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Charisma and conservation: charismatic megafauna's influence on safari and zoo tourists' pro-conservation behaviors

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Abstract Annually, millions of tourists go on safari and visit zoos primarily to view large charismatic wildlife. These venues rely on the inherent appeal of these animals to increase visitation and anchor conservation efforts. In conservation campaigns, flagship species are used to stimulate a connection to a species and promote pro-conservation behaviors. However, empirical support for behavioral outcomes associated with flagships is lacking. Nor is it known how a connection to a species influences behaviors. This study explored (a) how tourists connect to wildlife, how this relationship is influenced by the on-site experience, and how these factors interact to influence behavior, and (b) how the experiences between safari and zoo venues differed. A model was developed using interactional theory and analyzed with structural equation modeling. Data were obtained from 416 tourists to Tanzanian parks and protected areas and 452 tourists to two U.S. zoos and one aquarium. An existing connection to wildlife and experiential factors directly influenced tourists' connection to a species, but not behaviors. Tourists' connection to a species had a significant positive influence on pro-conservation behaviors for individual species and general biodiversity. The influence of the experience was equivalent across safari and zoo venues. Results support the ability of safari and zoo wildlife tourism to produce conservation outcomes.

Keywords Charismatic megafauna · Connection to wildlife · Flagship species · Pro-conservation behaviors · Structural equation modeling · Wildlife tourism

Introduction

Does viewing wildlife, in wild or captive settings, stimulate tourists to care about species and actively support their conservation? Advocates for wildlife tourism suggest that

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viewing charismatic species can increase tourists' awareness and participation in pro-conservation behaviors, such as philanthropy, which support the sustainability of tourism activities. Additionally, these benefits are purported to outweigh the costs of potential disturbances to wild populations and the use of captive populations in zoos. However, few studies have investigated how the wildlife viewing experience is linked to enhancing visitors' connection to wildlife and pro-conservation behaviors such as philanthropy, volunteering, and activism.

Wildlife tourism is defined as tourism activities that provide encounters with non-domesticated animals in wild (in situ) or captive (ex situ) settings (Higginbottom 2004a). Most education and conservation initiatives associated with wildlife tourism are designed to enhance visitors' attitudes and behaviors associated with species of interest. Research suggests that encounters with wildlife can facilitate a connection to nature (Clayton and Myers 2009). To that end, in situ and ex situ wildlife tourism venues have relied on charismatic megafauna (CMF) to anchor visitor supported conservation initiatives.

CMF are usually large vertebrates such as bears, great apes, big cats, and elephants. Such species are the cornerstone of the wildlife tourism industry and a rallying point for conservationists. CMF based wildlife tourism has been shown to be financially viable, highly popular, and capable of raising awareness of threats to the species of concern (Kerley et al. 2003; Lemelin et al. 2008; Lindsey et al. 2007; Lukas and Ross 2005; Matt and Aumiller 2002; Stoinski et al. 2008). Tourists have been shown to develop a strong connection to individual animals observed in wild and captive settings, and this connection has been shown to extend to the species as a whole (Curtin 2006; Schanzel and McIntosh 2000). Wildlife tourism sites that have CMF enjoy the added benefits of greater financial revenues; higher public profiles; and more volunteers than sites without CMF (Green and Higginbottom 2000; Higginbottom 2004a, b Higginbottom, et al. 2003; Preston and Fuggle 1987).

Studies have linked visitor responses such as: satisfaction (Obua and Harding 1996; Skibins et al. 2012a); understanding (Lukas and Ross 2005); concern (Bruni et al. 2008); and awareness (Peake et al. 2009) to in situ and ex situ CMF viewing experiences. Additionally, wildlife viewing experiences as a whole can increase a connection to nature (Beaumont 2001; Lindsey et al. 2007). For example, Cousins et al. (2009) reported that after observing in situ lion behavior, volunteers express a deep sense of wonder, awe and a connection with nature. Curtin (2006) found that following dolphin encounters, tourists related peak experiences and a state of euphoria. However, few studies have investigated the relationship between the CMF viewing experience and visitors' willingness to engage in pro-conservation behaviors (Schultz and Tabanico 2007). Furthermore, the links between attraction, awareness, and action purported by conservationists, have been challenged (Waylen et al. 2009).

This study explored the relationship between existing connections to wildlife, experience characteristics, caring, and pro-conservation behavioral intentions (hereafter pro-conservation behaviors) using interactional theory (Fig. 1) and structural equation modeling (Fig. 2) by examining in situ (Tanzanian parks and protected areas) and ex situ (U.S. zoos and aquariums, hereafter zoos) experiences. Interactional theory proposes that behavior is influenced by an interaction between the individual, and the social and physical environments (Altman and Rogoff 1987; Archer and Wearing 2003; Chan and Baum 2007; Ham 2010), and is particularly useful when the nature of proposed relationships is primarily exploratory. Additionally, interactional theory is more suited for studying suites of behaviors versus single behaviors (e.g. not littering). This study also investigated the differences between the in situ and ex situ experiences on conservation outcomes.

Additionally, the pathways between experience characteristics, caring, and behaviors were analyzed to understand how different CMF might serve as flagship species.

Wildlife tourism

Generalized concepts of sustainable nature-based tourism are recognized in the literature as early as 1965 and reference dimensions presented in the Brundtland Report (Blamey 2001). In an early article proposing a "symbiotic relationship" between tourism and conservation, Budowski (1976) states, "Tourism helps by lending support to those conservation programmes which will develop educational, scientific, and recreational resources, with the objective that they in turn will attract more, and different kinds of, tourists" (p. 29). There are examples of successful sustainable tourism for a variety of species, including lion tamarins (Dietz et al. 1994), bats (Pennisi et al. 2004), sea turtles and whales (Wilson and Tisdell 2003), and giant tortoises (Powell and Ham 2008).

Wildlife tourism, a distinct category of nature-based tourism, does not by definition need to meet sustainability metrics. In fact, the popularity of wildlife viewing can produce negative impacts due to poorly managed visitation (Sims-Castley et al. 2005). Examples of tourist induced negative impacts include: disease transmission to mountain gorillas (*Gorilla beringei beringei*) (Sandbrook and Semple 2006); increased habituation in brown bears (*Ursus arctos*) (Herrero et al. 2005); and food provisioning for wildlife in general (Orams 2002).

Poorly managed visitation may also compromise the effectiveness of on-site wildlife management plans. For example, to enhance viewing options, management strategies have been skewed to favor CMF populations at the expense of other species (Higginbottom 2004b; Lindsey et al. 2007). This may diminish visitors' interest in other species within the park or zoo. CMF are also often the most difficult and expensive species to manage (Lindsey et al. 2007), and the rush to capitalize on their presence may cause areas in greater need of conservation, or lacking CMF, to be overlooked, and financial resources to be diverted from underfinanced protected areas (Wilkie and Carpenter 1999).

