Biodivers Conserv (2017) 26:1009–1026
DOI 10.1007/s10531-017-1297-9

REVIEW PAPER

Kinship appeals and conservation social marketing

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Received: 29 August 2016 / Revised: 4 January 2017 / Accepted: 20 January 2017 /
Published online: 2 February 2017

Abstract Increasing environmental problems and the need to obtain public support to help address them make effective appeals in conservation fundraising campaigns indispensable. However, social marketing messages based on data, characteristics of focal species, self-interest, and moral responsibility tend to work best on targeted, and so limited, audiences. As conservation organizations reach out to broader audiences, they will require strategies that appeal to more potential donors. This paper argues that use of kinship symbolism to describe non-human species should make conservation marketing campaigns more effective. Evolutionary theories of altruism predict the power of kinship-recognition cues in encouraging and reinforcing sacrifice in non-kin, unreciprocated contexts, and these cues can be manipulated in marketing campaigns to protect threatened species and resources. People often behave altruistically toward "fictive" kin, and the labeling of non-humans as kin in many traditional, small-scale societies appears to be associated with environmental resource management. Characterizing non-human species, and even non-living resources, as kin to humans in marketing campaigns may promote a willingness to contribute to conservation-related causes.

Keywords Conservation in traditional societies · Conservation marketing · Fictive kinship · Induced altruism · Kinship appeals

Communicated by Peter Bridgewater.

This article belongs to the Topical Collection: Biodiversity appreciation and engagement.

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Introduction

Fictive kinship is commonly used cross-culturally to label relationships among individuals not socially recognized as legitimate kin. Like kinship ties, fictive kin relationships involve roles and responsibilities that often include somatically or reproductively costly, unreciprocated behavior. Such behaviors among genetically unrelated individuals appear to run counter to neo-Darwinian explanations for phenotypic altruism. However, kin terms, along with phenotypic similarity and close association during development, are human kinship cues that can reinforce inclusive fitness-related tendencies to behave altruistically. The use of kin cues, in other words, can encourage generous, even sacrificial behavior among non-relatives. Kin cues may also encourage similar behavior when used to label non-humans. If so, they may be useful as a means to enlist public support for conservation organizations and programs.

This paper outlines typical marketing strategies used to generate resources and promote behavioral changes for conservation-related purposes. It then discusses a generally untested strategy, a "kinship appeal" that emphasizes the relatedness of humans to other species. While this "we are family" approach may appear unduly romantic, two sources of support for it are discussed. First, evolutionary theories of altruism and inclusive fitness suggest the power of kinship markers to encourage contributions in contexts such as marketing campaigns. Second, many traditional, small-scale societies label non-human species, and even environmental features and resources, as kin, suggesting that kin labeling may be associated with ecological management in groups closely tied to their natural environments. The paper concludes with recommendations for how marketers might incorporate kinship appeals in conservation campaigns.

Conservation marketing

Many plant, animal, and other species are currently threatened with extinction. In the United States alone, one analysis suggests, 84% of species listed under the Endangered Species Act are "conservation reliant," meaning their survival depends on human intervention (Scott et al. 2010). Similar declines are common among animal and plant species worldwide (http://www.iucnredlist.org/; http://www.livingplanetindex.org/). Conditions are equally dire for ecosystems (MA 2005) and nonliving natural resources, including water (UNEP 2008).

Further, conservation requires funds that people are typically reluctant to provide. The worldwide unpaid "external" costs of economic production were recently estimated at $7.3 trillion (Trucost 2013). To the large extent that these unpaid costs impact conservation-related issues, they create a massive "conservation funding gap," particularly in developing nations (Blamford and Whitten 2003). Foundations, corporations, and other institutional donors can be approached directly. Individuals, on the other hand, who collectively contribute the largest percentage of philanthropic gifts, are typically approached through outreach campaigns. However, "the conservation community often fails to reach the public and influence their behavior" (Wright et al. 2015, p. 41), and conservation giving remains low, at roughly 3% of total contributions (Business Wire 2015). Given the number of conservation organizations and other interests competing for potential donors' time and money, persuasive marketing has become increasingly important.

Conservation marketing is a form of social marketing, or the use of commercial marketing theory and methods to encourage behavioral changes that will improve (someone's view of) individual or societal wellbeing (Gwynne 2003). Most effective social marketing campaigns work at influencing values, or "propositions" (Monroe 2003; Peattie and Peattie 2009), particularly where, as in conservation marketing, what is being "sold" is not based on customer preference and the benefits can be distant or unclear (Smith et al. 2010).

While many conservation problems are local, incentives used to promote remedies often fail because of competing interests among members of local communities (Berkes 2004). Further, due to increasing public awareness about how conservation problems are broadly interrelated, stakeholders now include groups with only indirect recreational, cultural, or ideational interests in conservation management (Manfredo 2008). Local marketing is therefore often best complemented or superseded by broader appeals. As Mesmer and Enck suggest, "The extent and nature of wildlife management and conservation actions are a function of program funding—conservation success in the twenty-first century will depend upon broad-based support from both consumptive and non-consumptive wildlife user groups" (2012, p. 217). However, marketing strategies aimed at broader audiences must, almost by definition, appeal to parties with many different, even conflicting, perspectives and concerns.

Marketers use several "persuasive appeals" (Manfredo 2008) to attempt to influence values and behaviors associated with conservation. Perhaps the most common is the informational appeal, which employs data, such as declines in species numbers, to describe the benefits of a policy or an organization's mission (Monroe 2003; Prakash 2002; Smith et al. 2010). Even when accepted as credible, however, data alone are not always effective, and such appeals can lead to selfish calculations regarding costs (Cornelissen et al. 2007). In addition, factors other than rationality often influence our economic and behavioral decisions (French and Gordon 2015; Samson 2014). "Particularly in the environmental realm, humans seem to be quite adept at ignoring information that conflicts with their behaviors," notes Monroe (2003, p. 119; also Cheng et al. 2011). In fact, in decision-making we often not only ignore but actively avoid factual information, even if it is potentially useful and easily accessible (Golman et al. 2016).

Another common conservation marketing strategy is selecting focal (or surrogate) species to "stand for" biodiversity more generally. These may be *indicator* species (whose status reflects a specific environmental condition of interest), *umbrella* species (whose protection will indirectly benefit other species in its ecosystem), or *keystone* species (whose activities directly affect the status of others). And while there can be scientific reasons for selecting particular focal species, many are chosen primarily for their appeal to the public, and even to scientists and conservationists (Ducarme et al. 2013). This has led to the development of the concept of a *flagship* species, or one that "can be used to anchor a conservation campaign because it arouses public interest and sympathy" (Simberloff 1998, p. 247; Smith et al. 2012). "Charismatic" flagship species are particularly effective, as they appeal to the popular imagination (Lorimer 2007). However, the use of focal species is often simplistic, manipulative, or biasing with regard to scientific research (e.g., Clucas et al. 2008; Small 2011, 2012). Further, focal species appeal differently to different audiences. For example, apex predators, which are often charismatic flagships, are typically dangerous to humans, and so least appealing in their home ranges, the very locales where they require protection (e.g., Kaltenborn et al. 2006).

Conservation marketers also appeal to material self-interest. Framing messages in terms of receivers' gains and losses is common, and sometimes couched as fear appeals—i.e., threats about what will happen if desired outcomes are not obtained. But, again, rational

appeals, even to self-interest, often fail, and fear appeals are often ineffective if the consequences of targeted behaviors are too far in the future (Cheng et al. 2011). Further, groups respond in different ways to the same message, requiring "proper segmentation of the population" in message design (Cheng et al. 2011, p. 48). "Nudging" with material incentives or disincentives such as gifts or penalties may enhance self-interest appeals (Spotswood et al. 2012; Von Bergen and Miles 2015), but can be expensive, result in backlash, and is typically unsuccessful in maintaining desired behaviors after campaigns are over (Gwynne 2003; Monroe 2003).

