans.

Posthuman literature frequently attempts to dislocate the “precarious web of semiotic constructions” (Bennett & Chaloupka, 1993, p. x) and attempts “to create a new vocabulary and to trouble the familiar language” (Jones & Hoskins, 2016, p. 85). Rosi Braidotti (2019) adds that “by highlighting the mechanisms that develop socially empowering images, the literary humanities also have the ability to affect the public’s response” (p. 52) and this may play a role in the transformation of societies and cultures (Price, 2016). Fictional and academic texts have the power to alter social understandings and actions (Lyons & Raynor, 2016). Speculative fabulations may influence societal change by creating spaces where an active estrangement from common significations and normalised behaviours forges something new. As Stengers (2007) says, “we need other kinds of narratives, narratives that populate our worlds and imaginations in a different way” (p. 9). Posthuman literature may benefit from the refinement, questioning and creation of language within speculative fabulation.

Donna Haraway (2016) says: “It matters what stories we tell to tell other stories with” (p. 12). How stories are told may influence how companion species subjectivities are perceived. By shifting narrative descriptions of non-human–human relationships towards a dynamic exploration of interconnectedness, posthuman literature may assist in creating new ways of experiencing companion species. Braidotti (2019) describes posthuman subjectivity as a

“multiplicity of grounded perspectives” (p. 38) within a “distributed model of consciousness” (p. 81) that exist in a “web of multi-layered and multi-scalar relations that co-construct states” (p. 81). Haraway (2016) suggests that humans embrace “tentacular thinking” (p. 30) to create a less “binary division of nature and society” (p. 50). Posthuman relational assemblages have no centre and a dynamic relational web entangles a barely retained sense of the individual. In posthumanism, relationships are the focus of agency, not the individual (Barad, 2007) who is “becoming-with” (Haraway, 2008, p. 98) the interconnectedness of lived experiences.

According to Hayles (1999), “the posthuman subject is an amalgam” and their “boundaries undergo continuous construction and reconstruction” (p. 3). The ‘sometimes’ demarcations between agents are in constant interchange and exist in a dynamic state of dissolution and coalescence. Posthumanism repositions humanity as “embodied and embedded” (Braidotti, 2018, p. 37) within a dynamic environment. In line with these ideas, posthuman material embodiment may provide a framework for literature to remake non-human–human relations through narratives. Focussing on posthuman embodiment and relationships in literature creates possibilities for creating empathy in the reader towards their companion species.

Generating empathy may usher in “new thinking about human relationships with other animals” (Phillips, 2023, p. 255), actively contributing to the discussions surrounding companion species subjectivity. How to encourage it in literature is a “key discussion within cognitive literary studies” (James, 2019, p. 580). Bernaerts et al., (2014) suggest that “narrative empathy” (p. 73) may occur when the reader adopts “the perceptual, emotional, or axiological perspective of a fictional character” (p. 73). Before continuing discussions of how the interconnected, material embodiment of posthumanism may promote empathy in literature, it will be helpful to investigate the challenges of narrative devices that inspire empathy in the reader through alternative ways and highlight why new pathways are desirable.

Empathy

Empathy, as Vincenzo Auriemma (2023) says, is “polysemous” (p. 7). According to Debes (2011), “empathy research is flourishing” (p. 2); de Vignemont and Singer (2006) suggest there are “nearly as many definitions of empathy” as there are researchers exploring empathy (p. 435). Currently, “the concept of empathy is used to refer to a wide range of psychological capacities” (Stueber, 2019). There are neuroscientific indicators of empathy where “studies have shown that observing another person’s emotional state activates parts of the neuronal network involved in processing that same state in oneself” (de Vignemont & Singer, 2006, p. 435).

Empathy is described by Auriemma (2023) as “the ability to place oneself in the emotional condition of another person, so as to understand” their “actions/reactions” (p. 7). Empathy may help to understand another being’s “lived experience” (p. 7) and to identify “with the other person’s situation” (p. 7). Debes (2011) calls empathy a “non-accidental process by which a person or persons come to feel what some other person or persons feel” (p. 2). Amy Coplan (2004) describes empathy as an experience of “psychological states” that are similar or reactive

to another subjective point of view (p. 144). It is usually wrought through an imaginative exercise wherein the perceiver experiences and becomes engaged with the target's experience while still maintaining an understanding of "self-other differentiation" (p. 144).

Perhaps the most helpful definition of empathy for exploring the ontologies of this paper is put forth by de Vignemont and Singer (2006): "There is empathy if: (i) one is in an affective state; (ii) this state is isomorphic to another person's affective state; (iii) this state is elicited by the observation or imagination of another person's affective state; (iv) one knows that the other person is the source of one's own affective state" (p. 435). This "narrower definition of empathy" (p. 435) provides a scaffold to differentiate empathy from other phenomena that are related – for example, "emotional contagion, sympathy, personal distress" and "cognitive perspective-taking" (p. 435). While these concepts may "occur in concert" (Auriemma, 2023, p. 121), they "each refer to a different phenomenon" (p. 121). For example, sympathy is not necessarily isomorphic. Heidi Maibom (2020) describes sympathy as "an emotion experienced by a person A for the wellbeing or plight of another person B. This emotion is rarely like the emotion(s) experienced by B" (p. 16). Sympathy differs from empathy in that sympathy is altruistic in motivation; sympathy indicates a concern for the welfare of another.

Emotional contagion – a concept important to later discussions in this article – does not satisfy the fourth criterion of empathy defined by de Vignemont and Singer (2006), as empathy has a "robust self-other differentiation" (Maibom, 2020, p.8), where emotional contagion does not. A "boundary confusion" (Coplan, 2004, p. 145) occurs and separate identities are lost when experiencing emotional contagion. The perceiver feels the target's experiences as if they are their own. This lack of awareness of "other" creates a potential avenue of exploration for posthuman literature that views interconnections and interdependencies as fundamental. Before addressing emotional contagion in literature, a discussion of the challenges of narratological devices used to create empathy in the reader can help in understanding why this field warrants attention.

