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ABSTRACT

This study focuses on the tourists' preference evaluation on service attributes of heritage attractions by stated preference (SP) method and employs logit models to estimate the relative influences of service attributes on site choice behavior of heritage tourists. Also, this study valuates tourists' willingness to pay for hypothetical managerial developments of the heritage service attributes. The results indicate that provision of outdoor café and restaurant service, operating hours until evening, and entrance fee in heritage attractions exhibit a statistically significant effect on probability of visitation. In addition, the results from welfare effects demonstrate that tourists are willing to pay extra money to utilize more service facilities for heritage attractions.
Keywords: heritage tourism, tourist preference, service attributes, choice behavior

INTRODUCTION

Heritage tourism, consistent with more general global trends in cultural tourism, has emerged as one popular form of tourism (Chen & Chen, 2009). Heritage sector also represents a significant component of tourism in many developed economies (Garrod & Fyall, 2000). However, with an increasing number of tourists and tourism activities, heritage management and heritage sustainability become a major concern for both perspectives of practitioners and academics. Currently a transitional phase can be identified, namely from product-led development of heritage attractions that emphasize exhibits and education, to a more visitor-oriented development that emphasizes consumer preferences and quality of personal experience (Apostolakis & Jaffry, 2005). In addition, the contribution of heritage resources in strategies is one of the means to achieve sustainable tourism development (Apostolakis & Jaffry, 2005). Therefore, a better understanding of heritage tourist behaviors and more specifically of tourists preferences in terms of service attributes provided by heritage sites can present insightful information for heritage managers to make effective sustainable development strategies.

The choice modeling approach, a stated preference (SP) model, has appeared as an attractive approach as the multi-attribute framework proves to be particularly useful as a

theoretical structure for economic valuation in the cultural heritage sector (Mazzanti, 2003; Tuan & Navrud, 2007). The SP model can be used effectively to explore tradeoffs that consumers are willing to pay between two attributes of products and services, especially their responses to price. A common reason why the SP models have become popular is that their ability to transform consumer decisions made into real markets; otherwise, they would be difficult to be observed (Rose, Hensher & Greene, 2005). Although the SP models have been widely applied to a variety of research fields, including transportation, marketing, environment, health, leisure and recreation etc. (Anderson, Chhandita & Timothy, 2006; Bergantino & Bolis, 2008; Hearne & Salinas, 2002; Hess, Adler & Polak, 2007; Kelly, Haider & Williams, 2007a & b; Morey, Buchanan & Waldman, 2002; Schroeder & Louviere, 1999), there are still few SP studies on heritage attractions (Apostolakis & Jaffry, 2005).

The objective of this study is to valuate the tourists' preferences and their willingness-to-pay for hypothetical managerial developments of heritage attractions in Tainan city, Taiwan by using the choice modeling approach. Tainan city has its unique comparative advantage for developing heritage tourism in Taiwan due to its rich historical heritages and cultural value. Two popular heritage sites, i.e. Chihkan Tower and Anping Tree House located in Tainan city are chosen as empirical cases in the study. More specifically, this study focuses on tourists' preferential valuation on service attributes of the heritage attractions based on the SP method and employs logit models to estimate the relative importance of service attributes on site choice behavior of heritage tourists.

HERITAGE CHOICE BEHAVIOR

Discrete choice modeling was first employed in market and transport analysis. Recently it has been used to estimate preference of products attributes and tourist choice behavior in tourism, such us ecotourism development (Kelly et al., 2007b；Hearne & Salinas, 2002)；demand for heritage attractions (Apostolakis & Jaffry, 2005)； choice of destination(Huybers, 2003); choice of accommodation (Albaladejo-Pina& Díaz-Delfa, 2009). Apostolakis & Jaffry(2005) was using discrete choice modeling methodology and stated preference experiment to evaluate preferences of tourists for hypothetical managerial initiatives for two heritage attractions in Crete. The results show that tourists are willing to contribute a significant amount of money for improvements in the quality of information for both heritage attractions. Moreover, information will substantially improve their satisfaction and their chances of visiting. Kelly et al. (2007b) studied preferences of tourists to Whistler mountain resort for a set of hypothetical tourism destination planning options. They demonstrate tourists preferred options which could increase the overall eco-efficiency of destinations the willingness to afford the additional fees for services.