Another approach is the appeal to social self-interest. Because we tend to conform to subjective social norms—that is, what we believe social norms to be—corrective and manipulative normative appeals can be effective in encouraging pro-conservation behavior (Berkowitz 2005; Manfredo 2008; St John et al. 2010). For example, labeling people as environmentally friendly, whether or not behaviors justify it, can promote environmentally friendly decision-making (Cornelissen et al. 2007; also Allcott 2011). However, here too, effects vary by demographic factors, and are "highly dependent on characteristics of the individual in the target audience" (Cheng et al. 2011, p. 57).

Finally, moral appeals are another strategy in conservation marketing (Chen et al. 2009). Social issues are often perceived in moral terms, including environmental attitudes (Feinberg and Willer 2013). Again, however, not everyone agrees about what is morally right. For example, to the Thoreau Institute, private property rights trump conservation as a moral value (http://www.ti.org/).

The strategies discussed above suffer from two limitations. One is that they are predicated on the expectation of rational decision-making, which is particularly problematic in the case of long-term projections about species and ecosystem survival (Low 2004; Manfredo 2008). The other is that they appeal only to certain segments of the public. While standard social marketing relies on understanding target audiences in order to tailor messages as specifically as possible (Jacobson et al. 2006), this approach can weaken campaigns by polarizing audiences that have competing interests. Since conservation organizations need to appeal to increasingly broad audiences, both of these limitations suggest there is value in looking for additional strategies that can appeal more generally to human cognitive biases.

Kinship appeals

Cognitive biases appear to underlie the appeal of several conservation marketing strategies. For example, audiences respond more favorably to animal species that exhibit certain characteristics, including beauty, size, and resemblance to domesticated species (Small 2011, 2012). "Cuteness" makes certain species star attractions in zoos, as well as poster species for conservation efforts. To the extent that cuteness is related to an innate appeal of neotenous, or juvenile, features (Archer and Monton 2011; Borgi et al. 2014), it is a cognitive bias that can on the one hand negatively impact species conservation, as the vast majority of species are not cute, and, on the other, provide an opportunity for the development of more effective social marketing campaigns (Estren 2012).

Another marketing approach informed by cognitive biases is based on anthropomorphism, or the attribution of human traits to non-humans. Anthropomorphism appears to be an "unavoidable product of a necessary perceptual strategy" and a powerful, universal tendency (Guthrie 1997, p. 57; Mitchell et al. 1997). Because anthropomorphizing leads to

individualization and empathy (Batt 2009; Slovic 2007), anthropomorphic animals are often (and cross-culturally) effective as commercial marketing tools (Brown 2010), and some studies suggest that anthropomorphizing encourages conservation behavior (e.g., Tam et al. 2013). The anthropomorphic appeal is to be used with care, however, as we anthropomorphize negative qualities as well as positive ones (thus, "greedy" otters). Anthropomorphizing particular species can also lead to support for eliminating competing species, or create "expectations of human-like social behavior that non-human species cannot satisfy" (Root-Bernstein et al. 2013, p. 1585).

Evolutionists tend to agree that conservation-related decision-making is impeded by short-term, narrow thinking and inclinations towards individualism and familism (Griskevicius et al. 2012; Low 2004, 2015; Penn 2003; Wilson 2009). They therefore propose that desired behavior will best be obtained in local, immediate, and personally profitable contexts. Profit, in evolutionary terms, is social as well as material, and we appear to find it easier to consider propositions if couched in social, rather than merely logical, terms (e.g., Cosmides and Tooby 1992). Therefore, appeals related to social self-interest and social pressure are likely to be effective (van Vugt 2009), and we will often invest in costly behaviors if they provide a social advantage (Roberts 1998).

However, evolutionists are pessimistic about the likelihood of success in generating conservation-related altruistic behavior, as short-sighted self-interest tends to trump wider appeals. As Bobbi Low puts it,

> If we could set aside our evolutionary past and act without self-interest, perhaps we could easily act as if the earth were our family. Yet that is precisely what we have been exhorting ourselves to do for literally hundreds of years, and it hasn't happened yet (Low 2004, p. 16).

Nevertheless, if it could be made easier for us to believe that the earth is indeed our family, we could more easily act self-interestedly to conserve it. In other words, an effective conservation social marketing campaign might center on appeals that emphasize kinship between humans and non-human species, or even non-living resources. While the idea may seem farfetched, the notion of a "mother" earth or nature is common in the West and cross-culturally ubiquitous. It may be possible to target processes associated with such "fictive" kinship to encourage conservation philanthropy. Low notes that group identity can be appealed to, and perhaps even manipulated, to "extend the boundaries of 'others' we are willing to accept as sharing our benefits" (2004, p. 19). In fact, evolutionary theory supports the likelihood that fictive kinship assignations promote altruistic behavior toward non-relatives and that the boundaries of perceived relatedness can be extended to non-humans.

Fictive kinship and induced altruism

The concept of fictive kinship is a catch-all for cases in which affinity is assigned to individuals who are socially understood to be unrelated to each other. Examples can be found in all types of societies and in many settings, including parenting (e.g., godparenting), marriage ("ghost marriages"), and siblingship (simulated in rites of passage and combat) (Qirko 2011). Kinship is sometimes defined on the basis of factors other than (or in addition to) genetic or marital ties, such as degree of involvement in raising children or the sharing of food (Holy 1996). Further, mechanisms of reproduction and inheritance have

not been equally well understood in all cultures. However, cross-culturally humans are generally conscious of the relationship between sex and reproduction, and all cultural models of kinship and marriage "bear a demonstrable relationship" to biological facts (van den Berghe 1979, p. 9). Thus, genetic relatedness is fundamental to the construction and understanding of kinship. As evidence of this, people often behave differently toward individuals with the same kin label based on degrees of genetic relatedness (e.g., Bloch 1999; Silk 1987).

Another attribute of kinship, fictive or otherwise, is its manipulability. Because kinship always entails mutual roles and responsibilities, it is often advantageous for individuals and organizations to manipulate kin assignation for their benefit. For example, namesaking (naming a child after oneself, a relative, or a partner) can promote familial commitment and strengthen community bonds (Gutman 1977; Johnson et al. 1991), and individuals often recast others into different kinship categories for material and reproductive advantage (e.g., Bodenhorn 2000; Chagnon 1981; Choi 1995). Symbols of kin relationships can be manipulated to promote desired behavior among strangers, as in the use of kin terms in political speech (Johnson et al. 1987; Salmon 1998). Finally, there is evidence that cues to kinship can reinforce even costly sacrificial behaviors in religious, military, and terrorist organizations which appear to share, irrespective of ideology, similar organizational practices related to kin labeling (Johnson 1986; Qirko 2013). Thus, fictive kin labels and roles can encourage the same kinds of costly, unreciprocated behavior toward non-kin that are appropriate to actual kin.

An evolutionary explanation for this phenomenon is that behavioral responses to kinship cues are a manifestation of evolved psychological mechanisms related to altruism and inclusive fitness. Because altruistic behavior benefits the somatic or reproductive success of a recipient at a cost to its provider (West et al. 2011), it should persist in populations only under certain conditions. In traditional Neo-Darwinian theory (i.e., leaving aside group selection, mimetic, and other models) there are only two such conditions. One is reciprocity, where altruists' costs are reciprocated with larger returns as a consequence of multiple exchanges between specific individuals or as received from third parties (Fehr and Fischbacher 2003; Trivers 1971). The other is kin selection, based on genes being shared in different proportions among individuals. Therefore, kin altruism can evolve if it provides benefits to altruists' genetic relatives that exceed costs to themselves (Hamilton 1964a, b; Madsen et al. 2007). Under these two conditions, individually costly behaviors (or "phenotypic" altruism) can ultimately be genetically advantageous (Alexander 1987).

