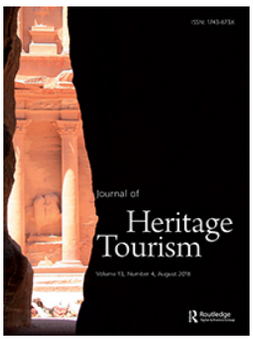

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Exploring the effects of a 'new' listing of a UNESCO World Heritage Site: the case of Singapore Botanic Gardens

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ABSTRACT

This study examines how the United Nations Education, Scientific and Cultural Organization World Heritage Site (WHS) listing impacts on push-pull factors, satisfaction and revisit intention. Data were collected on visitors to the Singapore Botanic Gardens before and after the WHS listing was awarded. The pre-listing and post-listing samples were compared and results revealed significant differences between the samples. Differences were observed for the importance of various push and pull factors as well as satisfaction and revisit intention. This study provides researchers and practitioners with greater insight into the effects of the WHS listing and recommends potential strategies for future marketing communications.

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UNESCO World Heritage Site; push-pull framework; satisfaction; revisit intention

Introduction

The United Nations Education, Scientific and Cultural Organization (UNESCO) is tasked with the identification, protection and preservation of cultural and natural heritage worldwide (2016). One of UNESCO's key initiatives is the UNESCO World Heritage Site (WHS) listing which is awarded to sites identified as important to cultural and natural heritage according to the World Heritage Convention. Essentially, the Convention's criteria require that the site possesses cultural, historical and scientific significance to humanity. Destination managers and local governments are required to adhere to the regulations stipulated by UNESCO which regulate and restrict the development or overdevelopment of these sites. To date, there are 1052 sites located in 165 countries across the world (UNESCO, 2016).

A majority of research on WHS listing has revolved around the sustainable development of these sites (e.g. Andréfouët & Wantiez, 2010; Landorf, 2009; Leask & Fyall, 2006; Reddy, 2009; Sheng & Zhao, 2016; Wager, 1995). Other studies have examined the economic impacts (e.g. Jones & Munday, 2001; Kim, Wong, & Cho, 2007; Subade, 2007; VanBlarcom & Kayahan, 2011) and local residents' perceptions (e.g. Collins, 2008; Jimura, 2011; Jones & Shaw, 2012; Nicholas, Thapa, & Ko, 2009) of these sites. Further, a number of studies have examined the impact of the listing from the visitor's perspective (e.g. Buckley, 2004; Dewar, du Cros, & Li, 2012; Huang, Tsaur, & Yang, 2012; López-Guzmán & Santa-Cruz, 2016; Poria, Reichel, & Cohen, 2013; Yang & Lin, 2011). Such studies have shown that the listing is often associated with increased demand and tourist arrivals (Poria et al., 2013; Tucker & Emge, 2010). In fact, the listing of the site is regularly used as a tool for destination branding (Ryan & Silvanto, 2010; Timothy, 2011) to create a distinct cultural image for the site (Puczko, Ratz, & Smith, 2007; Ung & Vong, 2010). However, to the best of the researchers' knowledge no study has been carried out to examine tourists' perceptions both before and after the listing of a tourist destination. Thus, this study delves deeper into understanding the importance

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of WHS listing to tourists as well as examines its effects on visitor motivation and perceptions of these sites.

The push-pull framework in tourism research serves as a means of identifying motivations that drive tourist behaviour (push factors) and attributes which draw visitors to various travel destinations (pull factors) (Kim, Lee, & Klenosky, 2003; Lee, Quintal, & Phau, in press). These push and pull factors have been found to be crucial in tourists' satisfaction and intention to revisit a travel destination (Sönmez & Graefe, 1998; Sparks, 2007). To date, only a few studies have examined the impact of WHS listing on these push and pull factors (e.g. Buckley, 2004; Kim & Lee, 2000; Mohammad & Som, 2010). However, these studies have focused on descriptive statistics in their investigation of the impacts the listing has on tourist arrivals. Further, no studies have examined a site both before and after it is awarded the listing. Evidently, a study which examines a pre- and post-listing sample of visitors would contribute greatly to understanding the impacts of the listing on tourist motivations and perceptions.

Finally, of the 1052 WHSs in the world, 203 are natural sites which encompass nature reserves and marine parks (UNESCO, 2016). A majority of studies have focused on UNESCO-listed national parks such as the Zhangjiajie National Forest Park in China (Zhong, Deng, & Xiang, 2008), Goreme Historical National Park in Turkey (Erdogan & Tosun, 2009) and Kakadu National Park in Australia (Buckley, 2004). However, to date, no studies have examined the impacts WHS listing has on tourist perceptions at botanical gardens. It was most opportune that the Singapore Botanic Gardens was recently added to the UNESCO WHS list as a cultural site in 2015 (UNESCO, 2016), providing an ideal opportunity for the current study to conduct a before and after examination of visitors to the Gardens.

Based on the above discussion, the current study aims to answer a single yet important research question: How does the WHS listing change tourist motivations and perceptions in the context of the Singapore Botanic Gardens? To address this research question, the objectives of this study are threefold: (1) to identify the various push and pull factors which affect visitation to the Singapore Botanic Gardens; (2) to examine the differential effects WHS listing has on these push and pull factors and (3) to investigate the impact push and pull factors have on satisfaction and intention to revisit for both the pre- and post-listing samples.