Narrative devices for empathy

Anthropomorphism

One narrative technique employed to elicit empathy for companion species is anthropomorphism. Anthropomorphism is a well-discussed topic with many definitions (Tyler, 2003). For example, anthropomorphism may be defined in a "literal sense, to refer to the practice of attributing physical human form to some nonhuman being" (p. 268). It also encompasses attributing "distinctively human activities and attitudes" (p. 268), as well as accrediting "intentionality, purpose, or volition" (p. 269) to a non-human being, whether they might be innately possessed of these features or not. Further, multiple scholars have made attempts to derive specific forms of anthropomorphism. De Waal (1999) identifies anthropocentric anthropomorphism, which imagines nonhumans having human traits. Heuristic anthropomorphism generates hypotheses based on human experience. In other words, heuristic anthropomorphism is identifying "with animals to develop testable ideas" (p. 262).

Portraying a human as a substitute or “a form of analogical thinking” (Westra, 2016, p. 183) of a non-human is called symbolic anthropomorphism. Critical anthropomorphism is a regulative idea, acknowledging the impossibility of anthropomorphism to describe non-human beings (Karlsson, 2011). Though understanding that completely disregarding anthropomorphism can lead to disregarding “animals as living subjects” (p. 711), and for example, applying “mechanomorphism” (p. 707) as an alternative, Karlsson suggests that critical anthropomorphism may be applied to “actively use anthropomorphic projections” (p. 711) for speculative contemplation.

Mithen (1996) suggests that “anthropomorphic thinking” emerged approximately forty thousand years ago, enabling humans to predict “an animal’s behaviour” (p. 161). While it may have assisted early humans to better understand “the minds of their prey” (Atherton et al., 2023, p. 1766), anthropomorphism is now being employed as a creative strategy to negotiate relationships with companion species and to encourage humans to find a greater appreciation of their companion species and their shared natural environments. Anthropomorphism allows for practical and literary explorations of interspecies companionship experiences, inviting “social connection” (p. 1768) that otherwise may not form.

Anthropomorphism is pervasive, revealed in the “literature and orature of most cultures” (Keen, 2007, p. 68), and even with the inherent challenges of exploring subjectivity in alterity that anthropomorphism contains, has “proven difficult to stamp out” (p. 68). Certain examples implement anthropomorphism to discuss non-human–human relations while minimising the erasure of alterity in companion species subjectivity. For example, while anthropomorphising, McKay’s (2020) *The Animals in That Country* uses poetic descriptions for companion species’s communication that are beyond complete comprehension. When the protagonist questions the loyalty of her dingo companion, the dingo’s response is:

“Milk shine. (Leave it for
the pack.) Its
door
is barking” (p. 144).

The broken poetics sometimes seem discernible or at least relatable. For example, the protagonist leaves the dingo in the vehicle to visit her mother. The dingo is left “sucking at the gap in the window of the camper like she’s dying in there” (p. 122), and the dingo reacts with: “This is forever” (p. 122). This narrative allows a broken, confusing communication that remains elusive yet kindred to human experience and creates a space for alterity to exist. McKay minimises anthropomorphism’s tendency to overlook innate differences between humans and their companion species. By undermining and perhaps misrepresenting “the human ‘distinctiveness’ of thought and language” (Phillips, 2023, p. 265), McKay (2020) has highlighted through minimalisation both the kinship and the alterity of humanity’s companion species.

However, anthropomorphism may also be responsible for misrepresenting the alterity of companion species (Caracciolo, 2022; Webb, 2022). Exploring the similarities between companion species and humans through anthropomorphism may result in projections and appropriations that create problematic depictions of non-human animals. Humanity's companion species have displayed abilities that are impossible for a human, and anthropomorphic representation represses opportunities to display these characteristics. For example, companion species may be aware of illness in humans (Wells, 2009) and chimps "have an extraordinary working memory capability for numeral recollection – better even than that of human adults" (Inoue & Matsuzawa, 2007, p. R1004).

Further, the ocular-centricity of humans means other bodily senses crucial to many companion species may be underrated and difficult to explore through literature when the writers do not possess similar abilities. Examples include the sonar employed by bats and dolphins (Au, 1993), the bodily neural networks possessed by octopi (Hochner et al., 2023) or the remarkable olfactory and hippocampi homing abilities of migratory birds (Gagliardo & Bingman, 2024). It is not possible to gather empirical evidence of the experience of companion species to understand what "it is like to *be* that organism" (Nagel 2024, p. 4, emphasis in original).

Without experiencing non-human sensory capabilities, human literature relies upon imagination and extrapolation, unlike the interpolation that is possible with conspecific sensory abilities. Caracciolo (2016) says on this subject: "Literature does not provide tools to validate insights into animal experience—it can only offer imaginary reconstructions whose perceived plausibility reflects the biases (and limitations) of the human imagination" (p. 144). Anthropomorphism potentially limits the exploration of companion species within human parameters (Phillips, 2023; Tyler, 2003).

There is a further challenge of anthropomorphism related to posthumanism, and that is that the concept itself may be erroneous. Anthropomorphism fails to account for the fact that human animals are natural and embodied, and share this experience with their companion species. Behaviours or attributes considered uniquely human and the foundation of anthropomorphism may be *embodied experiences*, not human ones. For example, Ciani et al.'s (2012) research suggests that companion species exhibit social behaviours observable in humans. Suspension over the assumption of human uniqueness means the "notion of anthropomorphism" (Tyler, 2003, p. 276) fails to make sense. Anthropomorphism provides no opportunity for companion species to behave like themselves or for the concept that non-human and human animals behave similarly due to the embodied experience.

As Nemati (2023) relates it is only recently with the rise of cognitive science that companion species "mental entities" have been considered (p. 928). Contemporary scientific research sometimes assumes cognitive function in companion species. "Non-dualistic frameworks" (p. 928) allow the discovery of the similarities and differences in the neural underpinnings of mental states in human and their companion species. "Human and nonhuman animals may be qualitatively different in some higher-level cognitive functions, but there are areas that it is possible to learn about human functions from animal behaviours and vice versa" (p. 930).

Perceiving subjectivity as a uniquely human phenomenon rather than interpreting it as innate to the embodied experience may be a limiting assumption.

Anthropomorphism may have complicated the exploration of subjective capacity in companion species alterity. Evidence continues for companion species subjectivity (Smith, 2023) and “human-centric” (Caracciolo, 2022, p. 127) assumptions of consciousness and subjectivity are no longer valid. It is anthropocentric to assume human animals have a monopoly on subjectivity. Anthropocentric assumptions of subjectivity have hindered exploration into companion species subjectivity in fields other than literature.

