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Published in:
Conservation Science and Practice

DOI:
10.1111/csp2.262

Publication date:
2021

Document Version
Publisher's PDF, also known as Version of record

Received: 5 February 2020 | Revised: 2 July 2020 | Accepted: 26 July 2020

DOI: 10.1111/csp2.262

CONTRIBUTED PAPER

Conservation Science and Practice
A journal of the Society for Conservation Biology
Open Access

WILEY

Does money "buy" tolerance toward damage-causing wildlife?

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Funding information
VokswagenStiftung (Volkswagen Foundation)

Abstract

The Kavango-Zambezi Transfrontier Conservation Area supports large-scale migrations of wildlife that occur in a mixed agri-conservation landscape in five Southern African countries. Human–Wildlife Conflict is a key challenge and understanding the drivers of communities' willingness to coexist with wildlife is thus critical. Community based natural resource management (CBNRM) is a widely used economic approach to foster human-wildlife coexistence with the assumption that monetary benefits can "buy" tolerance by offsetting the disservices of living with wildlife. We tested this assumption and hypothesized that Namibians would be more tolerant towards wildlife than Zambians because they received higher monetary benefits from wildlife. We used the Wildlife Tolerance Model (WTM) as the framework to define tolerance and identify tolerance drivers. We found Namibians tolerance was higher for lion, elephant and hyena but not for kudu and baboon. After controlling for confounding variables of the WTM that could potentially explain differences in tolerance, contrary to expectation, the monetary benefits did not account for higher Namibian tolerance. Instead, only nonmonetary benefits explained the higher tolerance. We used crowding theory to explain this finding, proposing that CBNRM in Namibia and the monetary benefits from the program "crowd in" intrinsic motivation to appreciate and tolerate wildlife.

KEYWORDS

benefits, coexistence, community based natural resource management, costs, crowding theory, governance, human-wildlife conflict wildlife, social ecological system values, wildlife tolerance model

1 | INTRODUCTION

Africa is undergoing rapid transformation. Key drivers are globalization, climate change and population growth, which is projected to increase nearly four-fold this century (United Nations, 2015). Africa's ability to adapt and

Submitted to Conservation Science and Practice as a Contributed paper for the Special Issue on Human Wildlife Conflict

develop resilience to rapid change will be key to ensuring sustainable livelihoods and biodiversity for future generations. There is much optimism about the prospects of globalization to improve human livelihoods and wellbeing in Africa. Essays such as "Africa rising" (The Economist, 2011, 2013, Fioramonti, 2014) and "lions on the move" (McKinsey Global Institute, 2010) portray the continent as the "last frontier" of the global economy (Moghalu, 2014).

On the one hand, these are positive developments with GDP growth in sub-Saharan Africa doubling to an average of 6.2% between 2002 and 2007 (Fosu, 2010). On the other hand, critiques of mainstream economics point to ethical problems relating to human wellbeing, including growing wealth inequality (Ndikumana, 2015; Obeng-Odoom, 2015) and food insecurity (FAO, 2015) despite large scale agricultural developments (EIU, 2015; Schoneveld, 2014). Moreover, economic growth is also predicted to cause environmental degradation and biodiversity loss. For example, "development corridors" are planned that will bisect 408 protected areas while some projected urban-growth areas will overlap strongly with critical biodiversity hotspots (Laurance, Sloan, Weng, & Sayer, 2015; Seto, Guneralp, & Hutyra, 2012); which is highly likely to exacerbate on going declines in wildlife populations (Bauer et al., 2015; Ripple et al., 2014; Ripple et al., 2017; WWF, 2016). A key question for Africa is, therefore, how to manage this transformation given that it is rapid with high stakes for both wildlife and rural people. If economic progress is too fast, some losses may be irreversible. Yet if progress is slow, dissatisfaction and social unrest may emerge as human populations increase at rates that the economy cannot support. Against this background, a critical question emerges: Will there be space and willingness for people and wildlife to coexist—where people are willing to share the landscape with wildlife while ensuring sustainable wildlife populations?

The creation of Transfrontier Conservation Areas is one potential solution initiated by the Southern African Development Community (SADC) to maintain large-scale ecological processes in the face of developmental pressures. The Kavango-Zambezi Transfrontier Conservation Area (KAZA, TFCA) is the largest TFCA in the world (520,000km^2) and one of 18 existing and proposed TFCAs in Southern Africa. It is characterized by large-scale migrations of megafauna such as elephant (*Loxodonda Africana*), buffalo (*Syncerus caffer*) and zebra (*Equus quaaga*), is home to numerous red-listed species, and contains the world-heritage listed Okavango Delta (KAZA, 2015). Seventy-one percent of its area is under some form of wildlife management, leaving 29% for agricultural use, rangeland, and development. It is also home to 27 million people, most living in currently unprotected sections (Glatz-Jorde et al., 2014). KAZA therefore presents an ideal area to examine questions of human-wildlife coexistence in mixed agri-conservation landscapes under global developmental pressures, where wildlife corridors are threatened and wildlife conflict is a key challenge (Glatz-Jorde et al., 2014; KAZA, 2015). Key questions for managing wildlife in such systems are: (a) what factors drive people's tolerance to living with wildlife? and (b) what policies are best to achieve coexistence? Here we define tolerance as the willingness of an individual to absorb the extra potential or actual costs of living with wildlife (Kansky, Kidd, & Knight, 2016). We define human-wildlife conflict as consisting of two components; (a) Impacts that deal with direct interactions between humans and wildlife species (Young et al., 2010), (b) Conflicts between humans over how to manage wildlife impacts.

Globally and in Southern Africa, Community Based Natural Resource Management (CBNRM) is commonly used to offset the costs of living with wildlife and foster human-wildlife coexistence (Hulme & Murphree, 2001; Nelson & Agrawal, 2008). However, policies change dynamically and can differ substantially between countries, particularly in relation to the extent of institutional devolution and benefit sharing between communities and national beneficiaries (Nelson & Agrawal, 2008; Muchapondwa & Stage, 2015: Galvin, Beeton, & Luizza, 2018). Notwithstanding such differences, fundamental to all policies is a utilitarian rationale—that is, communities receive monetary benefits from wildlife utilization in order to "buy" support for wildlife conservation and offset the costs of living with wildlife (Ashley & Barnes, 1996; Child, 2003; Cretois, Linnell, Kaltenborn, & Trouwborst, 2019; Jones & Murphree, 2001; Muchapondwa & Stage, 2015; t'Sas-Rolfes,- 2017; Virtanen, 2003). Indeed, economic incentives have increasingly gained prominence in environmental policy (Rode, Gómez-Baggethun, & Krause, 2015), and CBNRM is no exception. However, critics have warned that monetary incentives may "crowd out" intrinsic motivations, such as people's moral commitment toward nature conservation or their non-use values (Rode et al., 2015); which may undermine long term conservation efforts (Gómez-Baggethun & Ruiz-Pérez, 2011; Muradian et al., 2013). Motivation Crowding Theory (Frey & Jegen, 2001) suggests that people who are intrinsically motivated to engage in an altruistic behavior—for example donating blood—because they feel an inherent satisfaction or personal conviction, may feel discouraged to do the behavior if they are offered external rewards such as money. In this way the extrinsic reward causes a "crowding out" effect of the intrinsic motivation

(Ryan & Deci, 2000). Conversely, a "crowding in" effect may result when the external reward (money) reinforces the intrinsic motivation (Rode et al., 2015)—for example, financial benefits of conservation could "crowd in" additional, intrinsic motivation to conserve wildlife.