Relevant literature and hypothesis development

Push-pull framework

Dann (1981) proposed that touristic behaviour is driven by anomie and ego-enhancement motivations. Anomie motivations relate to the desire to escape one's daily routine, while ego-enhancement motivations relate to the sense of pride associated with travel. Subsequently, Iso-Ahola (1982) identified two basic dimensions of touristic behaviour, namely, escape and seeking. The author suggested that tourists are affected by these two dimensions concurrently as they encompass the reasons for visiting a travel destination and the rationale for selecting the destination. These early works on tourist motivations by Dann (1981) and Iso-Ahola (1982) served as a basis on which the push-pull framework was developed. The push-pull framework has been used to explain why tourists choose to travel as well as which destinations they will choose (Chen & Chen, 2015; Dann, 1981; Yoon & Uysal, 2005). The framework highlights that touristic behaviour is driven by two key forms of motivations, namely, push factors and pull factors.

Push factors are demand-related internal forces that drive a tourist to travel due to a disequilibrium or tension within their motivational system (Iversen, Hem, & Mehmetoglu, 2016; Kim et al., 2003). This results from a need recognition or a discrepancy between a tourist's actual and desired state (Babin & Harris, 2014). For instance, tourists may find themselves worn out by their daily routine (actual state) and crave for new and exciting experiences (desired state)

(Crompton, 1979). Thus, in order to address this need, tourists participate in drive-reducing behaviours which manifest in the form of travel behaviour.

Past studies have examined tourists for push factors which drive them to revisit parks (e.g. Chen & Chen, 2015; Kim, Lee, Uysal, Kim, & Ahn, 2015; Kim et al., 2003; Phau, Lee, & Quintal, 2013). For instance, Kim et al. (2003) examined tourists for their motivations to visit Korean national parks. The results of their study revealed four key push factors, namely, 'family togetherness', 'appreciating natural resources', 'escaping everyday routine' and 'adventure and building friendship'. Similarly, Phau et al. (2013) identified three push factors in tourists visiting a botanic park in Western Australia, namely, 'escape and health', 'appreciating cultural and natural resources' and 'curiosity'.

Research has shown that push factors may impact on tourists' satisfaction levels (Brida, Pulina, & Riaño, 2012; Devesa, Laguna, & Palacios, 2010; Ryan & Glendon, 1998; Wu & Wall, 2017; Yoon & Uysal, 2005). Travel destinations will elicit higher or lower satisfaction levels depending on tourist evaluations of aspects at the destination which closely relate to their motivations (Devesa et al., 2010). Thus, repeat travel behaviour is triggered and anteceded based on the satisfaction obtained from a fulfilling travel experience (Devesa et al., 2010; Ibrahim & Gill, 2005; Kim & Lee, 2000; Oliver, 1980; Severt, Wang, Chen, & Breiter, 2007). For instance, Yoon and Uysal (2005) in their study on tourists in Cyprus cited that motivations for 'relaxation', 'family togetherness' and 'safety and fun' served as antecedents to satisfaction with Cyprus as a travel destination. Consequently, it is hypothesised:

H1a: Push factors will positively impact on satisfaction with Gardens.

Push factors have also been found to impact on revisit intention (e.g. Crompton, 1979; Lee et al., in press; Yoon & Uysal, 2005). Chi and Qu (2008) suggested that desires and reasons for travel are recurring and therefore, the same push factors serve as reference points on which future travel plans are made. For instance, Yoon and Uysal (2005) demonstrated that motivations for 'relaxation', 'family togetherness' and 'safety and fun' increased tourists' intention to revisit Cyprus in the future. Similarly, Lee et al.'s (in press) study on fringe and urban parks highlighted the positive impacts of push factors such as 'thrill-seeking' and 'family/fun' on intention to revisit the park. Thus, it is hypothesised:

H1b: Push factors will positively impact on intention to revisit the Gardens.

Pull factors are supply-related attributes available at a travel destination which draw tourists to the destination (Prayag & Ryan, 2012). These attributes encompass both tangible resources such as facilities, gardens and beaches, as well as historical or cultural artefacts such as heritage buildings and statues (Baloglu & McCleary, 1999; Budruk, White, Wodrich, & Van Riper, 2008; Lee et al., in press; Terry, 2008). Activities available at the travel destination also serve as attractions which lure tourists to visit these destinations (Lee et al., in press). For instance, Uysal, McGehee, and Loker-Murphy (1996) identified six pull factors which appeal to tourists, namely, 'heritage and culture', 'recreational activities', 'comfort and relaxation', 'outdoor resources', 'resort enclave' and 'budgetary environs'. Kim et al. (2003) also highlighted that 'key tourist resources', 'information and convenience of facilities' and 'accessibility and transportation' served as the key reasons for visiting Korean national parks. Thus, the final choice of destination is made based on whether a destination possesses the desired attributes (Kim et al., 2003; Prayag & Ryan, 2012).

In relation to tourist motivations, the ability of a travel destination to elicit satisfaction relies on its ability to provide facilitating attributes which placate these motivations (Crompton, 1979; Dann, 1981; Uysal & Jurowski, 1994). These pull factors reinforce push factors which, in turn, lead to satisfaction (Yoon & Uysal, 2005). The cognitive evaluation of physical products offered by a travel destination, also known as instrumental performance, indicates to a tourist whether his/her push motivations may be satisfied by the destination. A positive evaluation results in satisfaction. For instance, Esu and Arrey (2009) examined visitors to the Calabar Carnival in Nigeria. Findings of the study indicate that the ability of the carnival to provide tourists with favourable attributes

such as 'refreshment/food', 'infrastructure' and 'safety/security' lead to higher satisfaction ratings. Consequently, it is hypothesised:

H2a: Pull factors will positively impact on satisfaction with the Gardens.

