

Insignificant, Outmoded, or Profound? Totemism as a Social Classification System

Delaviz Weeks¹

¹ University College London, University of London, United Kingdom



© Delaviz Weeks. This is an Open Access article distributed under the terms of the [Creative Commons Attribution-NonCommercial 4.0 License](https://creativecommons.org/licenses/by-nc/4.0/).

Received October 10, 2023

Revision received February 28, 2023

Accepted March 19, 2023

Keywords:

totemism,
social classification,
ontology,
structuralism,
non-human

The term “totemism” was initially used to consider the relationship between the human and nonhuman, conceiving of non-humans as intermediaries of human-to-human relationships. In this essay, I explore the relevance of totemism within the framework of social classification in an attempt to critically view totemism as a system of thought. I draw upon Claude Lévi-Strauss’ (1964, 1966) literature on totemism which uses his principle of structuralism to outline a system of paired oppositions between the human and non-human. I also refer to Philippe Descola’s (1996, 2014, 2018) usage of the term as embedded within three other ontologies, reflecting one specific way of experiencing the world. I find similarities and differences between the two scholars’ conceptions, but ultimately conclude that totemism is inherently structuralist. I argue, though, that this does not mean that it lacks a place in the ontological anthropology of today. The dynamic, exciting variety of non-human and human relations that totemism can encompass renders it worthy of revival to understand the contemporary lived realities of social classification.

INTRODUCTION

Kafka on the Shore, a novel by Haruki Murakami (2005), traces the intertwining relationships that form the web upon which two antagonists live their dream-like existences, although never meeting one another. The first antagonist, Kafka Tamura, leaves home at 15, propelled by an empty feeling felt since his mother left home with his sister. The reader quickly finds that most of his actions are dictated by a mythical figure, “a boy named crow”. The second is Nakata, an illiterate man in his 60s with uncanny abilities; he can speak to cats, and make leeches and fish fall from the sky. The two antagonists then embark on a series of surreal interwoven journeys, without ever meeting each other. The book, as described by Murakami, is his dreams put to paper; there are no explanations for the complex layers of stories that unfold. One of the most confusing narratives seems to portray Kafka’s absent father as a murderous cat butcher. When Kafka’s father is murdered himself, though, a newspaper report detailing his death contradicts any mention of cats. There is an inherent lack of logic and resolution to this plot; it battles between the rational and irrational. The book’s wider plotline, though, can be decoded to follow a logic of binary oppositions. At its most basic, the antagonists oppose each other: Kafka reads for hours every day and Nakata has been illiterate since the age of nine. There is also Kafka’s real mother and sister, who are ever-present in his thoughts. During the novel, he meets two women and is convinced that they are his mother and sister, his own mind attaching two pairs of people with similar ages and faces. The antagonists’ names, “Kafka” and “Nakata”, are also quasi linguistic-transformations of each other. The book undoubtedly has a multiplicity of interpretations. The way *Kafka on the Shore* appears on the surface, though, can be decoded to find underlying codes to the writing which portray it as expressions of possibilities. It is the relations between these abstract oppositions which can portray the book’s narrative as logical. In this article, I exemplify structuralism,

as formulated by Claude Lévi-Strauss (Lévi-Strauss, 1966), as a way of thinking which aims to decode large, abstract complexities which underpin social life. It can conceive of seemingly illogical things, as centred within the logic of binary oppositions instead (Layton, 1997). As I have demonstrated with Murakami’s novel, structuralism—and classification in general—may help make visible and static the relationships between perceptible phenomena.

To advance this, the novel can be interpreted to further contain themes of totemism. At the core of Lévi-Strauss’ totemism, he outlines an intellectual system realised through opposing relations. Lévi-Strauss identifies that a set of human relations can be decoded to mirror non-human relations (Lévi-Strauss, 1964). As with *Kafka on the Shore*, Kafka’s relation to crows and Nakata’s relation to cats is relevant, as both characters can communicate with them. However, totemism can be used to delve further, relating Kafka and Nakata to each other in the same way a crow relates to a cat. Just as the two characters never meet—yet their stories are intertwined—a cat roams the ground and a crow roams the sky; these two rarely meet, yet food webs make the two animals interdependent. I have aimed to exemplify both structuralism and totemism through the plot of Murakami’s (2005) *Kafka on the Shore* to provide an introduction to my argument. In this essay, I will discuss totemism through the framework of whether it has use as a system of social classification. I will firstly discuss Lévi-Strauss’s definition, arguing that his totemism does classify successfully, yet may ignore ethnographic material that lies outside of binary oppositions. I then argue that a deeper ontological approach may be needed, weighing up Philippe Descola’s (1996, 2014) totemism and comparing it with Lévi-Strauss. I argue that Descola may overlook the fact that totemism remains a system of classification in his ontological approach. I then use Marshall Sahlins’ (2014) discussion and Rane Willerslev’s (2013) ethnography to broaden the argument. Ultimately, though, I return to totemism as an inherently structuralist

phenomenon that arguably deserves a place in the anthropology of today.

DEFINING TOTEMISM: FROM DURKHEIM TO LÉVI-STRAUSS

Initially, the term totemism was defined by Émile Durkheim (1912) as a type of religion. The totem group, the non-human, was seen to have a certain power over the humans who associated with it. Durkheim (*ibid.*) assumed that natives could not order their own reality, and that totemism was a way for them to directly model their own social structures from the orders of animal and plant species. In current anthropology, this would be defined as ethnocentric. Ethnocentrism entails an anthropologist using their own culture as a benchmark for gathering knowledge about other ways of being (Baylor, 2012). Rane Willerslev (2013) presents a hypothetical statement, “I am a bear”. Durkheim could not, essentially, see statements such as “I am a bear” as one of a metaphor, and rather see it as a literal difference in logic between him, as the observer, and the observed. Lévi-Strauss discredits Durkheim’s view as a totemic “illusion” (Willerslev, 2013). As with structuralism, Lévi-Strauss defines totemism to represent a natural inclination of the human mind to order through oppositions. I argue that Lévi-Strauss’ logic still holds today, and that it can be useful and relevant to current anthropology.

It is useful to fully unpack Lévi-Strauss’ totemism through an example. In Edward Evans-Pritchard’s (1980) ethnography of the Nuer peoples, twins are perceived as “children of god” or “persons of above”, making them superior to normal humans who are “persons of below”. Twins are also perceived by the Nuer as birds. This is because birds exist above humans in their external resemblance. Previous scholars would have ended analysis here, envisaging that birds are a metaphor for twins. Lévi-Strauss takes this further, however, clarifying that it is also because birds are also categorised as “birds of above” and “birds of below”. The internal homology of this twin-bird relationship is that twins are, as birds of above also are, an intermediary between God, and humans/birds of below (Lévi-Strauss, 1964). His logic reminds me of a question in non-verbal reasoning tests which reads “__ is to __ as __ is to __”. It is also defined as analogical thinking, in which similar differences are paired in a structuralist shorthand (Chandler & Munday, 2020). Lévi-Strauss looks at the “is to” as the object of his concern. In this framing, “twins are to humans, as birds of above are to birds of below”. From this, totemism can appear as a system of social classification. The humans relate to others through totemic relations, just as systems of classification identify relations between phenomena. In this instance, totemism demonstrates a useful form of classification in allowing wider understanding of human/environment relations.