Here, we evaluated whether higher monetary benefits received from wildlife in Namibia compared with Zambia corresponded to higher wildlife tolerance in Namibian communities. Namibia receives higher financial benefits from wildlife. This is because while both countries have benefit sharing programs, Namibian conservancies retain 100% of the income from trophy hunting and tourism lodges (MET/NACSO, 2018) whereas Zambians receive 50% of the income (Metcalfe & Kepe, 2008). Second, in Namibia, elephants can be hunted as trophies due to special agreements with CITES, while in Zambia there is no such CITES agreement (Metcalfe & Kepe, 2008). Third, in our study area in Zambia hunting quotas are low because wildlife populations are recovering from a period of heavy poaching (Metcalfe & Kepe, 2008), and there are no tourist lodges.

Against this background, we hypothesized that (a) Namibians would be more tolerant towards wildlife than Zambians; (b) Namibians would perceive higher monetary benefits from wildlife than Zambians, and (c) the higher monetary benefits would explain the higher tolerance. Using surveys of local communities, we tested these hypotheses for five wildlife species present in both countries that potentially cause problems for farming communities, namely kudu (*Tragelaphus strepsiceros)*, lion (*Panthera leo*), hyena (*Crocuta crocuta*), elephant (*Loxodonta africana*) and baboon (Papio ursinus).

As we show below, in partial support of hypothesis (a) we found that tolerance of Namibians was higher than Zambians for lion, elephant and hyena but not for kudu and baboon. In support of hypothesis (b) Namibians perceived higher monetary benefits than Zambians. However, our third hypothesis was not supported—monetary benefits could not directly explain the higher tolerance. Instead, Namibians perceived higher nonmonetary benefits for these species and this explained their higher tolerance, suggesting a "crowding in" effect from the monetary benefits.

2 | METHODS

2.1 | Study area

We surveyed communities in the Kwando Wildlife Dispersal Area of KAZA in Zambia around Sioma-Ngwezi National Park, and in Namibia in the Mudumu Complex in Zambezi Region (Figure 1). Before independence both areas were part of Barotseland and the Lozi kingdom, an amalgamation of 25–35 different tribes (Flint, 2003).

2.2 | Zambia

Sioma-Ngwezi National Park (NP) is the Zambia's third largest NP and is situated in Sesheke and Sioma districts of Western province. It lies in the center of the KAZA TFCA, between the Zambezi river on the east and the Kwando river on the west. The Park is unfenced and forms an important link in the migratory route of elephants from the bordering national parks of Botswana and Namibia. It has mopane and acacia woodland interspersed grasslands and thickets (Ministry of Tourism and Arts, 2019). It is among the least stocked and developed national parks in Zambia and receives relatively few tourists (Ministry of Tourism and Arts, 2019). In Zambia, Game Management Areas (GMA) surround all national parks and act as buffer zones where communities may live and partner with Zambia Wildlife Authority (ZAWA) in a co-management arrangement to share benefits from wildlife. Communities elect Community Resource Boards (CRB) who get 50% of natural resource benefits and decide on development projects (Milupi, Somers, & Ferguson, 2020). We surveyed communities living in the GMA's along the Zambezi River in the east as well as communities living in Sioma Ngwezi NP along the Kwando River (Figure 1).

2.3 | Namibia

The Zambezi region of Namibia, previously called the Caprivi, is a narrow strip of land in the far northeast of Namibia, about 400 km long. Its unusual shape is due to its complex colonial history (Flint, 2003). The area is bordered by the Kwando, Linyanti, Chobe, and Zambezi Rivers and is a region of woodlands, swamps, and flood plains. There are three national parks in the landscape, Babwata, Mudumu and Nkasa Lupala, as well as the Zambezi State Forest. Communal lands and 15 conservancies surround these protected areas. Conservancies in Zambezi are communal lands that are unfenced, multiple use areas with fixed boundaries. They serve as wildlife corridors for movement of wildlife between KAZA countries and the NPs in the landscape. Conservancy governance is guided by the Ministry of Environment and Tourism (MET), and conservancy policies that are implemented through elected and salaried community members who serve on Conservancy Management Committees (CMC). The CMC collect and distribute 100% of