An extension of kin selection theory, induced altruism through the manipulation of kinship cues, helps explain why fictive kinship may promote altruistic behavior. Induced altruism, documented in many species, is elicited through coercion, manipulation, or deception (Ridley 1995; Trivers 1985). Sometimes inducement occurs through "kinship deceit," or the manipulation of cues to relatedness (Trivers 1985). Parasitic birds, for example, will care for foreign eggs and fledglings if manipulated to do so through cues that include egg location, size, color, etc. (Rothstein and Robinson 1998).

In humans, too, kinship cues and their identification appear to be deep-seated aspects of cognition (Park et al. 2008; Wells 1987). One likely human cue is *association*, especially in early development (Lieberman et al. 2007). The Westermarck effect, which predicts a lack of sexual interest between individuals reared together, offers support for the relevance of this cue in a variety of cultural contexts (Lieberman 2009; Lieberman and Lobel 2012). Another cue is *phenotypic similarity*, which is cross-culturally discussed as a kinship marker and has been shown to be reliable in a variety of studies (Alvergne et al. 2007; DeBruine et al. 2009). Further, facial similarity appears to decrease sexual interest while

increasing trust and prosocial behavior (DeBruine et al. 2008). Most obviously, *kin terms and markers* are cues to relatedness which also appear to appeal to evolved recognition mechanisms. As noted earlier, individuals often treat non-kin who are assigned kinship labels as relatives, and we appear to develop and use kinship terminology in ways that suggest there are cognitive mechanisms associated with doing so (Daly et al. 1997; Jones 2010).

Of course, a tendency to behave altruistically toward those labeled as kin does not mean that relatives always treat each other well. Further, we should not assume that kinship terms have the same meaning in all contexts. However, *even when people are consciously aware that they are not related, kin cues can encourage and reinforce behavior appropriate to genetic relatives, including altruistic behavior*. Further, because kin cues largely operate unconsciously, there is no reason to exclude the possibility that fictive kinship assignations for non-humans could, however subtly, promote values and behavior associated with genetic relatives. In fact, kin labeling for non-human species and resources occurs in many societies, and appears to be associated with conservation-related altruistic behavior.

Non-humans as kin

Ethnographic data show that the use of kin labels for non-humans is ubiquitous in traditional, small-scale societies. "Traditional" is here defined as "societies with historical continuity in resource use practice" (Berkes et al. 2000, p. 1252), while "small-scale" refers to foragers, horticulturalists, and non-intensive agriculturalists and pastoralists living in "face-to-face" communities where kinship is a primary organizing principle (Benedict 1968). Irrespective of their diversity, such societies share a direct and longstanding relationship with the environments they inhabit. And in many such societies (hereafter "traditional"), it is common for plants, animals, and non-living resources to be understood as "intentional, relational entities" with a stake in humans affairs (Atran and Medin 2008, p. 196; for overviews, see Descola 2013; Harvey 2005; Ingold 2011a). Numerous studies establish this (e.g., Atran and Medin 2008; Berkes 2012; Hall 2015; Kent 1989; Nadasdy 2007; Willerslev 2015). It is not anthropomorphism, but the view and treatment of non-humans as entities possessing their own intelligence, agency, self-awareness, and theory of mind (e.g. Aaltola 2008). And while in anthropology this view of the non-human has historically been associated with animistic belief systems, and so described in large part in mythic and religious terms (Stringer 1999), reformulations of animism now tend to emphasize traditional peoples' relational view of their interactions with the non-human, involving mutual respect and obligations (Bird-David 1999; Descola 2013; Harvey 2005, 2015).

Further, the relationships and responsibilities shared with the non-human world are often described in kinship terms. For example, the Uduk of Southeastern Sudan see themselves as "members of the great family of hoofed creatures, and kin to the wild antelopes" (James 1994, p. 188). To the Karam of the New Guinea Highlands, the cassowary are not taxonomically classified as birds but as sisters and cross-cousins (Bulmer 1967, p. 18). The Jivaroan tribes of eastern Ecuador and Peru see domesticated plants as consanguineal relatives (Descola 1996, p. 90), and the Guaja of eastern Amazonia believe themselves to be consanguineally related to howler monkeys, whom they perceive as having been created from themselves, and who as pets are given personal names and

kinship forms of address (Cormier 2003). Some Australian indigenous groups have matrilineal kin groups (*ngurlu*) that are explicitly "multi-species kin groups" (Rose 2015). For example, the "catfish" *ngurlu* includes both catfish in the river and "human catfish people" who share catfish flesh through descent. To the Rarámuri of the Sierra Madres, many species, including peyote, maize, coyotes, and bears, "are all humans. Rarámuri feel related to these life-forms much as Euroamericans feel related to cousins and siblings" (Salmón 2000, p. 1329).

Often, as with the Maori, "the environment is not simply a collection of resources to be exploited but a community of related beings, all of them linked to humans beings by ties of kinship, all of them important in themselves, all of them needing protection…and demanding respect" (Patterson 1994, p. 399). And kin relationships can be had with non-living phenomena as well. The Navajo (Dineh) kin bonds, known as Ke'e, extend to the earth itself, as mother, a "true kinswoman" (Witherspoon 1975, p. 20).

Linguistic data also provide support for the ubiquity of non-human kin labeling in traditional societies. Mario Alinei and his coworkers mapped "iconyms," or semantic drivers, for species names in European languages and dialects (2005, p. 249). Maps of hundreds of species' labels across dialects and languages reveal three main categories of iconyms. The most recent shows the influence of Christianity and Islam. This category supplants an earlier one related to "magico-religious pre-Christian and pre-Islamic beings and institutions," which, in turn, replaces an even earlier group of iconyms. In some Italian dialects, for example, "Holy Spirit," "St. Nicholas," or "priest" over time replaced variants of "witch," which in turn replaced "grandmother" as an iconym for butterfly. The earliest layer of animal names across Europe, still maintained as folk-names in many cases, assigns kinship for many non-human species.

Based on these findings and analyses of animal-related folklore among Europes's most isolated dialects and peoples, Alinei concludes that the earliest, kin-related iconymic category reflects totemism as exhibited by early small-scale societies, perhaps going back as far back as the Paleolithic. Over time and with increasing sociocultural complexity, a layer of pre-Christian, anthropomorphic naming followed, typically associated with local gods and mythological figures. These names, in turn, were followed by names taken from Christianity or Islam (Alinei 1997, 2005; Viereck 2002). The pattern is repeated in other parts of the world (Alinei 1997, p. 18).

Anthropological views of totemism have emphasized its classificatory functions rather than beliefs of human descent from totem species (Bird-David 1999; Lévi-Strauss 1964; Willis 1990). Thus, "For Lévi- Strauss…what makes a society totemist is the fact that the difference between Species A and Species B is similar to the difference between Clan 1 and Clan 2" (Pedersen 2001, p. 417). Similarly, Descola (2013) emphasizes not kinship but specific attributes said to be shared by totem species and groups affiliated with them. However, many traditional groups describe animals as "close relatives," not merely vehicles for humanity's consideration of itself (Harvey 2015, p. 135). Thus, "It is frustrating to Native Americans to hear others speak romantically of our closeness to nature or love of nature…To be Eagle, Wolf, Bear, Deer, or even Wasp clan means that you are kin to these other persons; they are your relations…thus, these kin exist as our elders and, much as do human elders, function as our teachers and as respected members of our community (Pierotti and Wildcat 2000, p. 1336)."

Or, as Root-Bernstein and colleagues put it,

> [I]t is important to recognize that within animistic or totemic complexes, representations of other species talking to or marrying humans are not imaginary

> constructions inhabiting imaginary worlds, as anthropomorphized animals may be in Western thought. Although metaphor and ritual may be important for making spaces in which non-humans can communicate or act as kin, within these spaces humans experience a *reality* of other species (2013, p. 1583—original emphasis).

