

## Developing Visitors' Perception Indicators on Giant Panda Conservation Centre, Zoo Negara, Malaysia

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**Abstract:** This paper interpreted the findings for the development of key factors that determine the visitors' perception on the facilities and services at the Giant Panda Conservation Centre (GPCC). Information from previous studies related to perception on zoos are combined with newly found variables obtained through initial visits to the study site have produced a new set of measurement scale. Factor analysis is used as a data reduction method. The significant variables are extracted and regrouped accordingly into several factors that generate a new set of scales. As a result, 30 statements are derived that significantly contribute in determining the visitors' perception on GPCC for conservation purposes; the variables are regrouped into 9 thematic indicators. The indicators as perceived by the visitors could be useful for the management in future development of the centre and in the provision of essential services and facilities.

**Key words:** Conservation • GPCC • Measurement • Awareness • Expenditure • Factor Analysis

### INTRODUCTION

Zoo associations describe their main objective as engagement in the promotion of "animal care and welfare, conservation of biodiversity, environmental education and global sustainability" [1]. Recently, many zoos realise that conservation and education are related to each other [2]. Based on the zoos' professional organization role, visitors should learn about certain conservation issues surrounding the displayed animal species and need to actively protect nature as a whole [3]. Zoo is one of the few available opportunities to experience living 'wild' animals in the context of choreography display to deliver conservation messages in the same way that the domesticated animals cannot [4]. Furthermore, the zoo visitors show a higher degree of humanistic attitudes to animals than the non-visitors, this can be observed as they tend to reveal emotional bonds to animals as similar as they give to human [5]. Therefore, zoo provides a distinctive exhibition

to visitors that is not only extensive and heterogeneous but also probably to be expected to value and care about animals [2].

**Visitors' Perception Towards Zoo:** As one of the conservation organizations, a zoo must provide opportunities to ensure that their visitors' interpretation and awareness obtained from the zoo experience will influence their behavioural change which will then lead to their support for environmental protection. This objective is consistent with the methods being developed in evolving the psychological disciplines of conservation, where emphasis is placed on the outcome of human behaviour and knowledge that can lead to protection of the environment [6]. One of the methods that can be used to reflect the zoo experiences that is related to a zoo's conservation mission is to look carefully on how the zoo's visitors portray the meaning of their experiences and whether these built up meanings can be supported in the development of changed conservation values [2].

The zoo exhibits may lead to a more metaphorical or empathic considerations of the animals exhibited regardless of the content of the exhibition meant by the zoo [7]. Furthermore, it has been suggested that the zoo visitors value the chance not only to deal with wild animals but to use this encounter to “explore their own environmental identities”, and “to contemplate human responsibility to the biological world” [8]. Thus, by observing the behaviour of the animals it would be possible for the visitors to define the meaning to be human as well as to consider the actual and the ideal relationship between human and nature.

Visitors may be able to learn more about conservation from the visit to the zoo if the visit could result in a very enjoyable experience for the existence of animals, creating an experience that encourages empathy with animals [2]. Even though several researchers have stated that there is the possibility that zoos may promote the impression of sadness or distance from animal [9, 10]. But, other researcher suggested that zoos allow empathy connections that can increase the desire to manage animals in zoo, and consequently, for the species and ecosystems that those animals live [11]. An example of the conservation-learning outcomes is shown by the research done at the Bronx Zoo on the gorillas, it has proven that the personal interaction between human and gorillas are positive, and has led to heighten the conservation concern of the animals [12]. They have also exposed that these concerns are connected to exhibit engagement and show that the zoo have the ability to achieve a high level of conservation-learning outcomes.

It has been suggested that in the environment of the zoo, the chances of interaction will increase empathy or/and the feeling of shared identity with the animal. Both perceived similarity [13, 14] and empathy [14, 15] seem to promote greater concern for animals [16]. The willingness to devote resources to protecting monkey is collaborated with a perception of the monkey being similar to humans and that with the feeling of self being interdependent with the natural world [17].