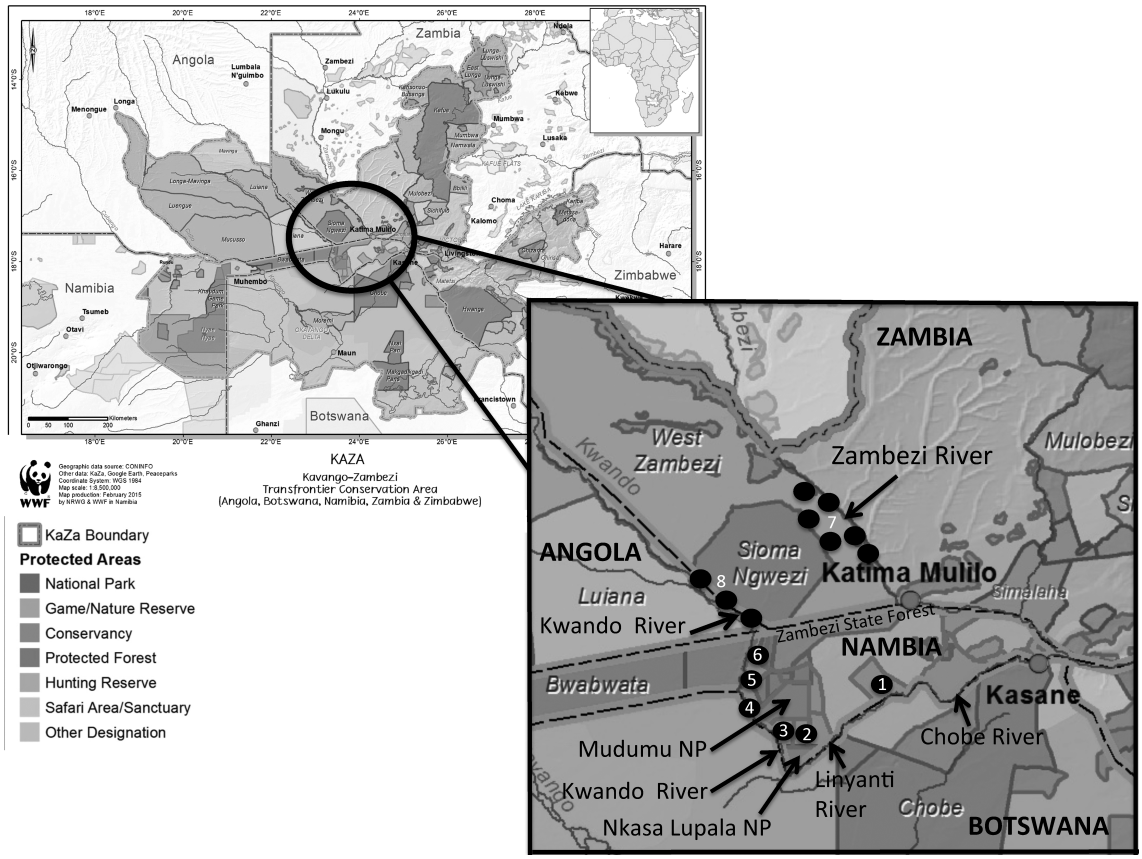

FIGURE 1 Map of study area– the Kavango Zambezi Transfrontier Conservation Area is southern Africa, showing the Mudumu complex in the Zambezi region of Namibia and the Sioma district in Zambia. Survey locations are indicated numerically; Namibia from 1 to 6 and in Zambia 7–8. 1 = Bamunu conservancy, 2 = Wuparo conservancy, 3 = Balyerwa conservancy, 4 = Mashi conservancy, 5 = Mayuni conservancy, 6 = Kwando conservancy, 7 = villages along Zambezi river and inland within Sioma-Ngwezi National Park, 8 = villages along the Kwando river within Sioma-Ngwezi National Park and along border with Angola. Map courtesy of NACSO

benefits generally from trophy hunting and tourist lodges (MET/NACSO, 2018; Nuulimba & Taylor, 2015). The study area we focused on encompassed six conservancies between Nkasa Lupala and Mudumu National Parks; Bamunu, Wuparo, Balyerwa, Mashi, Mayuni, and Kwando (Figure 1).

Both in Zambia and Namibia, general human assets are limited due to low education levels, widespread health risks, and general food insecurity. Financial assets are vested in livestock ownership, crop farming, and the use of natural resources that are traded in informal markets. The most common threats to livelihood assets are human-wildlife conflict, poor human and livestock health, floods and droughts, as well as variable rainfall (Glatz-Jorde et al., 2014).

2.4 | Community surveys

We used the Wildlife Tolerance Model (WTM) (Kansky et al., 2016) (Figure S1) as the theoretical framework for community surveys. We chose this model because in addition to monetary benefits, it identifies other confounding variables that could potentially explain drivers of tolerance. If differences in tolerance were found, we could then control for these confounding variables. We adapted the questionnaire from Kansky et al. (2016) to develop the WTM for the socioecological context of the study area. Table 1 describes the variables in the WTM. Tables S1, S2, S3 present questions, and variables used in surveys with an explanation of how these are modified to suit the current study.

The WTM consists of two components: an outer model (OM) with six variables and an inner model (IM) with 11 variables. In the OM, experience with a species is the first variable and is operationalized using two variables: (a) recent spatial exposure to a species, and (b) number of meaningful events a person has had with the species. Meaningful events are emotionally charged experiences, which can be either positive (PME) or negative (NME) and are not time constrained; that is, they could have occurred at any time in a person's life. Next, are

TABLE 1 General description of the variables from the wildlife tolerance model used in the survey

Outer model variables	
1. Experience:	
Exposure	Interaction frequency and spatial proximity of an individual with a species.
Negative meaningful events	Negative emotionally charged experiences, such as traumatic encounters with the species, which may have occurred at any time during an individual's lifetime.
Positive meaningful events	Positive emotionally charged experiences, such as an unforgettable meaningful nature experience with wildlife, which may have occurred at any time during an individual's lifetime.
2. Tangible costs	Direct costs incurred from living with wildlife such as monetary loss through livestock or crop loss due to wildlife.
3. Intangible costs	Nonmonetary psychological costs such as stress and fear as well as opportunity cost.
4. Tangible benefits	Monetary benefits for the individual and the community as compensation, equipment for mitigating damages received from organization or income due to wildlife-tourism.
5. Intangible benefits	Nonmonetary benefits from ALL wildlife species such as the positive emotions from living with wildlife, cultural value, meaning, learning, or spiritual value of wildlife.
6. Tolerance	Tolerance is measured through 4 main parameters: (1) tolerance to the killing of a species under different contexts, (2) the population size of a species that person is willing to accept; (3) tolerance to species visits to a person's farm or village and; (4) tolerance to monetary losses
Inner model variables	
1. Interest in wildlife	General interest in wildlife such as reading and watching movies about wildlife and learning about animal behavior
2. Institutions	Perceptions of support, trust, and skill competence in organizations that are involved with wildlife.
3. Wildlife value orientations[a]	Value priorities in relation to wildlife. Two dimensions are Utilitarian's who believe wildlife are primarily for human benefit and mutualists' who believe wildlife as deserving rights.
4. Values[b]	Self-transcendent, universalism values in relation to nature and the preservation of the natural environment
5. Empathy[c]	An ability to feel compassion when imagining a wildlife species in distress or having problems
6. Tangible costs-all	Direct costs incurred from ALL wildlife species such as monetary loss through livestock or crop loss due to wildlife.
7. Intangible costs-all	Nonmonetary factors such as stress and fear, which result from direct and indirect interactions with ALL wildlife and opportunity cost.
8. Tangible benefits-all	Monetary benefits from ALL wildlife species accruing to an individual and the community as income due to wildlife-tourism, trophy hunting.
9. Intangible benefits-all	Nonmonetary benefits from ALL wildlife species such as the positive emotions from living with wildlife, cultural value, meaning, learning, or spiritual value of wildlife.

Note: See also Kansky et al., 2016 for more details of the WTM. In Supporting Information we provide questions used in the survey to operationalize the variables and constructs.
[a]For the Wildlife Value Orientation construct we used the questions from Fulton, Manfredo, & Lipscomb, 1996.
[b]For the Values construct, we used three items of the Universalism—Nature construct of Schwarts's value theory (Schwartz et al., 2012).
[c]For the empathy scale we adapted the IRI construct (Davis 1980, 1983a, 1983b) to be applicable to animals.

benefit and cost variables—these are separated into tangible and intangible. Tangible costs refer to monetary costs such as crop damage or livestock losses. Tangible benefits refer to the monetary benefits such as from tourism or trophy hunting. Intangible costs refers to the nonmonetary costs such as psychological costs of fear, risk and stress, while nonmonetary benefits can be positive emotions from living with wildlife, cultural value, meaning, learning or spiritual value of wildlife (Table S2). The first hypothesis of the OM is that experience drives perceptions of costs and benefits; if experiences are more positive, people will perceive greater benefits, and vice versa. The second hypothesis is that cost and benefit perceptions drive tolerance.

