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Who is willing to pay to see the Big 7?

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This article investigates the non-consumptive, or appreciative value of the 'Big 7' and identifies the variables that influence willingness to pay (WTP). Addo Elephant National Park in the Eastern Cape Province, South Africa, is one of few places in the world where tourists can view all seven species: lion, buffalo, rhinoceros, leopard, elephant, southern right whale and great white shark. Two surveys were conducted, using the same questionnaire, one during summer and one during winter. A total of 232 completed questionnaires were used in the Heckman model selection procedure. The findings revealed that, although a variety of socio-demographic, behavioural and motivational factors influence the amount respondents are willing to pay, there is a clear distinction between the determinants for land species compared to marine species. This poses challenges for the marketing of and establishment of the Big 7 as a brand.

Keywords: contingent valuation (CV) method; conservation tourism; tourist expenditure; non-consumptive value; willingness to pay; Heckman estimator

Nature-based tourism can have either consumptive or non-consumptive use values. If not managed well, consumptive use, such as wildlife hunting and marine fishing, can deplete a resource and cause ecological damage, whereas non-consumptive use, such as wildlife viewing and photography, does not diminish the resource (Chardonnet *et al*, 2002). Most nature-based tourists are passive, non-consumptive observers (Luzar *et al*, 1995).

The Addo Elephant National Park, located approximately 70 km from Port

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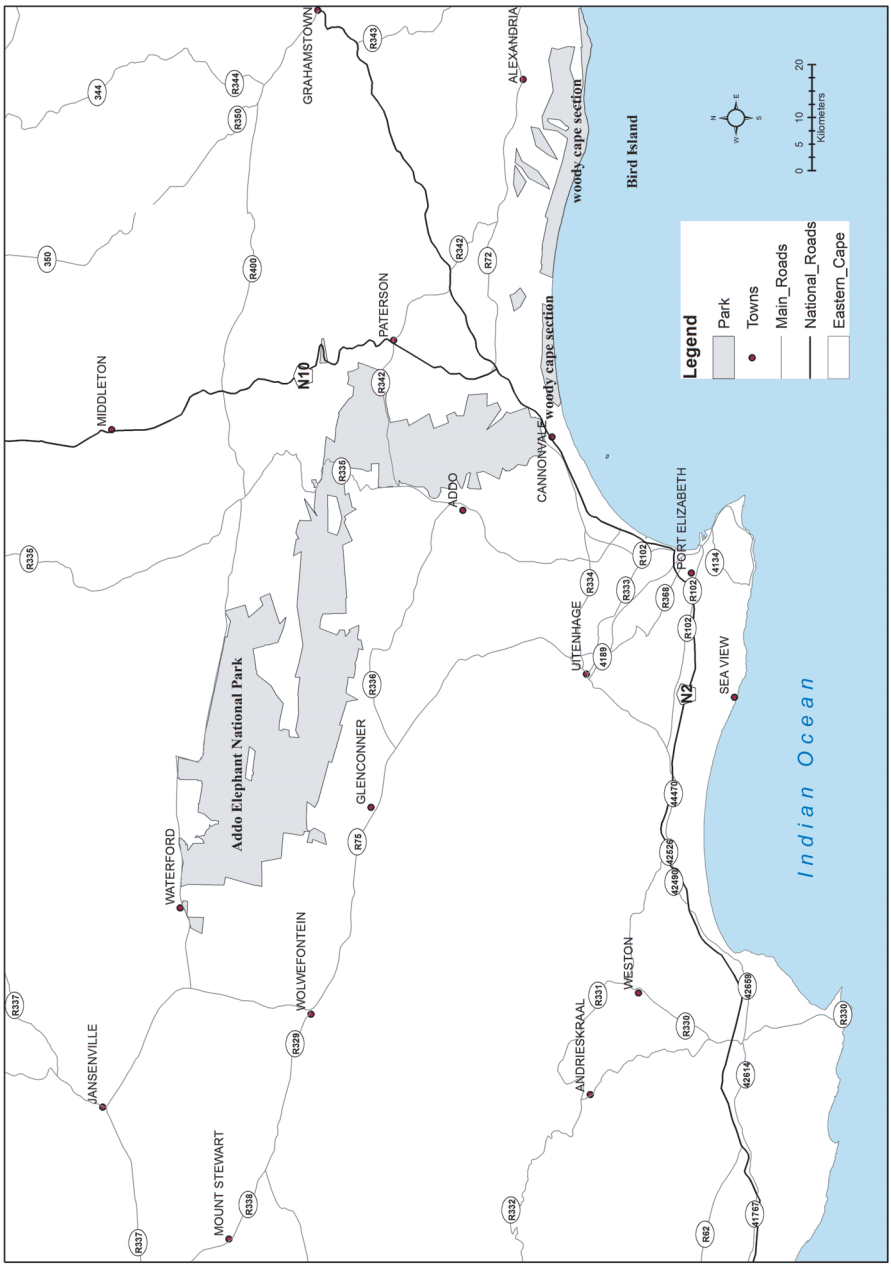

Figure 1. Addo Elephant National Park.

