

VISITOR RESPONSES TO ENVIRONMENTAL INTERPRETATION IN PROTECTED AREAS IN VIETNAM: A MOTIVATION-BASED SEGMENTATION ANALYSIS

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Abstract

Environmental interpretation is regarded as an effective soft management strategy for educating visitors and managing their impacts on protected areas. Only limited research has been conducted on visitors' views on environmental interpretation in protected areas in the rapidly developing destinations of South-East Asia, with particular gaps in understanding different visitor groups. This article seeks to fill this gap in the context of Vietnam by examining visitor responses to services for environmental interpretation in one of the country's largest national parks. The research employed Importance-Performance Analysis and subsequent motivation-based visitor segmentation based on 237 sets of pre and post-visit questionnaires distributed by the authors as self-complete questionnaires at the entry and exit gateway to the national park. The findings highlight that site interpreters were considered the most important service providers, while displays at the museum and videos were identified as important but low performing. A number of differences between motivation-based visitor groups as well as some culturally-anchored response patterns emerged which highlighted the need for park management to consider different visitor groups; not only in terms of their motivations to visit but also their cultural backgrounds when designing, investing maintenance funding, and evaluating interpretive services.

Keywords: protected areas, interpretation, motivation, importance-performance analysis, segmentation, Vietnam

Introduction

The number of visitors in protected areas has increased significantly in the last 40 years (Tan & Law, 2016). This increased visitor demand requires more suitable and effective visitor management (Eagles & McCool, 2002; Marion, Leung, Eagleston, & Burroughs, 2016) as visitor management can assist in managing the visitor experience as well as keep the balance between tourism development and the use of resources for sustainable development (Kuo, 2002). Visitor management in protected areas can be broken down into hard and soft management techniques (Mason, 2005), and the latter includes environmental interpretation alongside targeted marketing and landscaping and planting. Munro, Morrison-Saunders and Hughes (2008) point out that to improve interpretive services research on interpretation practice is necessary. Further, researchers such as Hendricks, Schneider and Budruk (2004) have argued for studies of interpretive services not to stop at the all-of-population level of analysis, but instead to explore differences between visitor groups as different groups may have differing preferences and responses to interpretive services.

Although a variety of authors have measured visitor responses in relation to a selection of interpretive services (Wearing & Whenman, 2009; Xu, Cui, Ballantyne, & Packer, 2013) research could not be located that assesses visitor responses with regard to a comprehensive range of a national park's personal and non-personal services for environmental interpretation. Such an analysis is pertinent in Vietnam which has seen a 25% annual increase in international visitors over the last two years (Viet Nam National Administration of Tourism, 2018); and this increase has not just manifested itself in urban and coastal areas but also in its national parks. Cat Tien National Park (CTNP) is one of the largest and most important national parks of Vietnam and although many interpretive services have been put in place the visitors' perspectives and

evaluations of these services have not been measured.

Framed by the rapid increase in international tourist arrivals, coupled with increasing domestic tourism in Vietnam, the overarching aim of this study is to explore visitor responses to environmental interpretation in the national park and to examine differences between motivation-segmented visitor groups to improve design and management of these services as a key park management technique. Specifically, this study sets out to (1) initially identify interpretive services provided in Cat Tien National Park, before (2) investigating visitor responses to these services by enlisting Importance-Performance Analysis (IPA). Subsequently (3) motivation-based visitor segmentation serves to provide a more nuanced understanding of visitors' importance and performance ratings of the park's interpretive services.

Literature Review

Interpretation in the context of natural environments has been conceptualised in a variety of ways by tourism researchers. For example, Moscardo (2003) describes it as the process of "providing information to visitors about the places they are in and encouraging them to appreciate and care for these places" (p.112). Similarly, Archer and Wearing (2002) define interpretation in national parks as "a means for communicating information, stories, values, and ideas to assist people in understanding their relationship with environment" (p.32). As such, interpretation in natural environments can be summarized as communication that provides visitors with information about a site (e.g. nature and culture, etc.), raises visitors' awareness of that site's features and challenges, and encourages visitors to care about the site. Services for environmental interpretation are classified in a variety of ways: basic signs and media-based services (Archer & Wearing, 2002),

self-guided and guided interpretation (Xu et al., 2013), interpersonal/personal and non-personal interpretive services (Tsang et al, 2011), and static displays, interpretive guides and ICT & mobile-driven applications (Tan & Law, 2016). Of these classifications the personal and non-personal distinction is a widely used approach.

One of the main purposes of interpretation in protected areas is to enhance the visitor experience (Komatsu & Liu, 2007) alongside assisting to manage visitors and their impacts (Archer & Wearing, 2002; Munro, et al. 2008). Moscardo (2014) makes the point that interpretation can assist in the management of negative visitor behaviours, by directing where visitors go and by raising visitor awareness about the site and its vulnerabilities alongside enhancing the visitor experience (Moscardo, 2003; Munro, et al. 2008). However, there is a need to develop a nuanced understanding of the preferred interpretation services of visitors and how different groups may respond to the interpretive services provided in a protected area. For example, Komatsu and Liu (2007) identified cultural differences between Japanese and Western visitors during an interpretation-focused study in Hawaii while Xu et al. (2013) made similar observations in the context of Chinese visitors experiencing what they term Western interpretation approaches.

In tourism research three approaches are commonly applied when investigating visitor responses to service provision. First, expectancy-disconfirmation theory seeks to understand the relationship between visitor expectations and their experiences with the performance of tourism attributes (Naidoo, Ramseook-Munhurrun & Ladsawut, 2010). However, according to Martín, Collado, and del Bosque (2009), there is no consistency in the comparison standards; additionally, this approach does not provide importance levels for each tourism attribute. Other studies use the performance-

only approach (McDowall & Ma, 2010) because Li and Carr (2004) contend that it is a “simple, easy and reliable tool” to measure visitor response (p.45). However, Wade and Eagles (2003) criticise that the performance-only approach can result in incorrect assumptions and poor investment decisions because the importance of attributes is not measured. Arguably the most established approach is based on Importance-Performance theory, which was first introduced by Martilla and James (1977). Based on the theory the authors developed Importance-Performance Analysis (IPA) with the aim of creating an effective and low-cost tool for assessing the performance of marketing programs from the perspective of customers. Wade and Eagles (2003) are supportive of IPA for this type of research and add that it can provide simple visual support that can assist with service-related management decisions. The current literature also suggests that not all interpretive services hold the same importance in the eyes of visitors (Tubb, 2003; Wearing & Whenman, 2009). While expectancy-disconfirmation and performance-only approaches cannot provide the importance levels of each service, IPA can account for this dynamic. Weighing up the three approaches IPA promises to be the most appropriate analysis tool for this study because it not only identifies importance-performance based visitor responses for each interpretive service, but it also provides a clear analytical framework which highlights management implications.