For the IM we chose five variables to include, namely interest in animals, wildlife value orientation, empathy, values and institutions (Table 1, Table S3). We could not

include all 11 variables due to limits of survey length. The five were chosen to be consistent with other WTM case studies. We also added four new variables to the IM that were found to be important in driving tolerance from other WTM studies (Kansky, unpublished data). These were the costs and benefits of all wildlife species in addition to the five we were interested in (Table 1, Table S3). For example, people who are more interested in animals are hypothesized to perceive relatively more benefits than costs, and therefore to be more tolerant than those who dislike animals. Some of the variables in the WTM are constructs, also termed latent variables. These are variables that cannot be measured directly because they are abstract or complex phenomena and need to be operationalized using a set of indicators that serve as proxy variables that can be measured (Babbie & Mouton, 2007). The Wildlife Value Orientation construct has two dimensions; utilitarianism and mutualism with a continuum between them (Fulton et al., 1996). For the values construct we used three items of the Universalism-Nature construct of Schwartz's value theory (Schwartz et al., 2012). For the institution construct, three organizations were comparable: (a) the national wildlife management authorities, ZAWA in Zambia and MET in Namibia; (b) the local community management institution—Village Action Committee (VAG) in Zambia and Conservancy Management Committee (CMC) in Namibia; (c) World Wildlife Fund (WWF), which operated in both countries.

Finally, in addition to the WTM variables we added six socio-demographic variables to the survey—gender, age, annual income, number of years at school, number of cattle and number of years lived in village (Table S1). These were chosen based on their potential to influence tolerance.

Villages were surveyed in September–October 2017 in Zambia and August–September 2018 in Namibia. Households were canvassed randomly between Monday and Saturday between 8 a.m. and 6 p.m. One adult from each household was approached to participate in the survey. Villages were sampled in proportion to their size such that more respondents were surveyed from larger villages. Face to face interviews were conducted in the local Lozi language by four trained, local enumerators. Data were recorded using a combination of portable devices, using the ODK collect software (getodk.org) and paper. Pilot surveys were conducted repeatedly until confidence in accuracy was achieved and the survey could be completed within an hour. Ethical requirements conformed to the Stellenbosch University Research Ethics Committee (project 0967). Few people canvassed refused to be interviewed and therefore nonresponse bias questions were not necessary.

We surveyed 286 farmers from Zambia, 123 from Zambezi river area and 163 from the Kwando river area. In Namibia we surveyed 554 farmers from six conservancies in the Mudumu Complex; Bamunu (69), Wuparo (77), Balyerwa (88), Mashi (80), Mayuni (73) and Kwandu (86).

2.5 | Data analysis

Some latent variables from the survey questions required further computations. These are explained in Supporting Information. We standardized the Tolerance construct by computing a z-score because the scales for its items were different.

We used the software Statistica 13, and the R "lmer" package (TIBCO Software Inc., 2018) to analyse the data. We computed reliability scores for the latent variables using Cronbach alpha. We first compared tolerance between the two countries using mixed model ANOVA with species and country as the two independent variables. For post hoc testing Fisher Least Significant Difference (LSD) was used and Cohen's D was computed to determine effect sizes, which were then categorized on a scale of negligible to huge based on McLeod (2019). After differences in tolerance were found, we wanted to determine which WTM and socio-demographic variables, if any, could have affected the outcome. For example, if Namibians were found to be more tolerant and had less monetary damages from elephants, then the higher tolerance could also have been because of the lower costs (see Kansky et al., 2016 for all WTM hypotheses). We then compared WTM and socio-demographic variables between the two countries using mixed model ANOVA with species and country as the two independent variables. Since we did find many significant differences between countries for the WTM and socio-demographic variables, which could potentially account for differences in tolerance, we added them as covariates to the mixed model ANOVA to investigate whether the addition of the covariates made any difference in tolerance between the two countries compared to the analyses without the covariates. In cases where there was a difference in tolerance between the two countries without covariates, but the difference disappeared after entry of the covariate, this indicates the difference in tolerance is driven by the covariate. The covariate is then a mediator. For the covariate analyses, because there were many potential covariates, we divided them into three groups (a) socio-demographic variables (b) WTM inner model variables (c) WTM outer model variables. If the analysis was not significant for a group, that is, none of the covariates in that group made any difference compared with the analyses without the covariates, then we did not do further individual covariate tests. However, if the covariate group did have an impact, then we performed

TABLE 2 Country comparisons of mean tolerance z scores for five wildlife species

	Zambia			Namibia				
	n	Mean	*SD*	*n*	Mean	*SD*	*p*	Cohen's D
Kudu	278	0.5105	0.2045	564	0.5219	0.1883	.43	0.06(negligible)
Baboon	277	0.3233	0.1826	561	0.3396	0.2056	.25	0.08(negligible)
Elephants	277	0.3209	0.1895	562	**0.3765**	0.2138	.001	0.27(small)
Lion	278	0.2427	0.1666	562	**0.3281**	0.2065	.001	0.44(medium)
Hyena	275	0.2264	0.1705	564	**0.3263**	0.2032	.001	0.52(medium)

separate analyses for each variable to establish which covariate from that group was responsible for the effect.

After finding that *Intangible Benefits* was the only variable explaining the higher tolerance of Namibian's for hyena, lion and elephant, we conducted an additional analysis to evaluate the "crowding in" hypothesis. In order to determine if the prevalence of *Tangible Benefits* was linked to the higher perception of *Intangible Benefits* we created two sub-groups within the Namibia data set: a group that did not perceive any *Tangible Benefits* and a group that perceived *Tangible Benefits*. We then compared perceptions of *Intangible Benefits* between these two groups using mixed model ANOVA with species and sub group as the two independent variables. For post hoc testing Fisher Least Significant Difference (LSD) was used and Cohen's D was computed to determine effect sizes.

3 | RESULTS

3.1 | Reliability of constructs

Using Cronbach's alpha, of the 12 latent variables, 9 had values above 0.7. Of the three that had values below 0.7, the *Tolerance* and *Intangible Benefit* latent variables value was 0.64 while the WVO-utilitarian value was 0.53 (Table S4). We considered the *Tolerance* and *Intangible Benefit* values acceptable because these constructs have been found to be reliable in other studies using the WTM (e.g., Kansky et al., 2016; Saif et al., 2019); however, we do acknowledge this as a limitation. We excluded the *WVO-utilitarian* variable from the co-variate analyses.

3.2 | Are there differences in tolerance between Namibia and Zambia?

There were no significant differences for kudu and baboon, but tolerance was significantly higher in Namibia for lion, elephant, and hyena than in Zambia. The effect size (Cohen's D) was medium for lion and hyena and small for elephant (Table 2).

3.3 | Are there differences in tangible benefits between Namibia and Zambia?

Tangible Benefits were significantly higher in Namibia for all five species (Table 3).

3.4 | Were there differences in Wildlife Tolerance model Outer Model variables that could potentially account for differences in Tolerance?

3.4.1 | Tangible cost

There was no significant differences between the countries for the monetary damage from four of the five species (kudu, baboon, lion, and hyena) but the monetary damage from elephants was significantly higher in Namibia (Table 3). Therefore, monetary damage could not be the reason for the higher tolerance of Namibians because higher monetary costs would lower tolerance levels.

