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A Study on the Correlations between Environmental Attributes and Place Attachment

Tin-Chang CHANG[1], Ching-Yang LIN[2]

Abstract

The problem of greenhouse effects has been concerned in the society that the idea of environmental protection is enhanced and the government has promoted energy conservation and carbon reduction, expecting people to ride bikes, instead of driving card. Through the overall construction and planning of the government, a lot of bikeways are established in Taiwan and people start to participate in such an emerging leisure exercise. Taking Dapeng Bay Bikeway as the research field, this study aims to understand the correlations between Environmental Attributes and Place Attachment of cyclists. With questionnaire survey and convenient sampling, local inhabitants cycling in Dapeng Bay Bikeway are studied. Total 230 valid copies of questionnaires are retrieved, with the retrieval rate 82.14%. The research results show the positive correlations between Environmental Attributes and Place Attachment, and the higher satisfaction with Environmental Attributes is presented, the higher Place Attachment (identity and dependency) is enhanced. Contrarily, the higher Place Attachment reveals the higher satisfaction with Environmental Attributes. It is expected to provide the government sectors with reference and suggestions for planning bikeways.

Keywords: environmental attributes, place attachment, local inhabitants, Bay Bikeway.

Introduction

The continuous concern about greenhouse effects has enhanced the idea of environmental protection in the past years that the government has promoted energy conservation and carbon reduction, expecting people not to drive cars, but

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ride bicycles. The government has apparently stressed on the construction and development of bikeways, according to Bikeway Systems Planning and Establishment in Taiwan, the bicycle tour in Challenge 2008 National Development Key Plans – Taiwan Double proposed by Tourism Bureau, and the Taiwan Bicycle Island and Campus Cycling and Walking to School (Institute of Transportation, MOTC, 2009). With such an overall construction and planning by the government, a lot of bikeways are established in Taiwan that people gradually participate in the emerging leisure exercise.

Following the trend of outdoor leisure exercise or tourism with bicycles, Sports Administration, Ministry of Education, proposed in 2004 "to connect areas with bikeways, actively promote the establishment of bikeways, provide emerging exercise sites, enhance pubic quality of life and citizen fitness, create new tourist spots, and construct green tourism network" in order to "construct excellent exercise environments and satisfy the public demands for exercise". Nonetheless, bikeways in Taiwan are dispersed in counties and cities and cannot be completely connected, comparing to well-planned bikeways in advanced countries, that some bikeways are not well used as expected and would be easily affected by various factors to reduce the utilization. The quantitative and qualitative development and planning of bikeways in Taiwan still present profound development space and potential (Council for Economic Planning and Development, 2002). The utilization of domestic bikeways has been largely increased, but the research on bicycles still focus on the design and manufacturing of bicycles and the management of bicycle industry. Research on cyclist behaviors and bikeway environments is still at the beginning stage. Most researchers studied cyclists from the separate dimensions of Environmental Attributes and Place Attachment, seldom from the both. For this reason, deep research and discussion from such a direction would enhance the utilization of bicycles and have the planning and development of bikeways conform to the demands of cyclists.

Literature review

Environmental Attributes

Takemi Sugiyama, Eva Leslie, Billie Giles-Corti & Neville Owen (2009) pointed out to effectively enhance physical activities of citizens by reinforcing environmental attributes and user awareness. In this case, Environmental Attributes should be considered in the establishment and planning of recreation spots, which should be managed by government sectors, for combining natural resources and environmental characteristics. Manning (1999) divided creational environments into resource setting, social setting, and management setting. Resource setting focused on the characteristics of creational resources, such as recreational

land being the development land or conservation land; social setting emphasized the interaction between tourists and others; and, Management setting referred to the management mechanism related to management units. Each recreational site therefore presents distinct characteristics and attributes to support different activities with various opportunities so as to satisfy recreationists' demands. Recreationists would choose different recreational environments according to personal purposes that such environmental attributes would become the preference (Lee, 2005).

Referring to Bryan (1977), Chan (2004) considered that sub-rock-climbing communities with distinct professional features would look for artificial rock-climbing gyms with heterogeneous environmental attributes. Lee (2005) discussed the effects of environmental attributes on the selection of accommodation and found that Ching Ching outperformed Lushan hotspring on 11 items, while Lushan outperformed Ching Ching on 2 items. In this case, environment preference was correlated with accommodation selection, and personal life style also revealed significant correlations with environment preference.