We also see glimpses of a view of non-human species as kin in the modern pet. In many Westerns societies, dogs and cats in particular may be referred to as family members, seen as interacting, relational non-human persons, and involved in weddings, birthdays, holiday gift-giving, and other kin-centered human activities (Carlisle-Frank and Frank 2006; Wilson et al. 2013). The phenomenon is relatively recent (Brandes 2009; Veidkamp 2009) and, notwithstanding its flexible nature and many instances of pet abuse and neglect (Shir-Vertesh 2012), has been accompanied by dramatically greater spending on pet care (Cropper 1998).

Some researchers go as far as to suggest that traditional peoples' understanding of their relationship to the non-human is what Salmón (2000) calls "kincentric," or the view that "life in any environment is viable only when humans view their surroundings as kin; that their mutual roles are essential for their survival" (p. 1327). To Salmón, kincentrism is communicated and enforced through social norms, including taboos explicitly associated with kinship. Certainly there are many such taboos—for example, in the Australian multi-species kinship *ngurlu* described earlier, human obligations include proscriptions against killing or eating non-human kin (Rose 2015; also Berkes et al. 2000; St John et al. 2010).

The kinds of kinship described above, and in the literature generally, vary. And the degree to which non-humans are perceived as kin is often hard to ascertain. Nevertheless, kin labeling of non-humans, however relationships with them are understood, is widespread in traditional societies, and, even where explicitly perceived as fictive, typically accompanied by behavioral obligations.

Traditional peoples and conservation

While a relationship between kin labelling and phenotypic altruism is predicted in evolutionary terms and supported by examples in human behavior, establishing if kin labeling of non-humans is associated with altruistic behavior, in particular that which could be described as conservationist, would provide additional support for the likely effectiveness of kinship appeals in conservation marketing. The degree to which traditional societies are in fact conservationist, however, is the subject of considerable debate.

A typical ethnographic account of traditional, small-scale societies' relationship with the natural environment is one provided by Kat Anderson of Native California groups:

> Native people reconciled the killing of their plant and animal kin by following certain rules when hunting and gathering (e.g., do not waste or overharvest) and by sharing the bounty with needy relatives and friends… Recognizing the impact of killing other creatures for food, California Indians in various tribes were careful to restore harmony through acts of reciprocity: offerings, prayers of thanks, special ceremonies, and management of habitats to benefit the plants and animals not taken (Anderson 2005, p. 59).

Many researchers agree that traditional societies manage their resources for their conservation (e.g., Atran and Medin 2008; Berkes 2012; Berkes et al. 2000; Hames 2007; Smith and Wishnie 2000). So many traditional norms and rules are associated with

conservation that St John et al. (2010) warn that outside interference, even in conservation management, can cause disruptions that do more harm than good. Many of these norms and rules run counter to individual and familial interests, and so constitute examples of altruistic behavior.

In fact, some researchers describe a cross-cultural continuum of views of the non-human world as ranging from relational to controllable. Increasing control generally corresponds with increasing societal scale and reliance on domesticated species, as well as with a decrease in direct contact with nature (Ingold 2011b; Kent 1989; Russell 2002). Small-scale foraging societies typically describe sharing and trusting relations with other species, while pastoralists are more like benevolent enslavers. In both settings, however, non-humans are interacting agents, in many cases viewed as kin. And in both cases, these views are accompanied by responsibilities towards the non-human that could be described as altruistic. In larger-scale societies where intensive agriculture and factory farming are typical, domination is the paradigm, and animals (with the occasional exception of pets) are generally reduced to the status of property (Ingold 2011b). Here, neither kin terms nor attendant responsibilities are typical.

However, other researchers hold that traditional societies often put short-term interests ahead of longer-term conservation strategies (Alvard 1993, 1998; Low 2004; Penn 2003). Low, for example, found in a cross-cultural sample that resource practices do not correlate with an explicit conservationist attitude in many traditional societies (1996). "Optimal" foraging strategies based on short-term cost/benefit assessments, as well as high social and reproductive value associated with successful hunting, may account for this (e.g., Hawkes and Bird 2002). These societies can get away with such practices while causing little apparent environmental damage because their populations are small and because the natural resources surrounding them are plentiful, with little market value (Alvard et al. 1997; Low 1996, 2004; also Krech 1999). Labeling of non-humans as kin, therefore, may not be associated with conservationism.

Two observations suggest that, despite arguments to the contrary, traditional peoples often do practice conservationist resource management. First, many examples of indigenous over-exploitation occur in societies in dramatic cultural or geographic transition—societies that are arguably not traditional at all (Smith 2011). Information is key to conservation: an incomplete understanding of environmental resources contributes to their overuse (Opotow and Weiss 2000). Stable societies should typically know more about their environments than groups in transition due to migration or disruption, and thus be more likely to exhibit conservationist behavior. Admittedly, stability is difficult to operationalize. Migrating human groups often cause serious damage to species and ecosystems they encounter (Duncan et al. 2013; Martin and Klein 1984)—but not always. At the same time, even subtle disruptions can have significant environmental consequences. For example, as Alvard (1995) notes, the Amazonian Piro typically hunt as short-term maximizers, and vulnerable primate species suffer over-exploitation as a result. Yet they now primarily use shotguns, and the hunting strategies and consequences of the neighboring Machiguenga, who use only bows, are quite different.

Second, traditional practices need not be explicitly conservationist to serve as such. Smith and Wishnie (2000) state that to be considered conservation behavior, actions should be specifically designed for such purposes, a condition that appears to exclude many practices of traditional peoples. However, design does not require explicit statements or decisions, and longstanding consensus can lead to policy (Ervin 2004). Even a realistic understanding of resources is not necessary for conservation to occur, as cultural norms may lead to unconscious conservation behavior (Smith 2001). Many traditional societies have developed stable relationships with their environments without practices whose

specific purposes involve conservation (Dietz et al. 2003; Ostrom 1990). Thus Low, while skeptical of the existence of an "ecologically noble savage," nevertheless notes that "Most traditional societies have been good short- to medium-term ecological managers…a variety of governance systems have managed resources over relatively long periods" (2004, p. 16). To the extent that these societies label many resources as kin, this association provides support for the contention that the relationship between perceived relatedness and altruistic behavior might extend to the non-human.

Marketing suggestions

Reviews of collections of successful conservation-related campaigns (e.g., Nėjė 2014) suggest that, aside from general appeals to "mother" earth or nature (e.g., Julia Roberts's video on www.conservation.org) and the occasional kin-labeling of non-human primates (e.g., Tom 2014), campaigns based on kinship with non-humans are rare. More developed kinship appeals could prove effective. For example, kin terms and other kinship symbolism (e.g., fictive genealogies) could be used to describe relations between audiences and target animals or resources. Naming is likely to be effective as well. While the personalization it provides has positive effects (Ensari and Miller 2006), naming can also contribute to the perception of shared group affiliation, which has been shown to reduce selfish behaviors in "tragedy of the commons" experiments (e.g., Kramer and Brewer 1984). Naming as kin, for example with the use of shared surnames, would likely strengthen naming's effects.

Additionally, phenotypic similarity between audience and target species could be highlighted and manipulated. We like species that resemble us (Batt 2009; Campbell et al. 1997). We often anthropomorphize in the popular media, and the transformation of Mickey Mouse's features to make them increasingly juvenile highlights the power of manipulating in the direction of what is psychologically appealing (Gould 1980). Human faces are also often "morphed" into animal faces for commercial and aesthetic purposes. However, other techniques can be developed to increase feelings of kinship through phenotypic similarity. For example, in one study, photographs of animals taken in a human portraiture style led to changes in viewer perception of subjects from "animals" to "kin," at least in the sense of "like us" (Kalof et al. 2015).