In a study on the visitors to the GPCC, it is indicated that there is a positive significant relationship between awareness on giant panda conservation and self-employment towards intention to visit GPCC in the near future [18]. This is an indication that the visitors to the GPCC are aware and concerned about this endangered species. The study of the visitors to the GPCC are found to be willing to pay for the program for the conservation of the giant panda in Malaysia [19].

**Objectives:** Based on the literature above, it can be concluded that, there are limited studies that are focusing on the measurement scales of the perception of the visitors towards GPCC. To fulfil this literature gap, this study will investigate and measure the visitors’ perception of GPCC.

## MATERIALS AND METHODS

A multiple stage sampling design was used in this research which involved a process of stratification and followed by a systematic selection of the sampling unit from each stratum; in each group the first, middle and last persons were taken as respondents [20]. In this scenario, the visitors to the Zoo Negara were stratified by selecting visitors who were visiting the GPCC only. The total visitors to the centre from December 2015 to November 2016 was 384,089. Thus the sample size based on the total number of visitors by using Ryan’s formula was at least 250 with a confident level at 95% [21]. The instrument used for this study was the survey questionnaire. The items in the factors were combinations of compatible questions from previous studies and newly develop questions.

Table 1: Total Number of Visitors at GPCC

Month	2014	2015	2016
January	-	17,283	30,882
February	-	22,689	43,735
March	-	19,748	30,325
April	-	16,752	23,117
May	-	22,514	34,669
June	-	21,299	29,519
July	41,632	16,394	40,197
August	35,057	20,085	35,707
September	44,668	16,603	40,683
October	33,057	12,616	41,307
November	34,151	23,587	33,948
December	46,569	30,986	51,851
TOTAL	235,134	240,556	435,940

Source: Zoo Negara Malaysia (2016)

## RESULT AND DISCUSSION

**Demographic Profiles:** 350 sets of questionnaire distributed to the visitors and only 335 sets of questionnaire are used and analyzed for this study; the response rate is 95%. 161 respondents are males (48.1%) and 174 are females (51.9%). In terms of age, nearly half (41.5%) of the respondents fall under the 25 to 34 age category, while 25.7% are in the 35 to 44 age category, this is followed by the under 25 years age category with 24.2%, those in the 45 to 54 age category form 6.3% and finally 2.4% are under age category of more than 55.

Table 2: Sociodemographic Characteristics of Respondents

Variables	Items	Frequency	Percentage (%)
Gender	Male	161	48.1
	Female	174	51.9
Age	Under 25	81	24.2
	25 – 34	139	41.5
	35 – 44	86	25.7
	45 – 54	21	6.3
	More than 55	8	2.4
Education Level	Secondary School	55	16.4
	STPM /Diploma	83	24.8
	Bachelor Degree	170	50.7
	Master Degree	25	7.5
	PhD	2	0.6
Occupation	Student	61	18.2
	Government Sector	93	27.8
	Private Sector	124	37
	Self-employed	39	11.6
	Retired	7	2.1
	Housewife	11	3.3
Monthly Income	Under 2000	19	5.7
	2000 – 3999	144	43
	4000 – 5999	94	28.1
	6000 – 7999	44	13.1
	8000 – 9999	7	2.1
	More than 10000	27	8.1

In terms of highest education level attained by the respondents, half of the respondents (50.7%) have obtained the bachelor degree education, 24.8% have the STPM/Diploma education level, 16.4% of the respondents have the secondary school level education, followed by 7.5% master degree education and lastly 0.6% at PhD level. Based on the level of education it indicates that people with higher education could be expected to have more sensitivities towards conservation of endangered wildlife since with higher level of education the visitors would have obtained more information on the impacts of conservation. One of the objectives of the establishment of the zoo is to educate people on environmental and conservation issues.