An example is the sniff test of self-recognition used by Horowitz (2017) to suggest self-recognition in canines. Human animals deny self-recognition ability in canine animals, who have not performed well in mirror tests of self-recognition that rely on ocular abilities – a sense modality prized by humans. However, canines pass self-recognition tests based on smell, spending more time studying the scents of unknown dogs than their own (Horowitz, 2017). This method of species-specific testing of self-recognition has been neglected until recently, exemplifying the limits of anthropocentrically derived subjectivity investigations such as anthropomorphism in literature.

In the novel *The Animals in That Country*, McKay (2020) writes that “people who anthropomorphise tend not to read cues” (p. 11) and Clarice Lispector writes in *Água Viva* that humanising animals is “an offense” (as cited in Friis, 2016, p. 43). Anthropomorphising animals can limit their capacities to those experienced by humans and diminish their innate value. For example, in the novel *Only the Animals* by Ceridwen Dovey (2015), the dead souls of animals relate their lives in a series of short stories. The life experiences of the companion species protagonists imitate the wishes and goals of humans. For example, in the chapter titled “Somewhere Along the Line the Pearl Would be Handed to Me”, the blue mussels Gallos and Muss discuss the “sadness of these throwaway things” (p. 101) when discussing human pollution. While anthropomorphic excursion may help develop reader empathy for their companion species, it can also be limiting.

Anthropomorphism can present challenges when used as a veil to acquaint the reader with the mindset of the author rather than portray the distinctness of companion species being. Helen Garner’s (2016) short story, “Red Dog: A Mutiny”, discusses a protagonist who looks after a relative’s dog and during that time develops a habit of taking the dog for an unleashed walk to the park. When the protagonist breaks from this routine and instead uses a leash, the dog reacts, according to the protagonist, by bursting “into a rage” (p. 80). The red heeler grasps hold of the leash and bites the protagonist in the ensuing tug of war. The protagonist’s interpretation of the dog’s reaction anthropomorphises the dog, assuming that the dog is “angry” (p. 80) and “that somewhere in his wild dog’s heart, he secretly despises” the protagonist (p. 81). However, there are multiple interpretations of the dog’s behaviour. For example, Rooney and Bradshaw (2002) suggest that tug of war in canines is associated with a high play drive and is considered a relationship-building activity. The protagonist’s interpretation relegates the canine, the unnamed red dog, to a “backdrop ontology” (Sloterdijk, 2015, p. 334). In this case,

anthropomorphising the dog's behaviour creates a dog who has become a reflection of the feelings of the human protagonist rather than a subject in possession of innate value.

Similarly, *The Animals in That Country* (McKay, 2020) anthropomorphises animals through dialogue. In the novel, companion species communicate using their bodies, scents and movements, translating to the protagonist as broken poetic phrases (Phillips, 2023). While this approach appreciates alterity in companion species experience, McKay (2020) uses it didactically to turn an accusing eye on human behaviour, a circumstance that positions humans as central to the text. For example, cows in a paddock call to the protagonist:

“I
know that
face.
It holds
children. Where
are they” (p. 192).

The protagonist thinks “their bodies make pictures that gets inside my bones until I’m half cow with skin shivers and nose chatters, pregnant again and again” (McKay, 2020, p. 193). The animals in the story also become involved in human-centred values – for example, Sue the dingo assists the protagonist in locating her lost family. Centralising humans is not always the case as sometimes the encountered animals have their own agendas – for example, Sue leaves the protagonist to search for a mate. While minimising anthropomorphic challenges, the book centralises humans and their concerns. The cows are accusatory, and the dingo is helpful (for the most part).

Anthropomorphism and didacticism may be balanced by descriptions of physical characteristics and minimisation of internal dialogues with the intention of limiting problematic depictions of non-humans (Phillips, 2023). There is an ongoing need for literature to embrace alterity in companion species; to empathise with companion species without humanising them (Haraway, 2008; Idema, 2016). Appreciating alterity is not about “fencing off” (Idema, 2016, p. 61) humans from their companion species. Instead the challenge is to reposition the human animal as “continuous with” (Friis, 2016, p. 51), or at least contiguous with their companion species, and not to co-opt non-human beings into humanity.

In truth, any “written figurations of animal consciousness” (James, 2019, p. 587) are innately anthropomorphic. Writing about non-humans in English, for example, is a human animal representing a companion species through a species-specific medium, “a voice speaking *for* the animal” (Vint, 2008, p. 179, emphasis in original) – a description of companion species that this article seeks to address. Although engaging with anthropomorphism is a reminder of the solipsistic nature of human writing, it also demonstrates human interest in exploring their companion species and this narrative exploration may shift beyond anthropomorphism.

Bridging characters

Erin James (2019) asks if it is possible to “inspire care for real-world nonhuman subjects” (p. 582) without anthropomorphism and its challenges. Some writers have chosen to use bridge characters – usually human – who foster concern for their companion species. Bridge characters invariably feel “deep love and compassion” (p. 583) for the companion species characters and express this to the reader through “an abundance of textual cues” (p. 583), which often focus on the physical and behavioural characteristics of the companion species. Bridge characters are examples of an “altruistic ethics of care in action” (p. 595) allowing readers to experience their perspective.

This technique is used in *Dog Boy* about a boy, Romochka, raised by a pack of feral dogs (Hornung, 2009). Through Romochka’s narration, the reader may share his love of the dogs who constitute his family. When Romochka is watching his dog family, he sees “them curious, delighted, intrigued, doubtful, frightened, worried, elated” (p. 45). They are his siblings who “pressed into his body, night after night, White Sister moulded herself to fit Romochka, to fit not just his body but his moods and thoughts” (p. 23).

However, there are challenges with bridging characters in posthuman literature including the necessary distancing from the companion species that this narrative device entails. The bridge character may evoke empathy at the expense of distancing the reader from the empathy’s focus. The bridging character provides a vicarious experience, potentially operating in tension with the philosophies of interfused, interspecies, dynamic, lived experiences consistent with posthumanism. The following discussions broach this subject and explore ways that literature can foster empathy in the reader for companion species while respecting their alterity and approaching the interconnected lived experiences of the posthuman subject.

Emotional contagion

As discussed, texts investigating companion-species appreciation and awareness employ strategies to increase empathy. In this article’s definition of the term – drawn from de Vignemont and Singer’s (2006) – empathy relies on awareness of otherness as a core component: “(iv) one knows that the other person is the source of one’s own affective state” (p. 435). This aspect of empathy could work in antipathy to the appreciation of the dynamic entanglement explored and created in posthuman literature. Emotional contagion, a “sister” of empathy (Auriemma, 2023, p. 120), is a communicative exchange that has the distinguishing feature of not recognising the other and, as a form of embodied communication, may be suited to explorations of non-human–human relations in a posthuman context.