A number of authors have called for IPA to be supported by segmentation to provide a more nuanced understanding of the findings (Boley, McGehee, & Hammett, 2017; Caber, Albayrak, & Matzler, 2012). For instance, Farnum and Hall (2007) argue that segmentation according to visitors’ characteristics creates more meaningful importance-performance grids, while Hendricks et al. (2004) emphasize that potential differences among clusters need to be explored as they may affect visitor responses, recommendations, and ultimately intention to return. As such, application of a segmentation approach helps to determine differences between visitor groups which serve to

inform targeted management decisions and targeted marketing (Bruyere, Rodriguez, & Vaske, 2002; Hendricks et al., 2004). The literature highlights that several visitor segmentation approaches have been incorporated in IPA studies, including by demographic and socio-economic variables (Wade & Eagles, 2003), benefits sought (Hendricks et al., 2004), benefits achieved (Crilley, Weber, & Taplin, 2012), and by loyalty level (Farnum & Hall, 2007). Benefit-based segmentation is commonly used by researchers such as Hendricks et al. (2004) who argue that this segmentation approach helps to equip managers with more detailed knowledge to inform their decision-making. Also, according to Frochot and Morrison (2000), benefit-based segmentation is regarded as an effective approach owing to its capacity for helping researchers differentiate between individuals and in anticipating visitor behaviour. In tourism research benefit-based segmentation is often connected to attribute or psychologically-based benefits, such as visitor motivations. For this study the latter approach was adopted as motivation-based segmentation has been identified as effective for both designing and evaluating services (Frochot & Morrison, 2000).

Over the last three decades many publications have focused on visitor motivation in protected and wildlife areas and yielded a range of visitor motivations (Beh and Bruyere, 2007; Curtin, 2010; Mehmetoglu & Normann, 2013; Slabbert & Laurens, 2011). As illustrated in Table 1 some motivations have recurrently been identified by studies, such as to relax/be outside, to learn about nature, to talk with others and to seek new experiences, while others have been identified by a smaller range of targeted studies, such as to see spectacular landscapes and to view megafauna. Spanning several continents and types of visitor activity, Table 1 provides a comprehensive overview of dominant motivations to visit protected natural areas that contain rich fauna as well as flora. The list was assessed for each motivation's relevance to the Vietnamese context and CTNP specifically, and subsequently adapted for CTNP.

Table 1. Main Visitation Motivations for Wildlife Tourism and Tourism in Protected Areas

Motivations	Authors
To relax, to be outside	Crilley et al. (2012); Curtin (2010); Driver (1983); Mehmetoglu and Normann (2013); Slabbert and Laurens (2011)
To learn about nature	Crilley et al. (2012); Curtin (2010); Driver (1983); Pan and Ryan (2007); Slabbert and Laurens (2011)
To escape from the daily life routine	Beh and Bruyere (2007); Crilley et al. (2012)
To talk with others	Beh and Bruyere (2007); Driver (1983); Muso, Hall and Higham (2004); Pan and Ryan (2007); Slabbert and Laurens (2011)
To travel with friends and my family	Crilley et al. (2012)
To seek new experience	Beh and Bruyere (2007); Mehmetoglu and Normann (2013); Pan and Ryan (2007); Slabbert and Laurens (2011)
To know about site elements and history	Mehmetoglu and Normann (2013); Slabbert and Laurens (2011)
To view mega fauna	Beh and Bruyere (2007)
To learn about mega fauna	Beh and Bruyere (2007)
To see spectacular landscapes	Beh and Bruyere (2007); Crilley et al. (2012); Curtin (2010); Driver (1983); Muso et al. (2004)
To take photographs	Driver (1983); Muso et al. (2004)

Cat Tien National Park

CTNP is located in South Vietnam (11.4232° N, 107.4287° E) and covers an area of 71,920 ha (UNESCO, n.d.). It is approximately 150 kilometres from Ho Chi Minh City (Hoang, Le, Nguyen, Nguyen, & Vu, 2001) and the Dong Nai River creates a 90 km boundary to the North, West and East of CTNP (Hoang et al., 2001). Due to the river boundary CTNP has one main entry and exit point where visitors need to cross the river by boat to reach the national park. CTNP is a typical lowland tropical rainforest in Vietnam and holds high biodiversity with rare and endemic forms of

flora and fauna (mammals, birds, reptiles, amphibians and fish) (Hoang et al., 2001). CTNP was recognized by UNESCO in 2001 as the 411th biosphere Reserve Zone in the world (UNESCO, n.d.). The national park has six divisions comprising Financial Planning, International Relations and Science, Administration, Centre of Environmental Education and Services, Rescue Centres and Forest Protection (Centre of Environmental Education and Services, CTNP, 2016). Two rescue centres also operate in the park. A Bear Rescue Centre was established in 2005 with financial and technical assistance from a non-profit organization based in Ho Chi Minh City and an Australian NGO, while a Primate Rescue Centre was established in 2008 and funded by three international NGOs.

According to unpublished tourism statistics held by the CTNP Centre of Environmental Education and Services the number of visitors to CTNP has increased by about 50% between 2010 (17,634) and 2015 (26,664); exhibiting an initially steady but then accelerating increase with 19,492 visitors in 2011, 18,355 in 2012, 18,348 in 2013, and 23,217 in 2014. This significant increase by both domestic (80%) and international visitors (20%) creates increased pressure on the visitor experience as well as on the park's key resources. Because a comprehensive and detailed overview of interpretive services in CTNP was not available from publically-accessible documents a detailed inventory of CTNP's interpretive services was included as the first step of research at the site (details in methodology). Owing to the combined factors of increasing visitor pressures on CTNP and the wide range of personal and non-personal interpretation mechanisms implemented in the CTNP, the park was selected as a suitable case to conduct the research.

Methodology

The research primarily enlisted self-complete questionnaires followed by statistical analysis to

address the research aims. In addition, a site visit and three brief interviews with staff members in the park's Centre of Environmental Education and Services were conducted in accordance with cultural protocol for accessing CTNP and to identify a list of interpretive services offered in CTNP. Once the national park, its management approach and interpretive services were sufficiently understood a self-complete questionnaire survey for domestic and international park visitors was designed and subsequently administered at the entrance gate to CTNP as the primary entry and exit point. Self-complete questionnaires were selected as the survey instrument to ensure that as many respondents as possible could complete the survey at any one time, while on the other hand seeking to minimise any social-desirability bias that can arise from a researcher-assisted approach (Bowling, 2005). One of the authors was on-site to introduce the research, distribute the questionnaires, and to answer questions.

To make optimal use of IPA, separate pre-visit and post-visit questionnaires were designed. As a result of the three CTNP interviews, the site visit, and two pilot surveys at CTNP a list of eight interpretive services were included in the questionnaire. The importance as well as the performance of these services was assessed on a 5 point Likert scale from 1-not important at all to 5-extremely important, and from 1-poor to 5-excellent, respectively. A section on visitor motivation was also included to allow for motivation-based segmentation during the second phase of the analysis. The list of motivations was generated from visitor studies conducted in the context of natural protected areas (Table 1) and then assessed and adjusted for the context of CTNP. The importance of each motivation was also measured on a 5 point scale from 1-not at all important to 5-extremely important. The questionnaires were available in two languages: English and Vietnamese. In addition to seeking input on the draft pre-visit and post-visit questionnaires from academic colleagues, a pilot survey involving 26 pre-visit and 18 post-visit questionnaires was conducted at CTNP to assess the methodology, response options, as well as the wording and clarity

of the self-complete questionnaire in both English and Vietnamese. Based on the pre and pilot tests some refinements were implemented. These included the rearrangement of questions to improve the questionnaire's flow and the rewording of a few questions to improve clarity. The survey was subsequently conducted with domestic and international visitors between 6th August and 2nd September 2016. Pre-visit questionnaires were distributed from 10am to 1pm and post-visit questionnaires were distributed from 3pm to 5pm, because these time frames were identified as the peak times during which visitors enter and exit the national park.