Summing up the above definitions, environmental attributes cover the spots and the characteristics in such spots where recreationists engage in activities (such as natural and environmental characteristics and the management characteristics, which could be identified by recreationists). What is more, different spots would present distinct environmental attributes that recreationists would select the recreational activities according to personal demands and preference. Environmental Attributes discussed in this study refer to local citizens participating in cycling in Dapeng Bay Bikeway who could identify various natural or artificial features and characteristics or the environments controlled by management sectors. Referring to Vespestad and Mehmetoglu (2010). Environmental Attributes are classified into: (1) *Natural Environmental Attributes*, the natural landscape in the creational environment, where the natural landscape elements are provided; (2) *Artificial Facilities Environmental Attributes*, the environmental features established or planned by managers; (3) *Management Attributes*, the characteristics related to management mechanism established by management sectors; (4) *Humanistic Resources Environmental Attributes*, the cultural characteristics in recreational environments.

Place Attachment

Tuan (1977) considered that the idea of Place Attachment reflected on various environmental interactions; the model of experiencing sites could be the process from perception to cognitive symbols; and the perception of specific sites could be changed from immediate happiness to permanent devotion. Place Attachment could be the behavioral performance of local affection and cognition (Scannell & Gifford, 2010). Lewis and Soureli. (2006) indicated that most of previous research

regarded Place Attachment as the process acquiring notion of affection or emotional bonding with the place. Scannell & Gifford (2010) pointed out Place Attachment covering multiple dimensional ideas between people and the psychological process and the place. Place Attachment was the feeling of dependency (i.e. Place Dependency) generated from the satisfaction with personal functions in the environment, after experiencing a place, as well as the connection among the sense of identity and belonging and other emotion to a place (i.e. Place Identity). Kaltenborn (1997) mentioned that people selected certain leisure spots because of local history or natural environments where they would like to continuously engage in leisure activities under the connection with time. However, negative experiences would result in attachment by giving meaning to the place and would induce in powerful emotion to slightly influence individual self-worth. Misra and McKean (2000). pointed out two dimensions for Place Attachment, namely (1) Psychological Attachment, i.e. Place Identity and (2) Function Attachment, i.e. Place Dependency. Tuan (1977) explained that sense of place resulted in Place Identity and further formed Place Attachment, which integrated the idea of action so that people appeared emotional correlations with the place and such strong emotion would affect people to act. In various studies, the discussion of Place Attachment contained the meanings of Place Dependency based on the environmental functions of a place and Place Identity about spirit and emotion.

(1) Place Dependency. Moore and Graefe (1994) pointed out the importance of Place Dependency on a place, showing the users strongly perceiving the dependency on special places or environments with similar functions so that the user appeared dependency on specific environments with specific activities. In other words, merely the places with such unique environmental characters could provide such substantial environments for users preceding such activities. It presented the importance of the substantial function in the place.

(2) Place Identity. A lot of researchers considered that people would present identity and sense of belonging when the environmental resources could satisfy the specific behavioral objectives, after being in touch with the environment.

Based on the past literatures, scaling methods, self-report technique(s), interviewing, and observation used to be applied to measuring Place Attachment, among which scaling methods were commonly utilized (Ke, 1994). With Likert-type, the scales from Extremely Disagree to Extremely Agree were summed for Attachment, according to the frequency contacting with the place, the diversity of use, and the irreplaceable significance, in order to discuss the development attitudes toward ecological tours. This study refers to the measuring questions proposed by *Chi et al.* (2012) for Place Attachment.

