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Heterogeneous consumer preferences for local community involvement in nature-based tourism drive triple-bottom-line gains

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Abstract

Relatively few studies have examined how the degree of involvement of local communities in nature-based tourism, and the benefits that are generated for them, impact the choices that tourists make when visiting developing countries. We surveyed over 400 visitors in multiple locations in Namibia, using a discrete choice experiment to elicit preferences for attributes reflecting tracking safaris of the critically endangered, desert-adapted black rhinoceros (*Diceros bicornis bicornis*) in the northwest of the country. Attributes included those related to local community involvement and the benefits they receive from tourism, as well as the reinvestment of tourism profits back into rhino conservation, and the wildlife likely to be seen on safari. Using a latent class model that assigned tourists to market segments based on the observed pattern of responses in the choice experiment, we find that respondents can be divided into four classes that reflect differences in tourism preferences and their own demographics and experiences. While responses to attributes varied across classes, respondents were consistent in demonstrating a strong preference for the largest share of profits being returned to the local community, and were willing to pay an additional $43–670 to ensure this happens. Respondents in the four classes differed in their views toward the financing of rhino conservation and the participation of community trackers in rhino safaris, although those respondents in the class most interested in rhino tracking safaris were willing to pay an additional $34 per trip for tracker involvement. Our results demonstrate the value of assessing heterogeneity in tourists' preferences for wildlife experiences, and suggest that appropriate pricing and marketing may result in "triple bottom line" gains for nature-based tourism.

KEYWORDS

black rhinoceros, choice experiment, communal conservancies, ecotourism, Namibia

1 | INTRODUCTION

Despite the very recent global travel decline due to the COVID-19 pandemic, nature-based tourism, defined as a subsector of sustainable tourism (Cater, Garrod, & Low, 2015) where nature is the primary attraction (Buckley, Pickering, & Weaver, 2003), has been steadily increasing around the world (Balmford et al., 2009). While nature-based tourism has the potential to generate substantial economic incentives for biodiversity conservation (Balmford et al., 2015; Bookbinder, Dinerstein, Rijal, Cauley, & Rajouria, 1998), the sustainability and resilience (Baral, 2013; Job & Paesler, 2013) of such incentives and associated positive conservation outcomes are strongly linked to the degree of involvement and revenue-sharing with local communities (Carius & Job, 2019; Sandbrook & Adams, 2012; Spenceley & Goodwin, 2007).

Attaining dual development and conservation goals appears reasonable in theory but has often proven difficult to achieve in practice (Kiss, 2004; Mitchell & Muckosy, 2008). Thus, community-based tourism (see Spenceley, 2008) and pro-poor tourism models (Ashley & Roe, 2002) have evolved to provide frameworks for how to overcome various social and institutional barriers to these challenges. The recent growth of joint-venture models (Snyman, 2014; Spenceley, Snyman, & Eagles, 2017), emphasizing the importance of stakeholder collaboration (Jamal & Stronza, 2009) and extending community involvement into the broader tourism value chain, has helped improve financial viability and governance/competence inadequacies. Therefore, determining additional leverage points through which local community members can sustainably participate in nature-based tourism is well warranted (Ndivo & Cantoni, 2016) and, if marketed correctly, may produce greater contributions toward conservation (Buckley & Mossaz, 2018; Mossaz, Buckley, & Castley, 2015).

For tourism enterprises to generate economic and conservation benefits for local communities they must attract tourists. However, benefits from tourism usually flow indirectly to local communities via contracts with third-party operators and employment, while direct engagement of tourists with locals stakeholders is typically more limited in developing countries (Romero-Brito, Buckley, & Byrne, 2016; Sandbrook & Adams, 2012; Walpole & Thouless, 2005). The few studies that have quantitatively examined consumer preferences for attributes related to local communities have shown mixed results, with some demonstrating neutral or even negative views on community benefits from, or involvement in, nature-based tourism (Bush, Colombo, & Hanley, 2009; Chaminuka, Groeneveld, Selomane, & van Ierland, 2012; Dikgang & Muchapondwa, 2014), while others show stronger preferences for local community involvement or benefits (León, de León, Araña, & González, 2015; Tekalign et al., 2018).Stated preference approaches such as discrete choice surveys are a useful tool to quantify consumer preferences for outdoor recreation and nature-based tourism (Boxall & Adamowicz, 2002; di Minin, Fraser, Slotow, & MacMillan, 2013; Naidoo & Adamowicz, 2005; Pröbstl-Haider, Hunt, Rupf, & Haegeli, 2020). These surveys have asked and answered a number of questions that are important both for tourism research and policy, including the design of recreational activities (Boxall & Macnab, 2000), the establishment of new protected areas (Carson, DeShazo, Schwabe, Vincent, & Ahmad, 2015) and the management of wildlife or scenic attributes of particular interest (di Minin et al., 2013). Discrete choice surveys (also known as choice experiments) are often conducted in order to elicit economic values for attributes that define the choices that respondents make to hypothetical tourism options. When the cost of the activity in question is included as an attribute, an estimation of the marginal willingness-to-pay (WTP) for the other attributes, and the optimal pricing of the tourism or recreation experience for a given configuration of attribute levels, can be estimated (Chase, Lee, Schulze, & Anderson, 1998; Naidoo & Adamowicz, 2005). Choice experiments therefore can provide practical guidance on the design of outdoor recreation and nature-based tourism activities, both existing and new.