Akinrinade et al. (2023) say emotional contagion is “phylogenetically ancient” (p. 1232), occurring early in evolution – it has been observed in several species (Akinrinade et al., 2023; Huber et al., 2017; Parr, 2001; Zhang et al., 2023). Maibom (2020) calls emotional contagion “an affective reaction that is largely consonant with that of the other person” (p. 51). Emotional contagion is “broadly defined as the emotional state-matching of a subject with another” (Pérez-Manrique & Gomila, 2022, p. 1) and it includes changes in the “neurophysiological, cognitive, and behavioural” (p. 1) aspects of the perceiver. As an automatic process, emotional

contagion is not “cognitively demanding” (p. 2). Emotional contagion differs from empathy in that the experienced emotions are synonymous with that of the perceiver. There is no recognition of a “foreign consciousness” (Stein, 1989, p. 27); there is no discrimination between the feelings of the perceiver and the target (Coplan, 2004; Evli, 2023).

Along with the unfamiliarity of the origin of the emotion, emotional contagion is also thought to be largely involuntary (Coplan, 2004). De Waal (2021) says: “Empathy rests on subconscious body-to-body connections over which we exert little control” (p. 180). Empirical brain activation studies have revealed that “our brain–body systems are equipped with a pre-rational, non-introspective process” (Gallese, 2011, p. 197). It works to map “the sensory description of others’ actions, emotions, and sensations onto the perceiver’s own motor, visceromotor, and somatosensory representations of those actions, emotions, and sensations” (p. 197). There is a mirrored physical response in the perceiver when emotional contagion occurs. In other words, the bodily reactions in the perceiver, including the hormones released during emotional contagion, are difficult to differentiate from those of the perceived (Akinrinade et al., 2023).

Human babies in maternity wards display emotional contagion. De Waal (1996) says: “Infants seem to ‘lose’ themselves in collectives of agony, joy, and sleepiness” (p. 80). Sagi and Hoffman’s (1976) experiments showed that day-old infants “exposed to a newborn cry cried significantly more often than those exposed to silence” (p. 175), potentially signifying “a rudimentary empathic distress reaction at birth” (p. 176). Considered “crucial for many social species” (Pérez-Manrique & Gomila, 2022, p. 1), emotional state-matching can aid group cohesion and promote the dissemination of knowledge of a threat (Akinrinade et al., 2023). Emotional state-matching also reduces stress, rebuilds relationships after combative interactions and interestingly marks “others as similar to self” (Pérez-Manrique & Gomila, 2022, p. 2).

These discussions define mimicry as the “action, practice, or art of copying or closely imitating” (Oxford English Dictionary, n.d.), and it is a process “distinct” from emotional contagion (Auriemma, 2023, p. 123). For example, it is possible to mimic behaviour without involving an “affective response” (Maibom, 2020, p. 52). However, there is a “strong overlap” (Auriemma, 2023, p. 122). For example, Hatfield et al. (1993) define emotional contagion as a “tendency to automatically mimic and synchronize expressions, vocalisations, postures, and movements with those of another person’s” (p. 96). Palagi et al. (2015) suggest “that rapid and automatically evoked facial mimicry may be one of the mechanisms for the occurrence of emotional contagion” (p. 2). Known as the “facial feedback hypothesis”, Maibom (2020) agrees, suggesting that “mimicry is the first step towards emotional contagion” (p. 52). Auriemma (2023) continues this discussion suggesting that these combined aspects may create a “cascade of events” (p. 125) that contribute to self-realised empathy.

Body language transmits emotional contagion through mimicry. In rodents, a still posture – or “freezing” (Hernandez-Lallement et al., 2022, p. 1231) – is a standard measure for observing emotional contagion. As primates are ocular-centric, facial expressions like “open-mouth face”

are “likely to convey positive emotions across social partners” (Davila et al., 2008, p. 27). With emotional contagion, “the distinction between what we and others feel isn’t terribly clear” (Young, 2017, p. 32). Embodied emotional contagion resonates with the posthuman experience that denotes a continual dynamic interaction, where self and “other” hardly exist as their boundaries are in a constant state of dissolution and coalescence. Because the concept of emotional contagion involves “subconscious body-to-body connections” (de Waal, 2021, p. 180) and lacks self-differentiation, its invocation may be suitable for “embodied and embedded” (Braidotti, 2018, p. 37) empathic explorations of companion species in posthuman literature.

Narrative devices for emotional contagion

There may be a need for further research into emotional contagion in literature. This lacuna may be present due to the “methodologically challenging” (Denham, 2024, p. 89) detection and measurement of “elusive” affective states (p. 89). More recently, this absence of data is being addressed primarily due to the advent of digital intelligence (Denham, 2024), as studies have shown that digital intelligence “with high emotional mimicry and empathic concern” (Liu et al., 2024, p. 703) correlates with “continuous usage intention” among humans (p. 73).

Posthumanism may intersect with emotional contagion through an absence of self-other differentiation and materiality. Haraway’s (2003; 2016) research often legitimises the agency of companion species through discussions on the capacities of non-human bodies, and this article continues this focus through the exploration of embodied subjectivity. Haraway (2016) says that “matter is never ‘mere’ medium” (p. 120) and that matter is powerful and a “generatrix of things” (p. 120). Haraway calls it the “source, ground, flux, reason, and consequential stuff” (p. 120). Through embodied cognition, matter can create an opportunity to discuss and explore collective existence and illustrate a foundational kinship of companion species.

By focussing on structures that highlight physicality, the writing may explore affinities with species who share space. Despite narration being a fundamentally cognitive procedure (James, 2019), some studies show that the written word may inspire emotional contagion (Gallese, 2011). In digital media, there is “experimental evidence for massive-scale contagion via social networks” (Kramer et al., 2014, p. 8788; Isabella & Carvalho, 2016). Gallese (2011) used neuroimaging to demonstrate that narrative – read or heard – effectively provokes the physical aspects of emotional contagion described above. Gallese explains: “When indulging in visual or mental motor imagery, we reuse our visual or motor neural apparatus to imagine things and situations we are not actually perceiving or doing” (p. 198). Founded in bodily experience, narratives that attempt to evoke mimicry and emotional contagion in the reader may be efficacious in exploring the construed estrangement between humans and their companion species.