Approximately 37.0% of the visitors sampled are private sector employees, 27% of them work in the government sector, 18.2% are students, while 11.6% are self-employed, only 3.3% of respondents are housewives and 2.1% are retirees. With the mean salary of RM4867.31, majority (43.0%) of the respondents earn salary from RM 2000 to RM 3999 per month, second highest at 28.1% of the respondents earn between RM 4000 to RM 5999 per month, followed by 13.1% who earn RM 6000 to RM 7999;

5.7% of them earn below RM 2000, 8.1% earn more than RM 10000, and finally only 2.1% of the respondents earn salaries of between RM 8000 to RM 9999 a month. Visitations to the zoo do require some level of expenditure; the cost could be significant especially if the visit is a family visit. Given that the majority of the visitors are wage earners, it can be concluded that they can afford to spend for the visits to see the giant panda.

**Factor Analysis:** Factor analysis was done to develop the scale for the visitors' perception on Giant Panda Conservation Centre. Items were reconstructed based on the accurate groupings (factors). Before running factor analysis, the KMO and Bartlett's Test were conducted to verify the suitability of the data collected. A sample size more than 300 is necessary condition for the factor analysis results to be acceptable [22]. With the total sample of 335, it was thus acceptable to run this factor analysis.

Other than that, the Bartlett's Test of Sphericity must be significant at  $p < .05$  to accept the factor analysis. From the test have been conducted, the result shows that the significance level is .000. Kaiser-Meyer-Olkin (KMO) value should be more than .60 as a condition for consideration to produce a good factor analysis [22]. The KMO value for this study is .867 can be considered sufficient to carry out the factor analysis.

Table 3 shows that the 30 variables are assigned accordingly to 9 components. All 9 components are then named as specific factors (attractiveness of giant panda, Giant Panda Conservation Centre attributes, satisfaction, uniqueness of giant panda, wildlife value orientation, awareness towards conservation, cost of visit to GPCC, and discontentment of GPCC) and in the particular factor, the items are developed as questions.

#### Factor 1 – Attractiveness of Giant Panda:

- Giant panda makes me feel happy. (.537)
- Giant panda makes me feel interested in wildlife. (.649)
- I wish I knew more about this giant panda. (.547)
- I learn something about this giant panda in this visit. (.638)
- I felt a sense of connection to giant panda. (.675)
- If I could, I would like to do something to help care for giant panda. (.727)
- I wish I knew more about giant panda species. (.694)
- I learn something about giant panda species today. (.701)
- If I could, I would like to do something to help protect giant panda species. (.687)

Table 3: Rotated Component Matrix

Rotated Component Matrix	Component								
	1	2	3	4	5	6	7	8	9
Giant panda makes me feel happy	.537								
Giant panda makes me feel interested in wildlife	.649								
Wish knew more about giant panda	.547								
Learn something about giant panda in this visit	.638								
Felt a sense of connection to giant panda	.675								
I would like to do something to help care for giant panda	.727								
Wish I knew more about giant panda species	.694								
Learn something about giant panda species today	.701								
I would like to help to protect giant panda species	.687								
Aesthetic appearance of GPCC		.683							
Availability of guides		.600							
Facilities in GPCC for visitors?		.639							
Availability of information on GP		.670							
Time allocated in GPCC is sufficient			.565						
Feel safe while at GPCC			.582						
GPCC is a perfect place to visit with family			.672						
Satisfied with the visit to the GPCC			.663						
Giant panda species				.723					
Giant panda observation				.687					
Extension of GPCC area					.501				
Giant panda can be described as similar to human					.749				
Giant panda can be described as weak					.575				
Attract the interest to know more about giant panda					.562				
Learn about giant panda life in wildlife						.642			
Increase level of awareness about endangered animal						.558			
Importance of wildlife protection						.511			
Conservation fee							.615		
Entrance fee							.664		
Giant panda can be described as dangerous								.812	
Visit other place if entrance fee is increased									.665
%variance	13.568	8.669	6.898	6.125	5.818	4.832	4.099	4.021	4.013
% cumulative variance	13.568	22.236	29.134	35.259	41.077	45.908	50.007	54.028	58.041
Extraction method: Principal Component Analysis.									
Rotation Method: Varimax with Kaiser Normalization.									
Rotation converged in 24 iterations.									
Eigen value > 1									
Factor loading > 0.5									
% of cumulative variance = 58.041									