3.4.2 | Intangible costs

There was no significant difference between the two countries for the *Intangible Costs* of living with elephant but significant differences for the four remaining species were as follows: *Intangible Costs* were significantly higher in Namibia for kudu but significantly higher in Zambia for lion, hyena, and baboons (Table 3). Therefore, it is possible that the higher intangible costs from lion and hyena in Zambia could explain the higher tolerance of Namibians for lion and hyena but not for elephants.

3.4.3 | Intangible benefits

Intangible benefits were significantly higher in Namibia for all five species. The effect sizes range from large to

TABLE 3 Descriptive statistics and comparison between Zambia and Namibia for the wildlife tolerance model variables

	Zambia			Namibia				
	n	Mean	*SD*	*n*	Mean	*SD*	*p*	Cohen's D
KUDU								
Tolerance	278	0.51	0.20	564	0.52	0.19	.43	0.06(negligible)
Tangible costs	285	374.42	704.56	568	713.12	3,800.09	.37	0.11(negligible)
Intangible costs	283	0.47	0.87	567	**1.41**	1.54	.001	0.7(medium)
Tangible benefit	281	1.08	0.45	563	**2.33**	1.38	.001	1.08 (large)
Intangible benefit	280	3.38	1.32	564	**4.28**	0.79	.001	0.9(large)
Exposure[a]	282	4.48	2.16	568	**6.46**	1.77	.001	1.04(large)
NME	284	0.05	0.16	567	**0.19**	0.34	.001	0.45(medium)
PME	284	**0.46**	0.52	568	0.32	0.37	.001	0.31(small)
Empathy	277	**4.63**	1.73	556	4.22	1.61	.001	0.25(small)
LION								
Tolerance	278	0.24	0.17	562	**0.33**	0.21	.001	0.44(medium)
Tangible costs	285	212.43	780.87	568	658.10	3,447.45	.24	0.16(small)
Intangible costs	283	**4.55**	0.86	568	4.15	1.09	.001	0.4(medium)
Tangible benefit	281	1.04	0.32	563	**2.28**	1.35	.001	1.11 (very large)
Intangible benefit	278	2.21	1.11	563	**3.83**	0.92	.001	1.65(huge)
Exposure[a]	281	7.34	0.98	565	7.16	1.49	.16	0.13(negligible)
NME	283	0.07	0.19	567	0.11	0.25	.07	0.19(small)
PME	284	0.03	0.12	568	0.08	0.20	.09	0.26(small)
Empathy	277	1.62	1.24	553	**2.87**	1.54	.001	0.87(large)
BABOON								
Tolerance	277	0.32	0.18	561	0.34	0.21	.25	0.08(negligible)
Tangible costs	285	106.22	604.45	568	225.53	1,593.40	.75	0.09(negligible)
Intangible costs	282	**2.61**	1.96	568	2.08	1.66	.001	0.3(small)
Tangible benefit	281	1.01	0.06	561	**1.60**	0.94	.001	0.77 (large)
Intangible benefit	278	2.32	1.09	563	**3.34**	0.98	.001	1.01(large)
Exposure[a]	282	**7.56**	1.12	564	6.96	1.93	.001	0.35(small)
NME	283	0.07	0.25	565	**0.13**	0.38	.02	0.17(small)
PME	284	0.17	0.36	568	0.15	0.38	.61	0.04(negligible)
Empathy	277	2.39	1.67	555	**3.38**	1.56	.001	0.63(medium)
ELEPHANT								
Tolerance	277	0.32	0.19	562	**0.38**	0.21	.001	0.27(small)
Tangible costs	285	460.02	1.070,50	568	**3,912.92**	12,833.13	.001	0.33(small)
Intangible costs	283	3.96	1.39	568	3.94	1.25	.83	0.02(negligible)
Tangible benefit	281	1.06	0.38	563	**3.46**	1.64	.001	1.76(huge)
Intangible benefit	279	3.11	1.41	564	**4.47**	0.81	.001	1.3(very large)
Exposure[a]	280	**6.21**	1.26	566	4.51	2.22	.001	0.87(large)
NME	284	0.23	0.33	567	**0.46**	0.52	.001	0.51(medium)
PME	284	0.31	0.45	568	**0.54**	0.53	.001	0.46(medium)
Empathy	277	2.54	1.82	554	**3.00**	1.60	.001	0.27(small)
HYENA								
Tolerance	275	0.23	0.17	564	**0.33**	0.20	.001	0.52(medium)

TABLE 3 (Continued)

	Zambia			Namibia				
	n	Mean	*SD*	*n*	Mean	*SD*	*p*	Cohen's D
Tangible costs	285	927.41	1974.09	568	520.51	2,621.74	.28	0.17(small)
Intangible costs	283	**4.17**	1.11	568	3.47	1.53	.001	0.5(medium)
Tangible benefit	281	1.02	0.19	563	**1.75**	1.05	.001	0.86(large)
Intangible benefit	279	1.99	1.02	564	**3.49**	0.94	.001	1.56(huge)
Exposure[a]	277	3.85	2.20	557	**6.55**	1.94	.001	1.33(very large)
NME	284	**0.18**	0.31	568	0.11	0.26	.01	0.23(small)
PME	284	0.09	0.24	568	0.09	0.23	.94	0.01(negligible)
Empathy	277	1.58	1.20	557	**2.92**	1.57	.001	0.91(large)

Note: See Table S2 for variable explanations and scales.
[a]Reverse coded so a higher score indicates lower exposure.

"huge." They were large for kudu and baboon, very large for elephant and "huge" for the carnivores (lion and hyena) (Table 3). Therefore, it is possible that the higher intangible benefits from elephant, lion and hyena in Namibia could explain the higher tolerance of Namibians.

3.4.4 | Exposure

Exposure was not significantly different for lion but was significantly different for the remaining four species. It was significantly higher in Zambia for kudu and hyena but significantly higher in Namibia for baboon and elephant (Table 3). Therefore, it is possible that the higher exposure in Zambia for hyena could explain its lower tolerance in Zambia.

3.4.5 | Negative meaningful events

Negative meaningful events were not significantly different for lion but was significantly different for the remaining four species. It was significantly higher in Zambia for hyena but significantly higher in Namibia for kudu, baboon, and elephant (Table 3). Therefore, it is possible that the higher number of negative events in Zambia for hyena could explain its lower tolerance in Zambia.

3.4.6 | Positive meaningful events

Positive meaningful events were significantly different for only two species—kudu and elephant. In Zambia respondents reported, more positive experiences with kudu while in Namibia respondents reported significantly more positive experiences with elephants (Table 3). Therefore, positive experience could not explain the differences in tolerance between Namibians and Zambians for elephant, hyena, and lion.

3.5 | Were there differences in inner model variables of the wildlife tolerance model that could potentially account for differences in tolerance?

3.5.1 | Wildlife value orientations

There were no significant differences for the mutualism dimension of Wildlife Value Orientation construct but Zambians had significantly higher scores for the utilitarian dimension of Wildlife Value Orientation indicating that these could account for the lower tolerance of Zambians as people with utilitarian value believe wildlife primarily have value if they benefit people (Table 4).

3.5.2 | Values

There was no significant difference between the two countries (Table 4). Therefore values could not potentially explain higher tolerance of Namibians.