Finally, children's direct contact with non-human species could be encouraged. Many children encounter animals as pets or toys, in pictures, or in zoos (Cook 2015). These contexts, as well as animal husbandry programs such as 4-H clubs, present animals in ways that likely foster distance rather than connection and kinship (e.g., Ellis and Irvine 2010). Serpell (1986) finds that children in tribal societies often receive prey species to keep as pets, which may reinforce kinship connections with those species. Media representations of animals might achieve the same result. We have "parasocial" relationships with television characters and other media figures; they become "real," and are even seen as members of our social groups (Giles 2002). Interactive animal documentaries and games (if not patronizing or distancing), would likely encourage similar bonding—and even more so if kinship were emphasized via other cues.

Conclusion

It could be argued that evolutionary explanations for responses to kinship cues are unnecessary, given the powerful effects of culture in shaping perception. Context influences notions of what is "cute" (Cho 2012) as well as the effects of anthropomorphism (Root-Bernstein et al. 2013; Tam 2015). Because individual experience and cultural norms teach us how to relate to kin, there could be problematic variability in the way kinship is understood cross-culturally. However, the emotive power of fictive kin assignations is, as Janet Carsten notes, both ubiquitous and puzzling (2004, p. 137). It requires explanation that evolutionary theory can provide.

Additionally, cultural variability in traditional peoples' views of both non-human species and conservation-related behavior might render a connection between the two difficult to support. There is strong consensus in the literature that traditional, small-scale societies typically view non-humans as agents, which they often label as kin. There is also evidence that many traditional, small-scale societies are conservationist in their values and behaviors, even if they lack explicit conservationist policies or agendas. Nevertheless, these facts only suggest a plausible connection, and establishing correlations rather than simple associations between non-human kin labeling and conservation-related practices is a logical next step. One approach would be to more rigorously analyze ethnographic materials of cross-cultural societal samples, as in Low (1996). This could not only test the strength of association between these variables but also lead to the development of stronger, additional hypotheses. For example, perhaps the degree of relatedness assigned specific non-human species or resources correlates with their material importance (itself related to their life history and behavioral ecology) and practices associated with their management. Because determining the degree of kinship labeling of non-human phenomena will be difficult, as ethnographers often do not report it, linguistic analyses such as Alinei's are also needed. Ethnographers do often provide detailed accounts of myths and stories, many of which deal with the origins and nature of human and non-human relationships (Salmón 2000; Viveiros de Castro 2004). A systematic review of these materials for references to kin labeling and conservation practices could prove useful, as traditional societies often view myths as accurate stories of past ages (Archambault 2006).

It might be argued that even if kin labeling of non-humans and conservation management are commonly associated in traditional societies, kinship appeals are unlikely to work in large-scale modern societies because of entrenched dualist views of nature and culture. However, as a consequence of scientific findings on non-human species consciousness and even culture (Descola 2013) as well as "neo-animist" and other popular culture movements (Howell 2013), the Western dualist view is undergoing transformation. And while gauging the power of kinship appeals through marketing campaigns is a logical way to address this objection, additional experiments might provide information. Tam et al. (2013), for example, found through visual and verbal prompts that anthropomorphism inspires a stronger connection to nature, which in turns fosters conservation behavior. Similar experiments could be used to test the power of kinship appeals.

For ethical reasons, members of conservation organizations are sometimes suspicious of marketing strategies they perceive as manipulative (Tapp and Rundle-Thiele 2016). However, given the increasing need for conservation funding, it makes sense to attempt to frame conservation appeals in terms that will resonate deeply. As E. O. Wilson notes,

> The only way to make a conservation ethic work is to ground it in ultimately selfish reasoning – but the premises must be of a new and more potent kind. An essential component of this formula is the principle that people will conserve land and species

> fiercely if they foresee a material gain for themselves, their kin, and their tribe (Wilson 2009, pp. 131–132).

Because it is clear that providing people with data that informs rational decision making is not always effective, exploring the potential flexibility of perceptions of kin and tribe is an additional approach worth considering. There appear to be aspects of evolved psychology that are activated by linguistic and other labeling of non-human species and resources as kin. Further, the "pervasive cosmology of traditional societies" is of a "community of beings" whose members are linked by mutual obligations (Berkes et al. 2000, p. 1259). It may be that large-scale, modern societies, no matter how distanced from the resources that sustain them, have not outgrown the power of attributing kinship to non-human species or its capacity to promote needed conservation practices.

Acknowledgements I am grateful to Kate Cummings for initial discussion of the topic, as well as to Bobbi Low, Bruce Tomaso, and two anonymous reviewers for their valuable comments and suggestions.

References

Aaltola E (2008) Personhood and animals. Environ Ethics 30:175–193. doi:10.5840/enviroethics20083025
Alexander RD (1987) The biology of moral systems. Aldine Transaction, London
Alinei M (1997) Magico-religious motivations in European dialects: a contribution to archaeolinguistics. Dialectol Geolinguis 5:3–30
Alinei M (2005) Names of animals, animals as names: synthesis of a research. In: Minelli A, Ortalli G, Sanga G (eds) Animal names. Istituto Veneto di Scienze, Lettere ed Arti, Venice, pp 245-268
Allcott H (2011) Social norms and energy conservation. J Public Econ 95:1082–1095. doi:10.1016/j.jpubeco.2011.03.003
Alvard MS (1993) Testing the "ecologically noble savage" hypothesis: interspecific prey choice by Piro hunters of Amazonian Peru. Hum Ecol 21:355–387. doi:10.1007/BF00891140
Alvard MS (1995) Intraspecific prey choice by Amazonian hunters. Curr Anthropol 36:789–818. doi:10.1086/204432
Alvard MS (1998) Evolutionary ecology and resource conservation. Evol Anthropol 7:62–74. doi:10.1002/(SICI)1520-6505(1998)7:2<62:AID-EVAN3>3.0.CO;2-I
Alvard MS, Robinson JG, Redford KH, Kaplan H (1997) The sustainability of subsistence hunting in the neotropics. Conserv Biol 11:977–982. doi:10.1046/j.1523-1739.1997.96047.x
Alvergne A, Faurie C, Raymond M (2007) Differential facial resemblance of young children to their parents: who do children look like more? Evol Hum Behav 28:135–144. doi:10.1016/j.evolhumbehav.2006.08.008
Anderson MK (2005) Tending the wild: Native American knowledge and the management of California's natural resources. University of California Press, Berkeley
Archambault J (2006) Native views of origins. In: Ubelaker DH (ed) Handbook of North America Indians, vol 3., Environment, origins, and populationsSmithsonian Institution, Washington DC, pp 4–15
Archer J, Monton S (2011) Preferences for infant facial features in pet dogs and cats. Ethology 117:217–226. doi:10.1111/j.1439-0310.2010.01863.x
Atran S, Medin D (2008) The native mind and the cultural construction of nature. MIT Press, Cambridge
Batt S (2009) Human attitudes towards animals in relation to species similarity to humans: a multivariate approach. Biosci Horiz 2:180–190. doi:10.1093/biohorizons/hzp021
Benedict B (1968) Societies, small. International encyclopedia of the social sciences. http://www.encyclopedia.com/doc/1G2-3045001171.html. Accessed 26 August 2016
Berkes F (2004) Rethinking community-based conservation. Conserv Biol 18:621–630. doi:10.1111/j.1523-1739.2004.00077.x
Berkes F (2012) Sacred ecology, 3rd edn. Routledge, New York
Berkes F, Colding J, Folke C (2000) Rediscovery of traditional ecological knowledge as adaptive management. Ecol Appl 10:1251–1262. doi:10.1890/1051-0761(2000)010[1251:ROTEKA]2.0.CO;2
Berkowitz AD (2005) An overview of the social norms approach. In: Lederman LC, Stewart LP (eds) Changing the culture of college drinking: a socially situated health communication campaign. Hampton, New York, pp 193–214

