行政院國家科學委員會專題研究計畫 成果報告

從空間認知觀點探討都市公園使用行為之研究
研究成果報告(精簡版)

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計 畫 主 持 人：張曜麟

計畫參與人員：碩士班研究生-兼任助理人員：竇立峰
碩士班研究生-兼任助理人員：許芠睿
大專生-兼任助理人員：楊佩珊

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中 華 民 國 99 年 10 月 31 日

摘要

本研究從使用者空間認知的角度切入，首先建構都市公園使用行為之理論架構，理論架構包含空間認知、滿意度與行為意圖三個向度。本研究以結構方程模式為研究模型進行模型之設定與實証，並利用卷調查作為資料蒐集方法。分析結果顯示，空間認知會正向影響滿意度，滿意度會正向影響空間認知，此一結果符合研究假設。
關鍵字：都市公園、空間認知、使用行為

Abstract

The aim of this study is to probe into the users' behavior in urban parks from the viewpoint of spatial cognition. This study establishes a conceptual framework to describe the behavioral intention of an urban park user. The theory framework consists of three dimensions: spatial cognition, degree of satisfaction and behavioral intention. And a structural equation model (SEM) is then employed to formulate the relationship between individual's behavioral intention of an urban park and its influencing factors. A set of questionnaires was designed and citizens in Tainan were interviewed in order to collect the required data for empirical study. The result from the analysis shows that spatial cognition positively affects the degree of satisfaction, and vice versa, which is consistent with the hypothesis of this study. The paper ends with a suggested research agenda to the government to renovate urban parks.
Keywords: Urban Park;Spatial cognition;User's behavior;Structural Equation Model

1. Introduction

Taiwanese cities have high population concentration. It leads to the occurrence of various problems, including the expansion of cities, insufficiency of public facilities, destruction of natural environment, increasing consumption of energy and resources, expansion of urban environmental effects and deterioration of living quality in cities. As the economy and national income grow, so does urban residents' need for recreational activities, whose accessibility is often limited by transportation resources and time allocation. As a result, parks play an important role in the daily life of urban residents. The development and conservation of parks and greens are important issues promoted by United Nations Educational, Scientific and Cultural Organization (UNESCO) in its 21st century sustainable development agenda, and it is considered a major indicator of reference when evaluating living quality of cities around the world. It not only influences greatly on resource preservation and space planning, but also positively affects cultural and social orders. The amount of lands preserved for parks becomes a crucial indicator when evaluating environment and living quality in a community (Hempel and Tucker, 1979).

However, urbanization has forced the shrinking and disrupting of the urban space. When it comes to urban parks, in addition to find more lands, a re-evaluation of current usage of park resources is also needed, to make sure that they can properly meet the recreational needs of urban residents. Therefore, parks should provide spaces and facilities to accommodate needs of different individuals, and elevate the living quality of urban residents with various

recreational experiences. Based on this idea, the study adopts a user-centered perspective in exploring the cognition of and emotional response to spaces, so to understand what the general public really expect from a park.

Research on cognition of park users include usage limitation of non-users (Scott and Jackson, 1996), use survey on users, or observation of park visitors' behaviors in combine with post-usage evaluation. However, users' behaviors in urban parks could be influenced by many factors, including space planning and facilities, each distinct in its own nature. As a result, the study focuses on how cognitions of various spaces in urban parks could influence user's behaviors. Degree of satisfaction and post-usage intention survey are adopted to evaluate users' behaviors, in order to explore the causal relationship between spatial cognition, degree of satisfaction and behavioral intention.

The study starts by understanding factors that affect users' behavioral intention, which was done by descriptive preference questionnaire survey. Then structural equation modeling (SEM) is adopted to construct a relationship model to analyze those intentions. The result derived could serve as a reference for public sectors for improvement and further development of urban parks in the future.

2. Literature Review

2.1 Spatial Cognition

Spatial cognition is defined by Moore and Hart (1976) as "the knowledge and internal or cognitive representation of the structure, entities and relations of space." Kuipers (1978) termed common-sense knowledge of space as "knowledge about the physical environment that is acquired and used, generally without concentrated effort, to find and follow routes from one place to another, and to store and use the relative positions of places." Kaplan and Kaplan (1981) argued that spatial cognition is a human process of storing, perceiving, and re-constructing of environmental stimulus. Thus spatial cognition should be considered as the process that people learn, store and construct spatial signals after being stimulated by the environment or space.