The rapid and continued growth of the wildlife tourism industry has brought tourists and tour operators to the table as de facto stakeholders in the management of parks and protected areas (Goodwin and Leader-Williams 2000). Managers must balance the

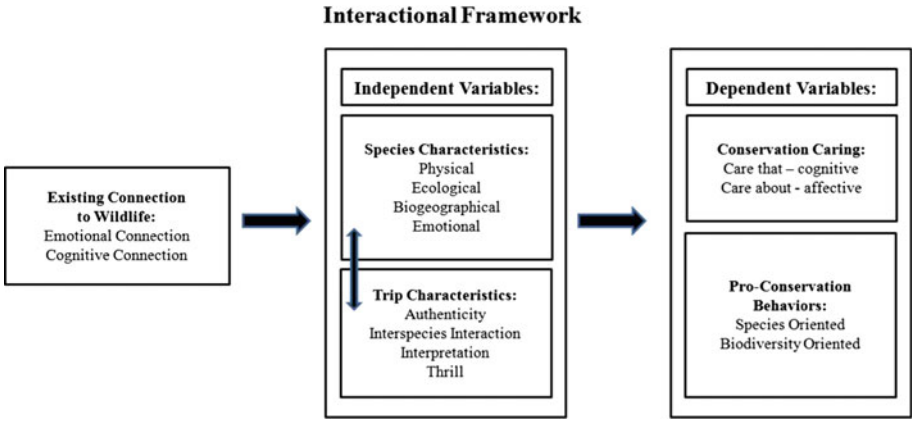

Fig. 1 Interactional framework of CMF viewing experience; adapted from Powell et al. (2009)

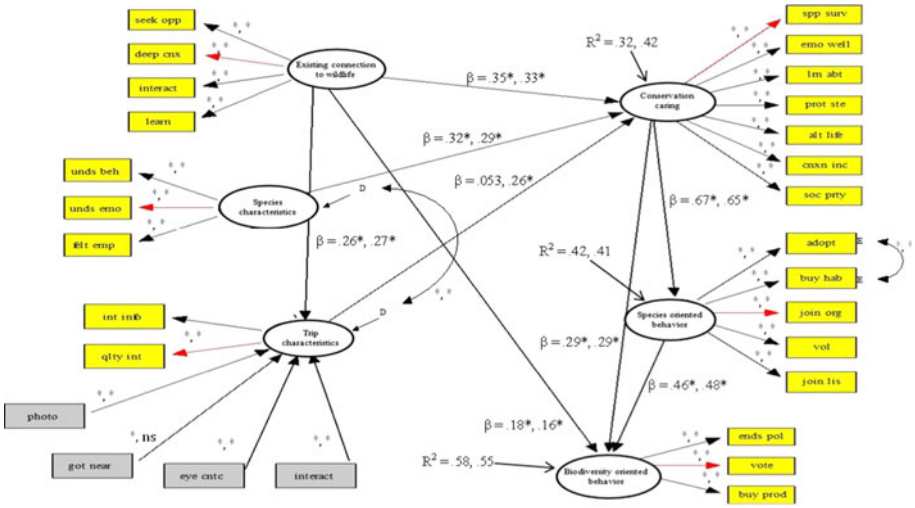

Fig. 2 Final structural model predicting pro-conservation behavioral intent. *Notes* Values reported for safari, zoo, respectively; all measurements robust; * $p < .05$; β = standardized parameter estimates; R^2 = explained variance. *CFI* .90, *NNFI* .89, *SRMR* .11, *RMSEA* .068, $SB\chi^2$ (*df*) 1869.94 (702), $p < .05$

demands of visitor viewing preferences against impacts to the resource (Semeniuk et al. 2009; Wright 1998). Overly restricting tourists can diminish viewing opportunities, which could decrease funding and public support for conservation associated with CMF. Additionally, zoos that focus too heavily on CMF may do so at the expense of committing resources to in situ support. Managers also face the challenge of how to extend the wonder and respect for CMF to "biophilically challenged" taxa, such as snakes (Myers et al. 2004), and biodiversity as a whole (Czech et al. 1998; Kerley et al. 2003).

Despite these challenges, CMF have been cited as a primary factor for conservation successes in wildlife tourism (Kruger 2005). They can also positively enhance attitudes and awareness, which Waylen et al. (2009) point out is not a benefit derived from many other conservation programs. However, the role of the viewing experience in fostering pro-conservation behaviors has received little attention in the literature.

Charismatic megafauna

A consistent trend among wildlife tourists is the desire to see large, potentially deadly vertebrates in wild (Goodwin and Leader-Williams 2000; Matt and Aumiller 2002; Okello et al. 2008) and captive settings (Balmford et al. 1995; Christie 2007; Ryder 1995). Studies have shown which characteristics make species more appealing to humans (Curtin 2005; Woods 2000); contribute to viewers' emotional affinity for species (Ballantyne et al. 2010); and contribute to the overall emotional appeal of species (Myers et al. 2004). Other research suggests charisma can be applied broadly (Lorimer 2007) and can be found in species as divergent as the flightless dung beetle (*Circellium bacchus*) (Kerley et al. 2003) and kapok tree (*Ceiba pentandra*) (Bowen-Jones and Entwistle 2002).

So, while there is research that investigates charismatic characteristics, little work links those characteristics to visitors' caring and willingness to support pro-conservation behavior. Furthermore, the differences between in situ and ex situ CMF viewing, and their influence on conservation outcomes are poorly understood (Ballantyne et al. 2007).

A species' ability to stimulate pro-conservation awareness and behavior is the basis of the flagship species concept. Any species that raises awareness of conservation issues and stimulates pro-conservation behavior, via a purposeful campaign, may qualify as a flagship species (Simberloff 1998). Ballantyne et al. (2007) found that observing species' natural behavior has the potential to increase visitors' understanding and foster a positive attitude toward conservation. Direct and indirect exposure to species used as flagships has also been shown to influence affective responses in viewers (Smith and Sutton 2008; Waylen et al. 2009; Wright 1998; Zinn et al. 2008).

CMF-based wildlife tourism provides fertile ground to investigate the flagship species concept. Myers et al. (2004) found that zoo visitors who observed gorillas and okapis (*Okapia johnstoni*) expressed increased levels of care and a strong desire to see them preserved in the wild. Ballantyne et al. (2010) found visitors expressed an emotional affinity for dolphins in captive and wild settings, and this affinity could transcend to biodiversity as a whole. These findings support the notion that any CMF could be stimuli for pro-conservation behaviors, and thus be considered for flagship status.

One reason for the success of CMF-based tourism is tourists' formation of a connection to nature that is derived from encounters with wildlife (Saunders 2003). Bentrupperbäumer (2005) recommends investigating species' attributes as one way of unraveling visitor preferences and conservation benefits. However, it is unknown if or what elements of a wildlife tourism experience may foster adoption of behaviors (Ballantyne et al. 2011).

Interactional theory

Interactional theory is a holistic framework intended to capture the complexity of phenomena by simultaneously considering psychological processes, environmental settings, and contextual factors (Archer and Wearing 2003; Altman and Rogoff 1987). This framework has been used to investigate the role of environmental and visitor characteristics, and education on behavior outcomes (Patterson et al. 1998; Powell et al. 2009; Werner et al. 2002).

Other behavior theories, such as the Theory of Planned Behavior (TPB) (Ajzen 1991) and Value-Belief-Norm (VBN) Theory (Stern 2000), have recognized that people rarely exist in behavioral vacuums and that the context of the behavior matters. Therefore, it is recommended that models incorporate experience characteristics in order to clarify relationships and increase the accuracy of predicting behavioral modification (Stern 2000; Stern et al. 1999). However, TPB and VBN are not designed to account for the role of the experience. Schultz (2000) implies interactional frameworks are the preferred method to investigate a connection to nature.