Elizabeth in the Eastern Cape Province of South Africa (see Figure 1), promotes the conservation of land and ocean species and does not allow hunting or fishing. It therefore promotes non-consumptive use. The Park's special world-wide attraction is its 'Big 7', which it energetically promotes as its own particular 'brand', since it is one of very few parks in the world to be able to offer all these species: the original 'Big 5', which are lion, African elephant, Cape buffalo, leopard and rhinoceros, and two marine species, the great white shark and the southern right whale.

The consumptive use values of wildlife species are easily determined by researching prices obtained at game auctions, which are based on demand and supply. Scarce and exotic species will generally reach higher prices, which means that if a park or game farm wants to introduce scarce species they will have to pay much more for these than for common species that are more easily available or regarded as being of lower value. The question we want to ask is whether this holds true for *non-consumptive* use values as well. Although thousands of tourists travel every year to view specific species, very little is known about the non-consumptive or what we may call the 'appreciative' value of wildlife, because this aspect has not yet been thoroughly researched (Saayman, 2013).

Determining the value of non-consumptive resources is problematic. It is difficult to estimate the value that tourists' attach to simply viewing or appreciating an animal in the wild using price-based models (Van Tonder, 2013), since a variety of issues affect this value, many of them intangible or at least difficult to pin down. One issue particularly relevant to our topic is the rhino poaching that has increased alarmingly across southern Africa over the past few years. This of course will have a severe impact on game viewing and specifically the Big 7. The depletion of the species as a result of poaching – a consumptive use that makes no attempt to be sustainable – complicates our attempt to fix a value on non-consumptive use of rhinos. It is difficult to determine the value that tourists attach to simply knowing that some rhinos still exist in their natural habitat and can be viewed there, though we can be sure that the increasing rarity of the species has increased its value. The point is that the rarity of a species affects its viewing price – but it is difficult to estimate the size of the effect and still more difficult to isolate the value for each particular species.

Our aim in attempting to determine the economic value that tourists place on simply viewing the Big 7 is to assist conservation authorities in developing relevant marketing pricing and conservation strategies to promote the economic growth and development of the Addo Elephant National Park, and ultimately to prevent the depletion of the Big 7. A further aim, though not the main purpose of the study, is to help the park management to determine whether promoting the Big 7 as a 'brand' is a successful marketing strategy. The study is exploratory and aims to provide insights into the 'appreciative value' of the seven species and to determine the predictors of tourists' willingness to pay (WTP) to view the species. Since to date no studies have been done of the non-consumptive or appreciative value of the Big 7 and the determinants of WTP to view these species, this research fills a gap in the literature. In addition it examines a factor not covered by previous studies: whether there are differences between those who are willing to pay and those who are not.

Literature review

A significant amount has been written about WTP for nature-based tourism and the determinants of this willingness (see, for example, Livengood, 1983; Kosz, 1996; Hadker *et al*, 1997; Tisdell and Wilson, 2001; Tsi *et al*, 2008; Aziz *et al*, 2010; Desaigues *et al*, 2010; Hakim *et al*, 2011; Saayman, 2013; Van Tonder, 2013). A variety of methods have been used to assess WTP, such as travel cost, hedonic pricing and contingent valuation (CV). While the hedonic pricing method is gaining popularity in studies where data is plentiful (for example, house price indices), the CV method is still most commonly used in determining the economic value of non-market environmental attributes or services (Van Tonder, 2013), such as those involving recreational or scenic resources, or endangered species (Frykblom, 1997; King and Mazzotta, 2000). In fact Spash (2000) observes that the CV method has become the most popular of the three methods mentioned above. Some recent studies in South Africa using a CV approach to WTP are Muchapondwa *et al* (2008) for wildlife management, Snowball *et al* (2008) for water service improvements, Lee *et al* (2013) for estuary management practices and Du Preez *et al* (2013) for the removal of an oil and ore dumping site.

The method has not been without its critics though. A recent paper by Hausman (2012) identifies the three weaknesses of CV that cause the most controversy as: hypothetical bias and upward-biased results, difference between willingness to pay and willingness to accept, and scope effects. The first weakness is that a hypothetical question or situation is sketched and respondents' answers tend to be upward-biased and therefore overstate the WTP. Carson (2012), however, quoting work by Samuelson (1954), asserts the opposite: that when asked what they are willing to pay for a public good, people will think strategically and rather understate their willingness in an attempt to shift the cost onto another group.