3.5.3 | Intangible costs from all wildlife species

Zambians perceived significantly higher intangible costs from all wildlife species (Table 4). Hence, this could

TABLE 4 Mean differences in inner model variables of the wildlife tolerance model that could potentially explain differences in tolerance between Zambia and Namibia

	Zambia			Namibia				
	n	Mean	*SD*	*n*	Mean	*SD*	*p*	Cohen's D
Interest wildlife	284	5.62	1.61	568	**6**	1.36	.001	0.26(small)
WVO-utilitarian	282	**5.34**	1.16	563	4.59	1.16	.001	0.65(medium)
WVO-mutulism	283	5.15	1.63	555	5.29	1.41	.62	0.09 (negligible)
Values	283	5.84	1.57	568	6.21	1.03	.13	0.3(small)
Cost tangible all	285	4,121.48	6,440.04	568	**8,343.68**	19,188.25	.001	0.26(small)
Cost intangible all	281	**6.73**	0.69	563	6.48	0.97	.001	0.28(small)
Benefit tangible all	279	1.1	0.52	555	**3.54**	1.64	.001	1.84 (huge)
Benefit intangible all	277	3.49	1.34	554	**4.59**	0.69	.001	1.15(very large)
Institution ZAWA/MET[a]	280	2.98	1.15	477	**3.68**	1.44	.001	0.52(medium)
Institution VAG/CMC[b]	268	2.39	1.06	502	**3.46**	1.44	.001	0.81(large)
Institution WWF	237	2.99	1.21	155	**3.38**	1.63	.001	0.28(small)

Note: Comparisons were done using ANOVA. See Table S3 for variable explanations and scales.
[a]ZAWA = Zambian wildlife authority, MET = Ministry of environment and tourism in Namibia.
[b]VAG = Village action committee, CMC=Conservancy management committee.

potentially explain their lower tolerance for elephant, lion, and hyena.

3.5.4 | Empathy

There were significant differences for all five species. Zambians had higher *Empathy* for kudu (effect size small) while Namibians had more *Empathy* for elephant (Cohen's D = small), baboon (Cohen's D = medium), lion (Cohen's D = large), and hyena (Cohen's D = large) (Table 4). Therefore, the higher empathy of Namibians could potentially explain their higher tolerance for elephant, lion, and hyena.

Namibians had higher scores for the remaining *Inner Model variables—Interest in wildlife, Tangible Costs from All wildlife species, Tangible Benefit from All wildlife species, Intangible Benefits from All wildlife species, Organization ZAWA/MET (Zambia Wildlife Authority in Zambia and Ministry of Environment and Tourism in Namibia), Organization VAG/CMC* (Village Action committees (VAG) in Zambia and Conservancy Management Committees (CMC) in Namibia), *Organization WWF (World Wildlife Fund for Nature*) (Table 4). Therefore these variables could potentially explain the higher tolerance of Namibians for elephant, lion and hyena.

3.6 | Were there differences in socio-demographic variables that could potentially account for differences in tolerance?

3.6.1 | Gender, years lived in village, and income

There were no significant differences between the countries for gender ($X^2 = 3.81$, $p = .051$ Fisher Exact $p = .06$). Females: Zambia 49.3% ($n = 141$); Namibia 56.4% ($n = 319$); Males: Zambia 50.7% ($n = 145$); Namibia 43.6% ($n = 247$), number of *Years lived in village*, which was on average 27.3 ± 20.5 years for both countries and income. Therefore, these variables could not explain higher levels of tolerance in Namibia.

3.6.2 | Education, age, number of adult cattle

Namibia presented higher values for number of years in school (Zambia 6 ± 3.22 [$n = 283$], Namibia 7.41 ± 4.2 [$n = 291$], $p = <.01$, Cohen's d = 0.37 [small]), number of adult cattle (Zambia 2.95 ± 5.31 [$n = 283$], Namibia 7.41 ± 4.2 [$n = 565$], $p = <.01$, Cohen's d = 0.37[small]), and age (Zambia 39.48 ± 13.72 [$n = 286$], Namibia 47.57 ± 15.69

[$n = 568$], $p = <.01$, Cohen's d = 0.54[medium]). These variables could potentially explain higher levels of tolerance in Namibia.

3.6.3 | Tribe

There were significant differences in the proportion of respondents from different language groups in the two countries (Chi-square [$df = 6$] = 369.39, $p = <.001$ Fisher Exact $p < .001$) (Table S5). Therefore, it is possible that the different proportion of tribes in each country could account for differences in tolerance.

3.7 | Do monetary benefits explain higher tolerance of Namibians?

Differences in *Tolerance* remained for all WTM and socio-demographic covariates except for two cases; (a) differences in tolerance disappeared for all three species when *Intangible Benefit* was a covariate (Lion: Zambia X = 0.2433 ± 0.1674, Namibia X = 0.3296 ± 0.2067 $p = .62$; Hyena: Zambia X = 0.2266 ± 0.1711, Namibia X = 0.3274 ± 0.2032, $p = .11$; Elephant: Zambia X = 0.3214 ± 0.1901, Namibia X = 0.3781 ± 0.2135, $p = .62$; (b) differences in tolerance disappeared for Elephant when the local institutions (Village Action committees (VAG) in Zambia and Conservancy Management Committees (CMC) in Namibia) was a covariate (Zambia X = 0.32 ± 0.189, Namibia X = 0.379 ± 0.214, $p = .11$).

Since Intangible Benefit was the only variable explaining differences in tolerance we were interested to determine if any of the antecedent variables to *Intangible Benefit* in the WTM could account for the differences in *Intangible Benefits*. In the WTM *Exposure* and *Meaningful Events* are predicted to drive perceptions of *Intangible Benefit* (Figure S1, Kansky et al., 2016). Therefore, we conducted a second ANCOVA with *Intangible Benefit* as the dependent variable with *Exposure, Positive Meaningful Event*, and *Negative Meaningful Event* as co-variates.

3.8 | Do exposure and meaningful events mediate differences in intangible benefits?

Significant differences in *Intangible Benefit* remained after conducting ANCOVA with these covariates. Therefore, these variables cannot explain differences in *Intangible Benefits*.

3.9 | Do Namibian's who perceive more tangible benefits also perceive more intangible benefits?

Respondents from the subgroup who perceived some *Tangible Benefits* for elephant, lion and hyena perceived significantly more *Intangible Benefits* than the subgroup that perceived no *Tangible Benefits* for these species (Elephant: no: X = 3.46 ± 0.952; yes: 4.12 ± 0.51, $p < .01$, Cohen's d = 0.92 (large); Hyena no: X = 3.0 ± 0.854; yes: 3.52 ± 0.854, $p < .01$, Cohen's d = 0.62 (medium); Lion: no: X = 3.19 ± 0.856; yes: 3.54 ± 0.732, $p < .01$, Cohen's d = 0.44 (medium).