On the research days all visitors waiting to cross the river to enter CTNP were invited by one of the researchers to complete the self-complete questionnaires. Those who agreed to participate after reading the information sheet received a pre-visit questionnaire. In order to overcome the challenge of matching pre-visit and post-visit questionnaires (Wang & Davidson, 2010), plastic-coated playing cards were distributed along with the pre-visit questionnaire upon entry. Playing cards were a suitable tool for tracking respondents in this rugged and humid outdoor environment because they are small, easily stored, distinctive and waterproof for protection against rain. Upon exiting CTNP, either on the afternoon of the same day or a day or two days later, pre-visit respondents were invited to complete a post-visit questionnaire which was then matched to the pre-visit one with the help of the playing card. Only questionnaires collected as a matched pre- and post-visit set were included in the analysis.

A total of 316 visitors agreed to participate in the survey while 335 declined; leading to a response rate of 48.5%. Reasons for the declines were not always clear but time constraints were cited by some, as were linguistic difficulties by those who were neither proficient in Vietnamese nor in English. From the 316 visitors who agreed, 304 usable pre-visit questionnaires were returned.

However, only 237 usable post-visit questionnaires were ultimately collected and matched to the pre-visit questionnaire, resulting in a second round response rate of 77.9%. The analysis of the survey data was guided by the study's three research aims. The first aim was addressed through the brief interviews with park staff, the site visit and the first pilot survey. For the second aim, which sought to investigate IPA-based visitor responses to the environmental interpretation the IPA grid was constructed with grand means following advice by Oh (2001) and Ryan and Cessford (2003). In pursuit of the third aim, the process recommended by Frochot and Morrison (2000) was followed where factor analysis was adopted to initially identify the main factors of visitor motivations which served as dimensions for the cluster analysis. Cronbach's Alpha was subsequently used to test the internal consistency of the variables in each factor. The K-means clustering algorithm was then applied to the motivation factors to establish motivation-based segments before crosstabs were used to examine the relationship among categorical variables. Finally, ANOVA was performed to test for significant differences between clusters in terms of importance and performance ratings (Frochot & Morrison, 2009).

Importance – Performance Analysis produces a visual output in the form of a four quadrant grid which assists significantly with the analysis of the importance-performance findings. The top left quadrant is termed 'Concentrate here', which represents a high importance but low performance rating by consumers. 'Keep up the good work' is the top right quadrant, which represents high importance as well as a high performance ratings by consumers. Conversely 'Low priority' (bottom left quadrant) represents both low importance and low performance, while 'Possibly overkill' (bottom right quadrant) is rated as high performing but of low importance to consumers. While IPA is widely used Oh (2001) has identified common problems with IPA, which include that the criterion concept of importance has not been defined clearly in the IPA literature and that there are at times misunderstandings of the two core concepts (importance and expectation). In

this research, visitors were asked to rate the importance and performance of interpretive services where importance is different from a predictive expectation about future performance or an ideal expectation about the best performance of the service. Additionally, to minimize any potential bias the two question sets were separated into pre-visit and post-visit questionnaires. Further, Oh (2001) indicated that using actual means (grand means) versus scale means (midpoints of the scale) when drawing the grid can create different results, in response to which grand means were used in this study as they are commonly used in tourism research (Hu, Horng, Teng, & Yen, 2013; Ryan & Cessford, 2003).

The services for environmental interpretation in CTNP as well as the respondents' demographics and trip characteristics will now be briefly introduced as a foundation for the findings section. The three CTNP interviewees identified the services for environmental interpretation as interpretive signs, directional signs, brochures, site interpreters, a meeting room and a museum. However, staff at the ticket office was subsequently added based on the site visit and the museum was separated into two different services (staff at the museum and displays at the museum). Based on the feedback from the pilot questionnaire survey additional modifications were made by removing the meeting room and adding videos at the rescue centre. Eight services for environmental interpretation were ultimately included in the questionnaire: interpretive signs, directional signs, brochures at the ticket office, staff at the ticket office, site interpreters, staff at the museum, displays at the museum and videos at the rescue centre.

Of the 237 respondents 74.3% were domestic (176 respondents) and the remaining 25.7% (61 respondents) were international visitors. The largest groups of international visitors were US Americans followed by Australians, Japanese and Singaporeans (Table 2); just over half of all international visitors were from Western countries while the remainder were from countries with

Eastern culture. The sample is broadly consistent with the unpublished tourism statistics held by CTNP's Centre of Environmental Education and Services. There was a relative balance between the number of female (54.0%) and male (46.0%) respondents. The majority of respondents were between 15 and 34 years old (43.5%) and university graduates or post graduates (Table 3). Most respondents were free independent travellers (FIT) (64.6%) and the majority (67.1%) stayed two days and one night in CTNP. About half (53.2%) had not visited a national park in the last three years while 44.3% reported between one and three visits over that time frame. 90.3% of respondents stated that they had not visited CTNP in the last three years.

Table 2. Respondent Nationality

Category	Study sample (2016)		National Park Statistics (2015)	
	Number of respondents	Percentage (%)	Number of visitors	Percentage (%)
Total	237	100	26 664	100
Vietnamese	176	74.3	20 139	75.5
International	61	25.7	6 525	24.5
<i>American</i>	<i>10</i>	<i>4.2</i>	<i>261</i>	<i>1.3</i>
<i>Australian</i>	<i>7</i>	<i>3.0</i>	<i>130</i>	<i>0.6</i>
<i>Japanese</i>	<i>5</i>	<i>2.1</i>	<i>196</i>	<i>0.7</i>
<i>Singaporean</i>	<i>5</i>	<i>2.1</i>	<i>NA</i>	<i>NA</i>
<i>Thai</i>	<i>5</i>	<i>2.1</i>	<i>NA</i>	<i>NA</i>
<i>Chinese</i>	<i>4</i>	<i>1.7</i>	<i>NA</i>	<i>NA</i>
<i>Korean</i>	<i>4</i>	<i>1.7</i>	<i>196</i>	<i>0.7</i>
<i>British</i>	<i>4</i>	<i>1.7</i>	<i>848</i>	<i>3.2</i>
<i>Dutch</i>	<i>4</i>	<i>1.7</i>	<i>587</i>	<i>2.2</i>
<i>Belgian</i>	<i>4</i>	<i>1.7</i>	<i>457</i>	<i>1.7</i>
<i>Taiwanese</i>	<i>2</i>	<i>0.8</i>	<i>NA</i>	<i>NA</i>
<i>Cambodian</i>	<i>2</i>	<i>0.8</i>	<i>NA</i>	<i>NA</i>
<i>Other</i>	<i>5</i>	<i>1.3</i>	<i>NA</i>	<i>NA</i>

Source: CTNP Centre of Environmental Education and Services (2017)

Table 3. Respondent Demographic and Trip Characteristics

Demographic characteristics	Number of respondents	Percentage (%)
Gender	237	100
Female	127	53.6
Male	110	46.4
Age	237	100
25-34	93	39.2
45-54	64	27.0
35-44	61	25.7
15-24	10	4.20
55-64	9	3.80
Highest Educational level achieved	237	100
College/University Graduate	165	69.6
Vocational school	42	17.7
Postgraduate	25	10.5
High school	3	1.3
Secondary school	2	0.8
Trip related characteristics	Number of respondents	Percentage (%)
Mode of travel	237	100
Free independent traveller	153	64.6
Packaged tour	84	35.4
Length of stay	237	100
2 days and 1 night	159	67.1
1 day	78	32.9
Times visited national parks in the last 3 years	237	100
0 times	126	53.2
1-3 times	105	44.3
4-6 times	6	2.5
Times visited Cat Tien National Park in the last 3 years	237	100
0 times	214	90.3
Once	23	9.7

Findings

The findings section will initially present importance and performance ratings in relation to each of the identified eight interpretive services before the analysis is deepened by exploring similarities and differences between motivation-based visitor segments.