The second weakness is that the amount a consumer is willing to pay to avoid a certain negative outcome should be equal to the amount that the consumer should receive in compensation for accepting the negative outcome. In most CV studies, however, these two amounts differ (Hausman, 2012). Carson (2012) notes that this is also true for market goods and he relates the discrepancy to the differences in welfare effects caused by changes in quantity that are not matched by changes in price.

The third weakness is that most CV studies do not take into account that the good might form part of a 'more inclusive package' (Hausman, 2012). Therefore, what people are willing to pay for good X and good Y separately should equal what they are willing to pay for good X and Y jointly and this condition is mostly violated. Carson (2012) notes that this discrepancy is not unique to non-market goods but also occurs when market goods and bundles of market goods are examined, casting doubt on the validity of the results.

The CV method generally measures WTP by means of a questionnaire or survey that asks respondents questions such as whether they are willing to pay for a certain attribute or benefit or to accept compensation for damages to the environment (King and Mazzotta, 2000). The method can thus be used to estimate not only non-use values of environmental services but also use values, making it ideal for the present study. In the present study we were, however, aware

of the weakness mentioned above, and particularly the fact that answers to the 'willingness to pay' question, being influenced by the respondent's income, are likely to be under- rather than overestimates. Future research could entail asking about willingness to be compensated in order to get the opposite bias.

Some studies that have used the CV method to estimate people's WTP for wildlife are Kosz (1996), Hadkler *et al* (1997), Tisdell and Wilson (2001), Tsi *et al* (2008), Aziz *et al* (2010), Van Tonder (2013) and Saayman (2013). These studies found that the main factors influencing visitors' WTP were income, education, age, nationality, marital status, children, professional standing, future plans to visit (loyalty) and donations. They all found that income and education were positively correlated with WTP, although some found that the effect of income was smaller than that of education (Kosz, 1996, Hadkler *et al*, 1997, Tisdell and Wilson, 2001, Aziz *et al*, 2010, Saayman, 2013). This indicates that respondents with a higher income and higher levels of education are likely to have a higher WTP. Aziz *et al* (2010) offer an explanation for the differing effects of education and income on WTP. They argue that income usually has a short-term effect, since respondents have other expenses to bear in mind, whereas education has a long-term effect since those with more education tend to be more rational and have more mature perceptions and attitudes.

Kosz (1996), Tisdell and Wilson (2001) and Aziz *et al* (2010) found that age has a negative effect on WTP, with older respondents exhibiting a lower WTP. In a study of marine species, Saayman (2013) also found this to be the case, with the exception of people viewing whales. However, Hadkler *et al* (1997) found the opposite: they argue that the older generation has more money to spare and thus a higher WTP.

Various findings show that professional standing is positively correlated with WTP, with people of higher professional status having a higher WTP (Hadkler *et al*, 1997, Tisdell and Wilson, 2001, Aziz *et al*, 2010); that nationality and WTP are negatively correlated, with national visitors having a lower WTP than international visitors (Hadkler *et al*, 1997; Aziz *et al*, 2010; Saayman, 2013); and that marital status is positively correlated with WTP, with married respondents having a higher WTP since they want to preserve the natural environment for future generations (Kosz, 1996; Aziz *et al*, 2010).

Kosz (1996) found that loyalty to the recreational site, or future plans to visit, were positively correlated with WTP. He argues that when people plan future visits to a park or other natural environment, they want to preserve it and hence are likely to have a higher WTP. However, those who belong to a conservation organization or make donations towards conservation are likely to have a lower WTP (Kosz, 1996; Hadkler *et al*, 1997; Tisdell and Wilson, 2001). These researchers have suggested that this is because they already contribute to the preservation of the natural environment; however, Saayman (2013) and Van Tonder (2013) in fact found that they have a higher WTP.

Methodology

Surveys and data

Two surveys were conducted at the park, one in summer (January 2012) and one in winter (July 2012), in order to minimize bias. The structured questionnaire,

Table 1. Animal rating and willingness to pay.

Animal	January 2012 Average rating	Pref	July 2012 Average rating	Pref	Rand (ZAR) value, January 2012	Rand (ZAR) value, July 2012
Elephant	2.79	1	2.88	2	R182.50	R367.86
Rhino	3.28	4	3.15	4	R212.00	R573.64
Southern Right Whale	4.89	6	5.15	6	R133.20	R169.83
Leopard	2.84	3	2.65	1	R287.78	R693.48
Great White Shark	4.97	7	5.31	7	R161.60	R235.00
Buffalo	4.54	5	4.08	5	R123.20	R328.83
Lion	2.82	2	2.90	3	R239.62	R514.00
Total					R1,349.89	R2,882.63

using questions based on research by Kosz (1996), Hadkler *et al* (1997), Tisdell and Wilson (2001), Aziz *et al* (2010) and Casey *et al* (2010), elicited respondents' socio-demographic profile, spending data, motives for visiting the park and preferences for seeing each of the Big 7 (on a scale of 1 = most preferred to 7 = least preferred). The questionnaires were interviewer administered to obtain more valid results, as suggested by the National Oceanic and Atmospheric Administration (NOAA) Report guidelines (see Arrow *et al*, 1993). A total of 232 completed questionnaires were obtained, 104 in January and 128 in July. Questionnaires were distributed to travel groups of on average four people each, thus capturing the spending detail of more than 900 visitors to the park.