Pull factors have also been found to impact on tourist intention to revisit a travel destination (e.g. Josiam, Kinley, & Kim, 2005; Lee et al., in press; Som & Badarneh, 2011). The ability of a travel destination to provide adequate tourist products and facilities positively impacts tourist intention to return to the destination. For instance, Som and Badarneh (2011) highlighted the importance of the availability of unique activities as well as cultural and heritage museums in promoting revisit intention at a travel destination. Similarly, Lee et al. (in press) also noted pull factors such as 'nature/conservation', 'children/conservation' and 'facilities' as crucial attributes promoting revisit intention to parks. Thus, it is hypothesised:

H2b: Pull factors will positively impact on intention to revisit the Gardens.

Satisfaction

Satisfaction manifests as a mild affective condition when a tourist favourably evaluates a consumption experience (Babin & Harris, 2014). This post-choice evaluation is a result of a cognitive appraisal of a consumption experience (Babin & Griffin, 1998; Bagozzi, 1991). A positive evaluation of this satisfaction judgement results in the emotional reaction of satisfaction. This is rooted in the expectancy-disconfirmation theory which posits that a consumer evaluates the performance of a given product based on their expectations of the outcome (Hackel & Ruble, 1992; Zehrer, Crotts, & Magnini, 2011). According to the expectancy-disconfirmation theory, satisfaction is a result of performance exceeding expectations, a phenomenon known as positive disconfirmation (Oliver, 1980). Conversely, dissatisfaction is a result of performance not exceeding expectations, a phenomenon known as negative disconfirmation. In the context of tourism, travel destinations that meet the anticipated standards set by tourists evoke satisfaction (Chen & Chen, 2015; Dunn Ross & Iso-Ahola, 1991; Hwang, Lee, & Chen, 2005; Lee, Phau, Hughes, Li, & Quintal, 2016; Song, Lee, Kim, Bendle, & Shin, 2014).

Research has shown that satisfaction is an antecedent to post-visit behaviours such as intention to revisit (Chen & Chen, 2015; Kozak, 2003; Lee, Graefe, & Burns, 2004; Loureiro, 2010; Musa, Doshi, Wong, & Thirumoorthy, 2012; Ung & Vong, 2010). In contrast, dissatisfaction motivates tourists to seek alternative destinations in order to satisfy their needs and wants (Alamanza, Jaffe, & Lin, 1994; Kozak, 2003; Su & Hsu, 2013). As such, satisfaction ensures that a travel destination is included in a tourist's evoked set for future destinations (Lee et al., 2004; Musa et al., 2012; Thomas & Butts, 1997). Consequently, it is hypothesised:

H3: Satisfaction will positively impact on intention to revisit the Gardens.

The hypothesised relationships discussed above can be seen in Figure 1.

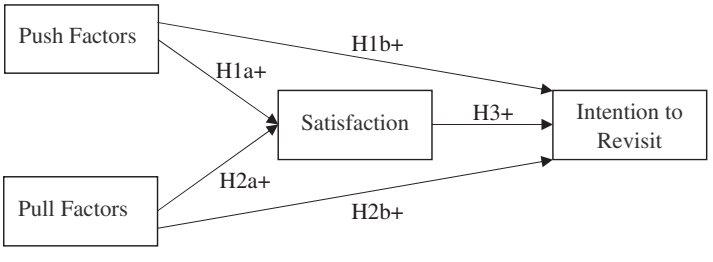

Figure 1. Conceptual model.

Methods

Study site

Singapore Botanic Gardens was founded in 1822 with support from Sir Stamford Raffles, a keen naturalist and founder of modern Singapore. The Gardens was originally located near Fort Canning and was later moved to its present site on Cluny Road in 1859. Under the British Government, the Botanic Gardens served as an institute for Kew-trained botanists. Today, the Gardens is managed by the National Parks Board and plays an important role in agricultural development in Singapore. On 4 July 2015, the garden was inscribed as a UNESCO WHS at the 39th session of the World Heritage Committee. The Singapore Botanic Gardens is the first in Asia and the third botanic garden to receive the listing besides Orto Botanico in Padova, Italy, and the Royal Botanic Gardens (Kew Gardens) in South West London, UK. Adeyinka-Ojo, Nair, and Khoo-Lattimore (2014) suggest that a single case study is suitable in unique study contexts. Given the rarity of UNESCO-listed botanical gardens and the opportune timing to measure prior- and post-listing perceptions of visitors, the single case study of the Singapore Botanic Gardens is deemed acceptable. Such revelatory cases have already been applied in tourism research (e.g. Morgan, Pritchard, & Piggott, 2002; Stephens Balakrishnan, 2008).

Data collection

Primary data were collected by trained data collectors with an on-site self-administered questionnaire at various locations at the Botanic Gardens. Data collection took place in April for the pre-listing sample and November 2015 for the post-listing sample. A systematic sampling method was utilised to reduce sampling bias. Every fifth visitor crossing a designated point at the park was intercepted and requested to complete the survey. An initial screening question was asked to identify only international visitors to the Botanical Gardens.

Respondents were given a brief introduction to explain the purpose of the study and asked to complete their questionnaires individually to reduce response bias. The questionnaire was developed in English and also translated into Chinese to cater to Chinese tourists. In total, 712 questionnaires were collected during each data collection phases. A total of 592 responses (83.2%) were deemed usable and utilised in this study. This included 299 responses for the pre-listing sample and 293 responses for the post-listing sample.