Environmental Attributes and Place Attachment

Wu and Porell (2000) pointed out the importance of Place Dependency on the users' activities that the users perceived strong dependency on specific places or environments with similar functions. Liu (2004) regarded Place Dependency as a form of Place Attachment and a kind of functional dependency, presenting the specific purpose undertaken and the activities offered by the place, or, compared with other places, the ability to satisfy specific demands. In regard to the environment, an individual would present the feeling of dependency on an environment, when living and doing activities in the environment, because of being familiar with the environment or the place being able to satisfy individual demands. Liu (2004) explained that people emotionally attached to a place because of the contact and experiences in the place, with which people generated some symbolic meaning or emotional connection because of specific demands being satisfied. Such emotional connection would develop distinct Place Identity by repeatedly using the place and differently depending on the place. After contacting with the environment, people would show the sense of identity and belonging on the place when the environmental resources satisfy the specific behavioral objectives (Williams *et al.*, 1992).

Aiming at above statements, the research framework and the following hypotheses are proposed in this study.

H1: Environmental Attributes presents significantly positive correlations with Place Dependency in Place Attachment.
H2: Environmental Attributes shows notably positive correlations with Place Identity in Place Attachment.
H3: Gender reveals effects on the correlations between Environmental Attributes and Place Attachment.
H4: Age appears effects on the correlations between Environmental Attributes and Place Attachment.
H5: Place of Residence presents effects on the correlations between Environmental Attributes and Place Attachment.
H6: Education Background reveals effects on the correlations between Environmental Attributes and Place Attachment.
H7: Occupation appears effects on the correlations between Environmental Attributes and Place Attachment.
H8: Monthly Income shows effects on the correlations between Environmental Attributes and Place Attachment.

Conceptual framework of the study

Summing up the above literature, the conceptual framework for this study (Figure 1) is drawn to discuss the correlations among demographic variables, Environmental Attributes, and Place Attachment.

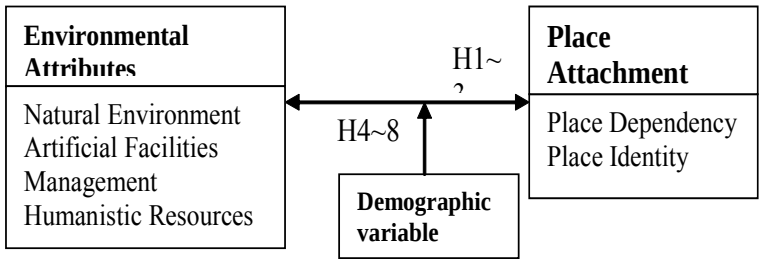

Figure 1: *Research framework*

Research method

Sample analysis in the research framework

Dapeng Bay Bikeway is planed as the research area in this study. Dapeng, used to name Datang, covers rich mangrove ecology. Japanese soldiers built military base here as the base for World War II during Japanese ruled period. After the retrocession, an aviation academy was established by Republic of China Air Force to continue the military use. Dapeng therefore has been a restricted area. Integrating with Lagoon Landscape, Customs of Fishing Village, Humanities in Communities, Natural Landscape, and Sunset at Beach, Dapeng Bay Bikeway outperforms other Bikeway systems in other cities and presents better tourism value. Dapeng Bay Bikeway therefore is selected for the research.

Sampling and data analysis

With on-site questionnaire distribution and collection, local inhabitants at Dapeng Bay Bikeway are distributed 285 copies of questionnaires. Having deducted invalid ones, total 230 copies are valid, with the retrieval rate 80.7%. Each retrieved copy is regarded as a valid sample. SPSS is utilized for analyzing the data and Factor Analysis, Reliability Analysis, Regression Analysis, and Analysis of Variance are applied to testing the hypotheses.

Research result and analysis

Factor Analysis of Environmental Attributes

According to Yen (2006), Environmental Attributes were extracted four dimensions with Factor Analysis, and the Cronbach α appeared 0.85 (Natural Environment), 0.92 (Artificial Facilities), 0.89 (Management), and 0.89 (Humanistic Resources). Based on the dimensions and questions proposed by Kaltenborn (1997) and Tagreed, (2012) Place Attachment was extracted two dimensions with Factor Analysis, and the Cronbach α revealed 0.90 (Place Dependency) and 0.91 (Place Identity).

Correlation Analysis of Environmental Attributes and Place Attachment

(1) Correlation Analysis of Environmental Attributes and Place Dependency in Place Attachment. With Regression Analysis to test H1, Table 2, the analysis results showed the significant correlations between Natural Environment (βeta=0.225, p<0.01), Artificial Facilities (βeta=0.186, p<0.05), Management (βeta=0.177, p<0.05), Humanistic Resources (βeta=0.159, p< 0.05) and Place Dependency in Place Attachment that H1 was supported.