Our study aimed to determine the predictors of visitors' WTP for the privilege of viewing the Big 7 in their natural environment. We were therefore interested, first, in *whether* they were willing to pay to see these animals and, second, *how much* they were willing to pay, and finally how we might distinguish the groups. Table 1 provides a synopsis of the preferences (lower values indicate higher preference for viewing the animal) and the associated WTP results derived from the questionnaire. During the January survey, only 26% of respondents indicated that they were willing to pay, but this percentage increased to 36% in the July survey.

Most of the variables to be included in the analysis were qualitative and not quantitative, which called for the creation of dummy variables. The variables 'education' and 'income' are nominal variables, ranging from 1 to 5 and 1 to 7, respectively, with higher numbers represents higher levels of education/income. These were coded in Microsoft® Excel® as shown in Table 2.

In addition to the category variables listed, the following continuous (slope) variables were also included in the analysis: age of respondents (AGE), size of the travel group (GROUP) and total spending in the park (SPEND).

Methods

The methods used in this study included factor analysis and regression analysis. First, a factor analysis was conducted to reduce the number of motives. The method chosen was principal components analysis (PCA) with orthogonal rotation

Table 2. Coding of variables.

Variable	Coding description
Gender	If the respondent was male, the variable took the value of 1 (MALE).
Marital status	If the respondent was married, the variable took the value of 1 (MARRIED).
Province of residence	Nine dummy variables were created for the nine provinces in South Africa. Most respondents came from the Western Cape (49% – PROV1), followed by the Eastern Cape (13% – PROV3) and Gauteng (11% – PROV2).
Foreigners	One dummy variable was created for visitors not originating from South Africa (14% – FOREIGN).
Language	South Africa's 11 national languages, and thus various cultures, were captured by three dummy variables (LANG1 – Afrikaans-speaking respondents, 43% of the sample; LANG2 – English-speaking respondents, 43% of the sample; LANG3 – other languages, 14% of the sample).
Accommodation type	The Park offers a wide range: camping facilities, self-catering chalets, forest huts and guest houses, the first two being the most popular. To assess whether accommodation preference plays a role in WTP, a dummy variable ACCC was created, taking the value of 1 if the respondent stayed in a self-catering chalet.
Accompanying children	Since preferences might depend on the composition of the travel party, respondents who had children accompanying them were captured by a dummy variable (CHILDREN).
Favourite animal	Two dummy variables were created – BIG5 if any of the Big 5 was the favourite (72%) and BIRD if the favourite species was a bird (indicating keen birders – 3% of the sample). The control group is 'other species'.
Member of a conservation organization	This possible evidence of a passion for conservation was captured by the dummy variable MEMBER, taking the value of 1 if the respondent was a member of such an organization.
Loyalty card	Frequent visitors to South Africa's national parks can buy a loyalty card which waives the conservation fees payable when entering any of the parks. To capture this 'frequent visitor', a dummy variable WILD CARD was created, taking the value of 1 if the respondent was a Wild Card holder.
Motives	Motives for visiting the Park were assessed using 14 statements on a Likert scale, where 1 = not important at all and 5 = extremely important. Dummy variables were coded after a factor analysis to capture motives, as explained in the results section below.

(varimax), and the software used was IBM SPSS Statistics 21. The Kaiser–Meyer–Olkin (KMO) measure verified that the sample was adequate for factor analysis, with KMO = 0.686 indicating that the correlations were sufficiently compact to allow factor analysis. Bartlett's test of sphericity confirmed that the correlations between items were sufficiently large to conduct PCA ($\chi^2(91) = 533.323$, $p < 0.001$). Factor scores were computed using the Anderson–Rubin method, since this method produces uncorrelated and standardized factor scores that can be used in subsequent analyses (Field, 2009).

The second analysis attempts to identify the predictors of WTP. However, WTP data are characterized by a large number of zeroes, which, according to Martinez-Espiñeira (2006), can be attributed to either a non-positive WTP or a lack of ability to pay. A selection of papers focuses on splitting these two reasons for non-WTP in order to find a true WTP variable (see, for example, Jorgensen and Syme, 2000; Meyerhoff and Liebe, 2006; Szabó, 2011; Atkinson *et al*, 2012; Meyerhoff *et al*, 2012). Removing the zeroes from the data set could, however, lead to sample selection bias and an alternative method has to be applied to take this into account.