Lévi-Strauss himself, though, fails to truly define whether his totemism is a system of classification or not. In the paragraph above, I interpret that his system creates distinctions between paired phenomena to decode them and, in turn, classify them. These totems function to mediate nature and culture relations. Lévi-Strauss, however, has stated that totemism is “not even a mode of classification, but an aspect or moment of it” (Lévi-Strauss, 1966, p. 218). Catherine Laudine (2016), for example, distinguishes Australian Aboriginal “use” classifications with totem classifications, stating that the latter is based on complex associative thinking and the former is more akin to scientific classification, such as taxonomy. She uses the example of food classifications, where—as I interpret it—there is no binary opposite to “an apple”. Food is instead ordered through classifying different foods by physical appearances and tastes. Totemism therefore cannot be compared to scientific modes of classification, based on equidistant distinctions, when it classifies through differential relations. Lévi-Strauss is therefore correct in perceiving his totemism to be only an “aspect” or different type of classification, when compared to scientific modes.

However, although Lévi-Strauss successfully debunks the so-called totemic “illusion” and deems totemism to be a distinct type of classification, Valerio Valeri (1994) argues that he leaves the field of totemism “disappointingly empty” (pp. 101–102). Totemism, in the period after Lévi-Strauss, had little further interpretations about more complex aspects; for example, the way in which totems became totems in the first instance. Lévi-Strauss’ analysis provided an “intellectual comfort”

(*ibid.*, p. 103) in determining totemism to be an ordering of the world as all human minds are inclined to do. However, it prevents further ethnographic insights from being gained if, as Lévi-Strauss defines, totemism is reduced to the fixed universality of humans rather than intentional systems of differences. It could then be argued that the field of totemism cannot move forwards as a current theory if it might ignore complexities that escape the category of binary oppositions.

CONSIDERING TOTEMISM AS AN ONTOLOGY

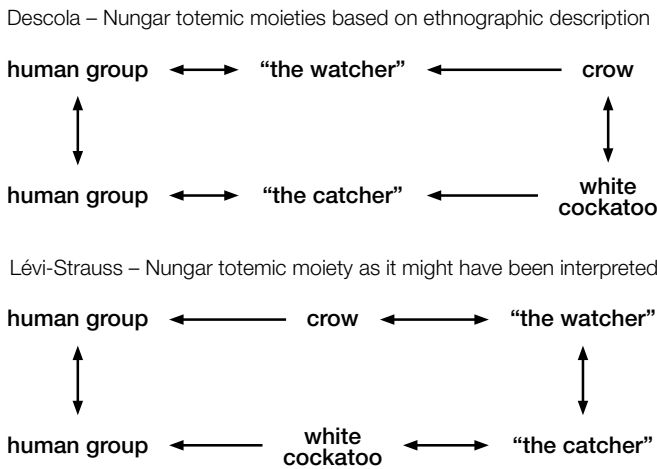
More importantly, then, does an inherently structuralist formulation of totemism have a place in current anthropology? Presently, anthropology can be said to have gone through an “ontological turn”. Here, we might take Eduardo Kohn’s (2015) definition of ontology as the study of reality and all subjective, human-constructed worlds. Thus, rather than focusing on ontology, Lévi-Strauss places concern upon the epistemological problem of ethnocentrism found in Durkheim’s definition of totemism, which he then aims to clear (Nunti, 2009). Epistemology thus questions the nature of knowledge and can consider the origin of knowledge differences (Holbraad & Pedersen, 2017). Lévi-Strauss corrects Durkheim’s rudimentary way of classifying totemism; however, he stops short at making totemism a unified ontology, which would allow for the changeable, practical aspects of living alongside non-humans. One can argue that this is what anthropology already is; however, this might just encompass what has been termed “good” anthropology (Kohn, 2015). For the anthropologist, it requires questioning all preconceived assumptions of what the world is, and the validity of these assumptions. Ontology is not fixed in its definition, yet fundamentally aims to go beyond questioning received anthropological knowledge, like kinship structures, to question the nature of everything (Holbraad & Pedersen, 2017). Therefore, it can be argued that the way structuralism totalises systems of differences as variants of a larger framework of logic gives equal precedence to all ways of being, which is at the motivational core of the ontological turn. Lévi-Strauss’ totemism, thus, can have relevance today as a structuralist phenomenon.

Structuralism can perform a symmetrisation of all variations of a phenomenon within a set. This is an intellectual claim made by Philippe Descola (2018) who, it can be argued, aims to develop Lévi-Strauss’ totemism. As totemism is just one way that humans interact with non-humans, Descola posits that all human–environment interactions can be summarised within four overarching ontologies. He conducts a “symmetrisation”; that is, puts each ontology on equal footing, so that all differing experiences of the world are level variations of each other. The four ontologies are as follows: *analogism*, *naturalism*, *animism*, and *totemism* (*ibid.*). Descola conceives each human to be made up of an “interiority” and a “physicality”, and their worlds to be made up of how these attributes relate to the world around them. “Interiority” concerns mental states: the way humans consider the continuities/discontinuities in non-human minds. “Physicality” encompasses the material: the way physical attributes are seen to differentiate/connect between humans and non-humans (*ibid.*). The differing ideas about these two states are paramount to Descola’s conception of how humans experience the environment around them differently.

Descola’s (*ibid.*) four ontologies seem to encompass four distinct ways of *Being*. *Analogism*, firstly, finds that, upon encountering non-human phenomena, the human’s interiority and physicality is entirely distinct from non-humans. This relates to the cosmological model prevalent in the Middle Ages and Renaissance, whereby each entity in the world is separated by minute but distinct differences in ranked systems. *Naturalism* parallels Modernity as an ontology. It denotes humans as relating to the non-human through similar physicality, seeing humans as part of the evolutionary continuum, and sharing similar physical attributes, such as cell structures, with non-humans. Non-humans, though, lack similar interiority through attributes such as culture, soul, or moral conscience. *Animism* relates humans to non-humans through their interiority but not through physicality. The non-human lives alongside them, within social kin structures and villages, however they engage with the world through dissimilar bodily structures (Kohn, 2009). These ontologies are all distinct from *totemism*, allowing totemism to be a singular theory but

Figure 1

Diagram Demonstrating Exemplified Differences in Totemic Classification of Nungar Totemic Moieties According to Descola and Lévi-Strauss



Note. Descola, 2014 (based on ethnographic description); Lévi-Strauss, 1912 (possible, retrospective interpretation)

embedded within the three other ontologies (Descola, 2018).

In Descola's framework, totemism determines that humans within this ontology find the non-human to be analogous with their interiority and physicality. This would mean that humans would see no mental or bodily differences between themselves and non-humans. This is the opposite to analogism because totemic differences create relations, whereas the analogic ontology purely aims to create differences between all phenomena. Descola conceives of this totemism as differing from Lévi-Strauss' framework of abstract totem terms. He reasons that a characteristic better signifies a group's qualities, rather than any morphological or behavioural attributes associated with the species-specific totem term. The totemic relationship is made, instead, to a set of qualities. To exemplify totemism, Descola (*ibid.*) uses the Nungar of South-Western Australia, where totemism is most prevalent as a singular worldview, rather than in many other places, he emphasises, where cosmologies of both animism and totemism appear to be used. The Nungar divide themselves into two totemic moieties: "the catcher" (*maarnetj*) and "the watcher" (*waardar*). These are respectively symbolised by the white cockatoo and the crow. The abstract qualities of "the catcher" and "the watcher" seem to more accurately embody the properties of each group, representing the group's characteristics (Descola, 2014). We might contrast Descola's real interpretation of the Nungar with what Lévi-Strauss might have concluded through my interpretation of his totemism (Figure 1).