Initially, 84 push and pull scale items were identified through an extensive literature review of park visitation. Then, two separate focus groups comprising 10 park visitors, randomly selected at Singapore Botanic Gardens, were conducted. Participants were asked to review the potential push and pull items that they perceived to be most relevant to botanic gardens in general. Duplicate, ambiguous or irrelevant items were removed from the initial list (Conradson, 2005). This reduced the number of items to 65, of which 28 were push items and 37 were pull items. As per previous studies on push and pull factors (e.g. Kim et al., 2003; Prayag & Ryan, 2012; Uysal & Jurowski, 1994), scale items were measured on a 7-point Likert scale ranging from 1 'strongly disagree' to 7 'strongly agree'.

Measures for satisfaction and intention to revisit were selected from existing scales based on their reliability and relevance. The measures were then adapted to fit the context of this study. These included: (1) three items for satisfaction (Ryu, Lee, & Gon Kim, 2012) and (2) three items for intention to revisit (Perugini & Bagozzi, 2001) ($\alpha = 0.78$). Similarly, these measures adopted a 7-point Likert scale ranging from 1 'strongly disagree' to 7 'strongly agree'.

Results

Descriptive analysis with SPSS 22 examined the respondents for their demographic profiles, as can be seen in Table 1. Visitors to the botanic garden in the pre-listing sample were mostly females (58.5%)

aged between 21 and 34 years (41.8%) and were single (41.8%). Students (49.5%) comprised the majority of the botanic garden's visitors. These visitors had attained either a bachelor degree (42.8%) or certificate (34.4%) and earned an income of under $14,000 (45.5%).

A similar demographic profile was found for the post-listing sample. Visitors were mostly females (51.5%) aged between 21 and 34 years (48.5%) and were single (57.5%). They were mostly students (60.4%) who had attained a bachelor degree (37.5%) and earned an income of under $14,000 (67.2%).

The first objective of this study was to identify salient push motivations and critical pull attributes that draw tourists to Singapore Botanic Gardens. In order to do so, exploratory factor analysis (EFA) with SPSS 22 examined the 65 push and pull factor items using the pre-listing sample ($N = 299$). Items with cross-loadings and communalities less than 0.40 were removed reiteratively. First, the 28 push factor items were factor analysed to examine the dimensionality of the construct. As can be seen in Table 2, the final 4-factor solution identified 12 items that explained 64.96% of variance with a Kaiser–Meyer–Olkin (KMO) value of 0.81 and Bartlett's test of sphericity of 994.98. Higher values attained in the KMO and Bartlett's test suggested dimensionality in the scale items. The first

Table 1. Sample profile – pre-listing vs. post-listing.

	Pre-listing ($N = 299$)		Post-listing ($N = 293$)	
	Frequency	%	Frequency	%
Gender				
Male	124	41.5	142	48.5
Female	175	58.5	151	51.5
Age				
Under 20 years	104	34.8	80	27.3
21–34 years	125	41.8	142	48.5
35–44 years	17	5.7	29	9.9
45–54 years	34	11.4	17	5.8
55–64 years	13	4.3	18	6.1
65 years and above	6	2.0	7	2.4
Marital status				
Single	138	46.2	168	57.3
In a relationship	87	29.1	69	23.5
Married	74	24.7	56	19.1
Occupation				
Manager	27	9.0	22	7.5
Professional	36	12.0	24	8.2
Technician/Trades Worker	10	3.3	5	1.7
Community/Personal Service Worker	12	4.0	3	1.0
Clerical and Administrative Worker	25	8.4	13	4.4
Sales Worker	23	7.7	13	4.4
Machinery Operator/Driver	1	0.3	0	0.0
Labourer	10	3.3	5	1.7
Student	148	49.5	177	60.4
Retired	7	2.3	11	3.8
Education				
Certificate	103	34.4	43	14.7
Bachelor Degree	128	42.8	110	37.5
Advanced Diploma or Diploma	54	18.1	58	19.8
Graduate Diploma or Graduate Certificate	11	3.7	47	16.0
Postgraduate Degree	3	1.0	23	7.8
Income				
Under $14,999	136	45.5	197	67.2
$15, 000–29, 999	51	17.1	48	16.4
$30, 000–49,999	41	13.7	30	10.2
$50,000–74,999	39	13.0	13	4.4
$75,000–99,999	14	4.7	3	1.0
$100,000–149,999	11	3.7	1	0.3
$150,000–199,999	2	0.7	1	0.3
$200,000 and above	5	1.7	0	0.0

push factor represented *novel experience* ($\alpha = 0.73$). The second factor referred to *memorable experience* ($\alpha = 0.72$). The third factor identified *cultural experience* ($\alpha = 0.71$), and the fourth factor described *rest and refreshment* ($\alpha = 0.65$).

Second, the 37 pull factor items were factor analysed to examine the dimensionality of the construct. As can be seen in Table 3, the final 4-factor solution identified 19 items that explained 66.07% of variance with a KMO value of 0.86 and Bartlett's test of sphericity of 3065.57. Higher values attained in the KMO and Bartlett's test suggested dimensionality in the scale items. The first push factor represented *nature resources* ($\alpha = 0.90$). The second factor referred to *local customs* ($\alpha = 0.87$). The third factor identified *family facilities* ($\alpha = 0.79$), and the fourth factor described *cultural attractions* ($\alpha = 0.84$).