Visitor importance and performance ratings of interpretive services

The means of the importance ratings for the eight environmental interpretation services in CTNP are outlined in Table 4. The five services with the highest means were site interpreters (4.82), interpretive signs (4.67), videos (4.64), staff at the museum (4.58) and displays at the museum (4.44); the gap to the next service is more than 0.9. Table 4 also shows the mean performance ratings for the same eight services. The four highest-rated services received means in excess of 3.9. They were interpretive signs (4.45), site interpreters (4.03), staff at the museum (4.00) and brochures (3.94). Site interpreters, interpretive signs, staff at the museum, displays, and videos all received mean performance ratings that were lower than mean importance ratings.

Table 4. Means of the Importance and Performance Ratings for Services for Environmental Interpretation

Services for environmental interpretation	Importance Ratings			Performance Ratings		
	Importance (mean)	Rank order	Std Dev (SD)	Performance (mean)	Rank order	Std Dev (SD)
Site interpreter/local tour guide	4.82	1	0.39	4.03	2	0.34
Interpretive signs about the site	4.67	2	0.53	4.45	1	0.59
Videos at rescue centre	4.64	3	0.52	3.26	8	0.53
Staff at museum	4.58	4	0.64	4.00	3	0.49
Displays at museum	4.44	5	0.70	3.28	7	0.71
Brochure at ticket office	3.51	6	0.64	3.94	4	0.43
Directional signs	2.18	7	0.75	3.42	5	0.52

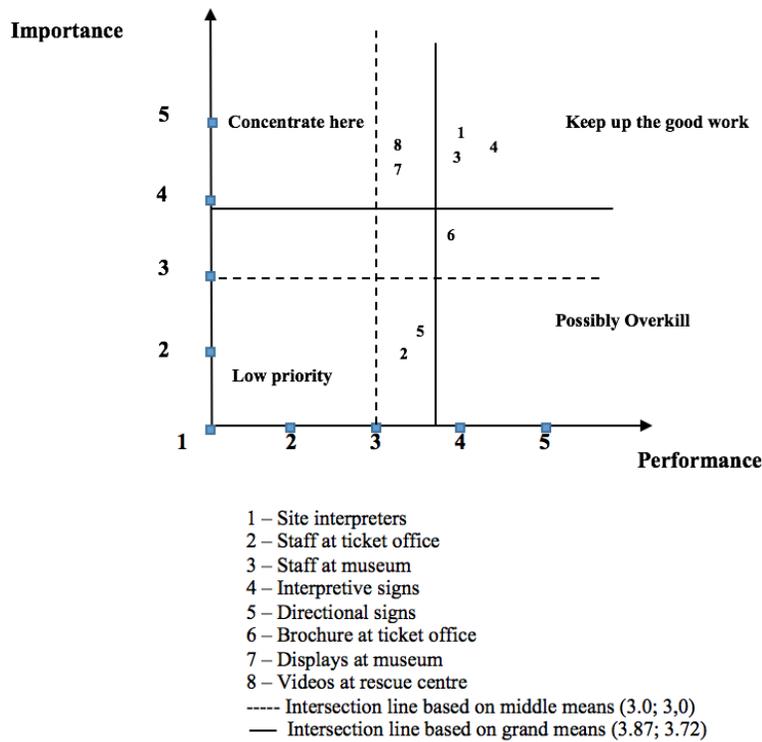
Staff at ticket office	2.03	8	0.71	3.34	6	0.50
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n=237 in all cases; importance rating means on 5-point scale: 1=not at all important, 5=extremely important; performance rating means on 5-point scale: 1=poor, 5=excellent

Importance-performance grid of services for environmental interpretation

The solid intersection lines represent the grand means (3.87; 3.72) and lead to the following four IPA quadrants (Figure 1) based on Martilla and James (1977). *Concentrate here* represents services considered very important but performing poorly, which applies to museum displays and videos. *Keep up with the good work* characterises interpretive services rated as very important and also performing very well; the findings reveal site interpreters, staff at the museum and interpretive signs to be located in this quadrant. *Low priority* highlights services rated low in terms of both importance and performance, which applies to staff at the ticket office and directional signs. Finally, the *Possibly overkill* quadrant illustrates which services performed well but are not perceived as very important, which applies to brochures. The results in Figure 1 suggest that the following services need to be improved, in order of priority: videos, displays, site interpreters, staff at the museum, interpretive signs, and brochures.

Figure 1. Importance-Performance Grid of Services for Environmental Interpretation



Visitor importance and performance ratings by motivation-based visitor groups

This section presents the similarities and differences in importance and performance ratings between motivation-based visitor groups; see details about the analytical methods employed in the methodology section. As illustrated in Table 5 the four most highly rated motivations are *to relax and rest* (4.44), *to enjoy scenic beauty* (4.43), *to view reptiles* (4.43) and *to view mammals* (4.42). These high means along with relatively low standard deviations show the consistency among visitor evaluations, emphasizing the importance of these four motivations for their visit. Although slightly less highly ranked, *to take photographs* and *to learn more about ecosystems* were also reported as important motivations with mean scores in excess of 4.0. The second most important set of motivations (with a means range from 3.68 to 3.91) is loosely focused around learning and novelty seeking and includes *to learn about reptiles*, *to learn about mammals*, *to learn about*

history of CTNP, for a totally new and different experience, to travel with friends and family and to escape from the daily life routine. In summary, Table 5 suggests that visitors came to CTNP mostly for relaxing, learning and novelty-seeking reasons.