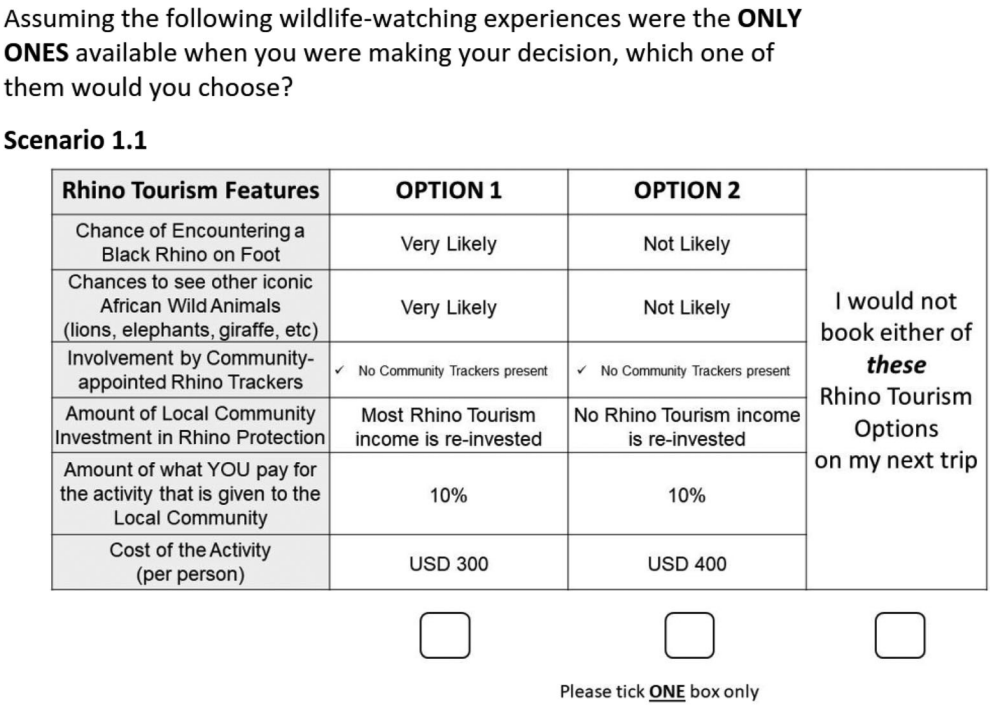
Recent research on consumer preferences has emphasized the fundamental importance of individual heterogeneity in the choices that people make in discrete choice surveys (Holmes, Adamowicz, & Carlsson, 2017). Exploring such heterogeneity is possible through a variety of empirical modeling strategies that incorporate information on demographics, socioeconomic status, attitudes and values, and past experiences (Johnston et al., 2017; Sarrias & Daziano, 2017). Indeed, the variable results observed from discrete choice surveys of tourists on the desirability of local community involvement in nature-based tourism are due at least in part to the fact that different types of people have different views on the topic (e.g., León et al., 2015). And yet with anecdotal information continuing to suggest that an increasing number of international visitors are concerned with both wildlife conservation and improving the well-being of local communities (e.g., Center for Responsible Travel, 2019; Twining-Ward, Li, Bhammar, & Wright, 2018), the time appears ripe for additional research on tourist preferences for the involvement of local communities in delivering nature-based tourism.

Here, we account for individual heterogeneity among tourists and, in the absence of available revealed

preference data, use a discrete choice survey to assess their preferences for local community involvement in free roaming, desert-adapted black rhinoceros (*Diceros bicornis bicornis*) tourism in northwest Namibia. We test whether the involvement of local communities in rhino tracking safaris, and the benefits they receive from such tourism, are preferred attributes of safaris for tourists. We use latent class modeling of our survey data to test whether different classes of tourists express different preferences for these aspects of community involvement, and based on this modeling explore the optimal pricing of black rhino tracking safaris. Our results suggest that there exists a latent WTP for these tourism experiences such that environmental conservation can be enhanced, while simultaneously improving local community welfare without compromising operating profits of tourism companies. These "triple bottom line" gains (i.e., in economic, environmental, and social sustainability dimensions; Stoddard, Pollard, & Evans, 2012) demonstrate that when done correctly, nature-based tourism can make substantial contributions to the conservation of threatened species, and that understanding heterogeneity in individual preferences can enhance the ability to optimize the pricing and features of this important sector of the tourism market.