Two methods that address sample bias found in the literature applied to WTP are the double-hurdle model (Martinez-Espiñeira, 2006) and the Heckman estimation procedure (Strazzera *et al*, 2003). We follow the latter and specifically the procedure explained by Strazzera *et al* (2003). The Heckman procedure assumes that the decision to pay and the amount that one is willing to pay, occur simultaneously. The traditional Heckman procedure involves two steps (therefore often referred to as the Heckman two-step method): selection and response. The linear Heckman selection model can be specified as follows (IHS Global Inc, 2013):

$$y_i = X_i^{'}\beta + \varepsilon_i \,, \tag{1a}$$

$$z_i = W_i\gamma + u_i \,, \tag{1b}$$

where z_i is a binary variable and y_i is only observed when $z_i = 1$, in other words, when respondents indicated a positive amount that they are willing to pay. The error terms, ε_i and u_i, follow a bivariate normal distribution:

$$\begin{bmatrix} \varepsilon_i \\ u_i \end{bmatrix} \sim N \begin{bmatrix} \sigma^2 & \rho\sigma \\ \rho\sigma & 1 \end{bmatrix} \tag{2}$$

where ρ is the correlation coefficient and σ the scale parameter. Equation (1a) is the response equation and shows the relationship between the predictors (X_i) and the amount that respondents are willing to pay (that is, y_i). Equation (1b) is the identification or selection equation and is a probit-type equation which defines the propensity that a respondent is willing to pay a positive amount. Two methods for estimation the Heckman model is available, namely the original two-step method (also referred to as limited information maximum likelihood) and the full information maximum likelihood method. Puhani (2000) indicates that the full information maximum likelihood method gives more robust estimation results since it controls for collinearity, and therefore it is also the method used in this paper.

There are no clear guidelines on the choice of explanatory variables to be included in the two equations estimated and therefore we follow the process suggested by Strazzera *et al* (2003). The two processes (identification and response) are first estimated separately to identify the most suitable variables to be included in the Heckman model. Second, the Heckman model is estimated.

For the selection equation in the first step, a dichotomous variable is coded that takes on the value of 1 if respondents indicated a ZAR amount in any of the WTP categories. Since the dependent variable (dubbed WTP) is dichotomous, logistic regression analysis was done using both EViews and STATA software. We postulate that a zero WTP rather indicated towards protest against the idea, than a lack of means to pay and therefore we exclude income and total spending from this part of the modelling process. Through elimination of non-significant variables, 10 variables remained in the identification equation[1] and these were consistently used in all the Heckman model estimations (see the results section).

For the response equation, a stepwise regression procedure was done in EViews 8 with the aim mainly of detecting possible identifiers rather than to ascertain the magnitude of the effect. To identify the variables to be included, the stepwise forwards procedure was used where the model starts only with an intercept and adds additional variables to the model based on the score statistic (Field, 2009), with a cut-off criterion of 0.5. This was supplemented by a stepwise backwards procedure, also with a cut-off criterion of 0.5. Only the variables identified by both stepwise procedures were included in the final Heckman models estimated.

Results

Results of the factor analysis

The number of factors extracted was based on the eigenvalues of the factors, and five components with eigenvalues greater than Kaiser's criterion of unity were identified in the initial analysis. Together these five factors explained 62.5% of the variance and therefore five factors were retained in the final analysis. The factor loadings after rotation are shown in Table 3.

Motives for visiting the park were identified according to the appropriate items. The first motivational factor included mainly accommodation aspects and thus was labelled *Accommodation and value*. This motive was the least important of the five (3.06 mean value). The second factor, labelled *Park attributes* since it included the desire to see the Big 7 and particularly elephants, had the second highest value. The third factor was *Education* and this had a mean value of 3.11, the third highest. This result illustrates the educational importance of a wildlife viewing experience and interpretation, of what the park offers, which is also one of the strengths of this park. The fourth factor, *Escape*, concerned with relaxing and breaking away, had the highest mean value (4.00). This is also the most common of all the motives in the tourism literature (Van der Merwe *et al*, 2011). The fifth factor, *Socialization and photography*, had the fourth highest mean value (3.08).

Table 3. Results of the factor analysis on motivational constructs.