Identification

“Emotional identification” (Roza & Guimarães, 2022, p. 11) of the reader with the protagonist is often the aim of the following narrative suggestions. Busselle & Bilandzic (2009) define

identification as the “adopting of the perspective and emotions of a character” (p. 338). Gholamain (1998) suggests that “when we identify with fictional characters, as in real life identifications, we internalise the character’s attributes, we establish emotional ties with them” (p. 5). Identification may effect the emotional involvement of the reader. By studying the “connections between aesthetic distance, attachment type and reader response” (Kerr 2005, p. ii), Kerr “found that those who identified most strongly with main characters recorded significantly more emotions in the course of reading” (p. 123).

Shared, but not equivalent

As discussed earlier, posthuman creative writing involves a human animal representing a non-human through a species-specific medium. While this anthropocentric aspect is difficult to overcome, it can be challenged and mitigated. As “embodiment is shared, but not equivalent” (Webb, 2022, p. 89), there is potential in describing human bodies experiencing events usually reserved for humanity’s companion species. This body swap provides the reader with similar features to identify with and mimic while preserving the alterity of companion species. Using human characters and bodies to experience companion species events can be an effective and affective way to elicit emotional contagion, while at the same time accepting and appreciating the alterity of non-humans. By placing humans in situations usually experienced by their companion species, the opportunity is presented to “represent the ‘mute interests’ of nonhuman entities” (Magaña, 2022, p. 671) without attempting to subsume companion species life “under human categories” (Caracciolo, 2022, p. 133).

Hornung (2009) explores the possibilities of this literary venture in *Dog Boy*, which frequently describes the body of a human animal performing canine acts. For example, Puppy – a second, younger human child who begins living with the dog family – bowls Romochka “over when Romochka squatted down, wriggled onto his lap and off again, and then raced around and around him in tight circles” (p. 210). *Dog Boy* also uses the human body to share physical, visual and audio cues that may stimulate emotional contagion. For example, Romochka “yelped in unfeigned terror, sharp and loud” (p. 258) and “pushed him [Puppy] down and over, growling nastily, and Puppy lay completely still, eyes almost closed, body braced passively, ready to receive whatever punishment Romochka wished to inflict” (p. 151–152). This approach draws aside the veil of canine embodied experience without disturbing the unknowability of companion species subjectivity. It provides insight into the embodied experience of communication that is not limited to vocal ability, but part of a broader conversation experienced by and available to all members of organic lived experiences. Using human bodies to describe experiences of humanity’s companion species allows for a fluent exploration of embodied communication in literature and through emotional contagion, promotes kinship while simultaneously preserving the alterity of companion species being.

Body description

One suggested technique to increase the likelihood of identification and thus the transmission of emotion in literature is the use of “nonverbal signals” (Liu et al., 2022, pp. 706). This includes detailed descriptions of voice, body language and facial expressions that may induce

mimicry in response (Caracciolo, 2022). Hornung (2009) employs body language to portray the protagonist's emotions to the reader when Romochka is separated from his dog family and sequestered in a guarded and locked room. The physical description of his experience is detailed: "This unrecognizable Romochka snarled and shook himself from side to side. The pale face was twisted, his teeth prominent in an animal grimace, his body held low in an inhuman form" (p. 285). Further description includes the protagonist's "tear-stained cheeks, bared teeth and wild eyes" (p. 285). Writing detailed body descriptions conveys to the reader the emotions of the protagonist without explicitly naming them and demonstrates potential for the transmission of emotional contagion.

Emotional description

Evoking the reader's sensory associations by employing emotive words and actions can be effective (Cook et al., 2023). In *Dog Boy*, the poisoning of the matriarch of Romochka's dog pack is an example of emotive word use (Hornung, 2009). Romochka has "his arms around her neck, his mouth open, but he cannot hear himself. Her faint whimper comes from far away, up in the sky. He holds her chest to his chest" (p. 267). Emotional writing invites the reader to share the emotional actions of the protagonist and may assist in creating a pathway for emotional contagion. To further this potential, including "narrative conflict" (Cook et al., 2023, p. 1303), suspense or thrilling elements provides opportunities for the reader to experience and identify with the emotional and physical interactions between the characters. For example, in *The Animals in That Country* (McKay, 2020), the protagonist fights with her ex-lover and must defend her dingo companion (pp. 192-194). Though brief, the heightened intensity of the scene invites the reader to share concern for the wellbeing of the dingo.

Personal perspective

Implementing a personal perspective such as first person or limited third person point of view can increase intimacy and the likelihood of triggering emotional contagion (Caracciolo, 2016). Orson Scott Card insists that it is a mistake to write in the first person present as this is not how humans communicate (Writers & Illustrators of the Future, 2024). First person progressive or past tense is employed when speaking or telling a story – for this reason, Card says to avoid first person present storytelling. While speech is not first person present, thoughts usually are, and this way of storytelling may generate emotional identification for the reader (Bortolussi & Dixon, 2003; Denham, 2024; Kerr, 2005). Writing in this tense minimises, as much as is feasible, the levels of separation between the protagonist and the reader. This perspective enhances the opportunities for mimicry and exploration of emotional contagion through descriptions of the embodied experience. While further research is necessary on the topic of emotional contagion in literature, several narrative techniques seem to possess qualities that can enhance the emotional engagement for the reader.

Conclusions

The posthuman literary explorations in this article focus on communicating empathy to the reader for their companion species. By examining narratological devices that can assist in the development of empathy, this article highlights their inherent biases and offers new pathways

for exploring companion species lived experiences. Narrative techniques that create a conceptual separation of humanity from their environments and companion species may limit philosophical enquiry. While anthropomorphising has its place in exploring non-human–human animal relations, there are challenges with its usage. The alterity of companion species experience needs to be upheld in interspecies discussions, both to assist in the better understanding of companion species and to apply pressure on anthropocentric systems of perception. This article acknowledges the concomitant challenges with specific narratological devices like anthropomorphism, exploring the preservation of the alterity of non-human subjectivity in literature.