Table 5. Means Scores for Motivation to Visit

Motivation statements	Mean	SD
M9-To relax and rest	4.44	0.65
M1-To enjoy scenic beauty	4.43	0.64
M5-To view reptiles	4.43	0.66
M3-To view mammals	4.42	0.68
M13- To take photographs	4.19	0.59
M2-To learn more about ecosystems	4.05	0.67
M6-To learn about reptiles	3.91	0.78
M4-To learn about mammals	3.90	0.79
M7-To learn about history of Cat Tien National Park	3.89	0.73
M8-For a totally new and different experience	3.84	0.85
M12-To travel with friends and family	3.84	0.95
M10-To escape from the daily life routine	3.68	0.93
M11-To meet people with similar interests and hobbies	3.17	0.96

Means calculated on 5-point scale: 1=not at all important, 5=extremely important

Factor analysis

Before conducting factor analysis, the data set was assessed for its suitability. The sample size, inter-correlations among variables, KMO measure and Bartlett's test were examined. Inspection of the correlation matrix showed that all variables had at least one correlation coefficient greater than 0.3. The KMO value for this sample size was 0.757, which is considered high according to Blaikie (2003), while Bartlett's Test of Sphericity was significant at $p < .0005$. These tests show

that factor analysis can be applied. Factor analysis revealed two factors that had eigenvalues greater than one and explained 60.5% of the total variance: they were labelled *Learning* and *Experience* according to the common features of the motivational variables included in each factor (Table 6). According to Blaikie (2003) and Field (2013), the importance of a variable to a factor can be measured by the factor loadings. Cronbach's alpha was used to test the reliability of the factors created and coefficients of factor 1 and factor 2 were 0.834 and 0.728 respectively, meaning that the variables within each factor were internally consistent. The mean for factor 1 (learning) was 3.89 (SD = 0.59), while the mean for factor 2 (experience) was 3.99 (SD = 0.56).

Table 6. Factor Analysis of Motivations to Visit Cat Tien National Park

Factor loadings		
Motivational variables	Factor 1 Learning	Factor 2 Experience
M6 - To learn about reptiles	0.938	
M7 – To learn about the history of CTNP	0.922	
M2 – To learn more about ecosystems	0.879	
M5 – To view reptiles	0.718	0.339
M11 – To meet people with similar interest and hobbies	0.471	
M9 – To relax and rest		0.802
M13 – To take photographs		0.744
M10 – To escape from the daily life routine		0.702
M12 – To travel with friends and family		0.659
M8 – For a totally new and different experience		0.594
Eigenvalues	3.388	2.662
Variance explained (%)	33.9	26.6
Scale mean	3.89	3.99
Standard deviation	0.59	0.56
Cronbach's alpha	0.834	0.728

Principal Component Analysis with Varimax orthogonal rotation; all loadings smaller than 0.3 have been omitted from the table

As the identified motivations may influence visitors' importance and performance ratings visitors were clustered into motivation-based groups to explore whether demographic features, trip-related characteristics and responses to the interpretive services differ depending on the motivation to visit CTNP.

Cluster analysis

This study used the K-means clustering method, in which the number of clusters had to be identified at the first stage. The elbow method (Frochot & Morrison, 2000) determined that four clusters are optimal, resulting in K-means clustering being used to assign respondents to four clusters/visitor groups. Table 7 shows that cluster membership was reasonably evenly distributed in the four cluster solution: 70 cases in cluster 1; 56 cases in cluster 2; 56 cases in cluster 3, and 52 cases in cluster 4. To interpret the visitor group profiles, each visitor group was labelled according to the importance they assigned to the different motivational factors. Group 1 had relatively high means for factors *Learning* and *Experience* and this visitor group was named *Enthusiasts*. Group 2 had lower means for both factors; thus, it was labelled *Passive visitors*. Group 3 had the highest mean for *Learning* but a relatively low mean for the *Experience* factor in comparison with the means of the three other clusters; therefore, the group was labelled *Active learners*. The last cluster had a high mean for *Experience* and the lowest mean for the *Learning* factor; hence, it was called *Novelty seekers*.

Table 7. Mean Comparison of Motivation Factors by Cluster

Factors	Clusters			
	Cluster 1 Enthusiasts n=70	Cluster 2 Passive visitors n=56	Cluster 3 Active learners n=56	Cluster 4 Novelty seekers n=52
Learning	4.15	3.41	4.56	3.36
M6 - To learn about reptiles	4.10	3.45	4.86	3.15
M7 – To learn about the history of CTNP	4.10	3.45	4.73	3.21
M2 – To learn more about ecosystems	4.20	3.63	4.77	3.54
M5 – To view reptiles	4.86	3.80	4.86	4.15
M11 – To meet people with similar interest and hobbies	3.50	2.75	3.59	2.75
Experience	4.51	3.40	3.69	4.29
M9 – To relax and rest	4.89	3.95	4.04	4.83
M13 – To take photographs	4.50	3.86	3.89	4.44
M10 – To escape from the daily life routine	4.39	2.75	3.46	3.96
M12 – To travel with friends and family	4.30	3.25	3.46	4.27
M8 – For a totally new and different experience	4.46	3.18	3.61	3.94

Visitor Groups’ Demographic Profiles and Trip Characteristics

As highlighted in Table 8 *Enthusiasts* tended to be domestic visitors (88.6%) with bachelor degrees (72.9%) who are female (64.3%). *Passive visitors* were domestic or international visitors with a

high educational level; this cluster had the highest rate of those holding postgraduate degrees (23.2% of the total cluster) in comparison with the other three clusters. *Active learners* were predominantly domestic visitors (58.9%) and the only cluster dominated by males (62.5%). *Novelty seekers* are domestic visitors (98.1%) who are female (59.6%) with a Bachelor’s degree (75%). *Passive visitors* and *Active learners* include the largest proportion of international visitors, with 50% and 41.1% respectively. With regard to trip characteristics clear patterns also emerged. For instance, *Enthusiasts* tend to stay for two days and one night (67.1%) and have not visited a national park in the last three years (58.6%). *Passive visitors* (73.2%) and *Active learners* (76.8%) also tended to spend two days and one night in CTNP, but the majority had visited other national parks in the last three years, with 57.1% and 58.9% respectively. *Novelty seekers* on the other hand tend not to have visited national parks in the last three years (71.2%) and half only stay for one day in CTNP.

Table 8. Demographic Profiles and Trip Characteristics by Visitor Group

Visitor Groups	Enthusiasts n=70	Passive visitors n=56	Active learners n=56	Novelty seekers n=52	Total n=234
	%	%	%	%	%
Nationality					
International visitors	11.4	50.0	41.1	1.9	25.6
Domestic visitors	88.6	50.0	58.9	98.1	74.4
Gender					
Female	64.3	50.0	37.5	59.6	53.4
Male	35.7	50.0	62.5	40.4	46.6
Educational level					
Secondary school	21.4	14.3	21.4	21.2	19.7
University Graduate	72.9	62.5	69.6	75.0	70.1
Postgraduate	5.7	23.2	8.9	3.8	10.3
Age					
15-34	51.4	35.7	37.5	46.2	43.2
35-44	12.9	35.7	32.1	26.9	26.1

45 and over	35.7	28.6	30.4	26.9	30.8
Length of stay					
For 1 day	32.9	26.8	23.2	50	32.9
2 days and 1 night	67.1	73.2	76.8	50	67.1
Any National park visited (in last 3 years)					
0 times	58.6	42.9	41.1	71.2	53.4
One or more times	41.4	57.1	58.9	28.8	46.6
Mode of travel					
FIT	75.7	58.9	57.1	65.4	65.0
Packaged tour	24.3	41.1	42.9	34.6	35.0
CTNP visited (in last 3 years)					
0 times	84.3	92.9	96.4	88.5	90.2
One or more times	15.7	7.1	3.6	11.5	9.8

The importance of services for environmental interpretation by visitor group

Table 9 highlights that the importance rating of site interpreters, interpretive signs, videos, staff at the museum and museum displays remained high (>4.0), while the evaluations of the importance of staff at the ticket office, brochures and directional signs were low to very low across clusters (an average between 2.0 and 3.7). Site interpreters, interpretive signs, videos and museum staff were the four most important services for three groups, *Enthusiasts*, *Passive visitors* and *Novelty seekers*. Meanwhile, while interpretive signs were comparatively less important to *Active learners* (compared to other services) they were nevertheless important (mean score >4).