Bird-David N (1999) "Animism" revisited: personhood, environment, and relational epistemology. Curr Anthropol 40:S67–S91. doi:10.1086/200061
Blamford A, Whitten T (2003) Who should pay for tropical conservation, and how could the costs be met? Oryx 37:238–250. doi:10.1017/S0030605303000413
Bloch M (1999) Commensality and poisoning. Soc Res 66:133–149
Bodenhorn B (2000) "He used to be my relative": exploring the bases of relatedness among Iñupiat of northern Alaska. In: Carsten J (ed) Cultures of relatedness: new approaches to the study of kinship. Cambridge University Press, Cambridge, pp 128–148
Borgi M, Cogliati-Dezza I, Brelsford V, Meints K, Cirulli F (2014) Baby schema in human and animal faces induces cuteness perception and gaze allocation in children. Front Psychol 5:411. doi:10.3389/fpsyg.2014.00411
Brandes S (2009) The meaning of American pet cemetery gravestones. Ethnology 48:99–118
Brown S (2010) Where the wild brands are: some thoughts on anthropomorphic marketing. Mark Rev 10:209–224. doi:10.1362/146934710X523078
Bulmer R (1967) Why is the Cassowary not a bird? A problem of zoological taxonomy among the Karam of the New Guinea Highlands. Man 2:5–25
Business Wire (2015) National Philanthropic Trust Comments on History-Making "Giving USA 2015 Report on Philanthropy". http://www.businesswire.com/news/home/20150616005682/en/National-Philanthropic-Trust-Comments-History-Making-%E2%80%9CGiving-USA. Accessed 26 Aug 2016
Campbell R, Pascalis O, Coleman M, Wallace SB, Benson PJ (1997) Are faces of different species perceived categorically by human observers? Proc R Soc Lond B 264:1429–1434
Carlisle-Frank P, Frank JM (2006) Owners, guardians, and owner-guardians: differing relationships with pets. Anthrozoös 19:225–242
Carsten J (2004) After kinship. Cambridge University Press, Cambridge
Chagnon NA (1981) Terminological kinship, genealogical relatedness and village fissioning among the Yanomamo Indians. In: Alexander RD, Tinkle DW (eds) Natural selection and social behavior. Chiron, New York, pp 490–508
Chen X-P, Pillutla MM, Yao X (2009) Unintended consequences of cooperation inducing and maintaining mechanisms in public goods dilemmas: sanctions and moral appeals. Group Process Integer Relationsh 12:241–255. doi:10.1177/1368430208098783
Cheng T, Woon DK, Lynes JK (2011) The use of message framing in the promotion of environmentally sustainable behaviors. Soc Mark Q 17:48–62. doi:10.1080/15245004.2011.570859
Cho S (2012) Aesthetic and value judgment of neotenous objects: cuteness as a design factor and its effects on product evaluation. Dissertation, University of Michigan
Choi SH (1995) The struggle for family succession and inheritance in a rural Korean village. J Anthropol Res 51:329–346. doi:10.1086/jar.51.4.3630141
Clucas B, McHugh K, Caro T (2008) Flagship species on covers of US conservation and nature magazines. Biodivers Conserv 17:1517–1528. doi:10.1007/s10531-008-9361-0
Cook G (2015) "A pig is a person" or "You can love a fox and hunt it": innovation and tradition in the discursive representation of animals. Discourse Soc 26:587–607. doi:10.1177/0957926515576639
Cormier LA (2003) Kinship with monkeys: the Guaja foragers of Eastern Amazonia. Columbia University Press, New York
Cornelissen G, Dewitte S, Warlop L, Yzerbyt V (2007) Whatever people say I am, that's what I am: social labeling as a social marketing tool. Int J Res Mark 24:278–288. doi:10.2139/ssrn.955285
Cosmides L, Tooby J (1992) Cognitive adaptations for social exchange. In: Barkow JH, Cosmides L, Tooby J (eds) The adapted mind: evolutionary psychology and the generation of culture. Oxford University Press, New York, pp 163–228
Cropper CM (1998) Strides in pet care come at price owners will pay. New York Times. http://www.nytimes.com/1998/04/05/us/strides-in-pet-care-come-at-price-owners-will-pay.html. Accessed 26 Aug 2016
Daly M, Salmon C, Wilson M (1997) Kinship: the conceptual hole in psychological studies of social cognition and close relationships. In: Simpson JA, Kenrick DT (eds) Evolutionary social psychology. Erlbaum, Mahwah, pp 265–296
DeBruine LM, Jones BC, Little AC, Perrett DI (2008) Social perception of facial resemblance in humans. Arch Sex Behav 37:64–77. doi:10.1007/s10508-007-9266-0
DeBruine LM, Smith FG, Jones BC, Roberts SC, Petrie M, Spector TD (2009) Kin recognition signals in adult faces. Vision Res 49:38–43. doi:10.1016/j.visres.2008.09.025
Descola P (1996) Constructing natures: symbolic ecology and social practice. In: Descola P, Pálsson G (eds) Nature and society: anthropological perspectives. Routledge, London, pp 82–102
Descola P (2013) Beyond nature and culture. University of Chicago Press, Chicago

Dietz T, Ostrom E, Stern PC (2003) The struggle to govern the commons. Science 302:1907–1912. doi:10.1126/science.1091015
Ducarme F, Luque GM, Courchamp F (2013) What are "charismatic species" for conservation biologists? BioSci Master Rev 1:1–8. doi:10.1016/0006-3207(94)906122
Duncan RP, Boyer AG, Blackburn TM (2013) Magnitude and variation of prehistoric bird extinctions in the Pacific. PNAS 110:6436–6441. doi:10.1073/pnas.1216511110
Ellis C, Irvine L (2010) Reproducing dominion: emotional apprenticeship in the 4-H youth livestock program. Soc Anim 18:21–39. doi:10.1163/106311110X12586086158402
Ensari NK, Miller N (2006) The application of the personalization model in diversity management. Group Process Integer Relationsh 9:589–607. doi:10.1177/1368430206067679
Ervin AM (2004) Applied anthropology: tools and perspectives for contemporary practice, 2nd edn. Pearson/Allyn & Bacon, Boston
Estren MJ (2012) The neoteny barrier: seeking respect for the non-cute. J Anim Ethics 2:6–11. doi:10.5406/janimalethics.2.1.0006
Fehr E, Fischbacher U (2003) The nature of human altruism. Nature 425:785–791. doi:10.1038/nature02043
Feinberg M, Willer R (2013) The moral roots of environmental attitudes. Psychol Sci 24:56–62. doi:10.1177/0956797612449177
French J, Gordon R (2015) Strategic social marketing. Sage, Los Angeles
Giles DC (2002) Parasocial interaction: a review of the literature and a model for future research. Media Psychol 4:279–305
Golman R, Hagmann D, Loewenstein G (2016) Information avoidance. J Econ Lit. doi:10.2139/ssrn.2633226. Accessed 28 Aug 2016
Gould SJ (1980) A biological homage to Mickey Mouse. In: Gould SJ (ed) The panda's thumb. WW Norton, New York, pp 95–107
Griskevicius V, Cantú SM, van Vugt M (2012) The evolutionary bases for sustainable behavior: implications for marketing, policy, and social entrepreneurship. J Public Policy Mark 31:115–128. doi:10.1509/jppm.11.040
Guthrie SE (1997) Anthropomorphism: a definition and a theory. In: Mitchell RW, Thompson NS, Miles HL (eds) Anthropomorphism, anecdotes, and animals. SUNY, Albany, pp 50–58
Gutman HG (1977) The Black family in slavery and freedom, 1750–1925. Vintage, New York
Gwynne MA (2003) Applied anthropology: a career-oriented approach. Pearson, Boston
Hall M (2015) Talk among the trees: animist plant ontologies and ethics. In: Harvey G (ed) The handbook of contemporary animism. Routledge, London, pp 385–394
Hames R (2007) The ecologically noble savage debate. Annu Rev Anthropol 36:177–190. doi:10.1146/annurev.anthro.35.081705.123321
Hamilton WD (1964a) The genetical evolution of social behavior. I. J Theor Biol 7:1–16. doi:10.1016/0022-5193(64)90038-4
Hamilton WD (1964b) The genetical evolution of social behavior. II. J Theor Biol 7:17–52. doi:10.1016/0022-5193(64)90039-6
Harvey G (2005) Animism: respecting the living world. Wakefield, London
Harvey G (2015) Introduction. In: Harvey G (ed) The handbook of contemporary animism. Routledge, London, pp 1–12
Hawkes K, Bird RB (2002) Showing off, handicap signaling, and the evolution of men's work. Evol Anthropol 11:58–67. doi:10.1002/evan.20005
Holy L (1996) Anthropological perspectives on kinship. Pluto, London
Howell S (2013) Metamorphosis and identity: Chewong animistic ontology. In: Harvey G (ed) The handbook of contemporary animism. Routledge, London, pp 101–112
Ingold T (2011a) The perception of the environment: essays on livelihood, dwelling and skill. Routledge, London
Ingold T (2011b) From trust to domination: an alternative history of human–animal relations. In: Ingold T (ed) The perception of the environment: essays on livelihood, dwelling and skill. Routledge, London, pp 61–76
Jacobson SK, McDuff MD, Monroe MC (2006) Conservation education and outreach techniques, 2nd edn. Oxford University Press, London
James W (1994) Antelope as self-image among the Uduk. In: Willis R (ed) Signifying animals: human meaning in the natural world. Unwin Hyman, London, pp 196–203
Johnson GR (1986) Kin selection, socialization, and patriotism: an integrating theory. Politics Life Sci 4:127–154. doi:10.1017/S0730938400004676

