THE PUBLIC PREFERENCES FOR ATTRIBUTES AT PARKS: A CASE STUDY OF RECREATIONAL PARKS IN KUALA LUMPUR, MALAYSIA

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Abstract

One of the most challenging tasks face by bureaucrats in city council, particularly in an urban area, is to make decisions on recreational parks. With high competition demand in land for projects such as housing areas, industrial and infrastructure purposes, an investment in recreational parks always seems not to be viable. This is compounded with the cost in establishing and maintains the parks. In the mean time, the parks also do not provide any monetary return to the council because, usually, no or minimal charges are imposed on visitors. Even though these arguments are not favourable to the investment in recreational parks, different conclusion could be drawn if sustainable development factor is included in the discussion. The factor explains that the environments need to be preserved without compromising its availability for future generation to use it. One way to do it is through the establishment of recreational parks. Therefore, this study is to investigate public preferences and their willingness to pay (WTP) for attributes provided at recreational parks in Kuala Lumpur (KL). Qualitative method is applied to determine the attributes and their levels, whilst the quantitative method which is Choice Experiments (CEs) is employed to investigate respondents' preferences for these attributes. The results from the choice data indicates that respondents in KL has the highest preference for recreational facilities, followed by visitor amenities, natural attractions and information. The CEs results also show that the samples in KL are willing to pay for improvement in these attributes.

***Keywords**: Choice Experiments (CEs); Willingness to Pay (WTP); Attributes.*

Introduction

Outdoor recreation, or specifically recreational parks, offers a range of active and passive pursuits in which the public can engage. The activities available in parks have many benefits. These include improving social interaction, promoting a healthy lifestyle, and enhancing knowledge (Manning, 1989). The parks also play a vital role for issue such as sustainable development. Such issue explains that that the environments need to be preserved without compromising its availability for future generation to use it.

Issues relate to sustainable development is one of the most challenging tasks face by bureaucrats in city council, particularly in an urban area like city centre of Kuala Lumpur. One of them is to finding open spaces suitable for recreational purposes. Technically, the amount of land required for an open space is determined by the open space ratio. In this ratio, the total population is divided into the area of open space. With high competition demand in land for projects such as housing areas, industrial and infrastructure purposes, an investment in recreational parks always seems not to be viable. This is

compounded with the cost in establishing and maintains the parks. In the mean time, the parks also do not provide any monetary return to the council because, usually, no or minimal charges are imposed on visitors.

In Kuala Lumpur for example, even though the ratio of open space per 1000 increased from 0.6 hectare in 1984 to 1.11 hectares in 2000, this ratio however, is considered low in comparison to other western cities which ranging between two to three hectares per 1000 (City Hall of Kuala Lumpur, 2003). Land in Kuala Lumpur concentrates on the residential areas (23%), infrastructure uses (21%), as opposed to open spaces and recreational purposes (7%) (City Hall of Kuala Lumpur, 2003).

The amount of land required for parks depends upon the attributes available in them. Parks with recreational facilities, such as jogging trails or bicycle tracks, may require large spaces, as compared to parks that provide basic amenities (such as park benches). The choice of attributes provided at parks not only affects the amount of land, but it is also one of the most important factors in attracting the public.

People visit a park depends on several factors and one of them is the attractions or characteristics that are available at the park. However, in reality, some parks have been designed and built without taking into account public preferences. Some of these parks may have facilities that are of no interest to the public and, this is likely to have an adverse impact on visitor numbers. Understanding public preferences could help to mitigate these problems and, for this reason, such information would be useful to parks' management.

The objectives of this article is to investigate how the stated preference (SP) choice experiments (CEs) can be used to (1) inform park's management on what attributes the public preferred to use at parks in the city centre of Kuala Lumpur; and (2) to calculate the value of attributes at parks.

The organization of this article is structured as follows. The following section provides a theory on the CE technique. This is followed with the study design including selection the attributes and generating the choice cards. This is followed with the CEs results and visitor's willingness to pay (WTP) to visit parks in Kuala Lumpur. Finally, some conclusions are drawn.

Choice Experiments

CE is a technique where respondents are required to choose the most preferred alternative from a series of alternatives presented to them (Bateman et al., 2002). These alternatives refer to various hypothetical scenarios that might be used to portray attributes provided at parks. These alternatives usually consist of possible combinations of various attributes and in order to portray a wide range of scenarios different levels of attributes are employed. An underpinning theory in CEs explains that the utility to consumer by using any good can be derived from the characteristics or attributes of the good (Lancaster, 1966).

Traditionally, the analysis of CEs data uses the multinomial logit (MNL) model (McFadden, 1974). MNL is the most frequently applied model for parameter estimation in CEs (Adamowicz, Swait, Boxall, Louviere, & Williams, 1997; Boxall & Adamowicz, 2002; Hanley, Mourato, & Wright, 2001).