HERITAGE SITE OF RESEARCH

Chihkan Tower
Chihkan Tower (Figure 1) is the landmark of Tainan city and it is also a most famous historic site in Taiwan. Chihkan Tower is situated on the foundation of Fort Provintia, which was built by the Dutch in 1653. Even though Chihkan Tower has survived different historical periods it retains rich and graceful architectural image. The courtyard of Chihkan Tower is crammed with various kinds of steles, stone horsesetc. and its appearance presents as an outdoor museum.

Anping Tree House

Anping Tree House (Figure 2) was originally the warehouse of Tait & Co. During Japanese occupation, it was used as an office and warehouse of the Salt Association of Japan. After Japan's defeat in World War II, Anping Tree House was abandoned and this building has been invaded extensively by banyan tress that roots and branches had created an unusual sight by wrapping around the building. Its long lasting and unique appearance and history become one of the famous historical sites.

Figure 1. Chihkan Tower   Figure 2. Anping Tree House

MODEL SPECIFICATION

A random utility theory as the theoretical basis of discrete choice models (McFadden, 1974) was used in this research. The random utility maximization theory starts from the assumption that individual consumer can generate one's market behavior by maximization of preferences. The utility of alternative i for individual n is expressed as:

$$U_{in} = V_{in} + \varepsilon_{in}$$
$$= \beta X_{in} + \varepsilon_{in}$$

(1)

Where the representative of systematic utility is symbolized as V_{in} (observed by the modeller) and a random term that contains unobserved effects is signified as ε_{in}. V_{in} not only relies on the observable attributes of alternative i, but also relies on the socio-economic characteristics of individual n. Further, where β represents a vector of coefficients and individual preference, and X_{in} stands for a vector of service attributes (i.e. price, facilities, time, information and promotion). To take the interaction effects into account, the utility function with not only the main effects of service attributes but also two interaction terms, i.e. video presentations with age (18-31) and interaction media with age (18-31). Hence, the utility function of this study is specified as follows.

$$U_{in} = f\left(\text{price, facilities, time, information, promotion, video presentations}*\text{age , interaction media}*\text{age}\right) + \varepsilon_{in}$$

(2)

The above expression is modified and becomes the multinomial logit model (MNL) in terms of the error term (ε_{in}) which is also independently and identically distributed (IID) Gumbell distributions across the population. (McFadden, 1974) and MNL probability is estimated as：

$$P_{in} = \frac{e^{V_{in}}}{\sum_{j \in C_n} e^{V_{jn}}}$$

(3)

After developing a theoretical framework, a mixed logit model (ML) from the stated preference data is estimated. The ML specification allows the researcher to examine the distribution of preferences with respect to varies attributes over the population of tourists. This is important, as the distribution of preferences plays an important role in determining the source of preference heterogeneity. Besides, the mixed logit approach is fairly new and has not seen many applications in heritage attractions yet. The ML model uses integration of the MNL choice probabilities over the hypothetic distribution of the parameters, such as the probability of individual n choosing alternative i is expressed as follows：

$$P_n(i) = \int \frac{e(V_{in})}{\sum_j e(V_{jn})} f(\beta|\theta) d\beta \qquad (4)$$

In the ML model, all of the vector β is distributed randomly across decision makers with density $f(\beta|\theta)$, where θ is a vector of parameters to be estimated, such as the mean and variance of preferences in the population. Note that this study assumed all of the parameters follow by normal distributions.