Using interaction theory as a guiding framework, this study investigated the influence of the CMF viewing experience on tourists' connection to a species (operationalized as Conservation Caring, see Methods) and pro-conservation behavior. Figure 1 represents how interaction theory was used to conceptualize the relationship between variables. This model is adapted from Powell et al. (2009) who found an interactional framework was successful for modeling the influence of nature-based tourism characteristics on behavioral intentions.

In this study, the interaction between the individual and contextual factors is modeled by the interaction between Existing Connection to Wildlife, and Species and Trip Characteristics. These in turn are hypothesized to have a direct positive influence on Conservation Caring and pro-conservation behaviors. More specifically, Conservation Caring is hypothesized as an intermediate dependent variable to behaviors.

Study sites

The goals of this study were based on tourists forming a connection with an animal during the experience. Tourists were allowed to self-describe the animal they connected with rather than select from a predefined list. Therefore, study sites were selected on the basis of their diversity of wildlife and the presence of several recognized CMF. All zoo sites are accredited members of the Association of Zoos and Aquariums.

In situ sites

The northern circuit of Tanzania was chosen for the consistent diversity and density of wildlife found at each park and protected area. Furthermore, most tourists use guides and thus have the potential for a basic exposure to interpretation. The northern circuit consists of the following national parks: Mt. Kilimanjaro, Arusha, Serengeti, Lake Manyara, Mkomazi, and Tarangire. Additionally, the Ngorongoro Crater is considered part of the northern circuit, although it is not a Tanzanian National Park.

Arguably, the most popular of these sites are Serengeti National Park (SNP) and the Ngorongoro Crater. Established as a game reserve in 1929 and a national park in 1951, SNP is the oldest and second largest (5700 mi^2/14,763 km^2) national park in Tanzania. It is home to over one million wildebeest, 300,000 Thomson's gazelle, 200,000 zebra and 32 other plains species. All 'Big 5′ species (elephant, rhino, water buffalo, lion, and leopard) are present, as well as other CMF such as hippo, giraffe, and cheetah. Additionally, there are several mesofauna present such as hyenas, jackals, aardwolf, and servals, and 500 bird species. SNP is also the site of one of the great biological phenomena, the wildebeest migration. Due to these and other features, SNP has been designated a world heritage site biosphere reserve (Tanzania National Parks, n.d.; Tanzania Tourist Board, n.d.).

The Ngorongoro Crater is located in the Ngorongoro Conservation Area (NCA) and is administered by the Ngorongoro Conservation Area Authority. NCA is adjacent to SNP. Established in 1959, the NCA is 3200 mi^2 (8292 km^2) and is a designated multiple use area. NCA is a Man and Biosphere Reserve and World Heritage Site. The Ngorongoro Crater is a large (100 mi^2/260 km^2) unbroken caldera. All visitors to the crater floor must be accompanied by a guide. The crater itself is home to 7,000 wildebeests, 4,000 zebra, 3,000 eland, and 3,000 Grant's and Thomson's gazelles. All 'Big 5' species are also present, as well as wild dogs, and 500 bird species including greater and lesser flamingo (Ngorongoro Crater, n.d.).

Ex situ sites

Brookfield Zoo, located in Brookfield, Illinois—a suburb of Chicago—receives more than 2,000,000 visitors annually. Founded in 1934, the 216-acre zoo is home to 450 different species and eleven multi-species habitat recreation exhibits. It has taken a leadership role in advancing the field of conservation psychology and is home to the Conservation Leadership Center and Center for the Science of Animal Welfare. The zoo is involved in 35 in situ conservation projects and houses 44 species that are part of a species survival plan (Chicago Zoological Society, n.d.).

The Shedd Aquarium is located on the shore of Lake Michigan in Chicago, Illinois. When the facility opened in 1930 it was the world's largest aquarium, and today it receives more than 2,000,000 visitors annually. The aquarium has expanded since its opening and now has four multi-species habitat recreation exhibits, and 32,500 animals representing 1500 species. Some of the more notable animals include whales, dolphins, otters, sharks,

and rays. The Shedd is involved in eight large-scale local and global in situ conservation projects (Shedd Aquarium, n.d.).

Zoo Atlanta was founded in 1889 and has become a nationally recognized leader in zoo-based conservation. The 40 acre site receives 700,000 annual visitors and is home to 900 animals, one of which is the giant panda. The zoo has the nation's largest gorilla and orangutan collection and three multi-species habitat recreation exhibits. The zoo also has several state-of-the-art interpretive exhibits linking in situ conservation to on-site exhibits. Additionally, Zoo Atlanta participates in 30 species survival plans and seventeen in situ projects around the world (Zoo Atlanta, n.d.).

Methods

Survey instrument development

Factors were developed and modified following DeVellis (2003). A pilot test ($N = 178$, 75 % response rate) was conducted at Brookfield Zoo, in July 2011, to identify construct validity and item clarity issues. The final survey instrument contained six factors, and 56 items (Table 1). All construct items were measured using 9 point Likert type scales; 1 = strongly disagree, 9 = strongly agree; 1 = extremely unlikely, 9 = extremely likely.

Existing connection to wildlife

This factor was adapted from Nature Relatedness (NR) (Nisbet et al. 2009) and Emotional Affinity to Nature (EAN) scales (Kals et al. 1999). These scales were selected based on their ability to distinguish the emotional and cognitive components of an individual's connection to CMF. The NR scale has been shown to measure the link between an individual's connection to nature and environmentally responsible behavior. In this study, items were designed to represent the 'self', 'perspective', and 'experience' sub-dimensions of NR. The EAN scale has been used to examine the relationship between an individual's emotional affinity toward nature and nature-protective behavior. Items in this study were designed to represent the cognitive and affective interest in nature, and emotional indignation over insufficient protection of nature sub-dimensions.

Species characteristics

Species Characteristics items encompass physical, ecological, biogeographical, and emotional attributes, which have been recognized to influence charisma (Bowen-Jones and Entwistle 2002; Clucas et al. 2008; Jacobs 2009; Kellert et al. 1996; Lorimer 2007; Rolston 1987; Sitas et al. 2009; Woods 2000). Physical attributes included general morphological features. Ecological attributes dealt with how the species behaved in its habitat. Biogeographical attributes consisted of symbolic roles of wildlife. Emotional attributes addressed the tourists' ability to understand and identify with emotional states of the animal.

Trip characteristics

Trip characteristics items were selected from experiential elements recognized for influencing awareness and behaviors. Those are, authenticity, interspecies interaction, interpretation, and thrill (Ballantyne et al. 2010; Beardsworth and Bryman 2001; Cousins et al.