The difference in classification is quite minor yet sketches out how Lévi-Strauss' totemism might carve out more of a direct connection between the human and non-human. In Descola's diagram, the humans relate through the difference between a crow and white cockatoo, yet it appears to be better articulated through the terms "the watcher" in opposition to "the catcher", as shown by the single-headed arrows. In my idea of Lévi-Strauss' interpretation, the abstract human qualities are identified, those of "the watcher" and "the catcher", and given more concrete labels through the parallel distinction of the crow and white cockatoo, also shown by the single-headed arrows. From the diagram, I interpret that totemism's addition to the three other ontologies defined by interiority/physicality is confusing when compared alongside Lévi-Strauss' totemism. Within Descola's own example, Descola's totemism seems to remain as a metaphorical system of differences. In fact, he seems to set the human further apart from the non-human by setting their terms of opposing relations as embedded in explicit characteristics of personality, e.g., "the watcher/catcher". Lévi-Strauss would instead consider these characteristics to be implicit in totemic non-human/human relations.

Descola (2014) has aimed to create four unified ontologies which allow for all engagements with the non-human. However, I argue that it appears as if totemism is the outlier, remaining at the level of a metaphor rather than an explicit form of being.

DOES TOTEMISM HAVE A PLACE ALONGSIDE ANIMISM?

To explain further, Descola's previous work seems to outline a more Lévi-Straussian definition of totemism which I am more inclined to agree with. His article, "Constructing natures" (1996), deems animism and totemism to be inversions of each other. Animism uses very human categories, such as kinship relations, to create a wide social network of all living beings. Totemism is then seen as an inversion of this, using the distinctions between non-human groups as useful differences for structuring human group differences. Conversely to animism, totemism does not outline social relations between humans and non-humans (Descola, 1996). Descola then moves on from this in his later work, "Beyond nature and culture" (2014), outlining the four ontologies. Totemism and animism cannot be inversions of each other if their "interiorities" are the same—seeing non-humans as having the same souls/spirits—but their "physicalities" are different. Totemism sees animals as having no bodily differences to humans whereas animism acknowledges physical differences. This move in his later work shifts totemism from its initial Lévi-Straussian definition—as a system of social classification—to an ontology which takes totemic relations as much more literal (Descola, 2014).

One can return to Willerslev's (2013) hypothetical statement presented earlier: "I am a bear". Descola unmistakably diverges from Durkheim's ethnocentric interpretation by fully embracing this as a reflection of a worldview—totemism. Non-humans and humans are the same on the inside and outside. When exemplified, as Descola (2014) does through the Nungar peoples, totemism still seems to be a system of differential relations classifying the social divisions of humans. To me, this seems inconsistent. Totemism is a system that separates human groups through meaningful parallel distinctions between non-humans. At the same time, these humans see themselves as mentally and physically analogous to non-humans, yet totemism does not seem to convey any social relationships through creating distinctions. Why, then, if non-humans and humans saw themselves as highly similar, is totemism not also a system of social interaction? I therefore see Lévi-Strauss' definition as more suitable for analytically reviving totemism, as it reduces totemism to a more decipherable phenomenon portraying totemism as a system of logical thought. Rather than an ontology defined by "interiorities" and "physicalities", I return to the view that totemism is inherently structuralist. Its use in current anthropology must therefore remain in the scope of structuralism.

Or perhaps a problem is found in the overwhelming emphasis on theory. Lévi-Strauss' totemism may sketch binary oppositions that, once identified, remain static. Willerslev (2013) argues that a lack of conceivable differences between humans and non-humans in his ethnography with Yukaghir peoples mean they often have to mark these differences through everyday practices. This entails using a practical form of animism rather than navigating the world through conceptual differences. They apologise to animals they hunt, for example, and laugh at animal spirits as ways of differentiation (2013, p. 50). The Yukaghir do not actively aim to differentiate themselves, and still engage in relational activity to make sense of the world (Swancutt, 2022). However, their dynamic modes of relation would make it unsuitable to formulate static totemic relations between themselves and non-humans. This example therefore limits totemism's use as a system of classification; it can't be used to describe all human/non-human relations when humans continuously change the way they relate to non-humans. This might be why Willerslev (2013) pointedly uses the term animism, instead of totemism, to illustrate his point.

CONCLUSION

To conclude, by considering totemism within the framework of social classification, it allows us to make more sense of contemporary theories of totemism within an anthropology that has since been left behind.

Ordering social relations in the way that totemism does, though, does not necessarily mean culture-specific literature becomes ‘time-bound’ or ethnocentric. Through exploring the literature of Claude Lévi-Strauss and Philippe Descola, I have demonstrated that totemism has the potential to be revived through a structuralist lens. It captures a unique way that

humans engage with their environment without direct social interaction. Ultimately, anthropology can benefit from a framework that can bring ethnographies out of the local and specific; identifying trends without generalising, and furthering the anthropology of human-environment relations.

Interdisciplinary Commentary

ANTHROPOLOGY & ARCHAEOLOGY

Totemism, animism, and other ontological “isms”: A literature review

Jasmine Regan Feldman
University of Leicester

This is a brief literature review intended to contextualise and complement the above article by exploring several of the theoretical frameworks of ontological studies. The prevalence of shamanism amongst totemic cultures is demonstrated by utilising case studies from Siberia and Israel. A study by Pedersen (2001) compared Northern and Southern North Asian ontologies, revealing a relationship between totemism, shamanism and defiance of hierarchical structures. On an interdisciplinary level, research into homuncular flexibility may elucidate complex animal-human relations as well as the importance of indigenous knowledge for science. Cassidy’s (2012) discussion on climate change and Cipolla’s (2021) posthumanist critique demonstrate the importance of indigenous multivocality in the anthropological ontological field. As the frameworks of ontological “isms” are most often drawn from indigenous case studies, the future concerns of archaeological and anthropological fields—be it climate change or advancing technology—need to consider and centre indigenous voices in the discussion.

Introduction

The above article introduces the reader to Lévi-Strauss’s concept of totemism and differentiates it from animism and other theoretical frameworks of ontological studies. To expand upon the author’s exploration of totemism as a means of social classification, this literature review will explore totemism and other ontological approaches to animal-human relations case studies. The author primarily discusses Lévi-Strauss’s understanding of totemism in Australian Aboriginal communities, and uses Descola to exemplify the application of totemism. This brief literature review will discuss further anthropological case studies that utilise totemism and compare its uses to applications of animism and other ontological approaches. Ontological frameworks are often applied to indigenous case studies; thus, it is important to briefly review the uses of totemism in modern anthropological work and critiques of the posthumanist approach in archaeology and anthropology.

Interpreting animal and human relations

As the author has already provided a detailed exploration of the complexities of defining totemism, this commentary will move to analyse different applications of the theoretical approach to animal-human relations. The above article discussed totemism in Aboriginal Australian communities and therefore this article will discuss examples of totemism in different indigenous societies. As a theoretical concept, totemism seems to have

Figure 1

The Flying-Man



Note. The flying-man from “Flying-man lamp from Dothan”, by R. D. Miller II, 2014, p. 34, <https://www.jstor.org/stable/pdf/jwashacadsci.100.4.0021.pdf>. Copyright 2014 by Washington Academy of Sciences.

largely fallen out of fashion between the eras of Lévi-Strauss and Descola. In the 1990s, totemism reemerged but was underpinned by concepts from “symmetrical” archaeology. A 2014 article by Robert Miller II continues this idea through a discussion of totemism in Iron Age Israel. The “flying-man” (Figure 1), discovered in Dothan, is Miller’s (2014) focus for examining totemic symbolism. The artefact appears to combine the image of a clam with that of a man with his arms outstretched; however, it is the hybrid depiction of a person and an animal that creates the image of a “flying man”.