Creating opportunities for the reader to experience emotional contagion by employing narratological devices and embodied experience suits a posthuman ontology that seeks to express the continuity of lived experiences. By creating a narrative that inspires emotional contagion through bodily experience, writers can embrace and explore the dynamic interactions of posthuman interconnectedness while respecting the unknowable alterity of companion species subjectivity. The purpose of such writing is not to devalue humans with regard to their companion species but to utilise emotional contagion – an “ancestral form of empathy” (Akinrinade et al., 2023, p. 1232) – which does not differentiate between self and other, and may create a nuanced discomposure of long-embedded anthropocentric biases. These techniques support an ontological and epistemological shift toward interconnected, lived experiences with kindred companion species.

Literature that engages with these concepts, both fictional and academic, can alter social understandings and actions. Speculative fiction is an experimental field that may provide a platform “to create a new vocabulary and to trouble the familiar language” (Jones & Hoskins, 2016, p. 85) through affective exploration. This article aims to locate pathways for posthuman storytelling beyond anthropomorphism that promote new understandings and appreciation of humanity’s companion species.

References

- Akinrinade, I., Kareklas, K., Teles, M. C., Reis, T. K., Gliksberg, M., Petri, G., Levkowitz, G., & Oliveira, R. F. (2023). Evolutionarily conserved role of oxytocin in social fear contagion in zebrafish. *Science*, 379(6638), 1232–1237. <https://doi.org/10.1126/science.abq5158>
- Arcari, P. (2020). *Making Sense of ‘Food’ Animals: A Critical Exploration of the Persistence of ‘Meat’*. Palgrave Macmillan.
- Atherton, G., Piovesan, A., & Cross, L. (2023). Autism, pets, and the importance of seeing human. *Autism Research*, 16(9), 1765–1774. <https://doi.org/10.1002/aur.2975>
- Au, W. L. (1993). *The Sonar of Dolphins*. Springer. <https://link.springer.com/book/10.1007/978-1-4612-4356-4>

- Auriemma, V. (2023). *Empathy: The Contribution of Neuroscience to Social Analysis*. Palgrave Macmillan. <https://doi.org/10.1007/978-3-031-38860-6>
- Barad, K. M. (2007). *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Duke University Press.
- Bennett, J., & Chaloupka, W. (Eds.). (1993). *In the Nature of Things: Language, Politics, and the Environment*. University of Minnesota Press.
- Bernaerts, L., Caracciolo, M., Herman, L., & Vervaeck, B. (2014). The Storied Lives of Non-Human Narrators. *Narrative*, 22(1), 68–93. <https://doi.org/10.1353/nar.2014.0002>
- Bortolussi, M., & Dixon, P. (2003). *Psychonarratology: Foundations for the Empirical Study of Literary Response*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511500107.010>
- Braidotti, R. (2018). A Theoretical Framework for the Critical Posthumanities. *Theory, Culture and Society*, 36(6), 31–61. <https://doi.org/10.1177/0263276418771486>
- Braidotti, R. (2019). *Posthuman Knowledge*. Polity.
- Busselle, R., & Bilandzic, H. (2009). Measuring Narrative Engagement. *Media Psychology*, 12(4), 321–347. <https://doi.org/10.1080/15213260903287259>
- Caracciolo, M. (2022). Animals squawking their mysteries: Narrative, poetic form, and the nonhuman in Laura Jean McKay's *The Animals in That Country*. *English Text Construction*, 15(2), 118–137. <https://doi.org/10.1075/etc.00053.car>
- Caracciolo, M. (2016). *Strange Narrators in Contemporary Fiction: Explorations in Readers' Engagement with Characters*. University of Nebraska Press.
- Carstens, E., & Moberg, G. P. (2000). Recognizing Pain and Distress in Laboratory Animals. *ILAR Journal*, 41(2), 62–71. <https://doi.org/10.1093/ilar.41.2.62>
- Ciani, F., Dall'Olio, S., Stanyon, R., & Palagi, E. (2012). Social tolerance and adult play in macaque societies: a comparison with different human cultures. *Animal Behaviour*, 84(6), 1313–1322. <https://doi.org/10.1016/j.anbehav.2012.09.002>
- Cook, A. M., Klin, C. M., & Westerman, D. L. (2023). Surviving with story characters: What do we remember? *Memory & Cognition*, 51, 1303–1316. <https://doi.org/10.3758/s13421-022-01391-2>
- Coplan, A. (2004). Empathic Engagement with Narrative Fictions. *The Journal of Aesthetics and Art Criticism*, 62(2), 141–152. <https://doi.org/10.1111/j.1540-594X.2004.00147.x>
- Debes, R. (2001). Editor's Introduction. *The Southern Journal of Philosophy: Spindel Supplement*, 49, 1–3. <https://www.proquest.com/docview/992930044/fulltextPDF/434D4B85F8B443C0PQ/1?accountid=10445&sourcetype=Scholarly%20Journals>

- Denham, A. E. (2024). Empathy & Literature. *Emotion Review*, 16(2), 84–95.
<https://doi.org/10.1177/17540739241233601>
- Descovich, K. A., Richmond, S. E., Leach, M. C., Buchanan-Smith, H. M., Flecknell, P., Farningham, D. A. H., Witham, C., Gates, M. C., & Vick, S. (2019). Opportunities for refinement in neuroscience: Indicators of wellness and post-operative pain in laboratory macaques. *ALTEX: Alternatives to Animal Experimentation*, 36(4), 535–555. <https://doi.org/10.14573/altex.1811061>
- de Vignemont, F., & Singer, T. (2006). The empathic brain: how, when and why? *Trends in Cognition Science*, 10(10), 435–441. <https://doi.org/10.1016/j.tics.2006.08.008>
- de Waal, F. B. M. (1996). *Good Natured: The Origins of Right and Wrong in Humans and Other Animals*. Harvard University Press.
- de Waal, F. B. M. (1999). Anthropomorphism and Anthropodenial: Consistency in Our Thinking about Humans and Other Animals. *Zoological Philosophy*, 27(1), 255–280. <https://doi.org/10.5840/philtopics199927122>
- de Waal, F. B. M. (2021). Empathy, the umbrella term. *Neuroscience and Biobehavioral Reviews*, 129, 180–181. <https://doi.org/10.1016/j.neubiorev.2021.07.034>
- Dovey, C. (2015). *Only the Animals*. Penguin Group Australia.
- Evli, M. (2023). Compassion Fatigue, Empathy, and Emotional Contagion in Nursing Students. *Journal of Education and Research in Nursing*, 20(2), 105–110. <https://doi.org/10.14744/jern.2021.833127>
- Flecknell, P. A. (1994). Refinement of animal use-assessment and alleviation of pain and distress. *Laboratory Animals*, 28(3), 222–231. <https://doi.org/10.1258/002367794780681660>
- Friis, E. (2016). In my Core I have the Strange Impression that I don't Belong to the Human Species: Clarice Lispector's *Água viva* as Life Writing. In S. Herbrechter & E. Friis (Eds.), *Narrating life – Experiments with Human and Animal Bodies in Literature, Science and Art* (pp. 33–55). Brill/Rodopi. https://doi.org/10.1163/9789004312074_004
- Gagliardo, A., & Bingman, V. P. (2024). The avian olfactory system and hippocampus: Complementary roles in the olfactory and visual guidance of homing pigeon navigation. *Current Opinion in Neurobiology*, 86, Article 102870. <https://doi.org/10.1016/j.conb.2024.102870>
- Gallese, V. (2011). Embodied Simulation Theory: Imagination and Narrative. *Neuropsychoanalysis*, 13(2), 196–200. <https://doi.org/10.1080/15294145.2011.10773675>
- Garner, H. (2016). *Everywhere I Look*. The Text Publishing Company.