Table 1 Initial factor loadings and item means

Factor and items[a, b]	Safari tourists ($N = 362$)		Zoo tourists ($N = 369$)	
	Mean (SD)	λ	Mean (SD)	λ
Existing connection to wildlife				
I actively seek opportunities to view wildlife	7.10 ± 1.95	.54	7.09 ± 1.83	.55
I feel a deep connection to wildlife	6.69 ± 1.93	.76	6.54 ± 1.93	.76
I am highly motivated by the need to interact with wildlife	6.26 ± 2.07	.73	6.13 ± 2.05	.76
I enjoy viewing all types of wildlife*	7.98 ± 1.24	.30	7.98 ± 1.46	.36
I spend a lot of time learning about wildlife	5.55 ± 2.11	.54	5.99 ± 2.02	.57
I have a responsibility to do all I can to protect wildlife*	7.18 ± 1.86	.41	7.10 ± 1.82	.50
Species characteristics				
I understood this animal's behaviors	6.09 ± 1.85	.50	6.15 ± 2.00	.56
I understood this animal's emotions	5.36 ± 2.18	.93	5.50 ± 2.14	.81
I felt empathy for this animal because of its emotions	5.47 ± 2.31	.64	5.74 ± 2.11	.76
This animal displayed human qualities*	5.07 ± 2.40	.30	5.81 ± 2.31	.43
This animal was intelligent*	6.79 ± 2.05	NS	6.90 ± 1.97	.41
Trip characteristics (reflective items only)				
I shared the experience with people who are important to me*	7.10 ± 2.18	.24	7.44 ± 2.05	.11
Seeing this animal makes me think of its habitat*	7.08 ± 1.90	.28	6.88 ± 2.09	.21
Information obtained from education materials/signs*	4.95 ± 2.28	.16	6.27 ± 2.35	.50
Information obtained from Interpreters/Park Rangers	6.45 ± 2.34	.85	4.92 ± 2.68	.64
The quality of interpretation was exceptionally high	6.28 ± 2.29	.76	5.77 ± 2.34	.80
Conservation caring				
My level of compassion for this species has dramatically increased because of my visit*	5.80 ± 2.00	.18	5.81 ± 1.96	.43
I am deeply concerned about the care and well-being of this animal at this site*	6.33 ± 2.02	.37	6.25 ± 2.16	.36
This species has as much right to exist as any human being*	7.35 ± 2.19	.23	7.52 ± 2.02	.31
Ensuring this species' survival is my highest priority	5.15 ± 2.27	.68	5.51 ± 2.30	.70
My emotional sense of well-being will be severely diminished by the extinction of this species	6.08 ± 2.27	.48	5.88 ± 2.38	.66
I need to learn everything I can about this species	5.01 ± 2.22	.63	5.23 ± 2.16	.76
I would protest this site if I learned of the mistreatment of this animal	6.27 ± 2.19	.48	6.45 ± 2.52	.46
I will alter my lifestyle to help protect this species	4.78 ± 2.20	.58	5.18 ± 2.31	.62
My connection to this animal has increased my connection to the species as a whole	5.82 ± 2.15	.53	5.66 ± 2.08	.72
Wildlife protection must be society's highest priority	5.95 ± 2.42	.54	5.68 ± 2.42	.64
Behavior—species oriented				
I would support entrance fees at this site being $10 - $25 higher, if the extra money were used for the care and survival of this species*	6.11 ± 2.32	.29	4.46 ± 2.48	.46
I will donate up to $75 to "adopt" this animal at this site	4.34 ± 2.54	.63	3.95 ± 2.44	.78
I will make a charitable contribution up to $150 to help purchase habitat in the wild for this species	4.11 ± 2.42	.70	3.57 ± 2.80	.75

Table 1 continued

Factor and items[a, b]	Safari tourists ($N = 362$)		Zoo tourists ($N = 369$)	
	Mean (SD)	λ	Mean (SD)	λ
I will become a member of an organization committed to protecting this species, within the next 6 months	3.61 ± 2.23	.72	3.84 ± 2.40	.73
I will volunteer at an event designed to help the conservation of this species, within the next 6 months	3.41 ± 2.29	.52	3.68 ± 2.36	.67
Before my visit is over, I will sign up for a mailing/email to receive updates about the care and conservation of this animal	3.20 ± 2.29	.51	3.74 ± 2.48	.64
I would write a letter/sign a petition to a government official supporting the protection of this species*	4.51 ± 2.70	.38	4.76 ± 2.72	.45
Behavior—biodiversity oriented				
Even if I never return, I will provide on going financial support to this site*	3.34 ± 2.17	.43	3.74 ± 2.35	.53
If asked, I would donate as much as $50 to help protect a species I've never heard of*	3.49 ± 2.32	.43	3.36 ± 2.23	.53
I will endorse public policy that severely restricts future growth and development in order to protect wildlife	5.42 ± 2.50	.68	5.03 ± 2.64	.76
Elected officials' views on wildlife will be a major factor in my voting	5.08 ± 2.41	.73	4.81 ± 2.51	.73
Even when they are more expensive or harder to find, I will buy groceries and products that support wildlife conservation	5.88 ± 2.23	.58	5.18 ± 2.49	.71

λ = standardized factor loading; * item not retained

[a] Rated as agreement on 9 point Likert scale (1 strongly disagree, 9 completely agree)

[b] Robust statistics

2009; Curtin 2005, 2006; DeMares and Krycka 1998; Kerley et al. 2003; Myers et al. 2004; Reynolds and Braithwaite 2001; Schanzel and McIntosh 2000; Russell and Ankenman 1996; Ryan et al. 2000; Sims-Castley et al. 2005). Authenticity addressed the overall feel of the tour and included items such as proximity and diversity of wildlife. Interspecies interaction related to how wildlife responded to individual tourists. Interpretation dealt with the overall quality and quantity of interpretive experiences. Lastly, thrill incorporated elements of species rarity and mystery, and perceived levels of risk.

Conservation caring

An individual's connection to a species is represented by the factor Conservation Caring, adapted from Rabb and Saunders (2005), and includes the dimensions care '*that'*, which are cognitive items, and care '*about'*, which are affective items. Care for a species relates to how individuals think, feel, and act towards that species. Such items are designed to be expressions of concern and not simple reflections of attitudes (Rabb and Saunders 2005). Inclusion of these items allows this factor to address issues of the individuals' relationship to the natural world and the influence of the experience under investigation (Saunders 2003).

Using these dimensions makes this factor more in line with empathy rather than knowledge. Empathy has been shown to be a better predictor than knowledge, of helping behavior, within the context of environmental issues (Ballantyne et al. 2010; Myers et al.

2004; Schultz 2000), and is more aligned with understanding how individuals care for a species (Saunders 2003; Vining 2003). Additionally, an individual's ability to empathize with a species implies the individual is able to identify an animal's emotions and cognitions as parallel to one's own. This has been suggested as a strategy to enhance conservation behaviors (Clayton et al. 2011).

Species and biodiversity oriented behaviors

Behavioral intent was separated into two factors on the basis of how actions pertain to an individual species, or biodiversity as a whole (Table 1). Individual species behaviors included donating money to "adopt" or purchase habitat for a particular species, and volunteering. Biodiversity oriented behaviors included support for sustainability policies and purchasing wildlife friendly products. Both factors were adapted from Stern (2000) and included the dimensions: non-activist public sphere, behavior in organizations, activism, and private sphere. These dimensions are supported in the literature as being well representative of pro-conservation behaviors (Kaiser et al. 2005; Schultz 2000; Stern et al. 1999). They also align well with conservation behaviors typically associated with individual species or species cohorts (Pennisi et al. 2004; Swanagan 2000; Walpole and Leader-Williams 2002; Waylen et al. 2009). One criticism of some models is that items are too general. Items in this study focused on highly site-specific behaviors, such as donating money directly to the site for the purposes of conserving the species; donating money to purchase habitat for the species; volunteering for and becoming a member of an organization devoted to the conservation of the species, and registering for updates from the site regarding the status of the species. Making items specific to a site has been shown to improve model explanatory capabilities (Powell and Ham 2008; Stern 2000).