In fact, spatial behaviors of humans are complicated. They are not only affected by spatial properties, but intervened by non-spatial properties as well (Gärling et al., 1986). Spatial congition is constructed by different elements, which can help for better understanding of its impact on people's behavior. Baker (1987) categorizes these factors into three groups: (1) environmental factors, refering to noices, flavors and refreshness, plus air qualities like tempeture, humidity and ventilation; (2) social factors, meaning the number, apprearance and behaviors of users in the environment; (3) design factors, which could be futher divided into "functional factors" and "aesthetic factors" like architecture, colors, proportion, material, texture, forms, shapes, styles, accessories and so on.

2.2 Degree of Satisfaction

Huang(2003) thinks that degree of satisfaction refers to the extent that one feels content or discontent, which usually depends on the gap between what a customer perceives of a service and what the customer has expected. When the two match, the customer is content.

When the perception exceeds expectation, the degree of satisfaction hightens. If it is the other way around, the customer is discontent. Dorfman (1979) points out that the experience of satisfaction differs because of personal preferences, expectations, perceptions and motives, and is further complicated by different degrees of influence of variables in one experience. Bigne et al. (2001) consider that the degree of recreaitonal satisfaction is a visitor's integrated assessment of the entire recreation process. Day (1977) thinks that degree of satisfaction is an integrated and generalized concept that should only be used once to assess one experience. Because individual varaibles triggering recreational satisfaction are abstract and difficult to be conceptualized, this study adopts the assessment of degree of integrated satisfaction, which is eaiser to collect from visitors, to measure visitors' recreational satisfaction.

2.3 Behavioral Intention

Behavioral intention refers to people's subjective judgments of their future behavior tendency, and can be used to predict people's behaviors. It denotes the likelihood that a particular behavior will be undertaken by a consumer towards products or enterprises after consumption (Engel et al., 1995). Huang (2005) defines behavior intention as the likelihood that a visitor would purchase more, pay more or recommend to others after experiencing commodities, activities, and services relating to one particular visit. Wang (2005) takes the possibility of re-visiting, recommending, promoting and providing suggestions for improvement as constructs to measure visitors' loyalty. Zeithaml and Bitner (1996) propose thirteen dimentions when examing the quality-intention link, and, by factor analysis, extract five behavioral demensions: loyalty, propensity to switch, williness to pay more, external response and internal response. Loyalty and williness to pay more are positive results, while the other three are negative. In order to investigate users' behavioral intentions, the study adopts "re-visiting intention," "recommendation intention," "purpose intention," and "substitute intention" as questions for measurement.

2.4 Planning of Facilities in Urban Parks

Chen Chi-Wen (2002), by text analysis, investigated the underlying concepts and values of a park designer when drafting the blueprint, and found five hidden values: "real-use value," "experience value of landscape," "operation value of parks," "representative value of the society," and "urban value of site." In addition, Wu (1984) also mentioned that when designing a park, "practicality," "safety," "aesthetics," "nature," "education," "easiness of maintenance" are the six general principles that a designer should hold. Municipal Ordinance of Park Management of Kauhsiung City also requires that "landscape," "recreation," "game," "sports," "culture and eduction," "service and management," and "other necessary or ancillary" facilities should all be included in a park.

3. Research Design

3.1 Research Design and Hypothesis

According to the literature review, the study proposed a research structure as shown in Figure 1:

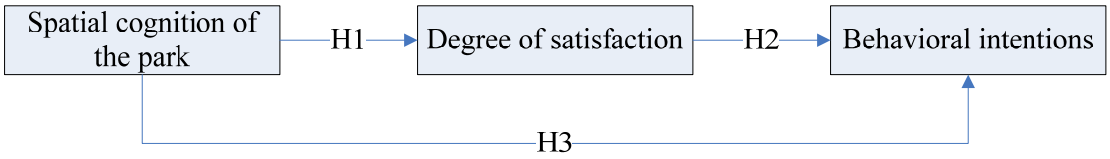


Figure 1. Research Design

According to the abovementioned research design and purpose, the study proposed hypotheses as below:

H1: Spatial cognition of the park affects users' degree of satisfaction

H2: Degree of satisfaction affects users' behavioral intentions

H3: Spatial cognition of the park affects users' behavioral intentions

3.2 Questionnaire Design

The study investigates the relationship among spatial cognition, behavioral intentions and degree of satisfaction. To guarantee a quality result, the study conducted a pilot test to secure the reability and validity of the survey. The questionnaire used in the pilot test went through analysis of items, factors, reliability and validy, and then formalized as the final version. Details of questionnaire design will be illustrated in the following part, with the questionnaire attached in appendix 1.