In this model, an individual faces a choice among J alternative parks in a choice set. The utility that visitor n derives from choosing a park can be expressed as:

$$U_n = V_n + e_n \quad (1)$$

Assuming an individual choice is based on the random utility model (RUM) framework, the indirect utility function of U_n can be decomposed into two components, V_n the part that is a function of factors observed by analysts which is known as deterministic element, and e_n the stochastic component (Hanley, et al., 2001). The MNL model assumes that individuals have homogenous taste preferences (i.e. where individuals have identical yardsticks when choosing alternatives in the choice cards).

A measure of economic value for each attribute available at parks can be calculated after the parameter estimates have been obtained. This economic value, always referred as implicit price, can be calculated by using equation 2.

$$\text{Implicit Price (IP)} = \frac{\beta_k}{\varphi} \quad (2)$$

where *k* refers to parameter of a non-monetary *k* attribute while φ is parameter for the price or cost.

Study Design

To investigate the application of CEs on individuals preferences on attributes at urban parks in Kuala Lumpur, a sample was taken from people who living at Kuala Lumpur area. A total of 242 people were interviewed face-to-face where the sample was randomly stratified by gender, age and ethnicities groups. The selection of attributes and their levels in the study were undertaken from several steps. It was started with the reviews from the specific attributes that have been used in the economic studies of outdoor recreation parks. Since the objective of this study to examine individuals' preferences on urban parks at Kuala Lumpur area in general, the study uses generic attribute rather than specific attributes.

Levels in generic attributes are described according to the number of specific attributes available for them. Attributes with higher levels contain more specific attributes, as compared to those with medium and basic levels. After conducting three focus group meetings and several stakeholder interviews, four three-level attributes and one two-level attribute have been chosen for this study. The attributes with three levels include recreational facilities, informational attributes, activities related to nature appreciation, and package price. The levels are basic, medium and higher. The amenity attribute is described in two levels: basic; and higher. The value for an adult price was RM5, RM20, and RM35. The price for children (i.e. 7-12 years old) is half from the adult price. The list of attributes and their levels together with its description used in this study is shown in Figure 1.

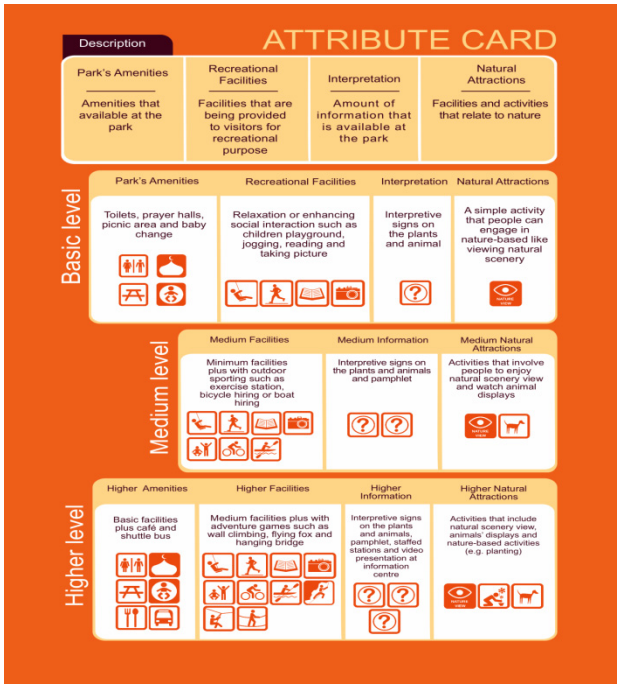

Figure 1. Attribute card

To assist respondents answering the CEs questions, these attributes were presented in a pictograph format. This may avoid respondents become bored and such a strategy (i.e. using symbols, graphics, or pictures) has been employed by analysts such as Rolfe and Bennett (2008), Álvarez-Farizo and Hanley (2002), and Campbell (2007). This study employs the orthogonal main effects design. A total of 18 choice cards were generated where the card were paired by using a cyclical or foldover approach (Louviere, Hensher, & Swait, 2000).

Asking respondents to answer all eighteen choice cards may be too much of a burden for them. The number of choice cards, therefore, was reduced to six. This number was seen as a manageable amount for respondents. The example of choice card is shown in Figure 2.