Furthermore, policy makers think that welfare effects are important because they provide useful information that tourists have prepared to pay to retain their original utility levels prior to a change in one of the product attributes. Certainly, this kind of marginal effects is considered in the research. A marginal willingness to pay for the representative tourist is calculated by the ratio of individual coefficients which is represented by the level of service attribute over the price coefficient (Rolfe, Bennett, and Louviere, 2000). Noteworthily, this definition emphasized on individual coefficients. Marginal willingness to pay (MWTP) is calculated by

$$MWTP = -\frac{\beta_{attribute}}{\beta_{price}} \qquad (5)$$

EXPERIMENT DESIGN

Service Attributes Selection

For the SP experiments design, five service attributes (i.e. entrance fee, wine and dining facilities, operation time, information, and promotion) of heritage attraction were used in this study. The service attributes with their subsequent levels were identified from literature reviews and direct observations within the two heritage attractions (i.e. Anping Tree House and Chihkan Tower) under the study.

According to Apostolakis and Jaffry's (2005) study indicated that promotional incentive could examine how they affect tourist activity in Crete at different parts of the day/week. The promotional incentive was used as price discount such as, the tourists were charged as a half-price on weekdays and as an original price on weekends. The promotional incentive was conducted to test whether there is any difference between these two attractions in terms of using patterns of the tourists' visiting. Burnett and Reeve (2001) suggested that providing a restaurant or a bar in the British Museum create a pleasant ambience with more space to sit, eat, and drink, in order to entice people to visit the British Museum and to spend more time and money in the restaurant. Hence, the

attribute of wine and dining facilities were selected in this study, and three levels of the attribute were included, for example, the provision of outdoor café, the provision of restaurant service and none for both services. Besides, Garrod and Fyall (2000) have commented on the important role of interpretation facilities to help tourists to improve their understanding of the attractions. There are three levels of information were applied in this study, such as signs and pamphlets, video presentations, and interaction media. In addition, researchers (Schroeder & Louviere, 1999; Hearne & Salinas, 2002) have used stated choice model to evaluate the effect of users' fees on selection of recreation sites. When the price is comprised as an attribute in a choice model, it becomes possible to examine the impact of price adjustments on tourists' choices and to compare the impact of price adjustments with the impact of changes in other attributes. The attribute of entrance fee comprises three levels, for instance, NT$30 and NT$50 for current price and NT$70 dollars for hypothetic price is to estimate tourists' preferences and their willingness to pay for hypothetical of the new heritage service attributes. Table 1 reports the service attributes and their subsequent levels.

Table 1. Service Attributes and Subsequent Levels

Service attributes	Levels of product attributes
Price	50 NT dollars 30 NT dollars 70 NT dollars
Wine and dining facilities	None Provision of outdoors cafe on-site Provision of restaurant on-site
Operation time	AM 08:30 - PM 18:00 AM 08:30 - PM 22:00
Information	Signs and pamphlets Information center with video presentations Interaction media
Promotion	No half-price on weekdays Half-price on weekdays

Choice Experiment Design

Two choice experiment surveys were carried out separately for Anping Tree House and Chihkan Tower. Respondents were asked about their preferences for service attributes. In addition, the questionnaires inquired about their personal characteristics. The survey was conducted at Anping Tree House and Chihkan Tower at Tainan during June of 2008. A sample of 102 questionnaires was distributed randomly for each attraction. The total number of 204 usable responses was collected, yielding 1836 observations for model estimation. According to the number of attributes and their associated levels, the method of fractional factorial orthogonal design was used to produce 27 choices set (see Figure 3). These 27 choices set was randomly blocked into three groups and each group contained nine-choice sets. In this study, each respondent was designed to answer nine-choice sets and to choose his/her preferred option in each choice set.

Figure3. A representative choice set

Option A	Option B
Entry fee $70	Entry fee $50
Provision of an outdoors café on-site	No Wine and dine facilities
AM 08:30-22:00	AM 08:30-18:00
Information center with video presentations	Signs and pamphlets
Half-price on weekdays	No half-price on weekdays