Item	Motivational factors – rotated factor loadings				
	Accommodation and value	Park attributes	Education	Escape	Socialization and photography
Spiritual experience	0.548				
Accommodation facilities	0.858				
Variety of accommodation	0.785				
Value for money	0.721				
Explore new destination		0.601			
See elephants		0.658			
Geographical features		0.589			
Big 7		0.716			
Benefits for children			0.793		
Educational purposes			0.841		
Break routine				0.869	
Relax				0.802	
Time with friends					0.806
Photography					–0.570
Mean value	3.06	3.19	3.11	4.00	3.08
Cronbach's alpha	0.76	0.53	0.64	0.74	0.21

Results of the Heckman selection model

This part of the analysis, summarized in Table 4, aimed to identify the predictors of the ZAR amount that respondents were willing to pay to view the Big 7, individually and collectively. The collective amount was the sum of the individual amounts listed by the respondents. As indicated in the method section, the Heckman procedure was used and the models estimated using full information maximum likelihood (using EViews 8). The Heckman procedure consists of estimating both the identification (selection) and response equations, controlling for possible biases in sample selection. The variables used in the identification equation are based on the results from the logistic regression, while those included in the response equation are based on the stepwise procedure. To allow for possible non-linearities in income and education, both variables are squared and also included in the various regressions (where appropriate).

The results of the estimations are shown in Table 4. Both the identification and response equations for every individual species, as well as collectively, are summarized in the table. The results of the selection or identification equations are first analysed.

- The respondents' province of origin play an important role, with respondents from the Western Cape (PROV1) being more likely to be willing to pay. The result is quite robust and is significant for the Big 7 collectively, as well as for all the land animal species (the Big 5).

Table 4. Results of the Heckman models.

	Total	Elephant	Leopard	Rhino	Lion	Buffalo	Shark	Whale
				Response equation				
C	–2,410.77	–787.26	–1,259.61	–275.33	–765.09	–1,020.66	305.22	714.54*
AGE	–62.83*	–11.35		–15.52	–5.75	–7.40		–5.53*
MALE		222.26		–272.89			–191.05*	
MARRIED		–223.46				–309.25	–185.51*	
LANG1	1,863.77	557.16*	438.07*		459.12*	617.96*		
PROV1							181.33*	216.19*
PROV2	3,826.62*	811.75*	949.56*	1,065.70*	857.73*	1,008.29*		
FOREIGN		265.63				266.09		
INCOME	3,001.24*	461.59	999.27*	564.98	422.81	515.31*	195.32*	79.19
INCOME^2	–375.80*	–56.79*	–117.91*	–76.17	–49.87	–64.69*	–30.91*	–9.43
SPEND	0.20	0.06*	0.08*	0.06		0.04		0.04*
CHILDREN	1,457.21	348.11			498.98*	434.74*	317.04	
ACCC	2,333.42*	498.92*	284.00	562.59*	466.95*	466.95*	422.18*	273.44*
MEMBER	3,123.65*	922.74*		600.21	761.12*	935.33*		
WILD CARD			–307.01				–250.61*	–282.29*
BIG5		–355.05	–247.69			–283.05	–565.12*	–645.31*
BIRD				–1030.83			–426.99*	
ACCOMMODATION and VALUE				–178.27			79.38	79.58*
ESCAPE	–513.57	–143.92			–228.93	–131.63		
SOCIALISE and PHOTOGRAPHY							–163.83*	–110.15*

Continued

Table 4 continued.

	Total	Elephant	Leopard	Rhino	Lion	Buffalo	Shark	Whale
				Selection equation				
C	–3.311*	–3.565*	–3.574*	–2.962*	–3.255*	–3.185*	–2.635*	–3.878*
PROV1	0.582*	0.578*	0.655*	0.647*	0.655*	0.539*	0.133	0.302
EDUCATION	1.187*	1.280*	1.293*	0.956	1.102*	1.021	0.551	1.114
EDUCATION^2	–0.143*	–0.155*	–0.154*	–0.113	–0.131	–0.124	–0.057	–0.124
MEMBER	–0.320	–0.302	–0.383	–0.428*	–0.471*	–0.379	–0.058	–0.202
BIG5	0.389*	0.360	0.376*	0.359	0.415*	0.533*	0.596*	0.705*
ACCOMMODATION and VALUE	–0.024	–0.006	–0.012	–0.020	–0.025	0.000	–0.007	0.080
PARK ATTRIBUTES	0.244*	0.294*	0.292*	0.245*	0.255*	0.259*	0.232*	0.244*
EDUCATION	–0.200*	–0.214*	–0.191*	–0.200*	–0.216*	–0.188*	–0.239*	–0.088
ESCAPE	0.047	–0.017	0.032	0.020	0.028	0.026	0.125	0.052
SOCIALISE and PHOTOGRAPHY	–0.109	–0.093	–0.141	–0.167*	–0.149	–0.157	–0.016	–0.034
				Interaction terms				
Log Sigma	8.26*	6.51*	6.93*	6.92*	6.85*	6.53*	5.20*	5.37*
Rho	–0.098	0.018	–0.264	–0.144	–0.143	0.098	–0.195	–0.520
Log likelihood	–814.67	–620.12	–708.31	–673.50	–685.52	–613.06	–384.48	–379.46

Note: *Significant at $\alpha < 10\%$.