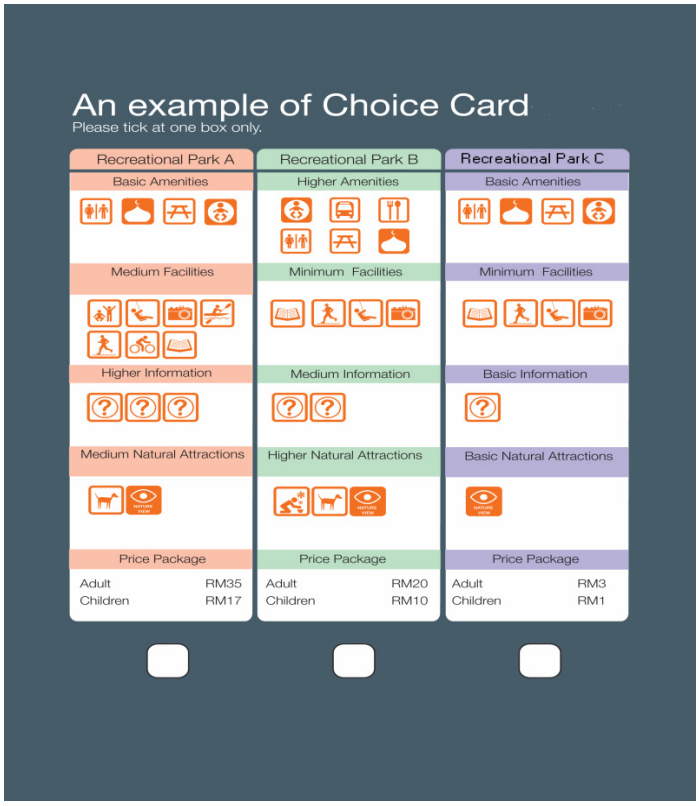

Figure 2. Choice card

Results and Discussion

After taking into account ill-informed responses the total numbers of usable respondents, included the pilot surveys, were 188. These possible ill-informed responses were determined from some screening questions where respondents were required to state the level of frequency for attributes used in the study, when they were answering the CEs questions. The frequency was measured as: always; seldom; and never. The respondents who stated "never" to all of these attributes were removed from the analysis, because their answers to the CE questions might be ill-informed. These 188 respondents provide 1128 choice responses.

An econometric analysis of CE data in this study is used to estimate the economic value of recreational parks. The variables used in the random utility models are presented in Table 1. The variables can be divided into two types. The first type encompasses the variables that are linked to parks and the second comprises variables that relate to respondents' socio-demographic characteristics.

Table 1

Variables for Random Utility Models

Variable	Type	Definitions
Amen	Qualitative	Amenities and services available at parks. It has two levels- basic and higher levels.
Fac	Qualitative	Facilities available at parks. It has three levels- basic, medium and higher levels.
Info	Qualitative	Information available at parks. It has three levels- basic, medium and higher levels.
NAtt	Qualitative	Natural attractions available at parks. It has three levels- basic, medium and higher levels.
Pri	Quantitative	Park entrance fee. The levels for package price were RM0, RM5.00, RM20.00 and RM35.00.
AgePri	Qualitative	The interaction between age of respondent and package price. It has three levels- 18 to 24 yrs old, 25 to34 yrs old and 35 yrs old and above.
EduPri	Qualitative	The interaction between education level attained by respondent and package price. It has two levels- Non-university degree and university degree
EthPri	Qualitative	The interaction between ethnic group of respondent and package price. It consists of three groups- Malays, Chinese, and Indians and others.

*The bold denotes base level

Multinomial Logit (MNL) Model

The indirect utility function (V) for Kuala Lumpur is shown in equation 3.

$$V = \beta_1.\text{Amen} + \beta_2.\text{Fac1} + \beta_3.\text{Fac2} + \beta_4.\text{Info1} + \beta_5.\text{Info2} + \beta_6.\text{NAtt1} + \beta_7.\text{NAtt2} + \beta_8\text{Pri} + \beta_n.Z_n \quad (3)$$

where Z_n refers to interactions between socio-demographic characteristics and the package price. In general, the results reported in Table 2 show that the significance of variables estimated from the basic MNL and the MNL with interactions models are similar.

Table 2

Coefficients of MNL Model for Kuala Lumpur

Variable	Basic MNL	MNL with interactions
Amen	0.52***	0.57***
	(0.09)	(0.09)
Fac1- medium	1.05***	1.15***
	(0.12)	(0.11)
Fac2- higher	1.62***	1.74***
	(0.12)	(0.13)
Info1- medium	0.20**	0.30***
	(0.10)	(0.11)
Info2- higher	0.23*	0.34**
	(0.14)	(0.15)
NAtt1- medium	0.34***	0.40***
	(0.11)	(0.12)
NAtt2- higher	0.35***	0.43***
	(0.12)	(0.12)
Pri	-0.08***	-0.06***
	(0.00)	(0.01)
AgePri1: 25 to 34 yrs old	-	-0.02**
(Age1 x Price)		(0.01)
AgePri2: 35 yrs old and above	-	0.01
(Age2 x Price)		(0.01)
EduPri: University Degree	-	0.02***
(Edu x Price)		(0.01)
EthPri1: Chinese	-	-0.10***
(Ethnic1 x Price)		(0.01)
EthPri2: Indian and others	-	-0.06***
(Ethnic2 x Price)		(0.01)
Summary Statistics		
Log-likelihood function: $L(\beta)$	-970.50	-873.56
Log-likelihood: $L(0)$	-1239.23	-1239.23
Psuedo-R^2	0.22	0.30
Adjusted Psuedo-R^2	0.21	0.29
Number of observations	1128	1128