2 | METHODS

Tracking safaris of free-roaming, desert-adapted black rhinos on foot in the northwest of Namibia is a key mechanism that helps sustain rhino monitoring while improving local livelihoods (Muntifering et al., 2017). The first formal partnership between a conservation organization (Save the Rhino Trust) and a private sector tourism company (Wilderness Safaris Namibia) was established in 2003, based at Desert Rhino Camp (DRC) in the Palmwag Concession Area (Figure 1). There are now six rhino-based tourism enterprises in the Kunene region, all based on the operational model developed at DRC (Muntifering et al., 2020). This model mandates that at least two trained and locally-employed trackers must lead the rhino safari on foot, along with an accredited guide who is responsible for the tourists' experience and safety (Muntifering et al., 2019). The demand for rhino safaris grew by 250% between 2011 and 2017, with at least 4,297 tourists participating in rhino tracking on foot in 2017 (Muntifering, 2019). Despite this being a small proportion of the roughly 1.5 million tourists who visited Namibia in 2017 (Ministry of Environment and Tourism, 2017), growth in black rhino tracking has contributed substantial amounts of income to associated local communities (population ~ 11,000) through contractual agreements with tourism operators. Between 2013 and 2018 communal conservancies that partnered with tourism operators to offer rhino safaris earned >$1 million in revenue (all monetary values in $2019), with > $260,000 generated in 2018 alone (Muntifering, 2019). Importantly, there is a strong positive correlation between increases in rhino revenue and employment of local trackers, which has grown from 18 to 58 during this period (Muntifering, 2019).



Assuming the following wildlife-watching experiences were the **ONLY ONES** available when you were making your decision, which one of them would you choose?

Scenario 1.1

Rhino Tourism Features	OPTION 1	OPTION 2	
Chance of Encountering a Black Rhino on Foot	Very Likely	Not Likely	I would not book either of ***these*** Rhino Tourism Options on my next trip
Chances to see other iconic African Wild Animals (lions, elephants, giraffe, etc)	Very Likely	Not Likely	
Involvement by Community-appointed Rhino Trackers	✓ No Community Trackers present	✓ No Community Trackers present	
Amount of Local Community Investment in Rhino Protection	Most Rhino Tourism income is re-invested	No Rhino Tourism income is re-invested	
Amount of what YOU pay for the activity that is given to the Local Community	10%	10%	
Cost of the Activity (per person)	USD 300	USD 400	

Please tick **ONE** box only

FIGURE 1 An example of a choice set (1 of 16) presented to respondents on black rhinoceros tracking safari options in northwest Namibia

We surveyed tourists in Namibia regarding their preferences for black rhino tracking safaris in the northwest of the country using a choice experiment and associated questions on tourism experience and individual sociodemographics. Discrete choice experiments are a type of stated preference survey that assume that people make choices between various alternatives based on a set of key attributes that differentiate those alternatives (Holmes et al., 2017). By manipulating relevant attribute levels according to experimental design principles, a model of choice can be estimated as a function of those attributes, which allows the relative weighting of attributes to be estimated. If one of those attributes reflects a cost or price, the marginal WTP for each of the other attributes can be estimated via attributes' coefficients in the statistical model of choice (Louviere, Hensher, & Swait, 2000).

Here, our choice experiment asked respondents to choose between two potential black rhino safari options, with an additional option of choosing neither experience (Figure 1). Attributes and their levels were designed based on the authors' knowledge of the study system, the anticipated sample size, the paper format of survey administration, and general experimental design considerations that limit the number of choice sets that can reasonably be presented to respondents. Our experimental design involved six attributes that characterized possible black rhino safaris, four of which had four levels and two of which had two levels (Table 1). This resulted in $(4^4 \times 2^2) \times (4^4 \times 2^2)$ combinations of attribute levels for a fully factorial design, which we reduced by using a fractional factorial design that allows only estimation of main effects without interactions among attributes (Louviere et al., 2000). The resulting minimum number of profiles (attribute level combinations) was 32, which we blocked into two sets, thereby presenting respondents with 16 scenarios to respond to, a design that we judged did not impose prohibitive levels of cognitive burden (Louviere et al., 2000).

In addition to the choice experiment (Part 2), there were three additional components to the survey. Part 1 asked respondents to describe the reasons for, and characteristics of, their current visit to Namibia, as well as any past visits to the country. Part 3 asked for specifics on rhino-related experience, and Part 4 asked sociodemographic questions. These variables were used to assess individual heterogeneity in preferences for the choice experiment attributes.

After a pretest ($n = 5$) and subsequent revisions, paper surveys were administered between August and November 2019 across 8 survey sites in Namibia. Urban sites designed to sample the general pool of tourists in Namibia included the city of Swakopmund and two locations in the capital city, Windhoek. Five sites were surveyed in the northwest of the country at tourist lodges within or adjacent to the desert-adapted black rhino geographical range, and were selected to cover a large part of the region while capturing a variety of visitor types (Figure 2). Three of the five sites offered rhino tracking safaris. Tourists were randomly selected on a voluntary basis at each survey site.