(1) Demographic information of users

This could help further understand different backgournd variables. Items included in this part are "gender," "age," "education degree," "profession," "major motive," and "most frequent visiting times".

(2) Scale of spatial cognition

Based on Baker's research (1987), the study categorized the spatial cognition attributes of a park into "environmental factors," "social factors" and "design factors," and presented them in three different scales, which contain 26 items in total. Items include either positive or negative statements, and the degree of agreement is measured with Five-point Likter Scale. "Strongly agree," "Agree," "Neither agree nor disagree," "Disagree," "Strongly disagree" are represented by five, four, three, two, and one point respectively. The average score of the sum of all points in different items represents the repondant's spatial cognition of the park. The higher the score, the more positive the spatial cognition.

(3) Scale of degree of satisfaction

The scale is constructed based on items proposed in Municipal Ordinance of Park Management of Kauhsiung City, in combine with an adjusted version of questionnaire designed by Li (2005). The scale include two aspects, "Degree of satisfaction towards space facilities" and "Degree of satisfaction towards space design," containg 10 itmes in total, with degree of agreement measured by Five-point Likter Scale. "Strongly agree," "Agree," "Neither agree nor disagree," "Disagree," "Strongly disagree" are represented by five, four, three, two, and one point respectively. The higher the score, the more satisfied the repondant.

(4)Behavioral intention

Behavioral intention indicates users' behaviors in a recreational space. Users' behavioral

intentions are evaluated by their extent of agreement on four statements: “I am willing to use this park space next time,” “I am willing to recommend this park to my friends,” “In general, I received what I need in this park,” and “In my heart, this park is not easily sustituted by another.”

3.3 Data Collection

After pilot test and correction, formal survey was launched in Dr. Thomas Barclay Commemorative Park, Tainan City, in January 2010. Questionnaires were disseminated to park users randomly by convenience sampling at park gates, and collected at the spot. The survey lasted for one day, one slot in the morning and the other in the afternoon. Among 426 questionnaires that were disseminated, 403 were valid- meaning validity rate reached 95%.

3.4 Data Analysis

The study employed SPSS 12.0 to conduct descriptive statistics, the path analysis model is then verified by LISREL v8.51.

4. Results

4.1 Demographic Analysis of Users

From Table 1, it could be inferred that male is the dominant gender, accounting for 51.5% of all respondents. Age group “under 20”, “31-40” and “41-50” are the three largest, occupying the same proportion, 22.6%, of respondents. 49.1% of respondents hold university degrees, followed by senior high school or vocational school degrees (21.6%). Students account for 29.3%, with 13.4% people serving in other professions, mostly retirees. The “major motive” for 50.9% of respondents is recreational sports, followed by 14.9% people aiming for releasing pressure. 33.7% of respondents’ “most frequent visiting time” is 2-5pm in the afternoon, while 21.8% prefer 8-11am in the morning.

Table 1. Data Analysis of Samples

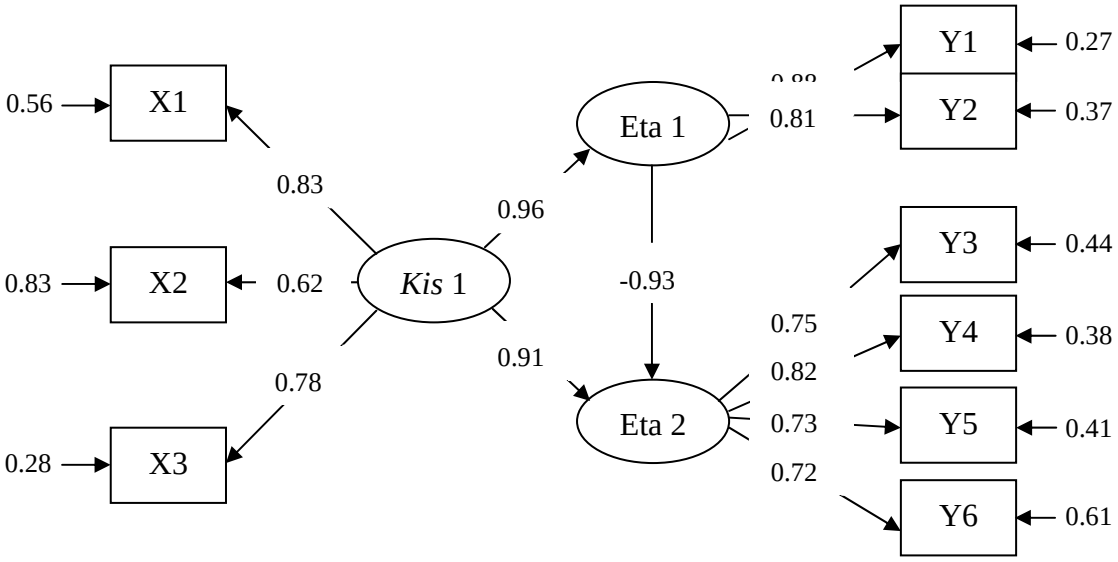
Items	Groups	Sample numbers	Proportion (%)
Gender	Male	208	51.5
	Female	195	48.5
Age	Under 20	91	22.6
	21-30	57	14.1
	31-40	91	22.6
	41-50	91	22.6
	51-60	50	12.4
	Over 61	23	5.7
Education degree	Elementary school	18	4.5
	Junior high school	32	7.9
	Senior high/vocational school	87	21.6
	University	198	49.1
	Graduate Institute and above	68	16.9
Occupation	Student	118	29.3
	House-keeping	41	10.2
	Services	48	11.9
	Military	5	1.2
	Public officials	24	6.0