***significant at 1%, ** significant at 5%, and *significant at 10%; std. errors are in brackets

In each model, the coefficients for Amen, Fac1, Fac2, Info at both levels, and Price are significant at least at the 10% level and have the *a priori* expected signs. It is noteworthy that the coefficient values for the higher level were greater than the coefficient values for the lower level. This indicates that the marginal utility received by respondents for higher levels of an attribute are greater than the utility received at the

lower level. The attribute of natural attractions (NAtt) is also significant (at the 1% level) in the basic and interactions models. This indicates that the respondents in KL appreciate natural attractions and this is expected, because by living in an urban area, such as KL, opportunities to participate in activities such as "hands-on training on planting" are limited. Most of the estimated interactions variables were significant at 5% or a higher level. The only insignificant variable is AgePri2.
The results for interactions with the prices attribute also show that the estimated coefficient for respondents who have a university degree is greater than the estimated coefficient for those who do not. This indicates that a respondent who has attained higher education is willing to pay more, compared to a respondent with a lower level of education. In terms of ethnic groups, the interaction coefficients for price for Chinese, Indians and others show a negative sign. This suggests that these ethnic groups were not willing to pay as much as Malays.

The explanatory power for the basic MNL model is considered higher with the adjusted psuedo-R^2 is 21%. The percentage, however, increased to 29% for the MNL with interactions model which indicates that the inclusion of socio-demographic characteristics improves model fit. Results from a Likelihood Ratio (LR) test also show that the coefficients in both models are not jointly zero.
In terms of implicit price, the respondents' willingness to pay, the results show that the respondents are willing to pay more on attribute facilities, follow with amenities, natural attractions and information. The results for the MNL with interactions model provide some illustrations of implicit price that take into account the respondents' socio-demographic characteristics. For instance, the average implicit price for a young Chinese respondent (i.e. 18 to 24 years old) who has attained higher education (i.e. having a University degree) is 71% less compared to the Malay respondents with similar characteristics.

Table 3

Implicit Price (in RM) of MNL Model

Attribute	MNL	MNL with interactions
Amen- basic to higher	6.20***	5.54***
	(1.03)	(0.85)
Fac1- basic to medium	12.58***	11.19***
	(1.34)	(1.11)
Fac2- basic to higher	19.41***	16.86***
	(1.38)	(1.16)
Info1- basic to medium	2.42**	2.94***
	(1.21)	(1.02)
Info2- basic to higher	2.81*	3.29**
	(1.63)	(1.39)
NAtt1-basic to medium	4.02***	3.86***
	(1.28)	(1.08)
NAtt2- basic to higher	4.21***	4.22***
	(1.33)	(1.12)

***significant at 1%, ** significant at 5%, and *significant at 10%; std. errors are in brackets

Conclusions and Policy Implications

Having discussed the results of the study, some conclusions could be drawn and be proposed to bureaucrats in the city centre of Kuala Lumpur. First, the study provides useful information to bureaucrats to plan public expenditure in terms of sustainable development purpose. The sustainable development can be done in various forms but the one that is highlighted in the study is through an investment on recreational parks. The potential benefits that could be generated from recreational parks can be used as one of the factors to justify why such investment is appropriate. For example, the calculated implicit prices allow the potential benefits be measured in monetary value. This is important because by having the values, it can be used to compare to the monetary costs of providing the parks. Such information could inform bureaucrats to make a decision whether or not to invest on recreational parks.

Second, the results of the study also could inform bureaucrats to identify attributes preferred by the public. Such information gives some useful hints as to how funding can be optimally invested. Usually, it is argued that funds should be invested in the attributes that were valued most highly by the respondents. The decision, however, might be inaccurate without taking into account the cost of providing it. For example, even though respondents mostly valued the attributes relating to facilities and amenities this does not necessarily indicate that the funding should be invested in the attributes. Attributes such as information which attract lower costs might need to be considered on benefit-cost grounds even though they offer smaller benefits. At the same time, the required quality of the chosen attributes must also be affordable.

Lastly, the results could inform bureaucrats about pricing strategy if they are going to impose an entry charge to recreational parks in future. In competition with the planning of other sectors, an allocation for an investment in recreational parks is not guaranteed. Therefore, bureaucrats in the council should consider charging visitors if available funds are not enough to cover the operation costs. The results such as the implicit prices (i.e. WTP) for attributes could be used as a basis to determine an appropriate charge.

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