The basis for analysis of data from discrete choice experiments is the multinomial logit model (MNL), although in its simplest form heterogeneity in preferences and how they are shaped by individual characteristics of respondents are ignored (Train, 2003). Extensions to the MNL that allow the incorporation of heterogeneity can take a variety of forms, including the interaction of respondent-level variables with particular attributes of

TABLE 1 Attributes and levels used in the discrete choice experiment assessing tourist preferences for a possible black rhino tracking safari in northwest Namibia

Abbreviation	Description	Levels
cost	Cost of the activity (per person)	(1) $100; (2) $200; (3) $300; (4) $400
rhino_foot	Chance of encountering a black rhino on foot	(1) Not Likely; (2) Very Likely
other_game	Chance to see other iconic Africa wild animals (lions; elephants; giraffe; etc.)	(1) Not Likely; (2) Very Likely
track	Involvement by community-appointed rhino trackers	(1) No community trackers present; (2) Conduct tracking; (3) Conduct tracking, provide presentation to group; (4) Greet guests the night before, conduct tracking; provide presentation to group
reinvest	Amount of local community investment in rhino protection	(1) None; (2) Some; (3) Most; (4) All
paylocal	Amount of what YOU pay for the activity that is given to the local community	(1) 0%; (2) 10%; (3) 25%; (4) 50%

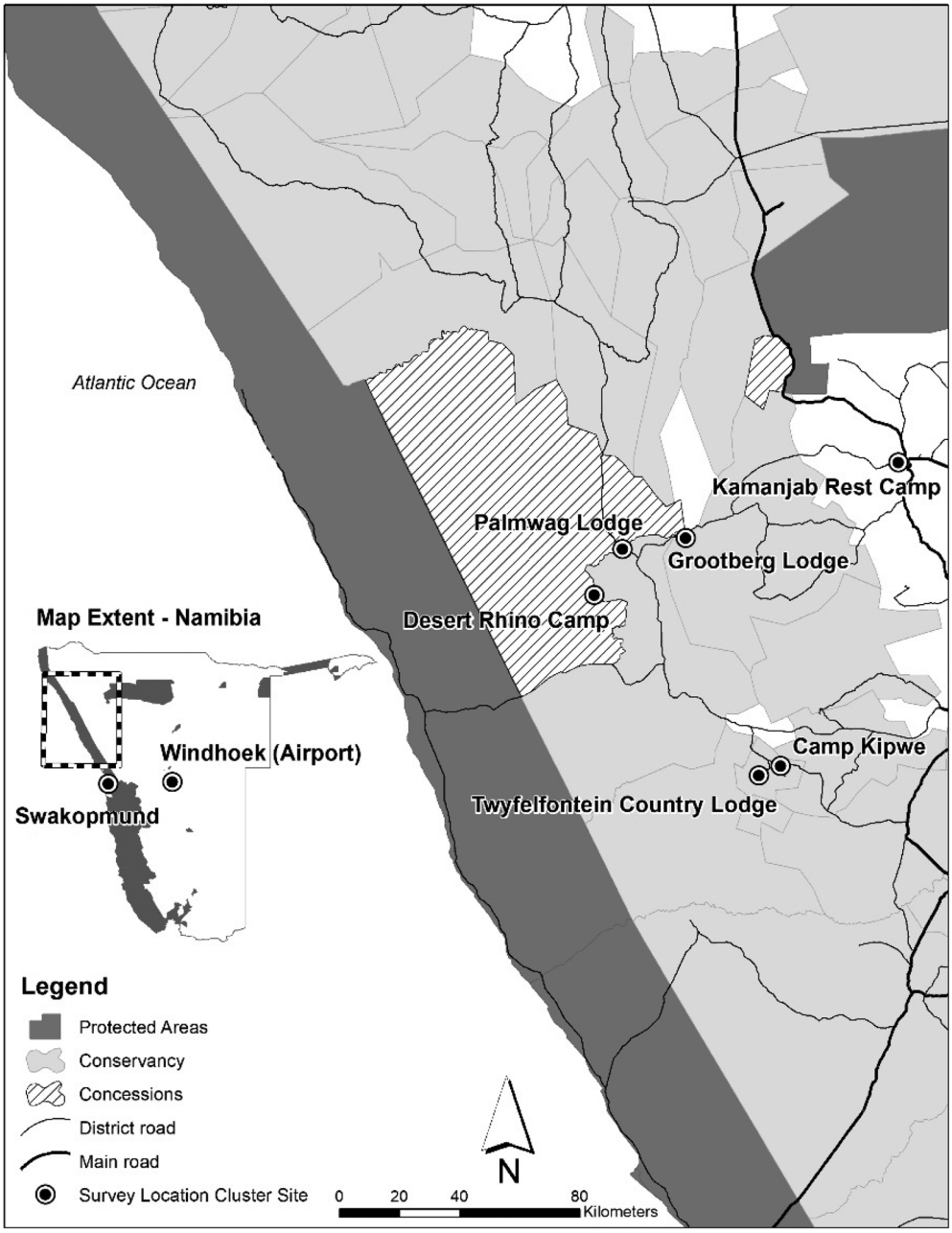


FIGURE 2 Map of northwest Namibia, including location of communal conservancies, tourism concessions, lodges currently offering rhino tracking safaris, and the locations where tourists were surveyed

interest (Train, 2003), the Random Parameters or mixed logit model (Train, 1998), models that allow the scale of variation among respondents to vary (Fiebig, Keane, Louviere, & Wasi, 2010) and latent class analysis (Boxall & Adamowicz, 2002). Here we address individual heterogeneity using the latter, latent class approach, since the identification of possible tourist market segments is of particular interest and applicability to the further development of the black rhino tourism industry in northwest Namibia.