	Teacher	43	10.7
	Manufacturing	45	11.2
	Commerce	25	6.2
	Primary sectors	0	0
	Others	54	13.4
Major Motive	Recreational sports	205	50.9
	Social activities	12	3.0
	Release pressure	60	14.9
	Kill time	25	6.2
	Connect with nature	26	6.5
	Enhance family bound	27	6.7
	Escape from urban life	1	0.2
	Enjoy solitary	2	0.5
	Find inspiration	4	1.0
	Shoot photos	11	2.7
	Refresh memory	7	1.7
	Satisfy curiosity	2	0.5
	Ecological education	2	0.5
	Conduct survey	3	0.7
	Others	16	4.0
Most frequent visiting time	5-8am	57	14.1
	8-11am	88	21.8
	11am-2pm	26	6.5
	2-5pm	136	33.7
	5-8pm	75	18.6
	Others	21	5.2

4.2 Result Analysis of Hypothetical Model on the Influence of Spatial Cognition and Degree of Satisfaction on Behavioral Intentions

In order to ensure the consistency of the result, the measuring unit of variables was standardized, and the parameters were assessed and estimated by maximum likelihood (ML). Figure 2 illustrates the path diagram of the hypothetical model of spatial cognition, degree of satisfaction and behavioral intentions. X1 to X3 are three endogenous variables: environmental factors, social factors and design factors. Y1 to Y4 are six exogenous variables, ranging from degree of satisfaction to behavioral intentions, with Ksi 1 representing spatial cognition, Eta1 representing two measured variables on degree of satisfaction, and Eta2 representing four measured variables on behavioral intentions.

After analyzing with LISREL, a structural equation modeling tool, the study demonstrates the assessment of goodness of fit as Table 2. It shows that in addition to the commonly used P-value generated by X^2 test, the model's goodness of fit is assessed with many other test values. The main reason was to prevent a biased X^2 statistic due to the observation number, thus multiple test values were preferred when assessing the goodness of fit. Putting the goodness of fit and the path diagram together, it is certain that the hypothetical model is explanatory.



Chi-Square=80.46， df=24， P-value=0.0000， RMSEA=0.072

Figure 2 Path Diagram on the Hypothetical Model of Spatial Cognition, Degree of Satisfaction and Behavioral Intentions

4.3 Overall Model Fit Analysis

The study uses LISREL v8.51 to conduct model confirmation in order to investigate the compatibility of the model and the input data. The higher the goodness of fit, the more compatible the model is. The overall analysis of the study's linear structural model is based on the standard proposed by Huang (2007) and Chiou (2006). Table 2 shows the overall model fit after assessed with 11 measuring indicators, revealing that the path-model fit of the study is good.

Table 2 Goodness of Fit of Hypothetical Model of Spatial Cognition, Degree of Satisfaction and Behavioral Intention- Summary

Measurement Model: hypothetical measurement model			
measuring indicator	ideal value	measured value	measuring standard
X^2/df	3-5	3.35	reached
RMSEA	.05 - .08	.072	reached
RMR	< .1	.047	reached
GFI	> .9	.96	reached
AGFI	> .9	.93	reached
NFI	> .9	.95	reached
NNFI	> .9	.94	reached
CFI	> .9	.96	reached
PNFI	> .5	.63	reached
PGFI	> .5	.51	reached
CN	> 200	213.14	reached

4.4 Path Analysis of the Hypothetical Model

Figure 2 reveals that environmental factors, social factors and design factors all have positive influence on users' spatial cognition. Among them social factors has the lowest path coefficient of direct effect (X2＝0.41, p＜.001), environmental factors ranking the second (X1=0.73, P＜.001), and design factors claiming the first (X3=0.84, P＜.001).