Survey sites and sampling procedure

In situ surveys were administered at the Kilimanjaro International Airport, Moshi, Tanzania. This site was selected because it serves as the principal entry/exit point for tourists visiting parks and protected areas within the northern circuit of Tanzania. Surveys were collected daily from October 29–November 3 2011 using a census approach. Tourists were intercepted upon their arrival in the international departure lounge of Kilimanjaro International Airport. Tourists were first asked if they spoke English, as the survey was only available in English. Those who spoke English were asked if they had participated in a wildlife viewing activity, in a natural area, while in Africa. Those who responded 'yes' were asked to complete a survey. A total of 416 surveys were collected, with a 98 % response rate.

Ex situ surveys were collected from visitors at two zoos and one aquarium. Brookfield Zoo (Chicago, Illinois, USA), Zoo Atlanta (Atlanta, Georgia, USA), and Shedd Aquarium (Chicago, Illinois, USA) were chosen for their high visitation rates, presence of African wildlife, immersive exhibits, and levels of interpretation.

Surveys were collected September 3–November 27 2011. Using a systematic sampling approach, visitors to Brookfield Zoo ($n = 162$) and Zoo Atlanta ($n = 87$) were intercepted by a survey team member at the central picnic grounds. Visitors to the Shedd Aquarium ($n = 203$) were intercepted at the Caribbean Reef exhibit. Surveys were only available in English. Visitors who indicated they had been on site for three hours or more were asked to participate in the survey. A total of 452 visitors were surveyed, with an 89 % response rate.

Analyses

Data were screened for missing values. Cases exhibiting missing values for more than 50 % of items per factor were removed. A total of 108 cases were removed. Data were screened for univariate and multivariate outliers following Tabachnick and Fidell (2007). No univariate outliers (±3 SD) were detected. A total of 27 cases were removed for exceeding the criterion Mahalanobis Distance value (χ^2 (*43*) = 77.38, $p < .001$). The final sample size was N = 353 for safari tourists, and N = 360 for zoo tourists.

Test for metric invariance

Establishing metric invariance provides a statistical benchmark for accepting differences between populations due to true score differences in the factors as opposed to inconsistent psychometric properties. Tests for metric invariance followed the hierarchical tests for configural, metric and structural invariance consistent with Byrne (2008). These tests were used to confirm both the fit and invariance of the measurement model of the CMF viewing experience. Metric invariance was assessed across zoo sites to provide statistical support for pooling the three independent sample sites. Next, metric invariance was assessed across safari and zoo tourist samples.

Once the measurement model was confirmed for acceptable fit and invariance, the structural model was tested with the same set of hierarchical invariance tests. This was done in order to confirm fit and uncover causal pathway differences in the model between populations. The structural model varied from the measurement model in that it also included formative items for Trip Characteristics. A factor may contain both formative and reflective items (Jarvis et al. 2003). However, formative items should not be included for measurement metric invariance testing.

Results

Survey sample description

The safari tourist sample was 47 % male, 48 % female (5 % no response); mean age was 46; 87 % reported completing at least four years of college; 22 % listed the United States of America as their country of residence, 15 % listed the United Kingdom, and 10 % listed France. Demographics for the zoo tourist sample were as follows: 35 % male, 56 % female (9 % no response); mean age was 38; 63 % reported completing at least four years of college; 96 % listed the United States of America as their country of residence.

Preliminary measurement model

In structural equation modeling, measurement models are used to assess how well individual items reflect a factor. Ideally, items should only reflect and load on one factor. A factor loading is the correlation coefficient between the factor and the item. Factor loadings range from 0–1, and the higher the value, the stronger the relationship between item and factor. Measurement models may also be used to assess the validity of items in factor or scale development. A measurement model may be tested across multiple samples. The initial model generated for multi-sample comparisons is referred to as the baseline configural model.

A baseline configural model was analyzed for in situ and ex situ samples to screen for low loading and cross loading items, factor reliability, and discriminant validity. No cross loadings were detected. Thirteen items were removed for poor performance (Little et al. 1999) (Table 1). Two items were removed from Existing Connection to Wildlife, Species Characteristics, Trip Characteristics, Species Oriented Behavior, and Biodiversity Oriented Behavior. Three items were removed from Conservation Caring. Fit indices supported the model as an acceptable representation of the data (Safari: Satorra–Bentler χ^2 449.89 (236) $p < .05$; CFI = .96; RMSEA = .051, Zoo: Satorra-Bentler χ^2 416.36 (236) $p < .05$; CFI = .97; RMSEA = .046) (Byrne 2008).

Support for pooling zoo samples

To support pooling data from the three zoo sites, the following tests were performed. The configural baseline model was tested on each zoo sample site to check for group invariance. Fit indices were acceptable for each sample site (Table 2) supporting the use of the configural model to test for group invariance. Based on the hierarchical models of constraints, zoo sample sites displayed measurement and structural invariance ($\Delta SB\chi^2$ $p > .05$, respectively). As factor loadings and parameter estimates were deemed equivalent across sample sites, zoo samples were pooled and treated as a single sample (Byrne 2008).

Testing the measurement model in safari and zoo samples

The following tests were performed to support using the same measurement model for safari and zoo samples. The baseline configural model was tested on safari and zoo tourists to check for group invariance of the measurement model (Table 3). The configural model fit the data well (CFI = .96; RMSEA = .049) and was deemed an acceptable representation of the factorial structure. The test for measurement invariance revealed a decrease in fit relative to the configural model ($\Delta SB\chi^2 = 37.68$ (*19*); $p < .01$). Two measurements were unequal across tourist samples. One was the error covariance between the species oriented behavior items 'donating $75 to adopt animal' and 'contribute $150 to purchase habitat'. The second was the factor loading for the biodiversity oriented behavior item, 'purchase products that support wildlife conservation'. These constraints were released and the model re-tested. The $\Delta SB\chi^2$ was acceptable ($p < .05$), and no additional constraints were released.

The test for structural invariance revealed no harm in fit relative to the configural model ($\Delta SB\chi^2$ $p > .05$) (Table 3); parameter estimates were deemed equivalent across groups. These data support partial measurement invariance and factorial invariance across groups. The model is an acceptable representation of the data for each sample and analysis of the structural model is supported.

Testing the structural model in safari and zoo samples

In structural equation modeling, structural regression models are used to assess causal relationships between factors. These differ from measurement models, which assess relationships between items and factors. In structural regression models, beta weights reflect the effect size of the predictor factor on the dependent factor. As with measurement models, a baseline structural model can be tested across multiple samples.