If the diagram illustrated by Weeks is utilised in understanding the Iron-Age artefact, the “flying-man” is interpreted through the relationship between a “man” (the human group) and a “clam” (the animal group). As the clam is a non-native species, the suggested interpretation is that the lamp invokes “distant lands” of “supernatural entities” (Miller, 2014, p. 34). The examples from the above article are drawn from ethnographic studies of the Nungar Aboriginal people of Australia; thus, the totemic relationship is discernible. The issue with the archaeological example from Israel is the lack of context or comparative examples to support the totemic interpretation. Indeed, Miller compares the style of the “flying man” to that of the shamanic imagery of Siberia (*ibid.*, p. 35). As Miller notes, the evidence for totemism is limited, especially in comparison to evidence for shamanism, necessitating further exploration

of shamanism and totemism in other North Asian case studies (*ibid.*).

Although not discussed in the Weeks' article, shamanism often appears to be associated with interpretations of totemism and animism. In the *Journal of Transpersonal Psychology*, Roger Walsh broadly defined, anthropologically, shamans as "specific groups of religious healers" (2001, p. 2), which can include, but are not limited by, "medicine men, witch doctors, sorcerers, wizards, magicians or seers" (*ibid.*). An article by Morten Pedersen (2001) discusses the varying examples of totemism, animism, and shamanism in North Asian ontologies. The study compares the ontologies of Northern North Asia (NNA) and the ontologies of Southern North Asia (SNA). Pedersen found that NNA societies were predominantly animistic, whereas SNA societies were predominantly totemistic. The SNA grouping largely contained Mongol peoples where totemism and shamanism seemed inextricably linked. Since totemism is based on vertical hierarchies (as discussed in the article above), it is only shamans within SNA ontologies that can move across the totemic structures (Pedersen, 2001). Whilst shamanism is most associated with SNA ontologies, per Miller's comparison to Siberian shamans, the NNA ontologies also relate to shamanism, if less prominently. As totemism is associated with hierarchy, this leads to the question: is shamanism associated with the defiance of totemic structures? Pedersen's case study associates shamans with wild animals, connected through "metamorphosis" in the totemic hierarchy (Pederson, 2001, p. 418). Following the author above's article on totemism, further exploration of the relationship between totemism, animism, and shamanism in human-animal relations is necessary.

Experimental psychology and neuroscience may introduce some nuance to understanding the symbolic representations of human-animal relations. A 2015 article by Won, Bailenson, and Lanier explores homuncular flexibility—i.e., the body's ability to adapt to control the movement of non-human avatars. The article demonstrates the human body's propensity for adapting to novel forms. As computer science technology advances, further research may reveal the extent to which humans can adapt to external human and non-human bodies. Interestingly, anthropological parallels can be drawn between homuncular flexibility, shamanism, and totemism. Are the shapeshifting shamans of the North Asian Indigenous ontologies further evidence of homuncular flexibility? A more interdisciplinary approach may demonstrate interesting links between Indigenous knowledge and current experimental science.

Indigenous studies criticisms

Rebecca Cassidy's article "Lives with others: Climate change and animal-human relations" (2012) analyses the dynamic relationship between humans and non-humans in the past, and the potential consequences of the future. Cassidy elaborates that it is the poorest and most marginalised that will be most affected by climate change: people who are often pastoralists dependent upon animal-human relations. Cassidy (2012) argues that the future of anthropology necessitates a more holistic approach to the study of animal-human relations, potentially including anthropologists assuming a more activist role. Many difficult questions are posed for archaeologists and anthropologists studying animal-human interactions regarding the lens through which their work should be cast. A great debate in the social sciences is the extent to which current politics should affect the angle of discussions, especially how climate change will and does affect animal-human relations now and into the future.

Critiques of ontology fall under the wider critiques of posthumanist thought. A major critique of posthumanist approaches to Indigenous studies is the issue of "flat ontologies". Bruno Latour's concept of a "flat ontology" (1999, p. 304)—the notion that no object (human or non-human) is more privileged in its influence than everything else—was based on actor-network theory where each "actor" affects every other "actor" with no discernment between human or non-human (Harman, 2015). If the flat ontological model is applied to Indigenous archaeologies, the issue is that it may be inconsistent with Indigenous ontology. However, it has been suggested that it may serve anthropologists and ethnographers well to first flatten their own ontological assumptions and subsequently

invite and place "methodological faith" in their interlocutors to sculpt their own conceptions of their own ontology and culture, although not unproblematically (Chidichimo, 2022, p. 52). Similarly, a more recent article by Craig N. Cipolla (2021) entitled "Posthuman potentials: Considering collaborative Indigenous archaeology" argues that posthumanist approaches parallel Indigenous collaboration in archaeology and are conversely beneficial to the discipline. Overall, the posthumanist critique introduces important dialogue that centres Indigenous ontologies in anthropological and archaeological studies which are essential to discussions of totemism, animism, and shamanism.

Conclusion

Following on from the above article, this brief literature review highlighted some interesting examples of animal-human relation case studies to expand the discussion of totemism into other ontological frameworks. The comparison between totemistic and animistic societies was intended to demonstrate the potential anthropological relationship between totemism and shamanism. Interdisciplinary approaches that utilise neuroscience and psychology may provide new avenues for the exploration of ontology in the future. Conversely, as seen in the Miller (2014) and Pedersen (2001) studies, Indigenous anthropology and archaeology may equally provide interesting insight for experimental science. Cassidy's (2012) discussion on climate change and Cipolla's (2021) posthumanist critique demonstrate the importance of Indigenous multivocality in the anthropological ontological field. As the frameworks of ontological 'isms' are most often drawn from Indigenous case studies, the future concerns of archaeological and anthropological fields, be it climate change or advancing technology, need to consider and centre Indigenous voices in the discussion.

PSYCHOLOGICAL & BEHAVIOURAL SCIENCES

Human and non-human animals' relations explained through a Terror Management Theory lens

Cristina Costea

Magdalene College, University of Cambridge

Terror Management Theory (TMT) proposes that humans are driven by the unconscious terror of death (Solomon et al., 1991). This commentary provides a non-exhaustive application of TMT to three psychological areas that explain human-animal relations: intergroup relations, development of morality, and emotional development.

Terror Management Theory: A brief introduction

Terror Management Theory (TMT) was developed with the aim to provide an organising paradigm for the many phenomena often studied separately in social psychology, such as intergroup relations and morality (Solomon et al., 1991). TMT proposes that humans have more complex abilities to conceptualise the future compared to animals, and with this capacity comes the realisation that death is inevitable (*ibid.*). It is not necessarily the act of dying that can create debilitating terror (although this, too, can happen for some), but the fear of "absolute annihilation" (*ibid.*, p. 101). Death entails *not living*, where living is a prerequisite for all behaviour; thus, it takes away all opportunities for enjoyment and growth.