Table 9. The Importance of Interpretive Services by Visitor Group

Importance of services for environmental interpretation	Overall sample n=237		Enthusiasts n=70		Passive visitors n=56		Active learners n=56		Novelty seekers n=52	
	Mean	RO	Mean	RO	Mean	RO	Mean	RO	Mean	RO
Site interpreter	4.82	1	4.86	1	4.67	1	4.93	1	4.90	1
Interpretive signs	4.67	2	4.79	2	4.45	2	4.70	5	4.77	2

Videos at rescue centre	4.64	3	4.73	3	4.42	3	4.78	2	4.66	4
Staff at museum	4.58	4	4.56	4	4.34	4	4.76	3	4.67	3
Displays at museum	4.44	5	4.32	5	4.26	5	4.72	4	4.49	5
Brochure	3.51	6	3.69	6	2.98	6	3.71	6	3.62	6
Directional signs	2.18	7	2.04	8	2.16	7	2.25	7	2.29	7
Staff at ticket office	2.03	8	2.10	7	1.87	8	2.07	8	2.08	8

Means calculated on 5-point scale: 1=not at all important, 5=extremely important

ANOVA testing did not return significant differences in the importance ratings for staff at the ticket office, staff at the museum, and directional signs across visitor groups. However, statistically significant differences were identified for site interpreters, interpretive signs, brochures, museum displays and videos (all p -values <0.00625). Bonferroni post-hoc tests were then applied to identify where the differences occurred. The results show that the mean ratings for site interpreters, displays and videos at the rescue centre by *Passive visitors* were significantly lower than by *Active learners*, although the mean scores were high for both groups (all $p < 0.0083$). Additionally, the importance rating for interpretive signs from *Passive visitors* was significantly lower than from *Enthusiasts*, although all mean scores by both groups were again high ($p=0.005$). The mean rating for brochures by *Passive visitors* was significantly lower than by three other clusters (all $p < 0.001$). Finally, the importance of museum displays assessed by *Active learners* was significantly higher than by *Enthusiasts* ($p=0.003$).

The performance of services for environmental interpretation by visitor group

Interpretive signs, site interpreters, staff at the museum and brochures received high performance scores while directional signs, staff at the ticket office, displays and videos were bottom of the ranking in all four visitor groups (Table 10). The results from ANOVA testing identify a

statistically significant difference in the performance rating for interpretive signs ($p < 0.001$) and the Bonferroni post-hoc tests demonstrate that *Enthusiasts* and *Novelty seekers* provided significantly higher performance scores than *Passive visitors* and *Active learners* (all $p < 0.0083$). However, there was no significant difference in the performance ratings for the remaining seven interpretive services across clusters (all $p > 0.0083$).

Table 10. The Performance of Interpretive Services by Visitor Group

Performance of services for environmental interpretation	Overall sample n=237		Enthusiasts n=70		Passive visitors n=56		Active learners n=56		Novelty seekers n=52	
	Mean	RO	Mean	RO	Mean	RO	Mean	RO	Mean	RO
Interpretive signs	4.45	1	4.66	1	4.25	1	4.27	1	4.65	1
Site interpreter	4.03	2	4.05	3	4.00	2	3.96	3	4.13	2
Staff at museum	4.00	3	4.08	2	3.85	4	4.00	2	4.05	3
Brochure at ticket office	3.94	4	4.00	4	3.91	3	3.91	4	3.90	4
Directional signs	3.42	5	3.39	6	3.63	5	3.32	6	3.38	5
Staff at ticket office	3.34	6	3.49	5	3.22	8	3.27	8	3.37	6
Displays at museum	3.28	7	3.32	7	3.26	7	3.28	7	3.23	7
Videos at rescue centre	3.26	8	3.14	8	3.36	6	3.37	5	3.09	8

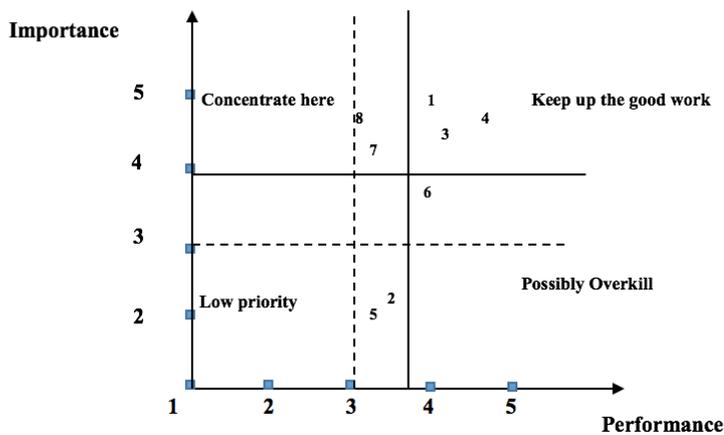
Means calculated on 5-point scale: 1=poor, 5=excellent

Importance-performance grid by visitor group

Figure 2 (a, b, c, d) illustrates the importance-performance grids for the four visitor groups. The solid intersection line was drawn according to the grand means of each cluster (Figure 2). The results illustrate only moderate differences in the positions of interpretive services across the four visitor groups. For instance, site interpreters, interpretive signs and staff at the museum are in the *Keep up the good work* quadrant in all cases. Museum displays and videos are in the *Concentrate*

here quadrant and the *Low priority* quadrant contains staff at the ticket office and directional signs. Variations, although relatively small, are nevertheless evident for directional signs and brochures. For example directional signs migrate nearer to the *Possibly overkill* quadrant in the *Passive Visitor* grid (Figure 2b), while brochures are in a lower position within the *Possibly overkill* quadrant for the same visitor group than in the grids of the other three groups.

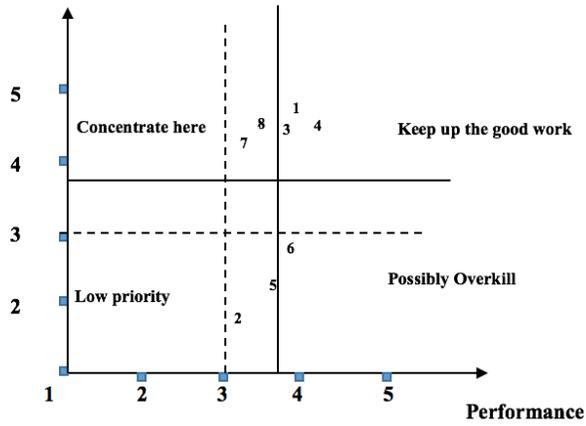
Figure 2. Importance-performance Grids for Interpretive Services by Visitor Group



- 1 – Site interpreters
- 2 – Staff at ticket office
- 3 – Staff at museum
- 4 – Interpretive signs
- 5 – Directional signs
- 6 – Brochure at ticket office
- 7 – Displays at museum
- 8 – Videos at rescue centre
- Intersection line based on middle means (3.0; 3.0)
- Intersection line based on grand means (3.89; 3.77)