Johnson GR, Ratwik SH, Sawyer TJ (1987) The evocative significance of kin terms in patriotic speech. In: Reynolds V, Falger V, Vine I (eds) The sociobiology of ethnocentrism. Croom Helm, London, pp 157–174
Johnson JL, McAndrew FT, Harris PB (1991) Sociobiology and the naming of adopted and natural children. Ethol Sociobiol 12:365–375. doi:10.1016/0162-3095(91)90031-K
Jones D (2010) Human kinship, from conceptual structure to grammar. Behav Brain Sci 33:367–416. doi:10.1017/S0140525X10000890
Kalof L, Zammit-Lucia J, Bell J, Granter G (2015) Fostering kinship with animals: animal portraiture in humane education. Environ Educ Res. doi:10.1080/13504622.2014.999226
Kaltenborn BP, Bjerke T, Nyahongo JW, Williams DR (2006) Animal preferences and acceptability of wildlife management actions around Serengeti National Park, Tanzania. Biodivers Conserv 15:4633–4649. doi:10.1007/s10531-005-6196-9
Kent S (1989) Cross-cultural perceptions of farmers as hunters and the value of meat. In: Kent S (ed) Famers as hunters: the implications of sedentism. Cambridge University Press, Cambridge, pp 1–17
Kramer RM, Brewer MB (1984) Effects of group identity on resource use in a simulated commons dilemma. J Pers Soc Psychol 46:1044–1057. doi:10.1037/0022-3514.46.5.1044
Krech S (1999) The ecological Indian: myth and history. Norton, New York
Lévi-Strauss C (1964) Totemism. Merlin, London
Lieberman D (2009) Rethinking the Taiwanese minor marriage data: evidence the mind uses multiple kinship cues to regulate inbreeding avoidance. Evol Hum Behav 30:153–160. doi:10.1016/j.evolhumbehav.2008.11.003
Lieberman D, Lobel T (2012) Kinship on the kibbutz: coresidence duration predicts altruism, personal sexual aversions and moral attitudes among communally reared peers. Evol Hum Behav 33:26–34. doi:10.1016/j.evolhumbehav.2011.05.002
Lieberman D, Tooby J, Cosmides L (2007) The architecture of human kin detection. Nature 445:727–731. doi:10.1038/nature05510
Lorimer J (2007) Nonhuman charisma. Environ Plan D 25:911–932. doi:10.1068/d71j
Low BS (1996) Behavioral ecology of conservation in traditional societies. Hum Nat 7:353–379. doi:10.1007/BF02732899
Low BS (2004) Human behavior and conservation. Endanger Species Update 21:14–22
Low BS (2015) Why sex matters: a Darwinian look at human behavior. Princeton University Press, Princeton
MA (Millennium Ecosystem Assessment) (2005) Ecosystems and human well-being: synthesis. Island Press, Washington, DC
Madsen E, Tunney R, Fieldman G, Plotkin H, Dunbar RI, Richardson J-M, McFarland D (2007) Kinship and altruism: a cross-cultural experimental study. Brit J Psychol 98:339–359. doi:10.1348/000712606X129213
Manfredo MJ (2008) Who cares about wildlife?. Springer, New York
Martin PS, Klein RG (eds) (1984) Quaternary extinctions: a prehistoric revolution. University of Arizona Press, Tucson
Mesmer TA, Enck JW (2012) Human dimensions of wildlife use management. In: Decker DJ, Riley SJ, Siemer WF (eds) Human dimensions of wildlife management. Johns Hopkins University Press, Baltimore, pp 203–219
Mitchell RW, Thompson NS, Miles HL (eds) (1997) Anthropomorphism, anecdotes, and animals. SUNY, Albany
Monroe MC (2003) Two avenues for encouraging conservation behaviors. Hum Ecol Rev 10:113–125
Nadasdy P (2007) The gift in the animal: the ontology of hunting and human–animal sociality. Am Ethnol 34:25–43. doi:10.1525/ae.2007.34.1.25
Nėjė J (2014) 33 Powerful animal ad campaigns that tell the uncomfortable truth. Bored Panda. http://www.boredpanda.com/powerful-animal-ads/. Accessed 28 Aug 2016
Opotow S, Weiss L (2000) New ways of thinking about environmentalism: denial and the process of moral exclusion in environmental conflict. J Soc Issues 56:475–490. doi:10.1111/0022-4537.00179
Ostrom E (1990) Governing the commons: the evolution of institutions for collective action. Cambridge University Press, Cambridge
Park JH, Schaller M, van Vugt M (2008) Psychology of human kin recognition: heuristic cues, erroneous inferences, and their implications. Rev Gen Psychol 12:215–235. doi:10.1037/1089-2680.12.3.215
Patterson J (1994) Maori environmental virtues. Environ Ethics 16:397–409
Peattie K, Peattie S (2009) Social marketing: a pathway to consumption reduction? J Bus Res 62:260–268. doi:10.1016/j.jbusres.2008.01.033