Then, confirmatory factor analysis (CFA) using one-factor congeneric models with AMOS 22 refined the push and pull factor structures as well as the established scales using the post-listing sample ($N = 293$). Items with cross-loadings and low factor scores identified in the modification indices were removed reiteratively. Following the removal of problematic items, the goodness-of-fit indicators for each of the one-factor models met the criteria $\chi^2/df \leq 3.0$, RMSEA ≤ 0.08, CFI ≥ 0.90, GFI ≥ 0.90, IFI ≥ 0.90, as suggested by Hair, Black, Babin, Anderson, and Tatham (2010), and the models were deemed acceptable. Composite reliabilities calculated from the parameter estimates ranged from 0.66 to 0.89 and the average variance extracted (AVE) scores ranged from 0.39 to 0.72. Although the AVE values for *novel experience*, *cultural experience* and *family facilities* were less than 0.50, it was just one of several estimates used in the examination of convergent validity. First, an examination of the parameter estimates that they were greater than twice the standard errors of the items suggesting partial support for convergent validity (Anderson & Gerbing, 1988). Second, the overall fit of the models also suggested convergent validity (Steenkamp & Van Trijp, 1991). Discriminant validity was assessed using two tests. First, the AVE values surpassed the squared correlations between any two constructs within the research model which ranged from 0.01 to 0.30 (Fornell & Larcker, 1981). Second, correlations between the various constructs were moderate with the highest being 0.55, suggesting discriminant validity (Bagozzi & Heatherton, 1994). A summary of the resultant 25 scale items representing the key constructs in the research model and their corresponding goodness-of-fit indices can be seen in Table 4.

Table 2. EFA for push factors – pre-listing sample ($N = 299$).

	Factor loadings			
	1	2	3	4
Push factor 1: Novel experience				
To meet interesting people	0.83			
To go to places that my friends haven't been	0.73			
To have a feeling that I am important	0.71			
To do something thrilling and exciting	0.55			
Push factor 2: Memorable experience				
To have a hassle-free visit		0.80		
To do something that I really like		0.78		
To have a memorable experience		0.72		
Push factor 3: Cultural experience				
To study the natural environment			0.79	
To enjoy nature			0.77	
To appreciate historical/cultural resources			0.72	
Push factor 4: Rest and refreshment				
To have an opportunity for physical rest				0.78
To get refreshed				0.78
Eigenvalues	4.02	1.48	1.27	1.03
Variance extracted	33.51	12.29	10.60	8.56
Cronbach's alpha	0.73	0.72	0.71	0.65

Notes: KMO value: 0.81; Bartlett's test of sphericity: 994.98.

Table 3. EFA for pull factors – pre-listing sample ($N = 299$).

	Factor loadings			
	1	2	3	4
Push Factor 1: Nature resources				
Enjoy beautiful landscape	0.88			
Enjoy natural resources	0.86			
Spend time outside in nature	0.83			
Enjoy the hilly landscape	0.75			
Enjoy the forest	0.74			
There are beautiful natural resources	0.65			
Push Factor 2: Local customs				
Enjoy local traditional food		0.80		
See traditional livestock pasturing		0.80		
Meet local people		0.79		
Experience a different culture		0.78		
Get familiar with the local customs		0.78		
Push Factor 3: Family facilities				
Children are able to have a good time			0.77	
Have a good time together as a family			0.75	
There are adequate BBQ facilities and drinking stands			0.73	
Restrooms are conveniently located			0.67	
Children can study natural resources			0.62	
Push Factor 4: Cultural attractions				
Visit cultural attractions				0.83
Visit historic sites				0.82
There are cultural and historic resources				0.70
Eigenvalues	6.42	2.92	1.98	1.24
Variance extracted	33.77	15.39	10.40	6.52
Cronbach's alpha	0.90	0.87	0.79	0.84

Notes: KMO value: 0.86; Bartlett's test of sphericity: 3065.57.

The second objective of this study was to examine differences between the push and pull factors as well as satisfaction and revisit intention of visitors before and after the WHS listing was awarded to Singapore Botanic Gardens. Independent groups *t*-test with SPSS 22 examined the 10 constructs using the pre-listing ($N = 299$) and post-listing ($N = 293$) samples. As can be seen in Table 5, some interesting results were revealed. For the push factors, the post-listing sample demonstrated significantly higher ($p < .01$) means for *novel experience* ($t = 4.13$) and *rest and refreshment* ($t = 4.72$) compared to the pre-listing sample. However, the pre-listing sample showed a significantly higher ($p < .05$) mean for *memorable experience* ($t = 4.78$) over the post-listing sample. Interestingly, no significant differences were found for the *cultural experience* push factor. Results reveal that *memorable experience* appeared to be valued the highest for both the pre-listing ($t = 4.78$) and post-listing ($t = 4.58$) samples. Meanwhile, *novel experience* appeared to be of least importance to the pre-listing ($t = 3.60$) and post-listing ($t = 4.13$) samples.

For the pull factors, the post-listing sample presented significantly higher ($p < .01$) means for *local customs* ($t = 4.27$) and *cultural attractions* ($t = 4.70$). Conversely, the pre-listing group demonstrated significantly higher ($p < .05$) means for *nature resources* ($t = 5.18$) and *family facilities* ($t = 5.27$). Results also revealed that *family facilities* appeared to be valued highest for the pre-listing ($t = 5.27$) and post-listing ($t = 5.01$) samples. Meanwhile, *local customs* appeared to be of least importance to the pre-listing ($t = 3.40$) and post-listing ($t = 4.27$) samples. Finally, the pre-listing sample demonstrated significantly higher ($p < .05$) means for *satisfaction* ($t = 4.95$) and *intention to revisit* ($t = 5.40$) relative to the post-listing group.

Finally, the third objective of this study was to investigate the impact push and pull factors have on satisfaction and revisit intention. Initially, the 10 constructs were introduced into a full measurement model to ensure no significant misfits and no further improvement to the mode was required (Jöreskog, 1970). The initial full measurement model did not produce good fit. Therefore, the modification indices were consulted to see if any possible improvements could be made (Garver &

Table 4. CFA for key constructs – post-listing sample ($N = 293$).