- Furthermore, likeliness to be willing to pay clearly increases with education levels, although the relationship is non-linear. Again this relationship seems to be more pronounced in the Big 7 collectively than in the individual species and the result is probably driven by the land animal species (elephants and leopards).
- Members of conservation agencies generally show a tendency to be less willing to pay to view the Big 7. The result is especially pronounced and significant when rhinos and lions are considered. This might possibly be because these visitors already felt that they were contributing enough to wildlife management in South Africa.
- Not surprisingly, there is also a positive correlation between preferences and tendency to indicate a positive WTP, with respondents who chose one of the Big 5 as their favourite being more likely to be willing to pay to view the animal. What is interesting is that this remains true even when the sea species are considered.
- Finally, motives for visiting the Park influence WTP, with *Park attributes*, *Education* and *Socialization and Photography* displaying significance. The motive *Park attributes* is positively associated with the decision to pay, while the motives of *Education* and *Socialization and Photography* are negatively related to WTP, although the latter is only significant for WTP for rhinoceros.

In terms of the response equation, the table shows that a variety of factors influenced WTP for different species, ranging from socio-demographic and behavioural to motivational and economic factors. As expected, income played an important role: for each species, as well as for all the Big 7 species combined, income was a significant determinant of WTP. As expected, the relationship is non-linear since the squared income variable is also significant, indicating that a peak is reached, where after it decreases again.

Table 4 shows the following trends as regards to some of the socio-demographic variables.

- Age was negatively associated with WTP, suggesting that the older visitors' WTP to view the species comprising the Big 7 was consistently lower than that of the younger visitors. A possible reason for this might be that older visitors have encountered the species more often before, reducing its rarity and subsequently the price.
- Men were generally willing to pay less than women to view the species, with elephants being the only exception (although not significant).
- Afrikaans-speaking visitors were willing to pay more than visitors from other language groups. This might be a cultural phenomenon and the reasons therefore could be explored in future research.
- The results show that place of residence (province and country) plays a role, since visitors from Gauteng (PROV2) and the Western Cape Provinces (PROV1) were willing to pay more than visitors from other provinces of South Africa. There was a positive relationship between WTP and foreign visitors for some species although this relationship is never significant.

As regards to some of the behavioural variables, the following can be observed from Table 4.

- Visitors who tended to spend more on their holiday at the park also tended

to be willing to pay more to view the Big 7 species, indicating a tendency to spend on nature-based products.
- Respondents travelling with children were willing to pay more to view certain species – lion and buffalo – which might indicate the popularity of these species to the younger generation.
- Visitors staying in chalets were consistently willing to pay more to view all the Big 7 species. This again points towards an ability to pay, since staying in chalets are more expensive than camping – the most significant other form of accommodation offered by the park.
- Members of conservation organizations were consistently willing to pay more to view the various species, as opposed to Wild Card (see Table 2) holders who were less willing to pay. The latter could be influenced by the fact that they visit the parks more frequently, making viewing of species less scarce.
- In terms of preferences for various species, we found almost no significant relationship with WTP, except that visitors who prefer the Big 5 were willing to pay less to view marine species, while bird lovers were also willing to pay less to view sharks.

As regards motives, it is evident that only two of the five motives, *Accommodation and value* and *Socialization and photography*, had a significant influence on the magnitude of spending. The latter has a negative effect on WTP, while the former has a positive influence – especially on the marine species. The motive of *Escape* is also identified as being influential during the stepwise procedure, but it is not a significant covariate of WTP.

When the interaction terms are considered, it is evident that ρ is quite low and not significant in any of the estimated models. This implies that there is no selection bias in the models. According to Strazerra *et al* (2003), a positive and significant ρ indicates that the WTP estimates are biased upwards (that is, the people in the response equation have a higher mean WTP than the total sample), while a negative and significant ρ indicates the opposite.

Findings and implications

First, the paper identified clear differences between visitors who were willing to pay and those who were not (the protestors) and we postulated that these differences are mainly driven by motivations and revealed preferences than ability to pay. The fact that the models show no evidence of selection bias indicates that this is a valid assumption for revealed WTP. Interesting differences can be observed in the results of the selection equation, especially between land animals and marine animals. Those who were willing to pay to view land animals were more likely to originate from the Western Cape province of South Africa and education played a significant role. This is not true for the decision to make a positive payment to view marine species.

Second, while preferences for certain animal species (the Big 5) clearly influence the decision to pay a positive amount, the connection between visitors' preferences for the Big 5 and the amount they were willing to pay to view a species, were not that pronounced. This confirms previous findings by Van Tonder (2013) and Saayman (2013) in the South African context.