If this fear remained conscious, it would inhibit our ability to carry on with our daily activities (i.e., living), because self-preservation instincts cannot save us from the inevitability of death. As our time alive is limited, so are our opportunities to fulfil our goals, and thus goals should be

intentionally prioritised to maximise self-actualisation (Maslow, 1943). Carver and Scheier (1981 cited in Solomon et al., 1991) developed a hierarchy of standards for self-regulation, where maintaining a positive self-image is one of the superordinate goals of human existence. This positive-self image can only be created through self-preservation (i.e., staying alive), which can be achieved directly and symbolically (Solomon et al., 1991). Direct self-preservation is achieved through fulfilling our biological needs (e.g., food, water, shelter); symbolic self-preservation suppresses our conscious awareness of our impending death.

TMT proposes that symbolic self-preservation is achieved through developing a cultural anxiety buffer, which functions through two components: a cultural worldview and self-esteem (Solomon et al., 1991). The authors propose that people derive a sense of personal value through engaging in actions that meet the standards of their culture, such as occupying certain social positions; the extent to which individuals perceive success in meeting these standards helps to develop self-esteem. In sum, people have a life-long occupation of meeting and upholding culturally variable standards of behaviours and roles in their societies, which serve as a distraction from the terror of death (ibid.). I include references for the empirical base of TMT in the “Conclusion and further reading” section, as an evaluation of the theory is beyond the scope of this commentary.

Intergroup relations between human and non-human animals

TMT proposes that the role of the cultural anxiety buffer is to keep the terror of death in the unconscious, to allow humans to proceed with daily activities (Pyszczynski et al., 2015). However, reminders of human mortality have been found to increase dislike of non-human animals (Beatson & Halloran, 2007), support for their extermination (Lifshin et al., 2017), as well as denial of similarities between humans and animals (Pyszczynski et al., 2015). This is hypothesised to show that when threatened, humans tend to distance themselves as much as possible from animals, regarding them as an out-group (Tajfel & Turner, 2001). This finding is moderated by participant characteristics such as personality type (Pyszczynski et al., 2015), belief in mind-body dualism (Heflick et al., 2015), age (Kahane & Caviola, 2022) and most likely cultural background. This behaviour aligns with the predictions of Social Identity Theory (Tajfel & Turner, 2001), which proposes that when we categorise ourselves to be a part of a social group, we identify with their values, creating a clear distinction between those that belong to the social group and those who do not. To maintain self-esteem, the in-group must compare favourably to out-groups, which may be achieved through discrimination: unequal treatment on account of group membership (Williams et al., 2003).

Discrimination against animals may be based on assumptions that they do not have the cognitive capacity to feel emotions or think, especially if they are less phylogenetically similar to us (Prato-Previde et al., 2022). These assumptions can devalue non-human animals compared to humans, and have been used as a justification for animal maltreatment. However, the perspective of intergroup relations can be used to create more positive relations between humans and animals; for example, some propose that bolstering a sense of human-animal solidarity—“a sense of belonging, psychological attachment and closeness” (Amiot & Bastian, 2017, p. 2)—predicts more positive attitudes and behaviours towards animals. Categorising animals as a part of our in-group may avoid triggering the cultural anxiety buffer; or at the very least, acknowledging the moral nature of all living beings may discourage unfair treatment towards animals.

Child development of morality

The reader may then ask: “When do we begin to see ourselves as separate from non-animals, if ever?” Some research suggests that young children are socialised by adults to see moral differences between human and non-human animals (Pallotta, 2008). Ideologies and social practices (i.e., the cultural worldview in TMT) are thought to influence the cross-cultural variation seen in attitudes towards non-human animals, for example if they are regarded as pets, food, research tools, or other categories.

Young children do not yet understand the implications and finality of death, so they do not yet contend with the terror of absolute annihilation (Solomon et al., 1991). As they mature, children come to understand that their caregivers, and by extension, themselves, are not infallible in the face of death (ibid.). To deal with this emergent terror, children internalise the values endorsed in the cultural-worldview in their environment; this builds their self-esteem, and helps sustain a sense of their own symbolic immortality as they mature (ibid.).

Although attitudes surrounding non-human animal treatment have been found to differ cross-culturally (Bruder et al., 2022), some researchers theorise that humans use the same underlying moral mechanism when faced with comparing humans and animals: *multi-level weighted deontology* (Kahane & Caviola, 2022). This mechanism applies moral constraints on harming both human and non-human animals, but it is much weaker when considering non-human animals (ibid.). This mechanism is supported by findings that adult humans appear to value human lives significantly higher than non-human lives, even in the absence of the capacity to think and suffer in humans compared to animals (ibid.). However, this differentiation between man and animal is not nearly as pronounced in children. For example, Kahane and Caviola (ibid.) conducted an experiment that gave a moral dilemma to save one human or either one, two, ten or one hundred dogs to US adults and 6- to 10-year-old-children. While adults typically valued the life of a human 100 times more than the life of a dog, 71% of children prioritised 100 dogs over one human. Interestingly, adults’ and children’s ratings of cognitive and hedonic capacities in both humans and animals were similar. Despite this, children were less morally anthropocentric than adults (ibid.), suggesting that the gradual socialisation of children can create a sharp moral divide between humans and non-humans.

To maintain a positive self-esteem, TMT proposes that people act in accordance with the cultural worldview they are socialised in (Solomon et al., 1991). Depending on the cultural worldview, animals can have symbolic meanings or stereotypes that prompt positive or negative reactions, which likely influences how people behave toward them. Thus, behaviours towards animals that are congruent with the prevalent cultural worldview are reinforced across development.

Emotional development and attachment

Attachment literature indicates that children use caregivers as secure bases during their development, to whom they return in situations of distress (Ainsworth, 1979). A secure attachment between children and caregivers has been found to be beneficial for developing an adaptive internal working model (Bowlby, 1980), which is an internal template on which future relations are built. Thus, positive and secure attachments to caregivers in infancy can translate to mutually beneficial relations between humans and animals, as seen in the well-documented cases of successful pet keeping (Amiot & Santerre-Bélec, 2022).

However, negative experiences with caregivers in infancy can result in an insecure or disorganised attachment, which may impair internal working model formation (Bowlby, 1980). For example, insecure attachment in adults has been strongly associated with animal-hoarding disorder (AHD), where an individual feels the compulsion to “save” as many animals as possible, despite limited ability to take care of them all (Prato-Previde et al., 2022). The accumulation of animals beyond the ability to provide them all with appropriate care results in negative and even fatal consequences for the animals; their caregivers are reluctant to admit that they are not caring for their pets appropriately, and exhibit severe distress upon separation. Disorganised attachment and conduct disorder are two more important correlates of animal mistreatment and abuse, which can start from childhood (ibid.). TMT may explain these links by suggesting that an inappropriate outlet for managing the terror of death leads to inappropriate emotion regulation strategies across development, with more severe consequences for human-animal relations as the human’s ability to create harm increases.

Conclusion and further reading

TMT is a useful paradigm that can organise findings across several areas of social and developmental psychology, by suggesting that human

actions are driven by the unconscious terror of death. These findings can be applied to human-animal relations:

- our tendency to prefer in-groups can be leveraged to improve human-animal relations through human-animal solidarity;
- human moral intuitions are deontologically weak with respect to animals, as a result of socialisation in a particular cultural worldview;
- animal treatment can be a reflection of (dys)functional emotional development.

This commentary presents broad, non-exhaustive applications of TMT at the expense of rigorous critiques of the evidence base. For further in-depth discussion, see Pyszczynski and colleagues (2015).