The following tests were performed to support using the same structural regression model in safari and zoo samples. A baseline structural model was generated to represent the proposed relations of the theoretical model in Fig. 1. Fit indices indicated a reasonably

Table 2 Fit indices and testing outcomes for metric invariance of measurement model across zoo sampling sites

Model	CFI[a]	NNFI[a]	SRMR	RMSEA[a]	SBχ^2 (*df*)[a]	Δ SBχ^2 (Δ *df*)[b]
Preliminary CFA measurement model						
Brookfield Zoo	.95	.94	.057	.057	331.92* (236)	
Shedd Aquarium	.97	.96	.043	.052	341.34* (236)	
Zoo Atlanta	.90	.88	.066	.088	363.07* (236)	
Configural model	.94	.94	.057	.065	1022.38* (708)	
Measurement invariance	.94	.94	.064	.063	1060.53* (746)	34.58 (38) $p > .05$
Structural invariance	.95	.94	.11	.061	1083.96* (774)	53.38 (77) $p > .05$

* $p < .05$

CFI Comparative Fit Index, *NNFI* non-normed fit index, *SRMR* standardized root mean squared residual, *RMSEA* root mean square error of approximation, *SB*χ^2 Satorra–Bentler Scaled Chi square, *df* degrees of freedom

[a] Robust statistics

[b] Difference calculated using the Satorra–Bentler Scaled Chi square adjusted difference test (Satorra and Bentler 2001)

well fitting model (CFI = .90; RMSEA = .070) (Byrne 2008; Kline 2005). The measurement invariance model did not differ significantly from the baseline model (ΔSBχ^2 $p > .05$) supporting measurement invariance between safari and zoo tourists (Table 3).

The test for structural invariance revealed that four constraints ($p < .05$) were not equal across groups. The first was the structural path between trip characteristics and conservation caring, the second is the factor loading of 'I understood this animal's behavior', the third is the error covariance between the species oriented behavior items 'donating $75 to adopt animal' and 'contribute $150 to purchase habitat', and the fourth is the factor loading of 'I was able to get very close to this animal'. These constraints were released and the model re-tested. The respecified structural model fit the data well (CFI = .90; RMSEA = .068) and revealed no harm in fit relative to the configural model (ΔSBχ^2 $p > .05$) (Table 3). These data support measurement invariance and partial structural invariance across groups for the structural model. With the exception of the previous four constraints, the proposed model (Fig. 2, Table 3) predicting wildlife tourists' intention to engage in pro-conservation behavior is an acceptable representation of the data and is equivalent across safari and zoo tourists.

Influence of the CMF viewing experience on conservation caring and pro-conservation behaviors

The following results pertain to the first research question: does viewing CMF, in situ or ex situ, influence tourist-supported conservation outcomes. Fit indices for the model (SBχ^2 = 1869.94 (*702*), $p < .05$; CFI = .90; NNFI = .89; SRMR = .11; RMSEA = .068) indicated the model is an acceptable representation of the relationships present in the data (Byrne 2008; Kline 2005; Marsh et al. 2004). The model in Fig. 2 (also see Table 3 and 4) represents how the factors of an Existing Connection to Wildlife, Species Characteristics, and Trip Characteristics predict an intention to engage in pro-conservation behaviors.

Table 3 Fit indices and testing outcomes for metric invariance, structural invariance, and latent mean differences across safari and zoo tourists

Model	CFI[a]	NNFI[a]	SRMR	RMSEA[a]	SBχ^2 (*df*)[a]	Δ SBχ^2 (Δ *df*)[b]
Measurement model						
Configural model	.96	.96	.043	.049	868.94* (472)	
Measurement invariance	.96	.96	.046	.049	906.24* (491)	37.68 (19) $p < .01$
w/2 constraints released	.96	.96	.045	.048	892.31* (489)	21.84 (17) $p > .05$
Structural invariance	.96	.96	.058	.048	910.31* (504)	39.20 (32) $p > .05$
Structural model						
Configural model	.90	.89	.10	.070	1834.21* (668)	
Measurement invariance	.90	.89	.11	.069	1863.40* (686)	27.02 (18) $p > .05$
Structural invariance	.90	.89	.11	.069	1897.07* (706)	62.07 (38) $p < .01$
w/4 constraints released	.90	.89	.11	.068	1869.94* (702)	32.04 (34) $p > .05$
Latent means differences						
Measurement model w/zoo as ref. group	.96	.95	.047	.051	1102.64* (508)	

* $p < .05$

CFI comparative fit index, *NNFI* non-normed fit index, *SRMR* standardized root mean squared residual, *RMSEA* root mean square error of approximation, *SB*χ^2 Satorra–Bentler Scaled Chi square, *df* degrees of freedom

[a] Robust statistics

[b] Difference calculated using the Satorra–Bentler Scaled Chi square adjusted difference test (Satorra and Bentler 2001)

Conservation caring

An Existing Connection to Wildlife (safari $\beta = .35$, $p < .05$; zoo $\beta = .33$, $p < .05$) and Species Characteristics (safari $\beta = .32$, $p < .05$; zoo $\beta = .29$, $p < .05$) were moderate predictors of Conservation Caring. Tests constraining both direct effects across samples revealed no significant differences in β values. The factor, Trip Characteristics, was a significant predictor of Conservation Caring only in the zoo sample ($\beta = .26$, $p < .05$). This corresponds with the significant difference in parameter estimates across samples revealed in the test of causal invariance. The model accounted for 32 % (R^2 safari) and 42 % (R^2 zoo) of the variance in Conservation Caring.

Pro-conservation behaviors—species oriented behavior

Conservation Caring was the only significant predictor of Species Oriented Behavior, and was very strong (safari $\beta = .67$, $p < .05$; zoo $\beta = .65$, $p < .05$). The model accounted for 42 % (R^2 safari) and 41 % (R^2 zoo) of the variance in Species Oriented Behavior.

Pro-conservation behaviors—biodiversity oriented behavior

An Existing Connection to Wildlife was a weak predictor of Biodiversity Oriented Behaviors (safari $\beta = .18$, $p < .05$; zoo $\beta = .16$, $p < .05$). Conservation Caring was a weak predictor of Biodiversity Oriented Behavior (safari $\beta = .29$, $p < .05$; zoo $\beta = .29$, $p < .05$). Species Oriented Behavior is a moderate predictor of Biodiversity Oriented Behavior (safari $\beta = .46$, $p < .05$; zoo $\beta = .48$, $p < .05$). Tests constraining all direct effects across samples revealed no significant differences in β values. The model accounted for 58 % (R^2 safari) and 55 % (R^2 zoo) of the variance in Biodiversity Oriented Behavior.

Mean differences between factors

These results relate to the second research question: are there differences between in situ and ex situ CMF viewing experiences. The test for latent mean differences was performed with the zoo tourist sample as the reference group. Analyses revealed only two factors had means that were significantly different between safari and zoo tourists. Safari tourists scored .93 points higher on the factor Species Characteristics ($p < .05$), and .36 points higher on the factor Biodiversity Oriented Behaviors ($p < .05$) than did zoo tourists. It is important to note these are relative differences and not absolute values (Byrne 2008).

Tests constraining the disturbances of Conservation Caring, Species Oriented Behavior and Biodiversity Oriented Behavior across samples revealed R^2 values were not significantly different. The R^2 values were relatively high, and provide support for the predictive validity of the model (Kline 2005; Noar 2003).