4 | DISCUSSION

Results partially supported our first hypothesis that Namibians would be more tolerant towards wildlife than Zambians; however, the higher tolerance was only for three of the five species examined—elephant, lion, hyena. Despite Namibians' perceptions of higher monetary benefits from all five species (hypothesis two), results were not supportive of our third hypothesis—higher monetary benefits did not explain the higher tolerance for elephant, lion and hyena. The only two variables, from the 20 that could have potentially explained differences in tolerance, were the higher nonmonetary benefits in Namibia for lion, hyena and elephant and the lower level of satisfaction of local institutions for elephants in Zambia.

These findings suggest that we are not dealing with a "crowding out" effect—if tolerance of Namibians was lower despite receiving more monetary benefits, this would suggest a "crowding-out" effect. Since Namibians perceived higher monetary benefits than Zambians and were more tolerant, this suggests a "crowding-in" effect.

The Namibian CBNRM program could be viewed as a Payment for Ecosystem Services (PES) scheme where trophy hunters pay for recreational benefits, tourists pay for existence value benefits, and the Namibian government pays compensation for wildlife damage in exchange for the existence value of wildlife and national monetary benefits from tourism in general (Naidoo, Weaver, De Longcamp, & Du Plessis, 2011).

PES schemes have the potential to change motivations in both directions, "crowding in" or "crowding out," depending on which need satisfaction is triggered (Ezzine-de-blas, Corbera, & Lapeyre, 2019). A systematic review of 74 payments for ecosystem services (PES) schemes (Akers & Yasué, 2019) found that crowding-in was more likely to be present when schemes empowered local participants, provided in-kind nonmonetary community benefits, and aimed to foster feelings of

autonomy. Crowding out was more likely when feelings of autonomy were not met (Akers & Yasué, 2019). In Namibia, monetary benefits are small at the individual level, and the income from wildlife is not sufficient to sustain livelihoods (Lubilo & Hebinck, 2019; Muyengwa, 2015). However, in-kind benefits include meat from trophy hunting and special hunts for cultural festivals, which is appreciated by most (Lubilo & Hebinck, 2019; Muyengwa, 2015; Stomer et al., 2019). These may be sufficient to produce "crowding in" effects. The Namibian CBNRM program and national policy is also considered the most devolved program in the region (Hulme & Murphree, 2001) and therefore a sense of empowerment and autonomy is likely to be felt by communities thus reinforcing the "crowding in" effect.

In their review of crowding effects in the biodiversity sector Rhode et al., (2015) found four possible psychological explanations for "crowding in" effects. Three of these seem plausible in our study context: (a) "Warm glow" effects—when people perceive rewards as supporting and acknowledging their behavior, a sense of internal satisfaction is felt due to the social recognition. An example is when stewardship awards for communities are seen as acknowledgement of their traditional conservation activities (Van Hecken & Bastiaensen, 2010). (b) Reinforced positive attitudes or trust—positive attitudes toward conservation or trust in authorities and institutions are reinforced from the monetary rewards. An example, is when an annual party and payment awards were given to communities for forest management that created positive attitudes and trust that motivated people to accept forest monitoring (Sommerville, Milner-Gulland, Rahajaharison, & Jones, 2010). (c) Prescriptive effect—the reward sends a "message" indicating what constitutes desirable societal action (social norms). An example is when a PES scheme signaled to farmers who had previously seen trees as a hindrance to development that environmental protection is highly valued by outsiders (Van Hecken & Bastiaensen, 2010).

In support of the first motivation, Namibians may feel satisfied and proud of their conservation efforts. The monetary benefits and other benefits such as meat distribution, assistance with funeral expenses, student bursaries, assistance with chasing wildlife from fields and the sense of belonging (Mosimane & Silva, 2014), may be adequate to motivate an intrinsic "warm glow" feeling. Although these benefits are small when looking at the household level (Lubilo & Hebinck, 2019; Muyengwa, 2015), they may be sufficient to elicit the higher intrinsic appreciation of wildlife and ultimately tolerance. In support of the second motivation, the higher tolerance and nonmonetary benefits represent positive attitudes toward wildlife and may be due to feelings of appreciation from the monetary benefits. In support of the third motivation, it is possible that whereas in the past wildlife had little value, the valuation of wildlife by global citizens who come to the region for the wildlife and undeveloped landscapes could validate the intrinsic value of wildlife to locals. Since our study area in Zambia does not receive high volumes of international visitors, outside signals of the intrinsic value of wildlife would not be present.

In this study, we did not collect qualitative data on the nonmonetary benefits of wildlife. However, in a follow-up study where we conducted a series of dialogues in four Namibian conservancies in the Zambezi region we were able to get insight into some nonmonetary benefits participants perceived from wildlife (Table 5). These included appreciation of the beauty of wildlife, personal wellbeing from wildlife existence and appreciation of the ecosystem services they bring, such as shade and beauty. Opportunities to learn about animal behavior and to enjoy watching them were also mentioned. Other benefits included bequest values—a value associated with the knowledge that wildlife will be passed on to descendants to maintain opportunities for future enjoyment. Opportunities for connections between community members, other countries, and the global community were also appreciated. Lastly, a more explicit example of how monetary benefits contributed to nonmonetary benefits were the empowerment, dignity and meaning obtained from being employed and earning an income (Table 5).

In Zambia, communities may have appreciation of nonmonetary benefits similarly to pre-colonial African societies such as the Maasai before colonialism (Fernández-Llamazares, Western, Galvin, McElwee, & Cabeza, 2020). However, these may be buried more deeply in the subconscience of people because of the lack of a scheme that can "crowd in" these intrinsic motivations. That Zambian farmers are less intrinsically motivated is not surprising given the long history of underdevelopment in the region and underperformance of GMA's in Zambia in general and in the study area more specifically (Bandyopadhyay & Tembo, 2009; Lindsey et al., 2014).

While the crowding in effect seems the most plausible explanation for the higher tolerance, it is plausible that Namibians have always appreciated the nonmonetary value of wildlife more than Zambians even before the CBNRM policy due to cultural differences between the two countries. Our results indicated some differences in the proportion of respondents surveyed from different tribal groups (Table S5). The region has a complex history of interconnections, as both study sites were part of Barotseland, where the Lozi Kingdom reigned since the 16th century (Flint, 2003). During its expansion, between 25 and 35 different ethnic groups were assimilated into the Lozi kingdom (Flint, 2003). Although today, they all

TABLE 5 Quotations of intangible benefits reported by communities from four conservancies in Namibia during a social learning dialogue workshop series (Kansky unpublished)