We evaluated models containing between two and six latent classes, using the Bayesian Information Criterion (BIC), as well as the convergence of models, the share of respondents estimated to be in particular classes, and the resulting coefficients in each class to determine the number of latent classes that were best supported by the data (Greene & Hensher, 2013). Because there was a strong degree of correlation among many of the variables representing individual demographics and experiences, we reduced the original 58 sociodemographic input variables into a small set of independent variables using factor analysis. Factor analysis takes collinear input variables and uses the correlation matrix to develop a set of independent factors representing successively lower amounts of the total variation in the data (Revelle, 2020). The optimal number of factors can be assessed using BIC, as well as the correlation or "loading" of the original input variables onto the factors. We conducted all modeling using

the statistical software R (R Core Team, 2018), in particular using the gmnl (Sarrias & Daziano, 2017) and psych (Revelle, 2020) packages.

3 | RESULTS

We collected 486 surveys from tourists at 8 separate locations across Namibia. Summary statistics on individual characteristics of these respondents are presented in the Supporting Information. Removing surveys with incomplete responses to the choice experiment reduced the dataset to 406 individuals who made choices in 6496 rhino tourism scenarios, and further down to 274 individuals for those who completed the relevant sociodemographic questions. Our sample is not necessarily representative of the general tourism population visiting Namibia, but is rather a mix of (a) international tourists with varied motivations for visiting Namibia ($n = 199$), with surveys administered at Hosea Kutako International Airport and several major urban locations; (b) tourists currently visiting the northwest of the country ($n = 116$); and (c) tourists visiting one of the camps where rhino tracking by foot is available ($n = 91$). We include these survey locations along with other characteristics of individuals in our latent class models (see below).

BIC values suggested that a model with four classes or segments fit the data best, using a set of five independent factors derived from the individual-specific sociodemographic and experience variables (Table 2; Supporting Information). We compared this model to several other model specifications, including one with demographic variables entered directly, rather than via factors, as well as a mixed-mixed model that allowed preference heterogeneity within segments (Sarrias & Daziano, 2017), and found strong consistency among them (see Supporting Information for details). The four segments had relatively even membership percentages, and revealed substantial heterogeneity in response to the choice experiment attributes, with all five sociodemographic factors also playing significant roles in defining the segments (Table 3). Respondents in Class 1 (29.2% of respondents) were more likely to be very interested in seeing both black rhino and other wildlife on potential tracking safaris, viewed the highest level of community tracker engagement positively, tended to want most or all rhino tourism income reinvested in protection, and supported 50% of what they paid being redistributed to local communities. Unlike the other classes, Class 2 members (19.9%) were insensitive to price in the offered range ($100–$400). They were interested in seeing rhino on foot (but not necessarily other wildlife), viewed the highest level of community tracker engagement very positively, and supported all levels of income reinvestment in rhino protection, as well as all levels of income redistribution to the local community. Class 3 members (29.1%) did not want to track a rhino on foot, were ambivalent about seeing other wildlife, and did not want community tracker involvement at any level on a potential safari, but did want income reinvested into rhino protection and had the strongest preference of any class for redistribution of money back to the local community. Finally, Class 4 members (21.8% of respondents) can be described as visitors apparently uninterested in nature-based tourism. They were ambivalent about seeing rhino or other wildlife on a proposed safari, viewed any level of participation on such a safari by community trackers very negatively, and were uninterested in (or even opposed to) having tourism income reinvested in rhino conservation. As with the other three segments, they were, however, very supportive of having fees given back to the local community, with higher fractions more preferred.

Sociodemographic and experience factors were important determinants of membership in segments (Tables 3 and 4). Factor 1 was associated with membership in Classes 2 and 4. Positive values for this factor reflected survey responses coming from lodges offering rhino tracking, as well as respondents visiting other areas in the northwest of the country, and was negatively associated with surveys from urban areas. Classes 2 and 4 had substantially different views on rhino tracking, and while they were similarly shaped by Factors 3 (income) and 4 (experience), they were strongly separated by Factor 5 (education), with Class 2 membership tending to be associated with higher education attainment. Somewhat surprisingly, Class 4 (those not interested in wildlife tourism) tended to be more educated as compared to the other segments. They also tended to be self-driving tourists surveyed in the northwest of the country but not at locations offering rhino safaris, and were less likely to be German nationals than the other segments. Class 3 membership was associated with non-European nationality and a lower level of education than Class 1 (the reference segment in our analysis), which was characterized by having the lowest association with Factor 3 (income) and a higher level of association with Factor 5 (education) than Classes 3 and 4.