(2) Correlation Analysis of Environmental Attributes and Place Identity in Place Attachment. With Regression Analysis to test H2, Table 2, the analysis results presented the remarkable correlations between Natural Environment (βeta=0.214, p<0.01), Artificial Facilities (βeta=0.181, p<0.05), Management (βeta=0.165, p<0.05), Humanistic Resources (βeta=0.152, p<0.05) and Place Identity in Place Attachment that H2 was supported.

Table 2. *Regression Analysis of Environmental Attributes and Place Attachment*

Dependent variable→	Place Attachment					
Independent variable↓	Place Dependency			Place Identity		
Environmental Attributes	β	Beta	ρ	β	Beta	ρ
Natural Environment	2.312**	0.225	0.000	2.255**	0.214	0.000
Artificial Facilities	1.967*	0.186	0.011	1.894*	0.181	0.013
Management	1.872*	0.177	0.016	1.781*	0.165	0.021
Humanistic Resources	1.731*	0.159	0.027	1.613*	0.152	0.032
F	22.854			27.618		
Significance	**0.000*** **			**0.000*** **		
R2	0.238			0.286		
Regulated R2	0.031			0.037		

*Note: * stands for p<0.05, ** for p<0.01.*

Data source: Self-organized in this study

Moderating effects of demographic variables

(1) Effects of Gender on the correlations between Environmental Attributes and Place Attachment. The empirical results with Analysis of Variance, Table 3, revealed the effects of Gender on the correlations between Management, Humanistic Resources and Place Dependency and between Artificial Facilities and Place Identity that H3 was partially supported.

(2) Effects of Age on the correlations between Environmental Attributes and Place Attachment. The empirical results with Analysis of Variance, Table 3, revealed the notable effects of Age on the correlations between Natural Environment, Humanistic Resources and Place Dependency and between Management and Place Identity that H4 was partially supported.

(3) Effects of Place of Residence on the correlations between Environmental Attributes and Place Attachment. The empirical results with Analysis of Variance, Table 3, showed the significant effects of Place of Residence on the correlations between Artificial Facilities, Humanistic Resources and Place Dependency and between Natural Environment, Management and Place Identity that H5 was partially supported.

(4) Effects of Education Background on the correlations between Environmental Attributes and Place Attachment. The empirical results with Analysis of Variance, Table 3, appeared the remarkable effects of Education Background on the correlations between Management, Humanistic Resources and Place Dependency and between Artificial Facilities and Place Identity that H6 was partially supported.

(5) Effects of Occupation on the correlations between Environmental Attributes and Place Attachment. The empirical results with Analysis of Variance, Table 3, presented the notable effects of Occupation on the correlations between Management and Place Dependency and between Natural Environment, Artificial Facilities, Humanistic Resources and Place Identity that H7 was partially supported.

(6) Effects of Monthly Income on the correlations between Environmental Attributes and Place Attachment. The empirical results with Analysis of Variance, Table 3, showed the significant effects of Monthly Income on the correlations between Natural Environment, Management and Place Dependency and between Artificial Facilities and Place Identity that H8 was partially supported.

Table 3. *Effects of demographic variables on the correlations between Environmental Attributes and Place Attachment*

Demographic variable	Environmental Attributes	Place Dependency	Place Identity
Gender	Natural Environment	Insignificant	Insignificant
	Artificial Facilities	Insignificant	Significant
	Management	Significant	Insignificant
	Humanistic Resources	Significant	Insignificant
Age	Natural Environment	Significant	Insignificant
	Artificial Facilities	Insignificant	Insignificant
	Management	Insignificant	Significant
	Humanistic Resources	Significant	Insignificant
Place of Residence	Natural Environment	Insignificant	Significant
	Artificial Facilities	Significant	Insignificant
	Management	Insignificant	Significant
	Humanistic Resources	Significant	Insignificant
Education Background	Natural Environment	Insignificant	Insignificant
	Artificial Facilities	Insignificant	Significant
	Management	Significant	Insignificant
	Humanistic Resources	Significant	Insignificant
Occupation	Natural Environment	Insignificant	Significant
	Artificial Facilities	Insignificant	Significant
	Management	Significant	Insignificant
	Humanistic Resources	Insignificant	Significant
Monthly Income	Natural Environment	Significant	Insignificant
	Artificial Facilities	Insignificant	Significant
	Management	Significant	Insignificant
	Humanistic Resources	Insignificant	Insignificant

Data source: Self-organized in this study

Conclusions

This study aims to explore the relationship between Environmental Attributes and Place Attachment of cyclists.