This Factor 1 is titled as attractiveness of giant panda. The variables are either directly or indirectly related to the Attractiveness of Giant Panda. All the variables except help to protect giant panda species are directly related to the visitor attractiveness towards giant panda. Variable about help to protect giant panda species is influenced by other variables in this factor. Giant panda is an icon of conservation and has been a logo for World Wildlife Fund (WWF) since 1961. The arrival of giant panda in Malaysia encourages Malaysians to know more about the behaviour of this endangered animal and how this black and white coated animal can attract attention to

become a logo for WWF. With the playful behaviour, cuteness, strange diet behavior of eating bamboo shoots as its main diet makes the visitors attract to know about giant panda.

#### Factor 2 – Giant Panda Conservation Centre (GPCC) Attributes:

- Aesthetic appearance (cleanliness). (.683)
- Availability of park guide in GPCC. (.600)
- Facilities in GPCC for visitors. (.639)
- Information about giant panda in GPCC. (.670)

Giant Panda Conservation Centre (GPCC) Attributes is entitled for Factor 2 because all variables are directly related to the attributes of GPCC. The variables indicate that this factor can affect the perception of respondent towards GPCC. The centre has been specifically constructed to duplicate the home environment of the pandas. For the visitors, the facilities provided such as toilet, visitors' route in GPCC and the services like park guide, information signage, and learning centre make the visitors feel comfortable and easy to observe and learn about giant panda.

**Factor 3 – Visit Experience:**

- The time allocated to the visitors while in GPCC is sufficient. (.565)
- You feel safe while at GPCC. (.582)
- GPCC is the perfect place to visit with family. (.672)
- You are satisfied with the visit to the GPCC. (.633)

Visit Experience is the suitable title for this Factor 3 because all the variables are directly related to the visitor satisfactory experience in their visit to GPCC. Time allocated to the visitor while in GPCC is one of the crucial part because if the time allocated to the visitors is insufficient, this will affect the satisfaction and perception towards GPCC. Well managed time allocation makes the visitors feel satisfied while in the GPCC. With the objective of zoo becoming a part of environmental and conservation education [1], early education on conservation for children has successfully been shown in GPCC when the interpretive information about giant panda are well designed to attract children to read about the giant panda. With staff in vicinity in the GPCC and clear signage, the safety of visitors is well maintained and visitors feel safe while observing the giant panda.

**Factor 4 – Uniqueness of Giant Panda:**

- Giant panda species. (.723)
- Giant panda observation. (.687)

Both variables in this Factor 4 indicate the Uniqueness of Giant Panda in the GPCC. The variables can be measured after the respondent finished the trip at GPCC. The GPCC has shown the uniqueness of the giant panda where the male and female giant panda cannot be placed together in one place because the female animal becomes very aggressive especially if a cub is present. This is why separate areas are built for the male and female within the GPCC. Based on observations it shows that the giant panda will be active while eating and will

sleep almost all day. The best time to observe the behaviours of the panda is during their feeding times, they usually are unmindful to people observing their eating activities.

**Factor 5 – Wildlife Value Orientation:**

- Extension of GPCC area. (.501)
- Giant panda can be described as similar to human. (.749)
- Giant panda can be described as weak. (.575)
- Can attract your interest to know more about giant panda. (.562)

Factor 5 is entitled as Wildlife Value Orientation. The extension of GPCC area variable is influenced by the other two variables (similarity to human and being weak). Like human, giant pandas do need sufficient space to live and they can become weak if they no longer have the freedom to go where they want in the zoo confinement. The present visit to GPCC has made the respondents to be interested to learn more about giant panda.