Pedersen MA (2001) Totemism, animism and North Asian indigenous ontologies. J R Anthropol Inst 7:411–427. doi:10.1111/1467-9655.00070
Penn DJ (2003) The evolutionary roots of our environmental problems: toward a Darwinian ecology. Q Rev Biol 78:275–301. doi:10.1086/377051
Pierotti R, Wildcat D (2000) Traditional ecological knowledge: the third alternative. Ecol Appl 10:1333–1340. doi:10.1890/1051-0761(2000)010[1333:TEKTTA]2.0.CO;2
Prakash A (2002) Green marketing, public policy and managerial strategies. Bus Strateg Environ 11:285–297. doi:10.1002/bse.338
Qirko HN (2011) Fictive kinship and induced altruism. In: Salmon C, Shackelford T (eds) The Oxford handbook of evolutionary family psychology. Oxford University Press, New York, pp 310–328
Qirko HN (2013) Induced altruism in religious, military, and terrorist organizations. Cross-Cult Res 47:131–161. doi:10.1177/1069397112471804
Ridley M (1995) Animal behavior: an introduction to behavioral mechanisms, development, and ecology, 2nd edn. Blackwell, Boston
Roberts G (1998) Competitive altruism: from reciprocity to the handicap principle. Proc R Soc Lond [Biol] 265:427–431. doi:10.1098/rspb.1998.0312
Root-Bernstein M, Douglas L, Smith A, Veríssimo D (2013) Anthropomorphized species as tools for conservation: utility beyond prosocial, intelligent and suffering species. Biodivers Conserv 22:1577–1589. doi:10.1007/s10531-013-0494-4
Rose DB (2015) Death and grief in a world of kin. In: Harvey G (ed) The handbook of contemporary animism. Routledge, London, pp 137–147
Rothstein SI, Robinson SK (1998) The evolution and ecology of avian brood parasitism. In: Rothstein SI, Robinson SK (eds) Parasitic birds and their hosts. Oxford University Press, New York, pp 3–56
Russell N (2002) The wild side of animal domestication. Soc Anim 10:286–302. doi:10.1163/156853002320770083
Salmon CA (1998) The evocative nature of kin terminology in political rhetoric. Politics Life Sci 17:51–57. doi:10.1017/S0730938400025351
Salmón E (2000) Kincentric ecology: indigenous perceptions of the human–nature relationship. Ecol Appl 10:1327–1332. doi:10.1890/1051-0761(2000)010[1327:KEIPOT]2.0.CO;2
Samson A (2014) Introduction to behavioral economics. In: Samson A (ed) Behavioral economics guide. https://www.behavioraleconomics.com/introduction-to-be/. Accessed 28 Aug 2016
Scott J, Michae G, Dale D, Haines AM, Wiens JA, Neel MC (2010) Conservation-reliant species and the future of conservation. Conserv Lett 3:91–97. doi:10.1111/j.1755-263X.2010.00096.x
Serpell JA (1986) In the company of animals: a study of human–animal relationships. Basil Blackwell, Oxford
Shir-Vertesh D (2012) "Flexible personhood": loving animals as family members in Israel. Am Anthropol 114:420–432. doi:10.1111/j.1548-1433.2012.01443.x
Silk JB (1987) Adoption and fosterage in human societies: adaptations or enigmas? Cult Anthropol 2:39–49. doi:10.1525/can.1987.2.1.02a00050
Simberloff D (1998) Flagships, umbrellas, and keystones: is single-species management passé in the landscape era? Biol Cons 83:247–257. doi:10.1016/S0006-3207(97)00081-5
Slovic P (2007) If I look at the mass I will never act: psychic numbing and genocide. Judgm Decis Mak 2:79–95. doi:10.1007/978-90-481-8647-1_3
Small E (2011) The new Noah's Ark: beautiful and useful species only. Part 1. Biodiversity conservation issues and priorities. iodiversity 12:232–247. doi:10.1080/14888386.2011.642663
Small E (2012) The new Noah's Ark: beautiful and useful species only. Part 2. The chosen species. Biodiversity 13:37–53. doi:10.1080/14888386.2012.659443
Smith N (2001) Are indigenous peoples conservationists? Ration Soc 13:229–261. doi:10.1177/104346301013004002
Smith BD (2011) Shaping the human world: patterns of human niche construction by small-scale societies in North America. In: Smith BD (ed) The subsistence economies of indigenous North American Societies. Smithsonian Institution Scholarly Press, Washington DC, pp 593–609
Smith EA, Wishnie M (2000) Conservation and subsistence in small-scale societies. Annu Rev Anthropol 29:493–524. doi:10.1146/annurev.anthro.29.1.493
Smith RJ, Veríssimo D, MacMillan DC (2010) Marketing and conservation: how to lose friends and influence people. In: Leader-Williams N, Adams WM, Smith RJ (eds) Trade-offs in conservation: deciding what to save. Wiley-Blackwell, West Sussex, pp 215–232
Smith RJ, Veríssimo D, Isaac NJB, Jones KE (2012) Identifying *Cinderella* species: uncovering mammals with conservation flagship appeal. Conserv Lett 5:205–212. doi:10.1111/j.1755-263X.2012.00229.x

Spotswood F, French J, Tapp A, Stead M (2012) Some reasonable but uncomfortable questions about social marketing. J Soc Mark 2:163–175. doi:10.1108/20426761211265168
St John FAV, Edward-Jones G, Jones JPG (2010) Conservation and human behavior: lessons from social psychology. Wildl Res 37:658–667
Stringer M (1999) Rethinking animism: thoughts from the infancy of our discipline. J R Anthropol Inst 5:541–555. doi:10.2307/2661147
Tam K-P (2015) Are anthropomorphic persuasive appeals effective? The role of the recipient's motivations. Brit J Soc Psychol 54:187–200. doi:10.1111/bjso.12076
Tam K-P, Lee S-L, Chao MM (2013) Saving Mr. Nature: anthropomorphism enhances connectedness to and protectiveness toward nature. J Exp Soc Psychol 49:514–521. doi:10.1016/j.jesp.2013.02.001
Tapp A, Rundle-Thiele S (2016) Social marketing and multidisciplinary behavior change. In: Spotswood F (ed) Beyond behavior change: key issues, interdisciplinary approaches and future directions. Policy Press, Bristol, pp 135–156
Tom (2014) Helping Jane Goodall help chimpanzees (and all of us). Acart Communications. http://changemarketing.ca/2014/01/06/jane-goodall-institute-of-canada/. Accessed 26 Aug 2016
Trivers RL (1971) The evolution of reciprocal altruism. Q Rev Biol 46:35–57
Trivers RL (1985) Social evolution. Benjamin/Cummings, Menlo Park
Trucost (2013) Natural capital at risk: the top 100 externalities of business. Report for TEEB for Business Coalition. http://www.trucost.com/published-research/99/natural-capital-at-risk-the-top-100-externalities-of-business. Accessed 28 Aug 2016
UNEP (2008) Vital water graphics—an overview of the state of the world's fresh and marine waters, 2nd edn. UNEP, Nairobi
van den Berghe PL (1979) Human family systems: an evolutionary view. Elsevier, New York
van Vugt M (2009) Averting the tragedy of the commons: using social psychological science to protect the environment. Curr Dir Psychol Sci 18:169–173. doi:10.1111/j.1467-8721.2009.01630.x
Veidkamp E (2009) The emergence of "pets as family" and the socio-historical development of pet funerals in Japan. Anthrozoos 22:333–346
Viereck W (2002) Insights into the cultural history of Europe as provided by the *Atlas Linguarum Europae*. Studio Anglica Posnaniensia 37:3–15
Viveiros de Castro E (2004) The transformation of objects into subjects in Amerindian ontologies. Common Knowl 10:463–484. doi:10.1215/0961754X-10-3-463
Von Bergen CW, Miles MP (2015) Social negative option marketing: a partial response to one of Spotswood, French, Tapp and Stead's (2012) "uncomfortable questions". J Soc Mark 5:125–138. doi:10.1108/JSOCM-06-2014-0036
Wells PA (1987) Kin recognition in humans. In: Fletcher DJC, Michener CD (eds) Kin recognition in animals. Wiley, New York, pp 395–415
West SA, El Mouden C, Gardner A (2011) Sixteen common misconceptions about the evolution of cooperation in humans. Evol Hum Behav 32:231–262. doi:10.1016/j.evolhumbehav.2010.08.001
Willerslev R (2015) Hunting animism: human–animal transformations among the Siberian Yukaghirs. In: Harvey G (ed) The handbook of contemporary animism. Routledge, London, pp 148–158
Willis R (ed) (1990) Signifying animals: human meaning in the natural world. Unwin Hyman, London
Wilson EO (2009) Biophilia: the human bond with other species. Harvard University Press, Cambridge
Wilson CC, Netting FE, Turner DC, Olsen CH (2013) Companion animals in obituaries: an exploratory study. Anthrozoös 26:227–236. doi:10.5167/uzh-81068
Witherspoon G (1975) Navajo kinship and marriage. University of Chicago Press, Chicago
Wright AJ, Veríssimo D, Pilfold K, Parsons ECM, Ventre K, Cousins J, Jefferson R, Koldewey H, Llewellyn F, McKinley E (2015) Competitive outreach in the 21st century: why we need conservation marketing. Ocean Coast Manag 115:41–48. doi:10.1016/j.ocecoaman.2015.06.029