Items	Parameter estimates	χ^2	*df*	RMSEA	CFI	GFI	IFI	CR	AVE
Push factor 1: Novel experience		5.38	2	0.07	0.98	0.99	0.89	0.78	0.47
To meet interesting people	0.73								
To go to places that my friends haven't been	0.69								
To have a feeling that I am important	0.66								
To do something thrilling and exciting	0.67								
Push factor 2: Memorable experience		0.39	1	0.01	0.99	0.99	0.99	0.77	0.52
To have a hassle-free visit	0.79								
To do something that I really like	0.74								
To have a memorable experience	0.63								
Push factor 3: Cultural experience		1.47	1	0.04	0.99	0.99	0.99	0.66	0.39
To study the natural environment	0.59								
To enjoy nature	0.59								
To appreciate historical/cultural resources	0.68								
Push factor 4: Rest and refreshment		–	–	–	–	–	–	–	–
To have an opportunity for physical rest	–								
To get refreshed	–								
Push factor 1: Nature resources		0.14	1	0.01	0.99	0.99	0.99	0.87	0.63
Enjoy beautiful landscape	0.91								
Enjoy natural resources	0.87								
Enjoy the hilly landscape	0.72								
There are beautiful natural resources	0.65								
Push factor 2: Local customs		0.61	2	0.01	0.99	0.99	0.99	0.82	0.54
See traditional livestock pasturing	0.71								
Meet local people	0.76								
Experience a different culture	0.59								
Get familiar with the local customs	0.85								
Push factor 3: Family facilities		6.02	2	0.08	0.99	0.98	0.99	0.77	0.46
Children are able to have a good time	0.71								
Have a good time together as a family	0.66								
Restrooms are conveniently located	0.6								
Children can study natural resources	0.73								
Push factor 4: Cultural attractions		0.27	1	0.01	0.99	0.99	0.99	0.79	0.57
Visit cultural attractions	0.84								
Visit historic sites	0.84								
There are cultural and historic resources	0.56								
Satisfaction		0.83	1	0.01	0.99	0.99	0.99	0.84	0.65
What is your overall satisfaction?	0.85								
How does your satisfaction compare with your expectations?	0.86								
What is your satisfaction considering the time and effort invested?	0.69								
Intention to revisit		0.62	1	0.01	0.99	0.99	0.99	0.89	0.72
I intend to visit the park	0.78								
I plan to visit the park	0.89								
I will expend effort to visit the park	0.89								

Notes: χ^2: chi-square; *df*: degrees of freedom; RMSEA: root-mean-square error of approximation; CFI: comparative fit index; GFI: goodness-of-fit index; IFI: incremental fit index; CR: composite reliability; AVE: average variance extracted.

Mentzer, 1999). Reiteratively, 12 items were removed due to cross-loading. After these items were eliminated, the goodness-of-fit indices were deemed acceptable ($\chi^2/df = 1.75$, RMSEA = 0.03, CFI = 0.98, GFI = 0.96, IFI = 0.98), as can be seen in Table 6. This suggested that the model was ready for testing hypothesis testing using path analysis with AMOS 22.

Path analysis using multigroup analysis with AMOS 22 examined the causal relationships identified in *H1–H3* using the pre-listing ($N = 299$) and post-listing ($N = 293$) samples. Composites for the three push factors and four pull factors were created and served as indicators for their respective latent variables (push and pull factors). The goodness-of-fit indices for the structural model was deemed acceptable (χ^2/df = 2.94; RMSEA = 0.06; CFI = 0.91; GFI = 0.92; IFI = 0.92), as can be seen in Table 7. For the post-listing sample, *push factors* produced positive and significant impacts on

Table 5. Independent groups *t*-test – pre-listing vs. post-listing.

	Pre-listing ($N = 299$) Mean	Post-listing ($N = 293$) Mean	*F*-value	*p*-Value
Push factors				
Novel experience	3.60[a] (1.55)	4.13[b] (1.34)	10.30	0.01
Memorable experience	4.78[a] (1.19)	4.58[b] (1.07)	4.99	0.03
Cultural experience	4.39[a] (1.30)	4.55[a] (1.14)	5.52	0.12
Rest and refreshment	4.24[a] (1.37)	4.72[b] (1.23)	3.83	0.01
Pull factors				
Nature resources	5.18[a] (1.12)	4.96[b] (1.10)	0.45	0.02
Local customs	3.40[a] (1.37)	4.27[b] (1.21)	8.98	0.01
Family facilities	5.27[a] (1.22)	5.01[b] (1.11)	4.25	0.01
Cultural attractions	4.38[a] (1.47)	4.70[b] (1.19)	13.75	0.01
Satisfaction	4.94[a] (1.41)	4.75[b] (1.08)	20.49	0.05
Intention to revisit	5.40[a] (1.17)	4.41[b] (1.28)	0.85	0.01

Notes: Standard deviations are in parentheses. Means that share the same superscript letter are not significantly different from one another ($p < .05$) using independent groups *t*-tests.

satisfaction ($\beta = 0.70$; $p < .05$) and *intention to revisit* ($\beta = 0.80$; $p < .05$), supporting *H2a* and *H2b*. *Satisfaction* also produced a positive and significant relationship on *intention to revisit* ($\beta = 0.49$; $p < .001$), supporting *H3*. Interestingly, no significant relationships were noted between *push factors* and *satisfaction* nor *intention to revisit*.

Table 6. Measurement model – pooled sample ($N = 592$).