NEUROPSYCHOLOGY

Revisiting the cognitive and neuropsychological basis of animism

Sai Hou Chong

Homerton College, University of Cambridge

Animist and totemist ontologies have the common principle of attributing sentience to non-human beings and events. In this commentary, two human cognitive traits—*perceptual sensitivity to animation* and *theory of mind (ToM)*—and their potential roles in underpinning this principle are discussed. The former posits that, owing to the importance of identifying animate agents, humans have evolved a strong predisposition to ascribing animacy to anything exhibiting lifelike features; animism is thought to emerge from this bias. This attribution of animacy entails ascribing human-like intentionality, which I argue falls under the latter remit of ToM. In line with this, both cognitive traits place emphasis on the perception and interpretation of motion, involving activation of regions of the brain involved in ToM.

Introduction

Weeks discusses the validity of totemism within contemporary anthropology as a qualified system of social classification and ontology. The discussion presents Sahlins' criticism of Descola's categorisation of totemism as a distinct ontology and argues that totemism is a subset of animism instead. This commentary will hence refer solely to "animism".

Regardless, a core principle shared by most animist and totemist societies appears to be the attribution of sentience, "animation", or "spirit/soul" to non-human beings and phenomena (Swanutt, 2019). While animism is typically associated with non-literate, non-naturalist societies, scholars argue that animist perspectives are also prevalent in literate, naturalist societies, especially in art and literature (Cherry, 1992), making animism a universal phenomenon. Its ubiquity begs the question: is animism inherent in the human psyche, and if so, what are the potential neuro-psychological bases that underpin this? This commentary seeks to revisit this question.

Perceptual sensitivity to ascribing animacy

Guthrie (1995) proposed that animistic ontologies (or more generally, worldviews) emerge from an adaptive perceptual strategy to maximise sensitivity to objects or events of greatest immediate significance, which tend to be *agents* capable of movement, such as animals (as predators or prey) or humans (as partners or foe). When coupled with the inherent uncertainties of the environment and other organisms, along with the prevalence of deceptive strategies in nature such as camouflage, it is argued that the optimal strategy would be to attribute life to *any* object,

phenomenon, or even background with features typical of animate beings, especially movement (Guthrie, 1995). The benefits of correctly identifying an animate being significantly outweighs the minimal cost of misidentification; for example, a failure to spot camouflaged predators is significantly costlier than simply misidentifying environmental features for them. It is this evolutionary pressure to interpret the environment for agents that animism is thought to be based on, according to Guthrie (*ibid.*).

Direct evidence linking animistic worldviews and perceptual biases to ascribing animacy is sparse. Nevertheless, if the predisposition to assigning animacy is as important as Guthrie (1995) suggests, that trait is expected to be positively selected for, such that the perceptual bias *and* the animism that emerges from the former are expected to be ubiquitous within human populations (Schaffner & Sabeti 2008). Hence, evidence for Guthrie's hypothesis is *indirect*, mainly that there is a near-universality of (i) sensitivity to lifelike properties exhibited by inanimate objects, and (ii) ascribing animacy to such objects in human populations.

Arguably the best example of both is that adult humans in literate, naturalistic societies consistently struggle with identifying living things. McDonald and Stuart-Hamilton (2000) found that adults ranging from their twenties to their seventies all make "animism errors", namely by misidentifying non-living items as living beings, even among those undergoing tertiary education. Furthermore, when asked to justify their "errors", study participants often invoke lifelike properties exhibited by these objects, especially movement. Rather than being the consequence of intelligence, these "errors" were suggested to be mostly accounted for by a loss of *knowledge* in defining "life", suggesting that naturalistic perspectives on animacy are learned, not defined by development—contradicting Piaget—but animistic thinking is prevalent even in naturalistic societies.

In sum, Guthrie (1995) posits that, due to uncertainties in perceiving animate agents in the environment, humans have evolved to have a predisposition to ascribe animation to non-human beings and phenomena that exhibit lifelike properties. Consequently, animism is thought to be an emergent property of this evolutionary adaptation. Support for this hypothesis comes from observations on the prevalence of animistic thought in human populations. Despite a lack of direct empirical evidence, the hypothesis provides a paradigm for a cognitive and evolutionary basis for animism, onto which neuropsychological mechanisms could be incorporated.

A role for theory of mind

Animist societies generally interpret sentient or "animated" non-human beings and/or phenomena as goal-directed agents with intentionality; this same perspective is arguably shared within naturalist societies in the arts (Cherry, 1992), or even in advertising, where animistic cues were found to enhance brand favourability (Karpinska-Krakowiak & Eisend, 2021). I argue that, in a sense, ascribing sentience to such beings or events can be interpreted as the product of an extended framework of *theory of mind (ToM)*—the attribution of mental states to oneself and other persons—that includes them, with varying degrees of anthropomorphism involved.

While ToM abilities are probably not unique to humans, the complexity of the ToM within humans likely is. Despite recent studies demonstrating that macaques exhibit false-belief attribution, a hallmark of ToM ability (Hayashi et al., 2020), it is likely that their ToM abilities are limited to anticipating the behaviour of others. On the other hand, the (neurotypical) human adult possesses a ToM that behaves as a model for explaining causal relationships involving human behaviour, enabling predictions of the goals and beliefs of others, as well as deception. Extending our mentalising abilities to non-human beings, especially animals, could have numerous advantages in evolutionary terms, namely by allowing sophisticated inferences and predictions on their behaviour. Most notably, while select cognitive deceptive strategies are employed sparsely throughout the animal kingdom for hunting, humans are unique for employing a whole repertoire of deceptive tactics (Moser, 2019), the extensiveness of which I argue can only emerge from our ability to mentalise.

I note that this dovetails with Guthrie's (1995) hypothesis, in that

the latter predicts an oversensitivity to lifelike features *generally*, but ToM could act as a potential mechanism for explaining how *specific*, complex, and human-like intentionality is ascribed to beings exhibiting lifelike features. Both ideas place an emphasis on the role of motion perception in ascribing agency; indeed, an important aspect of the human ToM concerns the accurate inference of intentionality through observing movements. Consequently, motion detection is shown to be linked to ToM and human social cognition at large, as is repeatedly demonstrated with neurotypical individuals (Rice et al., 2016), as well as clinical evidence in individuals with mental impairments (Kelemen et al., 2005), showing that the ability to perceive motion is correlated with performance in ToM abilities.

Evidence in support of the link between motion perception and ToM can be found in neurological studies. Whilst ToM is a complex process involving many neural substrates, the brain regions most heavily implicated in ToM by functional imaging are the cortical midline structures (CMS) and the bilateral temporoparietal junction (TPJ; Mahy et al., 2014). The former is important for self-referential thinking (Shamay-Tsoory et al., 2006; Williams et al., 2005); meanwhile, the TPJ is involved in a broad range of social cognition tasks (Geng & Vossel, 2013), and is implicated in representing the mental states and agency of others (Farrer et al., 2003). Notably, the TPJ is also activated during motion processing, as Lee and McCarthy (2016) found using fMRI that common regions of the TPJ were activated during ToM and motion perception. Whilst the literature emphasises the importance of interpreting motion for social behaviour between humans, I argue here that one might extrapolate this to include our interactions with animated beings at large, such as for discerning between hostile or prey-like behaviour, amenable to future research.

In short, I argue here that extending ToM abilities to non-human agents could act as a primary cognitive mechanism from which a key feature of animism—attributing agency to non-human beings—emerges from, owing to strong similarities between that and the cognitive skills and outcomes of ToM. This can be thought of as an extension of Guthrie's

(1995) hypothesis, acting as a mechanism for explaining the complexity and specificity of animistic perceptions, with a particular importance for motion perception underpinning both ideas. Neuroimaging studies suggest that ToM is a complex neural process requiring integration from many brain regions, chiefly involving the CMS and TPJ, with a particular importance for motion processing as an input. Collectively, this suggests that ToM abilities could be an important contributor of animistic interpretations of the world.