Figure 2 demonstrates that the exogenous variables, Y1 and Y2, show positive influence. The path coefficient of direct effect of "degree of satisfaction towards space facilities" is 0.84 (Y1=0.84), while that of "degree of satisfaction towards space design" is 0.80 (Y2=0.80, p< .001).

The four exogenous variables on behavioral intentions in Figure 2 show positive influence. Among them, "recommendation" enjoys the hightst path cofficient of direct effect (Y4=0.81, p<.001), followed by "re-visiting" (Y3=0.74), "purpose" (Y5=0.72, p<.001), and "substitute intention" is at the bottom (Y6=0.62, p<.001).

The study focuses on constructing a model to assess the extent to which behavioral intentions are influenced by spatial cognition and degree of satisfaction. Figure 2 shows that spatial cognition has greatest direct influecne on behavioral intentions, with path coefficient of direct effect reaching 1.51 (p<.05) and is significant. It also has direct influence on degree of satisfaction, with path coefficient reaching a significant 0.95 (p<.001). However, the path coefficient of the direct effect of degree of satisfaction on behavioral intentions is -0.93, non-significant. It was probably because that users' spatial cognition is more influential than degree of satisfaction when it comes to behavioral intentions. Another possible reason was that the selected park has few facilities, so users do not have an explicit assessment on wheather they are satisfied with the facilities or not, which leads to a non-significant relationship between degree of satisfaction towards facilities and behavioral intentions.

Table 3 Path effects of Variables on Spatial Cognition, Degree of Satisfaction and Behavioral Intentions

Parameter	Path Coefficient of Direct Effect	t-value
spatial cognition - behavioral intentions	1.51	2.26*
spatial cognition - degree of satisfaction	0.95	17.67***
degree of satisfaction - behavioral intentions	-0.93	

5. Conclusions and Recommendations

5.1 Conclusion

Based on valid observations, the study draws conclusions as below:

(1) SEM analysis shows that H2, degree of satisfaction has positive influence on behavioral intentions, is not sustained due to non-significant relation. But in addition to that, both H1 and H3 are valid, meaning that spatial cognition has positive influence on both degree of satisfaction and behavioral intentions. The reason that H2 is not sustained, probably because that the selected park, Dr. Thomas Barclay Commemorative Park, features ecological landscapes with few facilities, so park visitors did not come for facilities.

Therefore there is no positive relationship between satisfaction towards space facilities and behavioral intentions.

(2) After conducting empirical research, the study found that most visitors to the park were aiming for recreational sports. The result also shows that users are more satisfied with "environmental factors" and "design factors," but not as much with "space design." The study believes that users, mostly residents in the neighborhood, are not content with facilities because "sport facilities" are not diversified enough. Respondents also showed their discontent with "parking space." The result shows that current facilities in the park have to be reviewed and re-planned to elevate degree of satisfaction.

5.2 Recommendations

(1) Conduct in-depth interviews with park designers and local government authority of urban planning

By conducting in-depth interviews with park designers and government officials in charge of urban planning, we can explore the possible changes that could be done from the supply side. On the other hand, surveys on park visitors' needs should also be conducted in order to understand what their real demands are. After analyzing and comparing opinions from both the supply and demand sides, we will discover the future direction of urban park design.

(2) Compare different urban park facilities

Compare different urban parks from a user's perspective, and analyze different users' spatial cognition, degree of satisfaction and impressions on park facilities, so to propose suitable space design plans for different types of urban parks.

(3) In-depth analysis and understanding of the constructs of spatial cognition of urban park spaces

The study concludes that environmental factors are a crucial attribute in special cognition, while design and social factors are not as important. It might have a lot to do with the nature of the selected park, which is non-profit-seeking. In the future, in-depth research is suggested to conduct in different types of urban park, in order to explore the relationship between spatial cognition and degree of satisfaction. In addition, the three attributes (environmental, social and design factors) proposed by the study could serve as independent subject for further research, so to better understand their individual implications.