Items	Parameter estimates	CR	AVE
Push factor 1: Novel experience		0.72	0.57
To meet interesting people	0.77		
To go to places that my friends haven't been	0.74		
Push factor 2: Memorable experience		0.67	0.51
To do something that I really like	0.76		
To have a memorable experience	0.66		
Push factor 4: Rest and refreshment		0.72	0.56
To have an opportunity for physical rest	0.78		
To get refreshed	0.71		
Push Factor 1: Nature resources		0.89	0.67
Enjoy beautiful landscape	0.91		
Enjoy natural resources	0.89		
Enjoy the hilly landscape	0.71		
There are beautiful natural resources	0.77		
Push factor 2: Local customs		0.83	0.61
See traditional livestock pasturing	0.81		
Meet local people	0.82		
Get familiar with the local customs	0.72		
Push factor 3: Family facilities		0.59	0.42
Have a good time together as a family	0.72		
Restrooms are conveniently located	0.57		
Push factor 4: Cultural attractions		0.85	0.74
Visit cultural attractions	0.87		
Visit historic sites	0.84		
Satisfaction		0.83	0.72
What is your overall satisfaction?	0.88		
How does your satisfaction compare with your expectations?	0.81		
Intention to revisit		0.81	0.69
I intend to visit the park	0.85		
I will expend effort to visit the park	0.82		
Model fit statistics			
χ^2/df	1.75		
RMSEA	0.03		
CFI	0.98		
GFI	0.96		
IFI	0.98		

Notes: χ^2: chi-square; *df*: degrees of freedom; RMSEA: root-mean-square error of approximation; CFI: comparative fit index; GFI: goodness-of-fit index; IFI: incremental fit index; CR: composite reliability; AVE: average variance extracted.

Table 7. Structural model and hypothesis testing.

	Pre-listing ($N = 299$)	Post-listing ($N = 293$)
H1a: Push factors → Satisfaction	−0.32	0.29*
H1b: Push factors → Intention to revisit	−0.55	0.38*
H2a: Pull factors → Satisfaction	0.70*	0.43**
H2b: Pull factors → Intention to revisit	0.80*	0.04
H3: Satisfaction → Intention to revisit	0.49***	0.39**
Model fit statistics		
χ^2/df	2.94	
RMSEA	0.06	
CFI	0.91	
GFI	0.92	
IFI	0.92	

Notes: *$p < .05$; **$p < .01$; ***$p < .001$. χ^2: chi-square; *df*: degrees of freedom; RMSEA: root-mean-square error of approximation; CFI: comparative fit index; GFI: goodness-of-fit index; IFI: incremental fit index.

For the post-listing sample, *push factors* produced positive and significant effects on *satisfaction* ($\beta = 0.29$; $p < .05$) and *intention to revisit* ($\beta = 0.38$; $p < .05$), supporting *H1a* and *H1b*. *Pull factors* produced a positive and significant impact on *satisfaction* ($\beta = 0.43$; $p < .001$), supporting *H2a*. Further, *satisfaction* was found to produce a positive and significant effect on *intention to revisit* ($\beta = 0.39$; $p < .001$), supporting *H3*. No significant relationship was found between *pull factors* and *intention to revisit*.

Discussion and implications

To reiterate, the objectives of the current study were to (1) identify the various push and pull factors which affect visitation to the Singapore Botanic Gardens; (2) examine the differential impacts the WHS listing has on these push and pull factors and (3) investigate the impact push and pull factors have on satisfaction and intention to revisit for both the pre-listing and post-listing samples. The findings from this study offer a number of theoretical and managerial implications.

To address the first objective, items for push and pull factors generated by a literature review and revised by focus groups identified 28 push and 37 pull items. EFA and CFA were conducted to confirm the factor structures of these items. The factor analyses identified four underlying push factors, namely, *novel experience*, *memorable experience, cultural experience* and *rest and refreshment*. Four pull factors were also identified, namely, *nature resources, local customs, family facilities* and *cultural attractions*. These factor structures reflect the findings of previous studies in tourism park literature (e.g. Chen & Chen, 2015; Chi & Qu, 2008; Kim et al., 2003, 2015; Phau et al., 2013; Yoon & Uysal, 2005).

Then, to address the second objective, *t*-tests were used to examine the degree to which various push and pull factors may vary in their importance of post-WHS listing. The results of the *t*-test revealed that the push motivations *novel experience* and *rest and refreshment* were higher for the post-listing sample, while *memorable experience* was higher for the pre-listing sample. This suggests that the WHS listing was crucial in increasing the novelty of the experience creating a sense of rejuvenation for visitors to the Gardens. However, the memorability of the experience was decreased by the listing potentially due to the heightened expectations of visitors. Interestingly, no significant differences were noted for the *cultural experience* factor suggesting that this motivation was not a primary driver for their visit to the Gardens. For the pull factors, *nature resources* and *family facilities* were higher for the pre-listing sample, while *local customs* and *cultural attractions* for the post-listing sample. This indicates the WHS listing has created a cultural orientation for visitors despite their lack of awareness of this, as indicated by the results for the push factors.

Interestingly, visitor satisfaction at the Singapore Botanic Gardens was found to decrease after the WHS listing. This could be due to the hype surrounding the Gardens' listing, which created overinflated expectations about what the Gardens offered. Further, revisit intention was also found to

decrease following the heritage listing. An explanation for this may be inferred from the increase in importance of the *novel experience* push factors. This indicates that visitors to the Gardens post-listing were driven more by the novelty factor compared to the pre-listing sample. It is possible that a majority of post-listing visitors were visiting the Gardens for the mere novelty of visiting a WHS. With this need being satisfied by their visit, the Gardens no longer held any appeal for future selection.