Option A ☐   Option B ☐

EMPIRICAL RESULTS

Respondent profile

The choice experiment survey was carried out separately at Anping Tree House and Chihkan Tower in June, 2008. A total of 204 useful samples evenly from each attraction are obtained. The respondent profiles of both attractions are reported in Table 2. The majority of respondents for both attractions were quite similar, for instance, Anping Tree House, most were male (51.0%), unmarried (79.4%) and age range mainly fell into 18-30 years (77.4%); and Chihkan Tower, most were female (54.9%), unmarried (83.3%), and age range primarily fell into range of 18-30 years (82.4%). Besides, the monthly income brackets for both Anping Tree house and Chikan Tower respondents fell mostly into range of under NT$20,000 (49%; 57.8% respectively) or NT $20,001-40,000 (33.3%; 27.5% respectively). Approximately, 64% of Anping Tree House respondents reported that their occupation was either student (42.2%) or Commercial (21.6%) and 73% of Chikan Tower respondents reported that their occupation was either student (54.9%) or Commercial (17.6%). In addition, both attractions' respondents were indicated that either Friend or Family were the main party with which they travelled; and they were mainly from southern part of Taiwan and had visited the heritage in Tainan for 1-3 times over the past one year.

Table 2. Respondent profile

Descriptive Statistics		Anping Tree House		Chihkan Tower	
		Frequency	Percent (%)	Frequency	Percent (%)
Gender	Male	52	51%	46	44.1%
	Female	50	49%	56	54.9%
Age	18~30	79	77.4%	84	82.4%
	31~50	19	19.6%	17	16.7%
	51 and over	4	3.9%	1	1%
Martial Status	Married	21	20.6%	17	16.7%
	Unmarried	81	79.4%	85	83.3%
Vocation	Student	43	42.2%	56	54.9%
	Civil servant	11	10.8%	3	2.9%
	Housekeeper	4	3.9%	2	2%
	Agriculture	0	0%	0	0%
	Commercial	22	21.6%	18	17.6%
	Self-employed	7	6.9%	8	7.8%
	Service worker	15	14.7%	15	14.7%
Income levels	Under NT$20000	50	49%	59	57.8%
	NT$20001~40000	34	33.3%	28	27.5%
	NT$40001~60000	13	12.7%	8	7.8%
	NT$60001 or more	5	4.9%	7	6.9%
Education	Junior high school	2	1%	1	1%
	High school	13	12.7%	11	10.8%
	University	66	64.7%	70	68.6%
	Postgraduate	21	20.6%	20	19.6%
Residence	North Taiwan	21	20.6%	30	29.4%
	Central	14	13.7%	28	27.5%
	Southern	61	60%	43	42.2%
	Eastern	2	2%	0	0%
	Other	4	3.9%	1	1%
Companion	Alone	1	1%	7	6.9%
	Friend	69	67.6%	63	61.8%
	Classmate	8	7.8%	10	9.8%
	Colleague	6	5.9%	1	1%
	Family	18	17.6%	20	19.6%
	Group tour	0	0%	1	1%
Number of visitor to heritage in Tainan	One times	32	31.4%	45	44.1%
	2-3 times	44	43.1%	37	36.3%
	4 times or more	26	25.5%	20	19.6%

Note:1 US$ ≒ 33.04 NT$

Multinomial logit model

The multinomial logit model was estimated by using the NLOGIT4.0 statistical software. Table 3 reports the parameters for the two attractions under the homogeneous specification model. The examination of the preference specification for the two heritage attractions indicate that the provision of outdoor café, the provision of restaurant service, the operation hours until evening, and the entrance fee for both attractions were statistically significant differences found in visitation. Regarding promotional incentives, half-price on weekdays showed a significant effect, but only for Anping Tree House. The positive coefficient of operation hours, provision of outdoor café and restaurant service indicate that the tourists were more likelihood of chosen attraction with these three services. The coefficient of entrance fee attribute has negative sign which means the increase in entrance fee was more likely to discourage the tourists from visiting these two attractions.

Table 3 also reports the interaction term for the two heritage attractions. The interactions of service attributes with tourists' socio-demographic and information attribute (i.e. video presentations× age 18-30) were shown that age group of 18 to 30 years was more likely to feel quite strongly about the interpretative material (i.e interaction media) than other two groups, especially in the Anping Tree House attraction.