Third, the results of both the selection and response equations indicate that there is clearly a difference in the covariates of WTP for marine species, compared to land species. This creates the impression that the Big 5 is a more established brand than the Big 7, and that the WTP for marine species are driven by different factors than for land species. The motives of respondents who are willing to pay more to view marine species are also different than those for land animals, which clearly have huge implications in establishing the Big 7 as a brand.

In addition, this research identified the following important socio-demographic and behavioural predictors of the ZAR amount respondents were willing to pay to view the Big 7. The results showed that more behavioural than socio-demographic variables influenced WTP. The socio-demographic variables influencing willingness to pay were as follows. *Age* had a negative correlation with WTP, which corroborates findings by Kosz (1996), Tisdell and Wilson (2001) and Aziz *et al* (2010), but contradicts findings by Hadkler *et al* (1997). While previous studies were inconclusive on the correlation between *Gender* and WTP, our study found that men were less willing to pay than women. *Language* was not found to be an influential factor in previous studies, but this research showed that in a multi-linguistic and multi-cultural country it does play a role. *Place of origin* was also found to have a positive association with WTP, in the case of the province of origin, which was also not evident in previous studies. Contrary to research by Hadker *et al* (1997), Aziz *et al* (2010) and Saayman (2013), we find that *International visitors* were not willing to pay more.

The following were the findings as regards behavioural variables. Those who spent more on their holiday at the national park were also more willing to pay to view the Big 7; that is, a positive relationship between *Spending* and WTP. While previous research is not clear on the implications of *Travelling with children*, our study found that this factor was positively related with WTP to view specific species. *Type of accommodation* has not been found to be significant in the previous literature, but our study found that visitors staying in chalets were more willing to pay than those in other types of accommodation such as tents or caravans. An interesting finding is that visitors who were *Members of conservation organizations* were willing to pay more than those who were *Wild Card holders* (although they were less likely to pay a positive amount). This study therefore directly contradicts findings by Kosz (1996), Hadkler *et al* (1997) and Tisdell and Wilson (2001).

Another interesting finding is that those who preferred specifically to view land animals (the Big 5) were more likely to pay to see the marine species, but the ZAR amount they were willing to pay were less. They therefore seemed to visit the Park mainly for the Big 5 and while valuing the Big 7 as being worth paying to see, they do not place substantial value on the marine species. This might be because the Big 5 'brand' is older and therefore more established. Park management should therefore encourage these visitors to view the marine species by promoting them more effectively and creating more opportunities to view them, for example by boat trips and marine educational programmes.

Our respondents' *motivations to visit* played a more substantial role in the selection equation than in the response equation, indicating that motives distinguishes those who are willing to pay from protestors. However, it has

limited influence on the magnitude of the payment with only the motives of *Accommodation and value* and *Socialization and photography* – respectively the most and the least important motives for visiting the park – having some influence on the WTP for marine species.

While the goal of most WTP research is to advise government on funding projects or choosing between projects, this was not the aim of our study. Rather, we aimed to explore the non-consumptive or 'appreciative' value of different species and to identify the profile of visitors who were willing to pay for this privilege and thus to assist park management in marketing the various species and funding conservation products, especially in view of the decrease, in real terms, of government funding for conservation in South Africa. Our research suggests that the current perception that only the rich are willing to pay for conservation is false, and that there is a non-linear correlation between WTP and income. It also shows that several socio-demographic and behavioural variables factors influence WTP for conservation and that some of these factors are not consistent for all species.

Furthermore, the study identified an average amount allocated to view each species, which could be considered the non-consumptive or appreciative value of these species, and the results of the Heckman model indicated that there is no selection bias in these estimates. This information could assist future research in the design of choice experiments.

Conclusion

The purpose of this research was to identify those visitors to the Addo Elephant National Park who were willing to pay to see the Big 7 and the socio-demographic and behavioural variables that influenced their WTP. As this study is the first to deal specifically with the Big 7, it makes a significant contribution to an important area of research not only for academics but also for practitioners. This type of research has not received the attention that it deserves. It shows that although the Park offers the Big 7, a large percentage of visitors are still focusing their wildlife experience on the Big 5. The result highlights the difficulty that conservation authorities face in establishing the Big 7 as a brand.

Using the Heckman selection model, the study reveals differences between those who are willing to pay and those who are not. It identifies several variables that influence WTP and adds several 'new' variables that will be useful in tourism-related fields of research. It contradicts some findings of other studies of WTP, as well as identifying interesting findings especially among the behavioural variables. The study is, however, exploratory and the small size of the sample can be viewed as a limitation.

We suggest that more research is required on WTP to view specific animal species, which can be labelled the 'appreciative value'. The results of this research could be used to design choice experiments, which could address some of the limitations of a questionnaire based study.

Note

1. The logistic regression model has a McFadden R-squared of 0.095 and an F-statistic of 2.11, which is significant at a 95% level of confidence, indicating a valid model specification.

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