The marginal WTP for various attribute levels could be calculated for three of the four segments. WTP for Class 2 could not be assessed given the insensitivity of this class to the cost of a rhino tracking safari (Table 4), although this class had strong positive coefficients for seeing a rhino on foot, as well as for all attribute levels related to reinvestment in rhino protection and income

TABLE 2 Loadings of individual respondents' characteristics[a] on five axes that resulted from a factor analysis on collinear sociodemographic and experience variables from $n = 300$ individuals

Factor 1		**Factor 2**		**Factor 3**		**Factor 4**		**Factor 5**	
Variable	**Loading**	**Variable**	**Loading**	**Variable**	**Loading**	**Variable**	**Loading**	**Variable**	**Loading**
survey_urban	−0.64	other_european	0.70	inc100_plus	0.87	a2first_trip	−0.70	edu_grad	0.68
survey_rhino_place	0.64			inc50_100	−0.55	c3kunene	0.64	edu_undergrad	−0.48
a6palmwag	0.51								
stay_NW	0.50								
a6twyfel	0.49								
Summary description									
Location		Nationality		Income		Experience		Education	
Proportion of the explained variance attributable to factor									
0.25		0.21		0.17		0.19		0.17	
Cumulative proportion									
0.25		0.47		0.64		0.83		1	

[a]survey_urban = Survey collected in Windhoek or Swakopmund; survey_rhino_place = Survey collected at one of the lodges offering black rhino tracking; stay_NW = Respondent has or will visit northwest Namibia on this trip; a6palmwag = Respondent has visited or will visit the Palmwag Concession Area; a6twyfel = Respondent has visited or will visit Twyfelfontein Rock Engravings; other_european = National of a European country other than Germany; inc100_plus = Annual household income greater than $100,000; inc50_100 = Annual household income between $50,000 and $100,000; a2first_trip = Respondent visiting Namibia for first time; c3kunene = Respondent has made past visit(s) to northwest Namibia; edu_grad = Highest level of formal education is graduate degree; edu_undergrad = Highest level of formal education is graduate degree.

TABLE 3 Parameter estimates from latent class model with four classes (Class 1 being the reference segment), and associated factors representing sociodemographic variables that condition class membership

	Class 1				Class 2				Class 3				Class 4			
	Estimate	*SE*	z-Value	*p*-Value	Estimate	*SE*	z-Value	*p*-Value	Estimate	*SE*	z-Value	*p*-Value	Estimate	*SE*	z-Value	*p*-Value
cost	−0.01	0.00	−16.1	<.001	0.00	0.00	−0.2	.805	0.00	0.00	−7.8	<.001	−0.01	0.00	−8.4	<.001
rhino_foot	1.81	0.18	10.3	<.001	1.07	0.25	4.3	<.001	−0.77	0.15	−4.9	<.001	−0.31	0.24	−1.3	.183
other_game	0.93	0.14	6.8	<.001	0.30	0.24	1.3	.211	0.06	0.13	0.5	.637	−0.24	0.21	−1.2	.250
track	−0.72	0.20	−3.6	<.001	0.20	0.17	1.1	.254	−1.03	0.15	−7.0	<.001	−1.30	0.28	−4.6	.000
track_talk	−0.11	0.18	−0.6	.526	0.39	0.24	1.6	.101	−1.45	0.16	−9.0	<.001	−1.18	0.28	−4.2	.000
track_talk_greet	0.45	0.20	2.3	.022	0.63	0.19	3.3	.001	−0.34	0.12	−2.7	.007	−1.28	0.26	−4.9	.000
reinvest_some	−0.33	0.20	−1.7	.094	0.71	0.15	4.7	<.001	0.99	0.15	6.4	.000	−0.05	0.27	−0.2	.849
reinvest_most	1.14	0.21	5.5	<.001	0.52	0.16	3.3	.001	0.21	0.15	1.4	.158	−0.55	0.24	−2.3	.021
reinvest_all	0.99	0.18	5.6	<.001	1.01	0.20	5.0	<.001	1.73	0.18	9.5	<.001	0.10	0.32	0.3	.751
paylocal10	−0.35	0.21	−1.6	.102	0.89	0.18	4.8	<.001	0.46	0.14	3.2	.002	1.06	0.33	3.2	.002
paylocal25	0.14	0.21	0.7	.503	0.68	0.18	3.9	<.001	1.40	0.18	7.6	<.001	0.88	0.33	2.7	.007
paylocal50	0.58	0.21	2.8	.005	1.09	0.20	5.6	<.001	2.40	0.22	10.8	<.001	1.91	0.38	5.0	.000
Share	29.2%				19.9%				29.1%				21.8%			
Factor 1 (location)	—	—	—	—	0.30	0.06	5.1	.000	0.07	0.05	1.3	.188	0.24	0.05	4.4	.000
Factor 2 (nationality)	—	—	—	—	0.04	0.06	0.8	.434	−0.13	0.05	−2.5	.013	0.02	0.06	0.4	.686
Factor 3 (income)	—	—	—	—	0.18	0.06	2.9	.004	0.26	0.05	4.8	.000	0.31	0.06	5.3	.000
Factor 4 (experience)	—	—	—	—	0.15	0.05	3.1	.002	0.08	0.05	1.6	.121	0.27	0.05	5.4	.000
Factor 5 (education)	—	—	—	—	0.37	0.06	6.5	.000	−0.10	0.05	−2.0	.050	−0.13	0.06	−2.3	.023