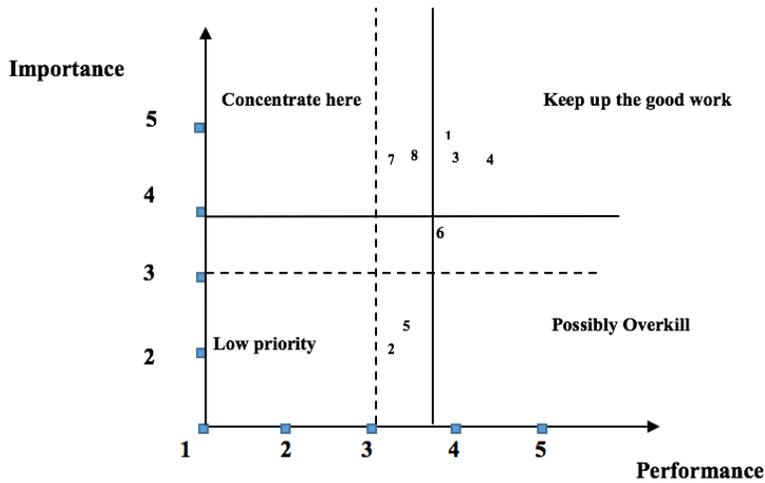
2a Enthusiasts

Importance



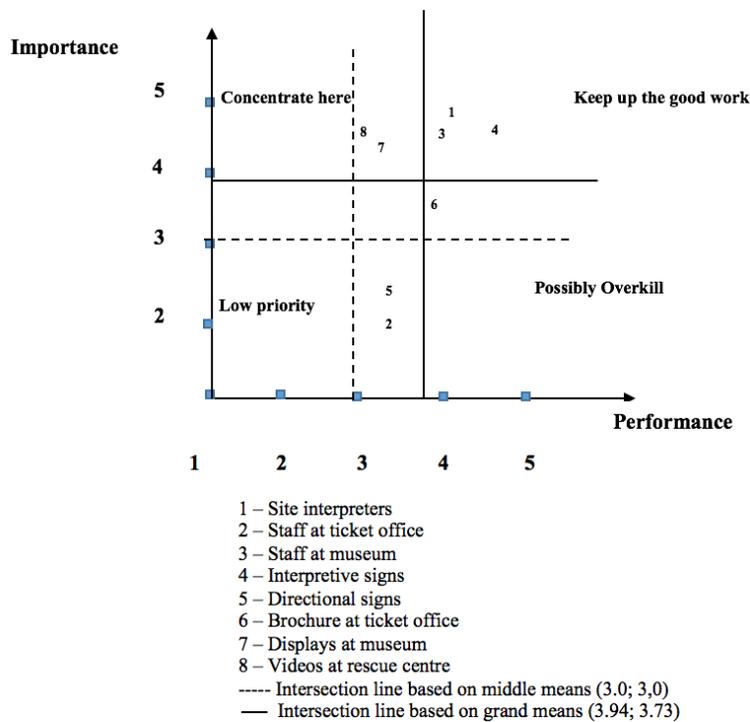
- 1 – Site interpreters
- 2 – Staff at ticket office
- 3 – Staff at museum
- 4 – Interpretive signs
- 5 – Directional signs
- 6 – Brochure at ticket office
- 7 – Displays at museum
- 8 – Videos at rescue centre
- Intersection line based on middle means (3.0; 3.0)
- Intersection line based on grand means (3.70; 3.69)

2b Passive visitors



- 1 – Site interpreters
- 2 – Staff at ticket office
- 3 – Staff at museum
- 4 – Interpretive signs
- 5 – Directional signs
- 6 – Brochure at ticket office
- 7 – Displays at museum
- 8 – Videos at rescue centre
- Intersection line based on middle means (3.0; 3.0)
- Intersection line based on grand means (3.99; 3.67)

2c Active learners



2d Novelty seekers

Discussion

From the perspective of all visitors, regardless of motivation-based cluster, site interpreters were identified as the single most important service, followed by interpretive signs, videos, staff at the museum, and museum displays. The significant and continued importance of site interpreters is interesting in the face of interpretation studies increasingly investigating and supporting the use of technology-based solutions (Tan & Law, 2016), including recent innovations such as Augmented Reality for interpretation (Amakawa & Westin, 2018). The importance of site interpreters is also reflected in Wei-ching's (2015) Taiwanese study which found interpretation by tour guides to be very important for visitors to Taijiang National Park. Tour guides were again identified to be of high importance to visitors in a China-based study by Xu et al. (2003) where the Western approach to environmental interpretation, which included self-guided rather than guided interpretation, was

not popular with domestic visitors. Similarly, the importance for Vietnamese national park visitors to be part of a group, and ideally be guided by an expert, was echoed by Do, Weaver, and Lawton (2015) who found that fear of dangerous animals, such as tigers and snakes, as well as of ghosts, a Taoist and Buddhist cultural characteristic (Peng, 2007), underlies this preference. However, in a New Zealand-based study examining interpretation for cultural landscapes guided walks were assigned the lowest importance by domestic New Zealand visitors (Carr, 2004), while in the Ocala National Forest in Florida (USA) museums and interpretive signs were the most desired services by visitors (Stein, Denny, & Pennisi, 2003). In combination, these findings suggest that different cultures hold differing preferences for interpretive services with respect to guided interpretation in particular; bearing in mind that three quarters of respondents in this study are domestic Vietnamese visitors. Possible reasons for the differing levels of importance across cultures was already alluded to above by Do et al. (2015), who elaborate that the high level of collectivism in Vietnamese culture, along with a fear of spirits grounded in Buddhism, is reflected in this preferences for (guided) groups during visits to national parks, rather than exploring on their own. In their qualitative study Do et al. (2015) make the point that this cultural approach is shared by other East Asian countries such as China, Thailand and South Korea, which aligns with Wei-ching's (2015) Taiwanese study. In highlighting broader differences between Western and Eastern cultural paradigms, it is important to note that this observation extends beyond the commonly applied binary distinction of domestic versus international visitors, as nearly half of the international visitors in this research were from other East Asian countries (Table 2).

When examining the park services' performance ratings the highest scores were reported for interpretive signs, followed by the two most prominent personal interpretive services, site interpreters and staff at the museum. Consistent with the earlier observation about cultural differences, Tsang et al. (2011) and Xu et al. (2013) both found that guided interpretive tours

receive very high performance scores in Hong Kong and mainland China, respectively. By contrast, respondents provided comparatively low performance scores for directional signs and staff at the ticket office. Through comment fields in the questionnaires several visitors explained that some of the safety signs were faded, unclear and overall in need of replacement, which is a concern for CTNP management as ineffective directional signs are the main cause for visitors getting lost (Xu et al., 2013). Respondents also expressed concern that CTNP should add safety signs in places where dangerous animals (e.g. snakes and tigers) are present, which resonates with Do et al.'s (2015) insightful observation that many Vietnamese feel safer in big cities than in national parks. Other interpretive services which received low performance ratings included videos and museum displays. Some visitors commented that the quality of videos was poor and that the audio volume was too low, implying the videos were not effective. This is an important concern for CTNP's Centre of Environmental Education and Services as Komatsu and Liu (2007) have demonstrated a high level of effectiveness in the use of videos for the purpose of changing visitors' attitudes and behaviours towards environmental issues.