(1) Relationship between background variables and Environmental Attributes. Cyclists who are married without children are more satisfied with the natural environment in Dapeng Bay than those who are married with children. Moreover, cyclists who graduated with a degree and live in Donggang enjoy more of the surrounding environment in Dapeng Bay than those who graduated from junior high schools and live in other areas. Therefore, the local authorities can provide the cyclists who are married with children or unmarried, with junior high school degree, and living in other areas with more opportunities of involvement to increase their satisfaction. Cyclists who ride for 1 to 2 hours are more satisfied with the natural environment, management, and humanistic ecology in Dapeng Bay than those who ride less than an hour. Therefore, planning various events or designing more bikeways can increase the cycling time as well as increase cyclists' familiarities with the environmental attributes in Dapeng Bay and thus increase their satisfaction.

(2) Relationship between background variables and place attachment. Cyclists aged 31 to 41 have higher attachment than those who are under 20 years old. Also, Donggang residents have higher attachment than those who live in Linbien and Nanjou. The local authorities can plan various events for those cyclists with lower attachment to increase their dependency on Dapeng Bay. Cyclists who go biking 11-20 times per month have a higher level of Place Attachment than those who go cycling for less than 10 times. Therefore, increasing the number of times cycling outdoor could improve cyclists' satisfaction that a higher attachment may be built to the local environment. Cyclists who ride for 1 to 2 hours each time have closer attachment and deeper sense of identify than those who ride less than an hour. Therefore, increasing the cycling time can enhance their understanding of Dapeng Bay Bikeway and also increase their satisfaction, mental dependency, and emotional identity.

(3) Correlation between environmental attributes and place attachment. The research results show that there is a positive correlation between Environmental Attributes and Place Attachment. It means that the higher satisfaction with Environmental Attributes could develop the closer Place Attachment (identity, dependency). It also shows that a higher satisfaction with Environmental Attributes could enhance cyclists' identity and dependency on Dapeng Bay Bikeway. Cyclists will be more comfortable with the area, produce emotional dependency on the place, and have better understanding of the surrounding area. Having a deeper feeling of Dapeng Bay, cyclists will have a feeling of being at their own home. They therefore will be more satisfied.

Suggestion

According to the research results, Environmental Attributes reveal positive correlations with Place Attachment of cyclists, presenting the higher satisfaction with Environmental Attributes, the higher identity and dependency on Dapeng Bay Bikeway that cyclists would be willing to cycle in Dapeng Bay Bikeway and appear identity and dependency on the place. During the research, it is discovered that the government intends to construct a lot of bikeways in the following years. Some suggestions therefore are proposed, as below.

(1) Increasing the environment diversities of bikeways. To enhance the attachment of cyclists to bikeways, Place Dependency needs to be reinforced, i.e. to satisfy the demands. Integrating bikeways with various resource attributes, devoting to environment diversities, and establishing local tourism resources could increase the use frequency of bikeways and enhance the attachment of tourists with lower attachment.

(2) Providing learning opportunities for cyclists. Diverse and rich interpretation systems could be provided for tourists acquiring information, enhancing the understanding about local culture and nature, and satisfying the demands so as to further identify with specific places emotionally. The management sectors could design interesting and educational learning opportunities to increase the interaction between tourists and the place so that the tourists could better understand the culture of bikeways and enhance the attachment to the place.

(3) Maintaining clean environment. Cyclists stress a lot on the overall environment cleanness. Although it would not directly enhance Place Attachment, it could increase the recreational experiences and further promote the satisfaction. High satisfaction would enhance the revisit intention and the recommendation to others that the cyclists would increase the experiences and enhance the attachment.

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