Discussion

This study had two main goals. The first was to investigate how the CMF viewing experience influenced tourists' Conservation Caring (i.e. affective and cognitive connection to a species) and pro-conservation behaviors. The second goal was to explore how experiential elements interacted to influence outcomes, and if tourist-based conservation outcomes differed by type of experience. Survey responses were based on the animal with

Table 4 Item means, factor loadings and fit indices of final structural model predicting pro-conservation behavioral intent

Factor and items[a]	Safari tourists ($N = 353$)		Zoo tourists ($N = 360$)	
	Mean (SD)	λ	Mean (SD)	λ
Existing connection to wildlife				
I actively seek opportunities to view wildlife.	7.08 (1.95)	.71	7.12 (1.80)	.74
I feel a deep connection to wildlife.	6.69 (1.90)	.88	6.56 (1.91)	.88
I am highly motivated by the need to interact with wildlife.	6.26 (2.06)	.87	6.16 (2.02)	.88
I spend a lot of time learning about wildlife.	5.55 (2.10)	.72	6.03 (2.00)	.74
Species characteristics				
I understood this animal's behaviors.	6.08 (1.80)	.70	6.16 (1.98)	.75
I understood this animal's emotions.	5.36 (2.11)	.95	5.52 (2.12)	.92
I felt empathy for this animal because of its emotions.	5.49 (2.29)	.79	5.77 (2.08)	.83
Trip characteristics (reflective and formative items)				
I was able to photograph this animal.	7.77 (1.92)	.11	6.86 (2.25)	.13
I was able to get very close to this animal.	7.40 (2.04)	.13	6.57 (1.98)	.022
I made eye contact with this animal.	5.21 (3.02)	.15	4.85 (2.63)	.14
I directly interacted with this animal.	3.43 (2.51)	.12	3.71 (2.48)	.12
Information obtained from Interpreters/ Park Rangers.	6.44 (2.32)	.85	4.96 (2.66)	.76
The quality of interpretation was exceptionally high.	6.28 (2.28)	.96	5.78 (2.33)	.94
Conservation caring				
Ensuring this species' survival is my highest priority.	5.16 (2.28)	.79	5.55 (2.26)	.82
My emotional sense of well-being will be severely diminished by the extinction of this species.	6.08 (2.25)	.71	5.94 (2.32)	.78
I need to learn everything I can about this species.	5.00 (2.23)	.80	5.29 (2.11)	.86
I would protest this site if I learned of the mistreatment of this animal.	6.25 (2.20)	.70	6.44 (2.50)	.66
I will alter my lifestyle to help protect this species.	4.79 (2.20)	.77	5.21 (2.28)	.79
My connection to this animal has increased my connection to the species as a whole.	5.86 (2.14)	.75	5.64 (2.06)	.87
Wildlife protection must be society's highest priority.	5.91 (2.44)	.74	5.70 (2.40)	.79
Behavior—species oriented				
I will donate up to $75 to "adopt" this animal at this site.	4.33 (2.53)	.68	3.95 (2.41)	.80

Table 4 continued

Factor and items[a]	Safari tourists ($N = 353$)		Zoo tourists ($N = 360$)	
	Mean (SD)	λ	Mean (SD)	λ
I will make a charitable contribution up to $150 to help purchase habitat in the wild for this species.	4.10 (2.39)	.73	3.60 (2.39)	.80
I will become a member of an organization committed to protecting this species, within the next 6 months.	3.62 (2.24)	.89	3.87 (2.39)	.88
I will volunteer at an event designed to help the conservation of this species, within the next 6 months.	3.42 (2.28)	.82	3.72 (2.34)	.85
Before my visit is over, I will sign up for a mailing/email to receive updates about the care and conservation of this animal.	3.21 (2.29)	.79	3.74 (2.45)	.82
Behavior—biodiversity oriented				
I will endorse public policy that severely restricts future growth and development in order to protect wildlife.	5.44 (2.47)	.85	5.05 (2.61)	.87
Elected officials' views on wildlife will be a major factor in my voting.	5.09 (2.39)	.89	4.83 (2.49)	.91
Even when they are more expensive or harder to find, I will buy groceries and products that support wildlife conservation.	5.85 (2.28)	.79	5.19 (2.47)	.83
Fit indices[b]				
SBχ^2 (*df*)	1869.94* (702)			
CFI	.90			
NNFI	.89			
SRMR	.11			
RMSEA	.068			

* $p < .05$

SBχ^2 Satorra–Bentler Scaled Chi square, *df* degrees of freedom, *CFI* comparative fit index, *NNFI* non-normed fit index, *SRMR* standardized root mean squared residual, *RMSEA* root mean square error of approximation

[a] Rated as agreement on 9 point Likert scale (1 = strongly disagree, 9 = completely agree)

[b] Robust statistics, λ = standardized factor loading

which tourists formed the strongest connection. According to Manfredo and coworkers (2008) "…from an applied perspective, it is important to realize that emotional responses are at the heart of human attraction to, and conflict over, wildlife" (p. 51).

Influence of the CMF viewing experience on tourist-based conservation outcomes

The model, as represented in Fig. 2, demonstrates that in situ and ex situ wildlife viewing had a significant positive effect on the tourist-based conservation outcomes of Conservation Caring (i.e., a connection to a species) and pro-conservation behavioral intentions.

This is one of the first attempts to measure Conservation Caring, and doing so fills a widely recognized gap in the literature (Ballantyne et al. 2011; Cousins et al. 2009; Myers et al. 2004; Saunders 2003). Data support this factor being a successful representation of the construct (Table 4), and corroborate its role as an intermediate step to behavior (Ballantyne et al. 2007; Peake et al. 2009; Stern 2000). Additional support comes from the significant direct paths from Conservation Caring to both behavior factors, as well as very high R^2 values (Fig. 2).

Data from this study suggests that the CMF viewing experience significantly and positively impacts Conservation Caring. In this model, Conservation Caring was the only significant predictor of Species Oriented Behavior, and accounted for 42 % of the explained variance. Additionally, the path from Conservation Caring to Biodiversity Oriented Behavior was significant, although not as strong as the path to species behaviors. Wildlife tourism venues wishing to cultivate pro-conservation behaviors among visitors, should find ways to stimulate levels of Conservation Caring. One approach is to provide interpretation that employs techniques such as affective messaging and persuasive communication (e.g. Powell and Ham 2008; Skibins et al. 2012b).

In this model, pro-conservation behavior is represented by the factors Species Oriented Behavior and Biodiversity Oriented Behavior (Table 4). Species Oriented Behavior included philanthropy, volunteerism, and activism. Biodiversity Oriented Behaviors included voting behaviors and consumer habits. Data supported both factors being successful representations of their respective constructs. Additional support for the validity of the factors comes from the large amount of variance (Table 4, Fig. 2). One reason for the strong performance of both factors is the specificity of the items. In previous studies, the poor performance of factors has often been attributed to the over-generalized nature of the behaviors, and the lack of linkages between the behaviors investigated and those that are sought (Ballantyne et al. 2007; Bamberg 2003; Smith and Sutton 2008).

It is worth noting that although the model demonstrates a strong predictive ability for pro-conservation behavioral intent following a CMF viewing experience, individual item responses are still relatively low. This adds to the argument that although wildlife tourists may enter an experience with relatively high levels of a connection to wildlife, venues still have many opportunities to stimulate pro-conservation behavior intentions and performance (Beaumont 2001; Orams 1997).

Wildlife tourism venues may also benefit from providing direct opportunities for pro-conservation behaviors throughout the experience. Providing tourists with immediate opportunities to participate in a pro-conservation behaviors has been shown to successfully convert intent to action (Gwynne 2007; Powell and Ham 2008;). Given the positive influence of the CMF viewing experience on Conservation Caring, and its subsequent strong correlations to behavioral intent, it would seem advantageous to offer tourists such opportunities. This study found support for direct financial contributions on site and an interest in sustainable products. Both in situ and ex situ sites could improve conservation outcomes by providing more opportunities for tourists to make donations, while in the experience, as well as offering a wider array of wildlife friendly products and souvenirs.