Finally, to address the third objective, path analysis was used to examine the differential impacts the WHS listing had on the relationships between push and pull factors on satisfaction and intention to revisit. For the pre-listing group, pull factors, but not push factors, were found to significantly impact on satisfaction and intention to revisit. These results confirm the findings from other studies, which suggest that pull factors impact on satisfaction and intention to recommend (e.g. Esu & Arrey, 2009; Lee et al., in press; Som & Badarneh, 2011; Uysal & Jurowski, 1994; Yoon & Uysal, 2005). However, it contradicts previous findings for push factors (e.g. Chi & Qu, 2008; Devesa et al., 2010; Ibrahim & Gill, 2005; Kim & Lee, 2000). This suggests that visitors prior to the WHS listing were driven to visit the Gardens solely based on the parks attributes.

However, for the post-listing group, push factors were found to positively impact on satisfaction but not intention to revisit while pull factors were found to impact on both. This supports previous findings suggesting that push and pull factors impact on satisfaction (e.g. Chi & Qu, 2008; Devesa et al., 2010; Esu & Arrey, 2009; Lee et al., in press; Som & Badarneh, 2011; Uysal & Jurowski, 1994; Yoon & Uysal, 2005). This suggests that visitors based their satisfaction ratings not only on the attributes at the Gardens but more importantly on how these attributes may satisfy their motivations.

Managerially, the results highlight that it is important that managers of UNESCO-listed botanic gardens need to emphasise the availability of historical and cultural attributes in order to drive home the cultural experience offered by these gardens. The contradictory results of unchanged cultural motivation and high value placed on the cultural attributes offer scope for the development of greater awareness of the heritage value of the garden. A comprehensive promotional campaign for the history and heritage of the Singapore Botanic Gardens will be able to build awareness and entice potential visitors to visit the gardens. For instance, managers could develop promotional videos and an interactive website to give potential visitors a glimpse of the cultural experience at the Botanic Gardens. The redevelopment of innovative and exciting educational tours such as the Heritage Tour, currently offered at the Gardens, will also go a long way to bringing the cultural experience to the forefront of visitor motivations. Further, the Singapore Botanic Gardens could introduce cultural festivals with re-enactments of the Gardens' colonial era as a means of attracting visitors as well as reinforcing the rich cultural heritage of the Gardens.

The decrease in satisfaction and revisit intention after the introduction of the WHS listing is concerning for managers of the Gardens. This decrease in the appeal of the Gardens' attributes, potentially due to the novelty effect, strongly suggests that managers need to be more innovative in developing their offerings to provide visitors more interesting and novel activities and attractions which, in turn, may entice them to visit the Gardens again. For instance, the Royal Botanic Gardens (Kew Gardens) in the UK was home to the festival of poison plants where visitors discovered marijuana and hallucinogenic mushrooms. This initiative was in line with the tradition upheld by the Orto Botanico in Italy where medicinal and poisonous plants are planted. Such a festival at the Singapore Botanic Gardens would not only be interesting and exciting to potential visitors, but its potentially controversial nature may also garner media attention, offering greater exposure for the Gardens. A list of such upcoming activities could potentially be publicised, not only on the Gardens' website but also on flyers, television screens and notice boards at crucial vantage points within the Gardens.

Finally, with regard to the findings of the path analysis, it was identified that push factors became relevant following the WHS listing, indicating that tourists were more involved in the selection of the destination. These visitors based their satisfaction ratings not only on the attributes at the Gardens

but more importantly on how these attributes may satisfy their motivations. It is thus necessary for managers to take a more tourist-based approach in the development of their offerings by conducting research on the various motivations that drive these visitors. By identifying salient push motivations reported by visitors, garden managers can tailor their offerings to these motivations. For instance, an examination of the means for family facilities suggests that visitors are more family oriented. The provision of family friendly events and facilitates are therefore crucial in addressing the needs of such visitors. Educational and interactive activities for children such as story-telling, show-and-tell presentations and colouring competitions would keep children entertained allowing for an overall entertaining experience for the family.

Limitations and future directions

Several limitations are acknowledged in this study. First, the current study only focused on the Singapore Botanic Gardens making the results difficult to generalise. While the rarity of UNESCO-listed botanical gardens and opportunity measure prior and post-listing perceptions of visitors justify a single case study, an examination of other WHSs is imperative. Future research may consider conducting before and after comparisons on other sites around the world which have been nominated for the listing. The UNESCO website provides a list of sites submitted to the Tentative List which could serve as a means for researchers to plan their future research sites.

Second, data for this study were collected in the months of April and November 2015, which coincided with Singapore's school holidays. This explains the greater number of students visiting the park. It is necessary for future studies to survey visitors to the Gardens at different times of the year to obtain richer diversity in their respondents. Further, the fact that the listing was granted in June 2015 could mean that visitors at the point of the second data collection may already have made plans to visit the park and their decision-making was not based on the basis of the listing. More data collected well after the listing has been established in the minds of the respondents are required to account for this potential pitfall.

Third, this study utilised quantitative methods in the data collection process. While quantitative data were critical in identifying generalisable trends in tourist motivations, satisfaction and behaviour at Singapore Botanic Gardens, motivations and perceptions may differ from one tourist to another. As such, more in-depth information on tourist perceptions may be gathered through qualitative methods in order to better understand this phenomenon.

Finally, the current study did not identify first-time and repeat visitors to the Gardens. Past research has shown that past experience greatly influences the reasons for visiting a travel destination and indicates loyalty (e.g. Huang & Hsu, 2009; Mazursky, 1989). This future studies could consider discretising visitors based on their loyalty behaviours in order to generate more in-depth understanding of the impacts of the WHS listing.

Disclosure statement

No potential conflict of interest was reported by the authors.

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