- Gholamain, M. (1998). *The attachment and personality dynamics of reader response* [Unpublished doctoral dissertation]. University of Toronto.
<https://www.collectionscanada.ca/obj/s4/f2/dsk2/ftp02/NQ35160.pdf>
- Haraway, D. J. (2003). *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. Prickly Paradigm Press.
- Haraway, D. J. (2008). *When Species Meet*. University of Minnesota Press.
- Haraway, D. J., & Kenney, M. (2015). Anthropocene, Capitalocene, Chthulucene. In H. Davis & E. Turpin (Eds.), *Art in the Anthropocene: Encounters Among Aesthetics, Politics, Environments and Epistemologies*, (pp. 255–270). Open Humanities Press.
- Haraway, D. J. (2016). *Staying with the Trouble: Making Kin in the Chthulucene*. Duke University Press.
- Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1993). Emotional Contagion. *Current Directions in Psychological Science*, 2(3), 96–100. <https://doi.org/10.1111/1467-8721.ep10770953>
- Hayles, N. K. (1999). *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. University of Chicago Press.
- Hernandez-Lallement, J., Gómez-Sotres, P., & Carrillo, M. (2022). Towards a unified theory of emotional contagion in rodents—A meta-analysis. *Neuroscience and Biobehavioral Reviews*, 132, 1229–1248.
<https://doi.org/10.1016/j.neubiorev.2020.09.010>
- Hochner, B., Zullo, L., Shomrat, T., Levy, G., & Nesher, N. (2023). Embodied mechanisms of motor control in the octopus. *Current Biology*, 33(20), R1119–R1125.
<https://doi.org/10.1016/j.cub.2023.09.008>
- Hornung, E. (2009). *Dog boy*. The Text Publishing Company.
- Horowitz, A. (2017). Smelling themselves: Dogs investigate their own odours longer when modified in an “olfactory mirror” test. *Behavioural Processes*, 143, 17–24.
<https://doi.org/10.1016/j.beproc.2017.08.001>
- Huber, A., Barber, A. L. A., Faragó, T., Müller, C. A., & Huber, L. (2017). Investigating emotional contagion in dogs (*Canis familiaris*) to emotional sounds of humans and conspecifics. *Animal Cognition*, 20(4), 703–715. <https://doi.org/10.1007/s10071-017-1092-8>
- Idema, T. (2016). Species encounters: O. Butler meets Haraway meets Deleuze and Guattari. In S. Herbrechter & E. Friis (Eds.), *Narrating life – Experiments with Human and Animal Bodies in Literature, Science and Art*, (pp. 55–72). Brill.
https://doi.org/10.1163/9789004312074_005
- Inoue, S., & Matsuzawa, T. (2007). Working memory of numerals in chimpanzees. *Current Biology*, 17(23), R1004–R1005. <https://doi.org/10.1016/j.cub.2007.10.027>

- Isabella, G., & Carvalho, H. C. (2016). Chapter 4 – Emotional Contagion and Socialization: Reflection on Virtual Interaction. In S. Y. Tettegah & D. L. Espelage (Eds.), *Emotions, Technology, and Behavior*, 63–82. Elsevier. <https://doi.org/10.1016/B978-0-12-801873-6.00004-2>
- James, E. (2019). Nonhuman Fictional Characters and the Empathy-Altruism Hypothesis. *Poetics Today*, 40(3), 579–596. <https://doi.org/10.1215/03335372-7558164>
- Jones, A., & Hoskins, T. K. (2016). A Mark on Paper: The Matter of Indigenous–Settler History. In C. A. Taylor & C. Hughes (Eds.), *Posthuman Research Practices in Education*, 75–92. Palgrave Macmillan. https://doi.org/10.1057/9781137453082_6
- Karlsson, F. (2011). Critical Anthropomorphism and Animal Ethics. *Journal of Agricultural and Environmental Ethics*, 25, 707–720. <https://doi.org/10.1007/s10806-011-9349-8>
- Keen, S. (2007). *Empathy and the Novel*. Oxford University Press.
- Kerr, A. (2005). *Towards a therapeutics of reading literature: The influence of aesthetic distance and attachment* [Unpublished doctoral dissertation]. University of Toronto. <https://www.proquest.com/pqdtglobal/docview/305368032?sourcetype=Dissertations%20&%20Theses>
- Kramer, A. D. I., Guillory, J. E., & Hancock, J. T. (2014). Experimental evidence of massive-scale emotional contagion through social networks. *Proceedings of the National Academy of Science: Psychological and Cognitive Sciences*, 111(24), 8788–8790. <https://doi.org/10.1073/pnas.1320040111>
- Krauthamer, H. S. (2021). *The Great Pronoun Shift: The Big Impact of Little Parts of Speech*. Routledge.
- Landa, L. (2012). Pain in domestic animals and how to assess it. *Veterinární Medicina*, 57(4), 185–192. https://vetmed.agriculturejournals.cz/artkey/vet-201204-0003_pain-in-domestic-animals-and-how-to-assess-it-a-review.php
- Liu, W., Zhang, S., Zhang, T., Gu, Q., Han, W., & Zhu, Y. (2024). The AI empathy effect: a mechanism of emotional contagion. *Journal of Hospitality Marketing & Management*, 33(6), 703–734. <https://doi.org/10.1080/19368623.2024.2315954>
- Lyons, R. E., & Rayner, S. J. (2016). *The Academic Book of the Future*. Palgrave Macmillan.
- Magaña, P. (2022). The Political Representation of Nonhuman Animals. *Social Theory and Practice*, 48(4), 665–690. <https://doi.org/10.5840/soctheorpract2022811171>
- Maibom, H. (2020). *Empathy*. Routledge.
- Marchesini, R. (2015). Against Anthropocentrism: Non-human Otherness and the Post-human Project. *Nanoethics*, 9(1), 75–84. <https://doi.org/10.1007/s11569-015-0220-7>
- McKay, L. J. (2020). *The Animals in That Country*. Scribe Publications.