The grid that maps the relationship between visitors' importance and performance ratings of the eight interpretive services illustrates that videos at the rescue centre and displays at the museum received high importance scores but low performance ratings, thus exacerbating the shortcoming discussed in the previous paragraph. Interpretive signs, site interpreters and staff at the museum are the three services assigned both the highest importance and performance (*keep up the good work*). As discussed earlier, the performance of these three services needs to be carefully measured and maintained to retain positive visitor feedback across the board, but in particular for the large majority of visitors with Eastern cultural background that have expressed high levels of importance for personal interpretive services. Staff at the ticket office and directional signs on the other hand should receive low attention from CTNP's Centre of Environmental Education and Services as

these services received both low importance and low performance ratings. Finally brochures are best described as *possibly overkill* as their performance was rated higher than their importance. In short, many services did not perform well in the eyes of the respondents. Xu et al. (2013) make the point that a lack of clear guidelines for environmental interpretation in national park coupled with a lack of visitor input may lead to unsuitably designed interpretive services. Moreover, some services such as videos and directional signs were designed by experts from external organisations who had little knowledge about the national park and the audience; hence, the design of these services may not have been optimal for the purpose. Effective design of interpretive services can be achieved through a deep understanding of visitors' perceptions of a service's importance and performance, and maximised through a nuanced understanding of different visitor segments (Hendricks et al., 2004). Stein et al. (2003) found that visitors to natural areas hold a variety of motivations and consequently require different services and facilities to attain them, while also arguing that designing services and facilities according to different motivations can support the sustainable development of natural areas. Similar to Tarrant, Bright, Smith and Cordell's (1999) observations in the context of outdoor recreation attributes, the IPA grids for the study's four motivation-based visitor groups highlight notable differences with regard to importance ratings, but few with respect to performance ratings

Following Hendricks et al.'s (2004) approach, the current study also used statistical tests to identify significant differences between the importance and performance ratings across visitor groups. Significant differences were identified for importance of site interpreters, interpretive signs, brochures, displays and videos. For instance brochures were comparatively low in importance for *Passive visitors* while they were important to *Enthusiasts*, *Active learners* and *Novelty seekers*. This difference could be argued to be linked to a visitor group's level of anticipated engagement with the national park and its features, as brochures offer the convenience of portability and a map

(Carr, 2004) which supports deeper engagement. This difference has managerial implications for identifying which groups of visitors to include in consultation about interpretive services, for instance when designing/redesigning brochures, and when designing targeted interpretive services more broadly (Wearing & Archer, 2003). In terms of performance, it is interesting to note that interpretive signs, site interpreters, staff at the museum and brochures are reported to be the top four services by all four visitor groups. Although not as unanimous, the four groups also broadly agree on the lowest performing services (videos and museum displays). The low performance ratings received by these services is concerning and adds urgency in view of the high importance scores attached to videos and museum displays. Conversely a significant difference in the performance rating was found with respect to interpretive signs, where *Enthusiasts* and *Novelty seekers* scored them higher than *Passive visitors* and *Active learners*; the reasons for this difference are not clear from the survey and further research is thus required before management can effectively address any shortcomings.

The key finding of this IPA-based visitor segmentation is that distinct visitor segments were identified that display both similarities and differences in their importance and performance assessment of interpretive services in CTNP. From a managerial perspective this nuanced understanding of the broad population generally referred to as ‘park visitors’ is valuable as similarities are just as insightful as differences when consulting about and designing interpretive services (Moscardo, Ballantyne, & Hughes, 2007). Nonetheless, particular note should be taken of the differing importance ratings between the groups as the motivational drivers of the four different visitor groups exhibit some tentative parallels with the visitation characteristics.

Conclusion

Environmental interpretation is a very important tool for any protected natural area. However, this research topic has not received significant attention from national parks management in Vietnam; neither at a central government nor at a local government level. Effective design of interpretive services has not only been credited with enhancing the visitor experience but also with helping to ensure better management of on-site visitors, minimizing negative visitor impacts on protected areas, and increasing visitor numbers in a sustainable manner (Eagles & McCool, 2002; Kuo, 2002; Mason, 2005; Munro et al., 2008). In this research site interpreters, interpretive signs, and staff at the museum are all considered very important as well as receiving high performance scores, which constitutes very positive feedback for CTNP management. On the other hand, museum displays and videos failed to receive high performance ratings from the respondents and are thus identified as the highest priority for redesign, due to their high importance to visitors.

Based on the research findings a number of recommendations can be formulated for Vietnam's national tourism organizations and CTNP management. First, central government and the Vietnam National Administration of Tourism should play an important role in guiding the development of interpretation systems in national parks and other protected areas. It emerged from informal conversations in the field that a lack of guidance from central government is widely regarded as one of the reasons for the shortcomings with regard to environmental interpretation in CTNP. At the same time CTNP should also adopt a more structured approach to ensuring that visitors are aware of interpretive services available and of the national park itself by directing visitors to the museum at the beginning of their visit to initially watch (redesigned) information and safety videos; indeed introductory videos could also be made available to visitors via other media both before and during the visit (Komatsu & Liu, 2007). Furthermore, the findings suggest that more

use should be made of audio and/or visual interpretation, which is echoed by interpretation studies in other continents (van der Merwe, Saayman, & Botha, 2019). The value of audio media for interpretation is now well established (Hristov, Naumov, & Petrova, 2018), and audio media can be used, or even placed longer term, in outdoor environments due to the technology's high resilience to moisture. However, when designing both video and audio content for interpretation it is important to consult users about the media's and content's appropriateness, and to ensure that information about the impacts of humans on ecosystems and the environment is included as part of the overall message (Tsang et al., 2011). The research has also underscored the importance of not treating visitors to protected areas as a homogenous group of people and that in the design, maintenance and evaluation of interpretive services different visitor groups need to be considered. While motivation-based segmentation proved very insightful in this study it also became clear that broader differences in the cultural backgrounds of visitors appear to be important in understanding both their importance and performance rating of interpretive services. As CTNP represents a park with comparatively high levels of interpretive services and management, these findings are relevant to other protected areas in Vietnam which have less resourcing and management support. Equally, the stage of tourism development in neighbouring countries, such as Cambodia and Laos, suggests that this research will also be of value to the management of protected areas in those countries as broad parallels are likely to exist. From a visitor experience management perspective the findings related to culturally-anchored preferences for guided versus self-guided interpretation are likely to be relevant for many countries, far beyond the countries of South East Asia.

Areas of further research include studies conducted in other seasons and over the coming years as Farnum and Hall (2007) argue that seasonal bias can affect visitor feedback. Frochot and Morrison (2000) also suggest that studies employing benefit segmentation should be conducted every two

or three years because benefit segments may change due to internal and external factors, which has implications for the park's interpretation and management plan. Additionally, there is a need to conduct further research using in-depth interviews or focus groups with different visitor segments to gain a more detailed understanding of their needs and preferences for environmental interpretation. A nuanced examination of visitors' cultural backgrounds appears particularly pertinent in this context as cultural paradigms may provide insights into preferences and visitor satisfaction; deepening our understanding beyond a basic East-West cultural distinction would be particularly fruitful. Finally, this research only examined visitors' perceptions of the importance and performance of currently available services. Research on visitor demand of other services should also be conducted to consolidate the environmental interpretation systems in CTNP.

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