Role of existing connection to wildlife on conservation outcomes

Tourists' Existing Connection to Wildlife was a moderate predictor of Conservation Caring. However, it was not a significant predictor of Species Oriented behaviors, and only a weak predictor of Biodiversity Oriented behaviors. This has interesting implications when addressing the argument of 'preaching to the choir' (Ballantyne et al. 2011).

For example, tourists' Existing Connection to Wildlife was as important a predictor of Conservation Caring as experiential elements (see below). This supports the argument that safari and zoo tourists' existing emotional attachment to wildlife was as important as the experience, and thus wildlife tourism is reinforcing and building tourists' caring.

However, Existing Connection to Wildlife was not a significant predictor of Species Oriented Behavior; and only weak at best in predicting Biodiversity Oriented Behavior (e.g. support for sustainability legislation, purchasing sustainable products). If wildlife tourists are 'the choir', one might reasonably expect a direct influence of an existing emotional attachment on intentions to engage in behaviors aimed at preserving a specific animal as well as biodiversity. However, this study found no direct support for Species Oriented Behavior and only weak support for biodiversity behaviors based on entering levels of Existing Connection to Wildlife. Thus, assuming wildlife tourists are 'the choir' and are pre-disposed to engage in pro-conservation behaviors appears unsupported by these results.

Role of experiential factors on conservation outcomes

The factor Trip Characteristics was a significant predictor only for Conservation Caring, and only for zoo tourists. The lack of a significant path to any dependent variable for safari tourists may be explained, in part, by the myriad of features composing a safari experience that were not measured in this study.

Another difference between safari and zoo tourists was the importance of proximity to the animal, as demonstrated by structural invariance constraints. This was a significant item for safari tourists, but not zoo tourists. This stands to reason as zoo tourists assume the experience will contain more direct interactions. Most zoo exhibits are designed to facilitate this experience, thus meeting the expectation. As such, a close proximity to the animal is a 'normal' experience for zoo-goers. However, part of the thrill for safari tourists is the ability to be very close to the animals (Curtin 2010) which is supported by the significance of this item.

The Species Characteristics factor also produced mixed results. The factor functioned as hypothesized in that it was a significant, albeit moderate, predictor of Conservation Caring. However, it was not a significant predictor of behavioral intent. The lack of a direct path to Biodiversity Oriented Behavior is understandable in that this factor was specific to one taxon. However, the lack of a significant path to Species Oriented Behavior is unexpected and runs contrary to previous studies (Myers et al. 2004). In this model, the factor only directly influences Conservation Caring, which in turn influences behavior. The implications of these findings for flagship species recognition are discussed below.

Comparison of experiential factors and conservation outcomes between in situ and ex situ tourists

Despite the debate regarding the potential value of in situ and ex situ wildlife viewing venues, both appear to positively influence tourists' caring and intentions to perform both species specific and general biodiversity behaviors. From an applied perspective, there were no meaningful differences between factor latent mean scores for safari and zoo tourists. Differences that are statistically significant are minor, and provide more information relevant for future studies than managerial implications. For example, safari tourists scored slightly higher on the factor Species Characteristics. This may be due to the greater diversity of animals present in a zoo, thus diluting zoo visitor responses.

Alternatively, it is possible that safari tourists are able to empathize with an animal more so than zoo tourists. However, this study was incapable of ascertaining why this occurred.

Safari tourists also scored slightly higher for intention to engage in biodiversity oriented behaviors. This may be attributable to safari tourists being more sensitized to the interconnectedness of ecosystems after an immersive safari experience (Markwell 2001; Ryan et al. 2000), and as such, are more prone to recognizing the value of biodiversity over one species. However, this explanation is speculative and not assessed by this study.

Implications for designating flagship species

Both in situ and ex situ CMF viewing is shown to positively influence caring and behaviors, thus indirectly supporting the flagship concept. However, flagships are not only expected to raise awareness and action for their own species, but for biodiversity as a whole. To that end, this study supports the notion that many CMF inspire intentions to act for both the species and biodiversity.

As shown in Fig. 2, an intention to engage in species and biodiversity oriented behaviors are strongly supported by the high R^2 values. Additionally, Species Oriented Behavior is a strong predictor of Biodiversity Oriented Behavior. This supports the notion that the CMF observed in this study could be successfully employed as flagship species. Furthermore, these results are not specific to any one species, as tourists were allowed to select the species to which they formed the strongest connection. This is highly encouraging for sites where traditional CMF are not present.

What emerged as important in forming a connection, regardless of taxon, were the emotional components of species characteristics (Table 4 and Fig. 2). This supports the ability to enlist a broad range of species as flagships, on the basis of emotional relatability and not traditional 'cute and cuddly' characteristics. This can benefit in situ sites without 'Big 5' species, and ex situ sites enhancing conservation efforts for lesser known species.

Several limitations temper the generalizability of the findings. First, tourists were asked which species they connected with during the experience. As such, responses were restricted to observed species. Viewing different species may alter results. Second, behavioral intentions and not actual behaviors were assessed. Therefore, results represent tourists' *intention to perform behaviors* and not actual behavior performance. Third, the experience was measured at a very coarse level. A more detailed comparison may reveal significant differences not detected by this survey instrument.

Conclusion

Direct exposure to wildlife, whether in situ or ex situ, appears to have the potential to be a powerful force to stimulate caring toward species of interest and pro-conservation behaviors for individual species and biodiversity as a whole. The emergence of Conservation Caring as a significant outcome and predictor of behavioral intent provides managers and practitioners empirical support for designing viewing experiences and interpretation to strengthen an emotional connection with an animal. Such experiences could focus on species' behavioral and emotional responses to environmental stimuli, as these emerged as strongly influencing Conservation Caring. For example, observing or interpreting how adults care for young or how sub-adult groups establish internal hierarchies could demonstrate understandable behaviors and emotions.

Additionally, providing opportunities for tourists to perform specific behaviors during their visit can improve conservation outcomes. Results from this study imply that tourists may be inclined to financially support species care and habitat preservation, as well as purchase wildlife friendly products. Wildlife tourism is ideally positioned to capitalize on such behavioral intentions. For example, philanthropic actions that are linked to specific animals or locations may have greater success than generic calls for support (e.g., Powell and Ham 2008). Gift shops could also present interpretation around sustainable products demonstrating the benefits communities and species receive from the purchase of such products.

This study has provided evidence for a more homogeneous treatment of wildlife tourists. The lack of differences in the results observed between safari and zoo tourists supports the strengthening of partnerships between in situ and ex situ locations to synergistically build on tourists' intention to perform pro-conservation behaviors. In fact, a more appropriate phrasing may be, 'the high degree of similarity in outcomes across safari and zoo tourists.' Partnering opportunities could include cultivating relationships between local businesses and ex situ locations, and facilitating trips and developing consistent interpretive themes between in situ and ex situ sites.

Future research may include further refinement of factors and specific attitudes, in order to pinpoint more exact differences between in situ and ex situ wildlife tourists. As protected areas struggle to justify their existence, and ex situ sites wrestle with being relevant to conservation, treating tourists, at either site, as one population provides a powerful new framework to address conservation messaging and outcomes.

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