Table3. Result from multinomial logit model

Service attributes	Anping Tree House		Chihkan Tower	
	Coefficient(t value)	Standard error	Coefficient(t value)	Standard error
Price	-0.03(-7.81)**	0.003	-0.03(-8.71)**	0.003
Provision of an outdoor café on-site	0.97(7.74)**	0.12	1.03(7.92)**	0.13
Provision of a restaurant on-site	0.46(3.60)**	0.13	0.58(4.16)**	0.14
Opening time AM 08:30-22:00	0.46(3.76)**	0.12	0.83(6.39)**	0.13
video presentations	-0.16(-0.57)	0.27	0.076(0.24)	0.31
Interaction media	-0.15(-0.51)	0.29	-0.58(-1.69)	0.35
Promotion incentive	0.30(2.34)*	0.12	-0.02(-0.18)	0.13
Age 18-30* video presentations	0.42(0.17)	0.31	-0.16(-0.47)	0.34
Age 18-30*Interaction media	0.70(2.12)*	2.12	0.61(1.60)	038
ASC	-0.22(-2.73)**	0.07	0.03(0.71)	0.08
No. of observations	1780		1712	
LL(β)	-511.99		-467.99	
LL(0)	-605.41		-592.40	
Likelihood ratio index	0.15		0.21	

Mixed logit model

Table 4 presents the results of the ML model which is the heterogeneous preference logit specification. The ML model considers the analysis of the systematic heterogeneity, estimate coefficient and the standard deviation and reports for each random parameter. The ML coefficients from preferences of respondents for the two heritage attractions were specified that the provision of the outdoor café and the restaurant service, the operation hours until evening for both attractions showed a significant positive effect on probability of visitation. The coefficient of the price attribute is negative, which means that increasing in the price reduced the tourists' utilities. Particularly, interaction media interpretation facilities and half-price on weekdays are only significant positive effect in the Anping Tree House. In addition, the latter part of Table 4 reports the results of the discrete choice systematic heterogeneous specification for the two heritage attractions. The estimated standard deviations for the random parameters for promotion effect attribute in Chihkan Tower were significant which was indicated an unobserved heterogeneity.

Table 4. Result from mixed logit model

Service attributes	Anping Tree House		Chihkan Tower	
	Coefficient(t value)	Standard error	Coefficient(t value)	Standard error
Random Parameter				
Price	-0.03(-7.56)**	0.004	-0.04(-7.49)**	0.005
Provision of an outdoor café on-site	0.98(7.62)**	0.13	1.17(7.31)**	0.16
Provision of a restaurant on-site	0.49(3.58)**	0.14	0.69(4.09)**	0.17
Opening time AM 08:30-22:00	0.48(3.80)**	0.13	0.96(6.26)**	0.15
video presentations	0.19(1.43)	0.13	-0.03(-0.20)	0.14
Interaction media	0.41(2.70)**	0.15	-0.07(-0.44)	0.16
Promotion	0.28(2.28)*	0.12	0.01(-0.13)	0.14
Derived standard deviations of parameter				
Price	0.004(0.47)	0.009	0.006(0.61)	0.009
Provision of an outdoor café on-site	0.03(0.11)	0.28	0.48(1.72)	0.28
Provision of a restaurant on-site	0.39(1.16)	0.34	0.55(1.75)	0.31
Opening time AM 08:30-22:00	0.03(0.14)	0.25	0.25(1.01)	0.24
video presentations	0.12(0.45)	0.28	0.28(1.17)	0.24
Interaction media	0.14(0.50)	0.29	0.34(1.04)	0.32
Promotion	0.30(1.05)	0.29	0.81(2.11)*	0.38
ASC	-0.22(-2.70)**	0.08	0.004(-0.05)	0.09
No. of observations	1780		1712	
LL(β)	-512.43		-462.25	
LL(0)	-614.82		-593.33	
Likelihood ratio index	0.17		0.22	