"Animals also improve the appearance of the environment" (male farmer, Wuparo)
"I am happy that nature is going back to its original state when animals that were extinct are back into existence" (male farmer, Bamunu)
"In the olden years people would always say that an elephant is huge and as big as a house. When I started going to the river that's when I knew how an elephant looks like. And when I saw an elephant for the first I was really happy. In addition in the olden days when elephants would cross going back to the river and children would just stare at them saying so this is how an elephant looks like and start admiring"(female farmer Wuparo)
"There was a time when I was in a boat and came across an elephant about 2 m away and one of the guides told us that if you are wearing bright colours please remove them and just stay still and keep quiet. From that very day I stopped fearing an elephant....Since that time, whenever I don't see the elephant I would have the feeling of missing the animal and would want to see it"(male farmer, Balyerwa)
"When I wake up early in the morning and the birds are singing and I see a few animals around, its a good feeling" (male farmer Bamunu)
"When I would be at the village I wont see any animals but once I go to the river I will be admiring the animals just by looking at them" (male farmer Balyerwa)
"When you live with wildlife near you there's that beauty" (male farmer, Bamunu)
"Sometime I went to visit at the next village and I came across an old man, the same old man that I met had told me as we were strolling around the area in the evening and the old man noticed an ant hill and then he narrated to him that hill wasn't there it just grew five years ago, because that place where it grew that's where animals used to come and drink water back then. He further narrated that animals used to feed on certain plants and after feeding on the plant they go to that same place where the ant hill grew, to go and drink water and after drinking water they would leave their wastes there and their wastes carried seeds of the plant that they used to feed on. Now the place is now beautiful and has enough shade because of wildlife. I was actually impressed how that area had turned out to be because the animals can also interact with the environment"(male farmer, Wuparo)
"When I was walking going to the field, I was really surprised when I came across a giraffe seated because it was my first time seeing a giraffe seated. I never knew and thought that a giraffe also sits down like human beings. All I had in mind is that it just stands for the rest of its life. ..... I stood there for a long time as I was strongly attracted and interested for quite sometime just looking and admiring it without making noise"(female farmer, Wuparo)
"I was amazed when I went to the river and came across a wildebeest, it was dancing and it was very interesting because it was doing all kinds of dances especially when it was moving its tail"(female Wuparu)
"Its important because at times when I get home from the river side I will narrate to my younger kids how a certain animals looks..... I want the kids to be able to differentiate the animals, to know which one is an elephant, buffalo and lion" (male farmer, Balyerwa)
"What I like about living with wildlife is my children that are growing should be able to know the animals by their names and how they look and should able to identify them. And it helps when animals are near by and they will be able to know the behaviour of animals when at school because they don't know how animals behave" (female farmer, Bamunu).
"Wildlife has brought togetherness and relationships among different countries and have started forming up organizations like KAZA because of wildlife" (female farmer, Wuparu)
"With the animals they are like a grain storage. Very soon they will start killing (hunting) and then we will get something out of it (meat). When animals are killed we are given some pieces of meat and it also helps to get to know people from other areas that come to their area (during the meat distribution)" (male farmer, Bamunu)
"Even people from far areas will come here in large numbers, people from America and different countries. When they see them it's a global village and they live with people, that's an interest why he loves living with wildlife" (male farmer, Bamunu)
"I was so connected to my grandfather, he would tell me stories about certain animals that I had never seen. And what happened, he ate everything and he left me with a legacy of stories"(male farmer, Bamunu)
"Back then there were no lodges in the community, people would just stay at home doing nothing but ever since they have built lodges community members are now offered jobs some of them are at the lodges, some are stationed at the hunting area and some by the campsites. I am grateful and thankful of how the lives of community members are being uplifted and they can take care of their families" (female farmer, Wuparu)

maintain their tribal roots and speak their own language, they also speak Silozi, which is the lingua franca in both regions that allows all groups to communicate. In addition, there always has been and still is intermarriage between Zambians and Namibians from this region, and many families have relatives in both countries (Flint, 2003; Zeller & Melber, 2019). Thus, it seems unlikely that cultural differences would account for our findings.

Lastly, support for the "crowding in" effect was found when comparing levels of nonmonetary benefits between two subgroups within Namibia that differed in their perceptions of monetary benefits. The group that perceived

some monetary benefits had significantly higher levels of nonmonetary benefits compared with a group that perceived no monetary benefits.

Policy implications of our results are that programs that provide monetary benefits, as well as other nonmonetary community benefits including a sense of empowerment and feelings of autonomy can increase tolerance to some wildlife species such as elephant, lion, and hyena. More case studies to validate if this pattern is replicated in other contexts would be important in order to disentangle what components of the system specifically contribute to "crowding in."

5 | CONCLUSIONS

There is ongoing debate around the benefits, values, and morality of a neoliberal economic approach to wildlife management and CBNRM approaches in Africa (Koot, Hitchcock, & Gressier, 2019; Muradian et al., 2013; Neuteleers & Engelen, 2015; Virtanen, 2003; Wunder, 2013). Our study has shown that relative to Zambians in the south western corner of Zambia, Namibian conservancy members' tolerance and perceptions of intangible benefits toward some wildlife species are more positive—most likely as a result of the economic approach taken in Namibia's CBNRM program. While Namibia's CBNRM program is not perfect, (Khumalo & Yung, 2015; Koot, 2019; Lubilo & Hebinck, 2019; Morton, Winter, & Grote, 2016; Nuulimba & Taylor, 2015; Schnegg & Kiaka, 2018), relative to Zambia, Namibians in the Zambezi region seem to be better off both in terms of monetary and intangible benefits from wildlife. Our results should however be considered of an exploratory nature as we acknowledge that due to multiple testing, there is a risk of false findings. Nevertheless, we believe they will make a contribution to conservation policy and direct future research.

Ideally, in order to examine the impact of CBNRM programs on communities willingness to tolerate and coexist with wildlife it would be important to conduct baseline studies before projects are implemented in order to more conclusively disentangle which components of a program contribute or not to changes in tolerance and behavior toward different wildlife species. The WTM and crowding theory are useful frameworks for such baseline studies.

ACKNOWLEDGMENTS

We thank the VolkswagenStiftung for funding this study as a postdoctoral fellowship to R. Kansky. We also thank the following people for assistance and support during the project: Shylock Muyenga for assistance with electronic data collection programing, Kabika Kumoyo, Mubita Nyambe, Brian Mulomba, Gift Muyamba, Inyambo Imakando for assistance with translating, piloting and survey interviews in Zambia, Alice Poniso, Daryl Mwilima, Rikki Matengu, Simasiku Mwanangombe, and Image Katangu for conducting survey interviews in Namibia, Ministry of Environment and Tourism in Namibia and Zambia Wildlife authority for research permission to work in their countries, Dr. Klinghoeffer and the Department of Wildlife Management and Tourism at University of Namibia and IRDNC with assistance, support and introductions to communities in Zambezi region and Liwena Sitali from KAZA and Mr. Nyambe from Peace Parks with assistance, support and introductions to communities in Zambia. Special thanks to the farmers and community members for their participation and willingness to take part in the surveys.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

AUTHOR CONTRIBUTIONS

Ruth Kansky conceptualized the project idea, designed and led the survey, and wrote the paper. Martin Kidd analyzed the data. Joern Fisher read and edited two drafts of the paper.

DATA AVAILABILITY STATEMENT

Data are not made available online.

ETHICS STATEMENT

Stellenbosch University ethics approval was granted for this research (0967). Free, prior, and informed consent was sought from survey participants prior to the start of surveys.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

How to cite this article: Kansky R, Kidd M, Fischer J. Does money "buy" tolerance toward damage-causing wildlife? *Conservation Science and Practice*. 2021;3:e262. https://doi.org/10.1111/csp2.262