Bibliography

1. Baker, J., (1987), "The Role of the Environment in Marketing Services: the consumer perspective." In *The Services Challenge: integrating for competitive advantage*, by John A. Caepeil, Carole A. Congram and James Shanahan, 79-84. Chicago: The American Marketing Association.
2. Bigne, J. E., Sanchez, M. I. and Sanchez, J. (2001), Tourism Image, Valuation Variables and after Purchase Behavior: inter-relationship, *Tourism Management* , Vol. 22, no. 6: 607-616.
3. Chen, C. W.(2002), The Cognitive Model of Park Design: the case of urban parks in Taipei, Master Dissertation, Department of Architecture, TamKang University, Taipei.

4. Chiou, H. J.(2006), *Structural Equation Modeling: the theory, technology and application of LISREL*. Taipei: Yeh Yeh Book Gallery.
5. Day, R. L.(1977),"Alternative Definitions and Designs for Measureing Consumer Satisfaction." In *The Conceptualization for Consumer Satisfaction and Dissatisfaction*, by H. Keith Hunt. Cambridge, MA: Marketing Science Institute.
6. Dorfman, P. W. (1979), Measurement and Meaning of Recreation Satisfaction: a case study of camping, *Environment and Behavior* ,Vol.11, no. 4: 483-510.
7. Engel, J. F., Blackwell, R. D. and Miniard, P. W.(1995), *Consumer Behavior.* 8th. New York: Holt, Rinehart & Winston Inc..
8. Gärling, T., Book, A. and Lindberg, E. (1986), Spatial orientation and way finding in the designed environment：A conceptual analysis and some suggestions for post occupancy evaluation, *Journal of architectural and planning research*, Vol.3, no. 3: 55-64.
9. Hempel, D. J. and Tucker, L. R. (1979), Citizen Preference for Housing as Community Social Indicators, *Environment and Behavior*, Vol.11, no. 3: 399-428.
10. Huang, F. M.(2007), *Structural Equation Modeling.* 5th. Taipei: Wu-Nan Culture Enterprise.
11. Huang, J. H. (2005), *The Relationship among Experiential Quality, Satisfaction and Behavior Intention: a case study of Hwatao kiln.* Master Dissertation, Leisure Serves Management, Chao Yang Technology University.
12. Huang, J. Y. (2003), *The World of Marketing.* Taipei: Common Wealth & Vision.
13. Kaplan, S. and Kaplan, R.(1981), *Cognition and Environment Functioning in an Uncertain World.* Ann Arbor: Ulrich's Bookstore Press.
14. Kuipers, B. (1978), Modeling Spatial Knowledge, *Cognitive Science* , Vol. 2: 129-153.
15. Li, M. C. (2005), The study of effecting the factors of user’s satisfaction for residents of Chia-Yi city in different types of park design ideals. Master Dissertation, Department of Horticultural Science & Graduate Institute of Horticulture of Architecture, National Chiayi University, Chiayi.
16. Moore, G. T. and Hart, R. A.(1976), "Extracts from the Development of Spatial Cognition." In *Environmental Psychology, People and Their Physical Settings*, by H. M. Proshansky, W. H. Ittelson and L. G. Rivlin, 258-281. Holt: Rinehart & Winston Press.
17. Scott, D. and Jackson, E. L. (1996), Factors that Limit and Strategies that might Encourage People's Use of Public Parks, *Journal of Park and Recreation Administration* , Vol.14: 1-17.
18. Urban Development Bureau, Kaohsiung City Government(2005), *Municipal Ordinance of Park Management of Kaohsiung City.* Kaohsiung City: Kaohsiung City Government.
19. Wang, B. W. (2005), *A Study of the Relationship among Leisure Experience Models, Tourism Image and Tourist's Loyalty: the B&B case study of Fencihu.* Master Dissertation, Graduate Institute of Tourism Management, Nan Hua University.
20. Wu, L. Y., (1984), General Principles of Park Design." *World Construction & Architecture*, Vol. 4: 74-80.
21. Zeithaml, V. A. and Bitner, M. J. (1996), *Service Marketing.* New York: McGraw-Hill.