Welfare Analysis

Welfare measurement is obtained from the estimated ML model. Table 5 reports an estimated two attractions about marginal willingness to pay. Welfare effects were of primary importance to policy makers because they had provided a monetary value to change in utility that a particular consumer experiences as a result of the change in one of the characteristics of the commodity under investigation. Regarding the provision of an outdoor café in the two attractions, tourists were likely willing to pay NT$32 for the narration of such facilities in the Anping Tree House and NT$30 in the case of the Chihkan Tower. Moreover, provision of a restaurant service in the two attractions, tourists were likely willing to pay NT$16 per visitor for restaurant service in the Anping Tree House and NT$17 per visitor for the Chihkan Tower. In addition, tourists in Chihkan tower were more willing to spend more money for staying longer than Anping Tree House's. Refer to a status quo of Chihkan Tower which had already operated till evening and had provided music concert. Besides, one part of tourists was willing to pay NT$24 per visitor to maintaining the status quo; and the other was willing to pay an extra NT$13 per visitor to obtain more information in relation to the Anping Tree House through the interaction media material and this may due to the alfresco nature of the Anping Tree House. As regards the promotion activities about half-price on weekdays, tourists were willingness to pay extra NT$9 per visitor for Anping Tree House visiting; however, there were no statistically significant differences for Chikan Tower.

Table 5. Marginal willingness to pay

Attributes	Anping Tree House		Chihkan Tower	
	Marginal WTP	Standard error	Marginal WTP	Standard error
Provision of an outdoor café on-site	32.28 (32.08,32.47)	2.93	30.07 (29.67, 30.47)	5.99
Provision of a restaurant on-site	16.01 (15.61, 16.41)	6.08	17.74 (17.28, 18.20)	6.85
Opening time AM 08:30-22:00	15.86 (15.76, 15.96)	1.50	24.55 (24.31, 24.80)	3.61
Interaction media	13.50 (13.35, 13.66)	2.39		
Promotion	9.45 (9.15, 9.76)	4.69		

Note: 95% confidence intervals in brackets. 1 US$ ≒ 33.04 NT$

CONCLUSIONS

This study has used the stated preference analysis to examine tourists' preferences regarding heritage attractions in Tainan city. Moreover, the tourists' preferences were translated into monetary units through an estimate of marginal willingness to pay. The managerial implications based on the empirical results were discussed and provided in this study.

The evaluation of respondents' preferences in both the multinomial and the mixed logit models indicated that tourists had significantly negative opinions about the increase in the entrance fees for the two attractions. That is to be expected given the inverse relationship between prices and levels of utilities. Empirical results indicate that both tourists preferred to visit heritage attractions, where offering wine and dining facilities, and opening until evening than those heritage attractions without providing flexible service. Considering the length of stay at attractions, the visitors had more opportunity to experience more which, in turn, positively influenced the amount of money to spend on attractions. From a manager' point of view, providing wine and dining facilities on site that will increase financial income to maintain heritage resources' sustainability. Besides, respondents preferred to promote on weekdays as half price than those did not. Moreover,

the young respondents were more likely than other two groups to favor the interpretation offered by interactive media, especially for the case of Anping Tree House. These findings showed that managers should consider the introduction of interpretative material in the form of interactive present to understand the core activities in Anping Tree House and should provide more consumer-oriented marketing approach to attract more tourists. On the other hand, providing more promotion incentive on weekdays which can encourage tourists to visit on weekdays, especially, it can improve in congestion level on weekend to increase tourists' satisfaction.

The results from welfare effects demonstrated that tourists were willing to pay extra money to use more service facilities for heritage attractions. More specifically, according to two attractions' uniqueness and status quo, the tourists had differed preferential utilities and welfare effects. For instance, tourists in Chihkan Tower were willing to pay more money for staying longer than the tourists in Anping Tree House because Chihkan Tower had already operated till evening and provided music concert. Hence, respondents of Chihkan Toower were willing to pay more money to possess this status quo and service facilities. In addition, Anping Tree House and Chihkan Tower revealed different characteristic of attractions; the policy maker should contrast to their uniqueness and develop differentiated products to increase and improve service facilities. As in all research, this study has a number of limitations. This study was only investigated for two attractions, more areas and types of attractions would need to be examined and generalized. For the future studies, application of this study in other tourism destinations is necessity, especially, researchers should evaluate more services/products for sustainable heritage tourism to elicit what services will be preferred by the tourists and what will be not..

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