TABLE 4 Summary of characteristics and willingness-to-pay of various market segments of tourists in northwest Namibia as determined by latent class analysis of a choice experiment on black rhino tourism

	Latent class			
	1	**2**	**3**	**4**
Summary description	We want to track rhino on foot and pay for community involvement	Money is no object to tracking rhino and helping communities	Save wildlife (from afar) and people	Not interested in wildlife tourism
Characteristics	*Least wealthy	*Surveyed in rhino range in NW Namibia	*Not European	*Surveyed in rhino range in NW Namibia
	*Middle range of education	*Wealthy	*Wealthiest	*Wealthiest
		*Previous visits to NW Namibia		*Previous visits to NW Namibia
		*Most highly educated		*Lowest education level
	Willingness-to pay			
High chance of seeing rhino on foot	$133.57	—	−$213.75	−$32.97
Max community tracker engagement	$33.56	—	−$94.00	−$134.09
Reinvest most $$ in rhino protection	$84.01	—	—	−$57.76
Reinvest all $$ in rhino protection	$73.30	—	$481.94	—
Local community gets 10%	—	—	$127.42	$110.82
Local community gets 25%	—	—	$390.96	$91.90
Local community gets 50%	$43.07	—	$670.64	$200.42

redistribution to local communities, and on the highest level of tracker involvement in safaris. Among the other three segments, WTP for various percentages of income redistribution to the local community were consistently positive and ranged from $43 to $670, while reinvesting all tourism income into rhino protection also had positive welfare implications for Class 1 ($73.30) and Class 3 ($481.94). We focused further inference on Class 1, since this was the only segment that had a statistically significant marginal WTP for the rhino encounter attribute. This type of tourist would be willing to pay an additional $150–$200 for a rhino tracking safari that includes the maximum level of engagement with community trackers (WTP for this component of $33), returns 50% of what they pay to the local community ($43), and reinvests either most ($84) or all ($73) rhino tourism income back into rhino protection.

4 | DISCUSSION

Our results suggest that there exists an untapped WTP from a segment of tourists, representing at least 30% of survey respondents, for local community involvement in black rhino tracking safaris in northwest Namibia. These consumers in Class 1 of our latent class model were willing to pay an additional $150–$200, on top of the price they are currently paying, for an experience that (a) involves community trackers, (b) delivers greater financial benefits to local communities, and (c) results in a greater portion of those benefits being reinvested by local communities in protecting rhinos. While our estimate of the fraction of the overall market belonging to this segment may seem low, it is worth reiterating that <0.5% of visitors to Namibia engage in black rhino foot tracking safaris. Given this is an almost globally-unique

wildlife experience of tracking rhino on foot in partnership with local community-based institutions and their trackers (we are aware of only one other site in Kenya offering a similar experience), the results suggest that the market for black rhino tourism may have substantial scope for expansion, as has been previously suggested (Muntifering, 2012).

Prices for black rhino foot tracking safaris at several of the participating lodges are ~$150 at current USD/NAD exchange rates, which is very similar to the average safari costs across scenarios that respondents in Class 1 selected ($128.40). This suggests our WTP estimate of $150–$200 for this segment of respondents mirrors actual current conditions, and represents a figure that would be more than sufficient to cover the additional salary cost for a greater level of involvement of community trackers, while still returning 50% of what is paid to the local community. Our results support the notion that operators would be able to maintain or possibly even increase the share of the safari price they retain, while local communities would receive a significant boost to the rhino income they currently receive, which already stood at about $250,000/year for conservancies with rhino tourism operations in 2017 (Muntifering, 2019). For example, using the 4,297 tourists who paid for a rhino tracking safari in 2017 and assuming that only 30% of these are Class 1 tourists (both likely to be conservative estimates), our results suggest that interest in local community involvement on the part of Class 1 tourists alone could yield an additional $188,250–$250,945 to local communities per year to further enhance community-based rhino protection.

Three of the four tourist market segments showed a strong preference for local community reinvestment of all rhino tourism income into rhino protection. This might seem to imply that communities would be unable to use any additional income to improve their own welfare. However, in reality, over half the income generated for local communities from black rhino tourism in northwest Namibia is reinvested in rhino protection in ways that community well-being is indeed improved, in particular through the employment of local conservancy trackers (Muntifering, 2019). This employment provides critically important income that trackers and their families use to purchase essentials such as food, clothing, school fees, and transportation. The value of such income streams in this extremely employment-limited region cannot be overemphasized; indeed, anecdotal evidence suggests that even extended families may benefit from a tracker's employment. Furthermore, our experience (J. R. M.) in attending conservancy annual general meetings suggests attendees recognize and appreciate rhino-related income streams that may contribute to investments in community-level assets such as schools, clinics, and youth development, although these and other tangible benefits from rhino tourism need to be increased in communal areas (Naro, Maher, Muntifering, Eichenwald, & Clark, 2020).