國科會補助專題研究計畫項下出席國際學術會議心得報告

日期：99 年 9 月 1 日

計畫編號	NSC 98－2410－H－041　－006　－		
計畫名稱	從空間認知觀點探討都市公園使用行為之研究		
出國人員 姓名	張曜麟	服務機構 及職稱	嘉南藥理科技大學 助理教授
會議時間	2010 年 8 月 28 日至 2010 年 8 月 30 日	會議地點	日本奈良市
會議名稱	2010 國際都市計畫研討會 International Symposium on Urban Planning 2010		
發表論文 題目	A Study on Use Behaviors in Urban Parks: from the Perspective of Spatial Cognition		

一、參加會議經過

2010 國際都市計畫研討會（International Symposium on Urban Planning 2010），於 2010 年 8 月 28 日到 8 月 30 日在日本奈良舉行。本研討會討論主題為：：歷史遺產與都市計畫「Historic Heritage and City Planning」，議題與內容十分多樣、具體、踏實，與會學者主要來自台灣、日本、韓國及中國。此次為本人第一次參加此一研討會，藉由參與的機會，讓本人認識了各國的學者。整個會議不管是在議程或內容的安排上，都充分地展現主辦單位的巧思與熱情。會議地點在 Nara Women's University。

在會議議程的安排方面，8 月 28 日（星期六）歡迎晚會—（奈良県新公会堂）；8 月 29 日（星期日）開幕典禮、論文發表及研討會； 8 月 30 日（星期一）參訪行程（平城遷都 1300 年祭会場）。

8 月 29 日上午研討會場次正式展開，同時在 8 處不同場地進行論文發表與討論，由於本人被排定於下午 1:30 之場次，故前往聆聽其它學者之論文發表，包括「A Study on the Use of Renewable Energy for Urban Regeneration Strategies in Korea -Focused on the Case of Rivers and Streams in Gyeonggi Province」、「Designing Urban Greenway Networks Using Multi-Objective Programming」、「A Study of the Travel Products from Shanghai to Japan」、「A Study of Predictions on Bus Travel Time Using Bus Probe Data - For Fixed-route Bus Arrival Time Information Service」、「A Comparative Study on Organizational Structure and Management System of Urban Bus Transport System in Metropolitan Cities of Developing Countries」等文章。

下午本人所報告之場次是村上博士所主持，報告完後針對研究調查實施之時間進行意見交換，並給予本人許多建議。

照片 1 歡迎酒會

照片 2 研討會地點－奈良女子大學

8 月 30 日是由主辦單位安排的參訪活動－平城遷都 1300 年祭，上午係前往日本之重要古蹟參訪，包括 Horyuji Temple. Saiin Garan (the Western Precinct), Daihozoin(treasure repository)，下午則是前往平城遺址(Heijo Palace Site)參觀，由此可以發現日本人對於歷史遺址保存之重視，同時也增加了許多珍貴的觀光資源。

9 月 1 日則是台灣都計學會的許多學術先進一同前往京都參訪當地著名的許多古蹟、寺廟，一睹聞名許久的京都風采，確實相當令人驚豔與羨慕。

照片 3 京都重要祭典海報

照片 4 京都祇園花見小路

9 月 2 日中午即搭機返回台灣。

二、與會心得

本次研討會主題設定於：(1) Transportation and Urban Infrastructure、(2) Open Space Planning、(3)Participatory Planning、(4)Urban and Regional Analysis、(5)Disaster Prevention、(6) Residential Environment、(7) Housing Issues、(8) General Plan, Comprehensive Plan、(9) Landscape Planning and Design 等，共九個主題，相當豐富且多元化，讓與會者受益良多。

本人藉由親身參與多場論文發表會，並與發表人針對都市計畫各議題進行討論。在討論的過程中，除了會學者之專業領域背景不同之外，各國國情亦有相當大之差距，藉由不同觀

點的激盪，可以產生許多新的研究方向。此一過程很明確的印證若欲進行某主題之國際比較時，參與國際研討會是必要的。

除了論文的發表之外，藉由參與國際研討會更可認識許多不同領域之國外研究者，透過以文會友之方式，讓更多的國外研究者能知道並瞭解台灣目前的研究現況。有了幾次難得的經驗後，希望後續能再利用此項補助之機會參與其他領域之國際研討會，以增加研究之面向。

除了參與國際研討會之外，本人亦利用此次難得的機會及有限的時間參觀了研討會所在地之奈良與京都，以此次的經驗可知，日本的古蹟保存與台灣有很大的差異，而此差異除了受到一些可觀測因素的影響之外，還受到一些脈絡因素的影響，若不是透過研討會上彼此面對面的討論，對那些不是生活在當地的人而言，是較難得知的。

三、考察參觀活動

本次主辦單位安排之考察包括法隆寺（Horyuji Temple）及平城王宮遺址（Heijo Palace Site）。前者是世界最古老的木造建築及日本第一處申請世界文化遺產的寺廟，保存得相當良好，同時在所有室內都不能拍照。後者則是日本奈良時代的首都，1963 年開始正式開展調查發掘，直至現在仍在繼續，遺址上則依當時之規格重現當時之宮殿。