**Factor 6 – Awareness towards Conservation:**

- Learn how giant panda life in their original habitat while at GPCC. (.642)
- Increasing the level of awareness about the life of endangered animal. (.558)
- A visit to the GPCC made me realize that the importance of wildlife protection. (.511)

All the variables above directly related to Awareness towards Conservation. The Factor 6 measures the awareness of respondent towards conservation on visiting GPCC. The design of GPCC shows the centre tries to emulate the natural habitat of giant panda. This is important because it will create the awareness on the importance of conservation of the habitats for wildlife protection. It makes visitors realize and reflect how difficult it is for animals to adapt the changes made by humans.

**Factor 7 – Cost of Visit to GPCC:**

- Conservation fee (.615)
- Entrance fee (.664)

This Factor 7 is named as the Cost of Visit to GPCC, because both of these variables are directly related to the cost to a visitor to visit GPCC. At present, the entrance fee to Zoo Negara's for Malaysian adult is RM 44, children (3 to 12 years) is RM 16 and senior citizen (65

years and above) is RM 21. This entrance fee is inclusive of the entrance fee to the giant panda observation complex. The value of this entrance fee is low compared to the expenditures for the maintenance and conservation of the giant pandas which are very high. Because of this issue, the researcher wanted to know the visitor's perception if the GPCC charges an extra fee for conservation.

**Factor 8 and Factor 9 – Discontentment of GPCC:**

- Giant panda can be described as dangerous. (.812)
- I will visit other places if entrance fee to GPCC increased. (.665)

Factor 8 and Factor 9 are combined into one and titled as Discontentment of GPCC. Both of the variables may result in unwanted effects to GPCC. As a wild animal, giant panda may cause harm and danger in certain situations; thus the safety of the visitors is a priority to the management of GPCC. In order to avoid any untoward incident, precautionary measures have been put into place at the centre. Increasing the safety measures may require higher expenditure which may lead the increase in the entrance fee to cover costs. However, the increase in the entrance fee may give a negative effect to visitor arrival.

**DISCUSSION AND CONCLUSION**

The initial motivation of this research was to identify the perception of the visitors to GPCC at Zoo Negara Malaysia for the conservation of the giant panda which are on loan by the Government of China to Malaysia. For the purpose of managing the complex, information relating the views of the visitors on the facilities, services, environment of the complex are necessary. A systematically derived information is still lacking and it is understood that the scale to measure the perception of visitors about GPCC is thus not available. This study is carried out to derive the indicators that take into account the perception of the visitors to GPCC. Factor analysis is used to develop a new scale that measures the indicators. The analysis produces 9 thematic factors that are associated with 30 indicators of the visitors' perception on the facilities, services, environment and management of the GPCC. The development of this new scale consists of factors from the existing literature together with newly developed factors.

The discovery of awareness towards conservation would be valuable for the further investigation in general perception on conservation of animal. The awareness

factors have not been included in past literature because most of the literature are focusing on the value of wildlife orientation in the zoo. As shown in this study, factors like attractiveness of giant panda, the centre attributes, satisfaction on amenities, uniqueness of giant panda, cost of visit to GPCC, and discontentment of GPCC are directly associated with the visitors' perception toward GPCC.

The results show that management of the GPCC is successful in making visitors learn and care about giant panda. The visits to the GPCC have created a sense of attachment among the visitors towards the giant panda; this could lead to more empathy towards the protection of wildlife in general. The information in GPCC is easily accessible and presented in interesting manners which makes the centre able to accomplish in educating the visitors about conservation. Even if the main reason people come to GPCC is to have a good time with the family, they normally value the opportunity to interact with animal [2]. This can influence peoples' willingness to pay for the conservation of giant panda and create the opportunities for monetary donations for environmental conservation by allowing people to express care for the giant panda.

**ACKNOWLEDGEMENT**

The authors wish to acknowledge the Management of the Zoo Negara Malaysia the help provided during the data collection period and their comments and suggestions.

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