The insensitivity to price among Class 2 members may indicate that the WTP of tourists in this segment for a rhino tracking safari was greater than the highest cost level in our choice experiment ($400). Indeed, tourists will pay higher prices than this to track other endangered wildlife species on foot, such as mountain gorilla (*Gorilla beringei beringei*), where prices range from $400 (DR Congo) to $1,500 (Rwanda) per person per day. Tourists in Class 2 also had strong preferences for community involvement in tracking safaris, suggesting that we may have captured even greater WTP values than those observed for Class 1 if the price levels in our choice experiment been higher. Furthermore, and despite variability across other attributes, WTP for ensuring the highest level of income is shared with local communities was consistently high across all tourist segments. There thus appears to be considerable scope for generating additional income for local communities from tourism in northwest Namibia, a result which mirrors the general global philanthropic interest of citizens in wealthier countries for improving human well-being in developing countries (Johnson, 2018).

The WTP estimates we have documented have the potential to be used to leverage additional funds via an emerging initiative in Namibia that matches funding from tour operators with other national and international funding sources (wildlifecredits.com). For instance, Class 3 respondents had a WTP of $481.94 for local community reinvestment into rhino protection, even though they themselves were not interested in participating in a rhino tracking safari, perhaps reflecting an existence value for black rhino persistence. If ~30% of the ~0.5 million visitors on holiday in Namibia are indeed the Class 3 type of tourist, capturing even 1% of the WTP of these visitors would generate an additional >$700,000 per year in funds to support community-based rhino protection. This amount alone would allow communal conservancies to finance all rhino monitoring efforts, whereas two-thirds of the financial support for such monitoring is currently covered by NGOs (Muntifering, 2019). Given tourism reductions expected from the current COVID-19 global pandemic (Evelina, Samuel, & Homateni, 2020), mobilizing financial values beyond those associated with tourism will be of increasing urgency throughout the conservation sector.

Beyond this particular system, our work provides quantitative evidence for the existence of "triple-bottom-line" performance in the nature-based tourism sector (Buckley, 2003), and adds to the growing literature on

community-based involvement in this type of tourism (Ndivo & Cantoni, 2016; Snyman, 2014). If local communities and the wildlife upon which the tourism sector depends can benefit from visitor preferences at no additional cost (or at a profit) to tour operators, the overall sustainability of the system should increase. Naturally, any expansion of tourism in the region should be monitored carefully, so that the negative impacts of excess tourism seen in northwest Namibia (Muntifering et al., 2019) and in other systems (e.g., Penteriani et al., 2017) do not compromise the conservation of black rhino and the broader environment. In addition, we acknowledge that our results are based on a stated preference survey. Whether these results reflect actual behavior remains an open question, although evidence from the literature points to consistent results from choice experiments when paired with or compared to actual behavior (e.g., Carlsson & Martinsson, 2001; List, Sinha, & Taylor, 2006). We now intend to test this by working with a tourism operator to offer a choice of rhino safaris and fee structures that reflect the status quo as well as the alternatives preferred by Segment 1 in our latent class model.

Tourism based on tracking of black rhino on foot led by trackers from local communities in northwest Namibia has contributed to the recovery of the largest free-roaming population of this species on the planet (Muntifering et al., 2017). Our findings for black rhino tracking in Namibia suggest that a segment of the international tourism market could be seeking not just unique wildlife encounters, but also a strong community experience that engages and empowers local people in conservation and development. The applicability of these results should be explored in other conservation tourism contexts, particularly in areas at the wildlife-local community interface. Ultimately, sustaining or growing triple-bottom-line gains will require adaptive and integrated management of the tourism sector, including important community-based aspects, with the overall aim of continued benefits for both wildlife and people.

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CONFLICT OF INTEREST

Our respective institutions (WWF, NNF, Save the Rhino Trust, and MEFT-Namibia) are collectively involved in supporting nature-based tourism and community-based natural resource management as integrated biodiversity and rural development solutions in Namibia. Save the Rhino Trust advises on the design of black rhino tourism but does not profit financially from such advice.

AUTHOR CONTRIBUTIONS

All authors codesigned the study. **Jeff R. Muntifering**, **Juliette Perche**, and **Andrew Malherbe:** Collected the data. **Robin Naidoo**, **Juliette Perche**, and **Jeff R. Muntifering**: Analyzed the data. All coauthors wrote the paper and approved its submission.

DATA AVAILABILITY STATEMENT

Due to its critically endangered status and the threat of poaching, data from research projects on desert-adapted black rhino in Namibia are not made publicly available. However, data may be provided upon reasonable request to the corresponding author.

ETHICS STATEMENT

Survey research was conducted with the permission of the Ministry of Environment, Forestry and Tourism following relevant guidelines and protocols.

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SUPPORTING INFORMATION

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

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