Bering (2002) pushes the significance of ToM further to include *all* philosophical–religious theorising in a systematising framework he describes as the *existential* ToM (EToM). Under this paradigm, the ToM's explanatory framework is extended to consider life events as interpretable and affected by agents with intentionality. Akin to Guthrie's (1995) position, the EToM is suggested to have emerged as a response to interpret the uncertainties inherent in the world into readily explainable events, as well as confer a sense of psychological control. It is of my opinion that both EToM and non-human ToM as discussed earlier could complement each other in shaping animistic ontologies or worldviews, as they both reinforce the idea of causal relationships being shaped meaningfully and intentionally.

Conclusion

For this commentary, I contend that animist ontologies can be thought of as an integration of perceptual sensitivity to animation and ToM to hence ascribe sentience to non-human beings or phenomena. Nevertheless, many unanswered questions remain. There are still significant shortfalls in our understanding of the neuropsychological basis of the cognitive processes described here, even within neurotypical individuals. Pattern recognition and visual imagery is likely important but left unaddressed, as they are not the focus of this commentary. More interestingly, the postmodernist perspective that all societies effectively create relationships and hence animate the “objective” world offers enticing possibilities for a unifying neuropsychological model of ontology.

Article references

- Baylor, E. (2012). *Ethnocentrism*. Oxford University Press. <https://doi.org/10.1093/obo/9780199766567-0045>
- Chandler, D., & Munday, R. (2020). *A dictionary of media and communication* (3rd ed.). Oxford University Press.
- Descola, P. (1996). Constructing natures: Symbolic ecology and social practice. In P. Descola & G. Palsson (Eds.), *Nature and society: Anthropological perspectives* (1st ed., pp. 82–102). Routledge. <https://doi.org/10.4324/9780203451069>
- Descola, P. (2014). *Beyond nature and culture* (J. Lloyd, Trans.). University of Chicago Press. <https://doi.org/10.7208/chicago/9780226145006.001.0001>
- Durkheim, É. (1912). *The elementary forms of the religious life* (J. W. Swain, Trans.). George Allen & Unwin.
- Evans-Pritchard, E. E. (1980). *The Nuer: A description of the modes of livelihood and political institutions of a Nilotic people*. Oxford University Press. ISBN: 9780198740018
- Holbraad, M., & Pedersen, M. A. (2017). *The ontological turn: An anthropological exposition*. Cambridge University Press. ISBN: 9781107503946
- Kohn, E. (2009). A conversation with Philippe Descola. *Tipiti: Journal of the Society for the Anthropology of Lowland South America*, 7(2), 135–150. <https://digitalcommons.trinity.edu/cgi/viewcontent.cgi?article=1105&context=tipiti>
- Kohn, E. (2015). Anthropology of ontologies. *Annual Review of Anthropology*, 44(1), 311–327. <https://doi.org/10.1146/annurev-anthro-102214-014127>
- Laudine, C. (2016). *Aboriginal environmental knowledge: Rational reverence*. Taylor and Francis. ISBN: 9781138249837
- Layton, R. (1997). *An introduction to theory in anthropology*. Cambridge University Press. ISBN: 9780521620185
- Lévi-Strauss, C. (1964). *Totemism* (R. Needham, Trans.). Merlin Press. ISBN: 9780850363821
- Lévi-Strauss, C. (1966). *The savage mind*. University of Chicago Press. ISBN: 9780226474847
- Murakami, H. (2005). *Kafka on the shore* (P. Gabriel, Trans.). Vintage Books. ISBN: 9780099458326
- Nutini, H. G. (1971). The ideological bases of Lévi-Strauss's structuralism. *American Anthropologist*, 73(3), 537–544.
- Sahlins, M. (2014). On the ontological scheme of *Beyond nature and culture*. *HAU: Journal of Ethnographic Theory*, 4(1), 281–290. <https://doi.org/10.14318/hau4.1.013>
- Swancutt, K. (2022). Animism. *Cambridge Encyclopedia Of Anthropology*. <http://doi.org/10.29164/19anim>
- Valeri, V. (1994). Wild victims: Hunting as sacrifice and sacrifice as hunting in Huau. *History of Religions*, 34(2), 101–131. <https://doi.org/10.1086/463385>
- Willerlev, R. (2013). Taking animism seriously, but perhaps not too seriously? *Religion and Society*, 4(1), 41–57. <https://doi.org/10.3167/arrs.2013.040103>