- Mithen, S. (1996). *The Prehistory of the Mind: A Search for the Origins of Art, Religion, and Science*. Thames and Hudson.
- Nagel, T. (2024). *What Is It Like To Be a Bat?* Oxford University Press.
- Nemati, F. (2023). Anthropomorphism in the Context of Scientific Discovery: Implications for Comparative Cognition. *Foundations of Science*, 28(3), 927–945. <https://doi.org/10.1007/s10699-021-09821-1>
- Oxford English Dictionary. (n.d.). Mimicry. In *Oxford English Dictionary*. Retrieved January 27, 2025. <https://www.oed.com/search/dictionary/?scope=Entries&q=mimicry>
- Palagi, E., Nicotra, V., & Cordoni, G. (2015). Rapid mimicry and emotional contagion in domestic dogs. *Royal Society Open Science*, 2(12), Article 150505. <https://doi.org/10.1098/rsos.150505>
- Parr, L. A. (2001). Cognitive and physiological markers of emotional awareness in chimpanzees (*Pan troglodytes*). *Animal Cognition*, 4, 223–229. <https://doi.org/10.1007/s100710100085>
- Pérez-Manrique, A., & Gomila, A. (2022). Emotional contagion in nonhuman animals: A review. *WIREs Cognitive Science*, 13(1), Article e1560. <https://doi.org/10.1002/wcs.1560>
- Phillips, J. (2023). Proximities and Cross-Species Empathies in Laura Jean McKay's *The Animals in That Country*. *Narrative*, 31(3), 255–272. <https://doi.org/10.1353/nar.2023.a908401>
- Price, K. (2016). Academic Libraries and Academic Books: Vessels of Cultural Continuity, Agents of Cultural Change. In R. E. Lyons & S. J. Reyner (Eds.), *The Academic Book of the Future* (pp. 74–82). Palgrave Macmillan.
- Rooney, N. J., and Bradshaw, J. W. S. (2002). An experimental study of the effects of play upon the dog–human relationship. *Applied Animal Behaviour Science*, 75(2), 161–176. [https://doi.org/10.1016/S0168-1591\(01\)00192-7](https://doi.org/10.1016/S0168-1591(01)00192-7)
- Ross, M. D., Menzler, S., & Zimmermann, E. (2008). Rapid facial mimicry in orangutan play. *Biology Letters*, 4(1), 27–30. <https://doi.org/10.1098/rsbl.2007.0535>
- Roza, S. A., & Guimarães, S. R. K. (2022). The relationship between reading and empathy: An integrative literature review. *Psicologia: Teoria e Prática*, 24(2), 1–18. https://www.researchgate.net/publication/361623434_The_relationship_between_reading_and_empathy_An_integrative_literature_review
- Sagi, A., & Hoffman, M. L. (1976). Empathic distress in the newborn. *Developmental Psychology*, 12(2), 175–176. <https://doi.org/10.1037/0012-1649.12.2.175>

- Sloterdijk, P. (2015). The Anthropocene: A Process-State at the Edge of Geohistory? (A. S. Springer, Trans.). In H. Davis & E. Turpin (Eds.), *Art in the Anthropocene* (pp. 327–340). Open Humanities Press.
- Smith, S. (2023). Temporal Subjectivity. *Journal of Posthuman Studies*, 7(1), 80–90. <https://doi.org/10.5325/jpoststud.7.1.0080>
- Stein, E. (1989). *On The Problem of Empathy* (W. Stein Trans.) (3rd Rev. ed.). ICS Publications.
- Stengers, I. (2007). Diderot’s egg: Divorcing materialism from eliminativism. *Radical Philosophy*, 144, 7–15. https://www.radicalphilosophyarchive.com/issue-files/rp144_article1_diderotsegg_stengers.pdf
- Stueber, K. (2019). Empathy. In *The Stanford Encyclopedia of Philosophy*. Stanford University. <https://plato.stanford.edu/entries/empathy/>
- Tyler, T. (2003). If Horses Had Hands *Society and Animals*, 11(3), 267–281. <https://doi.org/10.1163/156853003322773069>
- Vint, S. (2008). “The Animals in That Country”: Science Fiction and Animal Studies. *Science Fiction Studies*, 35(2), 177–188. <https://www.jstor.org/stable/25475137>
- Webb, T. (2022). ‘Her Brains Are All Over Her Body’: Jeff VanderMeer’s Avian Weird. *Animal Studies Journal*, 11(1), 80–101. <https://doi.org/10.14453/asj/v11i1.4>
- Wells, D. L. (2009). The Effects of Animals on Human Health and Well-Being. *Journal of Social Issues*, 65(3), 523–543. <https://doi.org/10.1111/j.1540-4560.2009.01612.x>
- Westra, A. (2016). *The Typic in Kant’s “Critique of Practical Reason”: Moral Judgment and Symbolic Representation*. De Gruyter.
- Writers & Illustrators of the Future. (2024, May 19). *Orson Scott Card Live Q&A Sponsored by Writers of the Future* [Video]. YouTube. <https://www.youtube.com/watch?v=h7MAII5IidQ&t=3543s>
- Young, E. (2017). I feel your pain. *New Scientist*, 230(3073), 32–35. [https://doi.org/10.1016/S0262-4079\(16\)30859-4](https://doi.org/10.1016/S0262-4079(16)30859-4)
- Zhang, Y., Yu, J., Zhang, Y., Zhang, Y., Sun, F., Yao, Y., Bai, Z., Sun, H., Zhao, Q., & Li, X. (2023). Emotional Contagion and Social Support in Pigs with the Negative Stimulus. *Animals*, 13(20), Article 3160. <https://doi.org/10.3390/ani13203160>