Commentary references

- Cassidy, R. (2012). Lives with others: Climate change and human-animal relations. *Annual Review of Anthropology*, 41, 21–36. <https://doi.org/10.1146/annurev-anthro-092611-145706>
- Chidichimo, E. (2022). Credo, cognition, and culture: An anthropology of religion. *Cambridge Journal of Human Behaviour*, 1(1), 47–58. Available at: <https://jhumanbehaviour.com/wp-content/uploads/2022/10/Chidichimo-E-Credo-cognition-and-culture.pdf>
- Cipolla, C. N. (2021). Posthuman potentials: Considering collaborative Indigenous archaeology. *Cambridge Archaeological Journal*, 31(3), 509–514. <https://doi.org/10.1017/S0959774321000202>
- Harman, G. (2015). *Bruno Latour: Reassembling the political*. Pluto Press. <https://doi.org/10.2307/j.ctt183p1ks>
- Latour, B. (1999). *Pandora's hope: Essays on the reality of science studies*. Harvard University Press. ISBN: 9780674653368
- Miller, R. D. II (2014). Shamanism and totemism in early Israel. *Journal of the Washington Academy of Sciences*, 100(4), 21–58. <http://www.jstor.org/stable/jwashacadscie.100.4.0021>
- Pedersen, M. A. (2001). Totemism, animism and North Asian Indigenous ontologies. *Journal of the Royal Anthropological Institute*, 7(3), 411–427. <https://doi.org/10.1111/1467-9655.00070>
- Walsh, R. (1989). What is a shaman? Definition, origin, and distribution. *Journal of Transpersonal Psychology*, 21(1), 1–11. Available at: <https://www.atpweb.org/jtparchive/trps-21-89-01-001.pdf>
- Won, A. S., Bailenson, J. N., & Lanier, J. (2015). Homuncular flexibility: The human ability to inhabit nonhuman avatars. In R. A. Scott & S. M. Kosslyn (Eds.), *Emerging trends in the social and behavioral sciences* (1st ed., pp. 1–16). Wiley. <https://doi.org/10.1002/9781118900772.etrds0165>
- Ainsworth, M. D. S. (1979). Attachment as related to mother-infant interaction. In *Advances in the study of behavior* (Vol. 9, pp. 1–51). Elsevier. [https://doi.org/10.1016/S0065-3454\(08\)60032-7](https://doi.org/10.1016/S0065-3454(08)60032-7)
- Amiot, C. E., & Bastian, B. (2017). Solidarity with animals: Assessing a relevant dimension of social identification with animals. *PLOS ONE*, 12(1), Article e0168184. <https://doi.org/10.1371/journal.pone.0168184>
- Amiot, C. E., & Santerre-Bélec, L. (2022). Toward more equal and mutual human-pet relations: Insights and possible solutions based on social psychological theories. *Frontiers in Veterinary Science*, 9, Article 1009267. <https://doi.org/10.3389/fvets.2022.1009267>
- Beatson, R. M., & Halloran, M. J. (2007). Humans rule! The effects of creatureliness reminders, mortality salience and self-esteem on attitudes towards animals. *British Journal of Social Psychology*, 46(3), 619–632. <https://doi.org/10.1348/014466606X147753>
- Bowlby, J. (1980). *Attachment and loss. Vol. 3: Loss, sadness and depression*. Hogarth Press. ISBN: 9780701203504
- Bruder, J., Burakowski, L. M., Park, T., Al-Haddad, R., Al-Hemaidi, S., Al-Korbi, A., & Al-Naimi, A. (2022). Cross-cultural awareness and attitudes toward threatened animal species. *Frontiers in Psychology*, 13, Article 898503. <https://doi.org/10.3389/fpsyg.2022.898503>
- Heflick, N. A., Goldenberg, J. L., Hart, J., & Kamp, S.-M. (2015). Death awareness and body-self dualism: A why and how of afterlife belief. *European Journal of Social Psychology*, 45(2), 267–275. <https://doi.org/10.1002/ejsp.2075>
- Kahane, G., & Caviola, L. (2022). Are the folk utilitarian about animals? *Philosophical Studies*. <https://doi.org/10.1007/s11098-022-01833-2>
- Lifshin, U., Greenberg, J., Zestcott, C. A., & Sullivan, D. (2017). The evil animal: A Terror Management Theory perspective on the human tendency to kill animals. *Personality and Social Psychology Bulletin*, 43(6), 743–757. <https://doi.org/10.1177/0146167217697092>
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370–396. <https://doi.org/10.1037/h0054346>
- Pallotta, N. (2008). Origin of adult animal rights lifestyle in childhood responsiveness to animal suffering. *Society & Animals*, 16(2), 149–170. <https://doi.org/10.1163/156853008X291435>
- Prato-Previde, E., Basso Ricci, E., & Colombo, E. S. (2022). The complexity of the human-animal bond: Empathy, attachment and anthropomorphism in human-animal relationships and animal hoarding. *Animals*, 12(20), 2835. <https://doi.org/10.3390/ani12202835>
- Pyszczynski, T., Solomon, S., & Greenberg, J. (2015). Thirty years of Terror Management Theory. In *Advances in Experimental Social Psychology* (Vol. 52, pp. 1–70). Elsevier. <https://doi.org/10.1016/bs.aesp.2015.03.001>
- Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). A Terror Management Theory of social behavior: The psychological functions of self-esteem and cultural worldviews. In *Advances in Experimental Social Psychology* (Vol. 24, pp. 93–159). Elsevier. [https://doi.org/10.1016/S0065-2601\(08\)60328-7](https://doi.org/10.1016/S0065-2601(08)60328-7)
- Tajfel, H., & Turner, J. (2001). An integrative theory of intergroup conflict. In M. A. Hogg & D. Abrams (Eds.), *Intergroup relations: Essential readings* (pp. 94–109). Psychology Press. ISBN: 9780863776793
- Williams, D. R., Neighbors, H. W., & Jackson, J. S. (2003). Racial/ethnic discrimination and health: Findings from community studies. *American Journal of Public Health*, 93(2), 200–208. <https://doi.org/10.2105/AJPH.93.2.200>
- Bering, J. M. (2002). The existential theory of mind. *Review of General Psychology*, 6(1), 3–24. <https://doi.org/10.1037/1089-2680.6.1.3>
- Cherry, J. L. (1992). *Animism in thought and language* [Doctoral dissertation, University of California at Berkeley]. eScholarship University of California. <https://escholarship.org/uc/item/1112x6ht>
- Farrer, C., Franck, N., Georgieff, N., Frith, C. D., Decety, J., & Jeannerod, M. (2003). Modulating the experience of agency: A positron emission tomography study. *Neuroimage*, 18(2), 324–333. [https://doi.org/10.1016/S1053-8119\(02\)00041-1](https://doi.org/10.1016/S1053-8119(02)00041-1)
- Geng, J. J., & Vossel, S. (2013). Re-evaluating the role of TPJ in attentional control: Contextual updating? *Neuroscience & Biobehavioral Reviews*, 37(10), 2608–2620. <https://doi.org/10.1016/j.neubiorev.2013.08.010>
- Guthrie, S. E. (1995). *Faces in the clouds: A new theory of religion*. Oxford University Press. ISBN: 9780195098914
- Hayashi, T., Akikawa, R., Kawasaki, K., Egawa, J., Minamimoto, T., Kobayashi, K., Kato, S., Hori, Y., Nagai, Y., Iijima, A., Someya, T., & Hasegawa, I. (2020). Macaques exhibit implicit gaze bias anticipating others' false-belief-driven actions via medial prefrontal cortex. *Cell Reports*, 30(13), Article e4435. <https://doi.org/10.1016/j.celrep.2020.03.013>
- Karpinska-Krakowiak, M., & Eisend, M. (2021). The effects of animistic thinking, animistic cues, and superstitions on brand responses on social media. *Journal of Interactive Marketing*, 55, 104–117. <https://doi.org/10.1016/j.intmar.2021.03.002>
- Kelemen, O., Erdelyi, R., Pataki, I., Benedek, G., Janka, Z., & Keri, S. (2005). Theory of mind and motion perception in schizophrenia. *Neuropsychology*, 19(4), 494–500. <https://doi.org/10.1037/0894-4105.19.4.494>
- Lee, S. M., & McCarthy, G. (2016). Functional heterogeneity and convergence in the right temporoparietal junction. *Cerebral Cortex*, 26(3), 1108–1116. <https://doi.org/10.1093/cercor/bhu292>
- Mahy, C. E., Moses, L. J., & Pfeifer, J. H. (2014). How and where: Theory-of-mind in the brain. *Developmental Cognitive Neuroscience*, 9, 68–81. <https://doi.org/10.1016/j.dcn.2014.01.002>
- McDonald, L., & Stuart-Hamilton, I. (2000). The meaning of life: Animism in the classificatory skills of older adults. *International Journal of Aging and Human Development*, 51(3), 231–242. <https://doi.org/10.2190/825Y-GWAT-9BM8-G5TR>
- Moser, C. J. (2019). *Aggressive mimicry as a human hunting strategy* [Master's thesis, Texas A&M University]. OAKTrust. Texas A&M University. <https://oaktrust.library.tamu.edu/handle/1969.1/189127>
- Rice, K., Anderson, L. C., Velnosky, K., Thompson, J. C., & Redcay, E. (2016). Biological motion perception links diverse facets of theory of mind during middle childhood. *Journal of Experimental Child Psychology*, 146, 238–246. <https://doi.org/10.1016/j.jecp.2015.09.003>
- Schaffner, S., & Sabeti, P. (2008). Evolutionary adaptation in the human lineage. *Nature Education*, 1(1), 14. Available at: <https://www.nature.com/scitable/topicpage/evolutionary-adaptation-in-the-human-lineage-12397/>
- Shamay-Tsoory, S. G., Tibi-Elhanany, Y., & Aharon-Peretz, J. (2006). The ventromedial prefrontal cortex is involved in understanding affective but not cognitive theory of mind stories. *Social Neuroscience*, 1(3–4), 149–166. <https://doi.org/10.1080/17470910600985589>
- Williams, J. H., Waiter, G. D., Perra, O., Perrett, D. I., & Whiten, A. (2005). An fMRI study of joint attention experience. *Neuroimage*, 25(1), 133–140. <https://doi.org/10.1016/j.neuroimage.2004.10.047>