照片 5 日本第一處世界文化遺產－法隆寺


照片 6 平城王宮遺址暨重建之宮殿

整體而言，日本對於其文化遺產保護得相當完整與慎重，同時也適當的規劃使之成為深具吸引力之觀光資源，確實值得我們學習。

四、建議

目前研討會有一普遍之缺點，亦即時間壓縮得非常明顯，故討論時間通常較為受限，此為美中不足之處。

五、攜回資料名稱及內容

1.研討會論文集。

六、其他

感謝國科會對於此次參與國際研討會之經費補助，讓本人得以持續進行國際交流，增加研究之廣度與深度。

附件為報告全文，本研討會採全文審查。

附件

A Study on Use Behaviors in Urban Parks: from the Perspective of Spatial Cognition

Abstract

The aim of this study is to probe into the users' behavior in urban parks from the viewpoint of spatial cognition. This study establishes a conceptual framework to describe the behavioral intention of an urban park user. The theory framework consists of three dimensions: spatial cognition, degree of satisfaction and behavioral intention. And a structural equation model (SEM) is then employed to formulate the relationship between individual's behavioral intention of an urban park and its influencing factors. A set of questionnaires was designed and citizens in Tainan were interviewed in order to collect the required data for empirical study. The result from the analysis shows that spatial cognition positively affects the degree of satisfaction, and vice versa, which is consistent with the hypothesis of this study. The paper ends with a suggested research agenda to the government to renovate urban parks.

1. Introduction

Taiwanese cities have high population concentration. It leads to the occurrence of various problems, including the expansion of cities, insufficiency of public facilities, destruction of natural environment, increasing consumption of energy and resources, expansion of urban environmental effects and deterioration of living quality in cities As the economy and national income grow, so does urban residents' need for recreational activities, whose accessibility is often limited by transportation resources and time allocation. As a result, parks play an important role in the daily life of urban residents. The development and conservation of parks and greens are important issues promoted by United Nations Educational, Scientific and Cultural Organization (UNESCO) in its 21st century sustainable development agenda, and it is considered a major indicator of reference when evaluating living quality of cities around the world. It not only influences greatly on resource preservation and space planning, but also positively affects cultural and social orders. The amount of lands preserved for parks becomes a crucial indicator when evaluating environment and living quality in a community (Hempel and Tucker, 1979).

However, urbanization has forced the shrinking and disrupting of the urban space. When it comes to urban parks, in addition to find more lands, a re-evaluation of current usage of park resources is also needed, to make sure that they can properly meet the recreational needs of urban residents. Therefore, parks should provide spaces and facilities to accommodate needs of different individuals, and elevate the living quality of urban residents with various recreational experiences.

Based on this idea, the study adopts a user-centered perspective in exploring the cognition of and emotional response to spaces, so to understand what the general public really expect from a park.

Research on cognition of park users include usage limitation of non-users (Scott and Jackson, 1996), use survey on users, or observation of park visitors' behaviors in combine with post-usage evaluation. However, users' behaviors in urban parks could be influenced by many factors, including space planning and facilities, each distinct in its own nature. As a result, the study focuses on how cognitions of various spaces in urban parks could influence user's behaviors. Degree of satisfaction and post-usage intention survey are adopted to evaluate users' behaviors, in order to explore the causal relationship between spatial cognition, degree of satisfaction and behavioral intention.

The study starts by understanding factors that affect users' behavioral intention, which was done by descriptive preference questionnaire survey. Then structural equation modeling (SEM) is adopted to construct a relationship model to analyze those intentions. The result derived could serve as a reference for public sectors for improvement and further development of urban parks in the future.

2. Literature Review

2.1 Spatial Cognition

Spatial cognition is defined by Moore and Hart (1976) as "the knowledge and internal or cognitive representation of the structure, entities and relations of space." Kuipers (1978) termed common-sense knowledge of space as "knowledge about the physical environment that is acquired and used, generally without concentrated effort, to find and follow routes from one place to another, and to store and use the relative positions of places." Kaplan and Kaplan (1981) argued that spatial cognition is a human process of storing, perceiving, and re-constructing of environmental stimulus. Thus spatial cognition should be considered as the process that people learn, store and construct spatial signals after being stimulated by the environment or space.

In fact, spatial behaviors of humans are complicated. They are not only affected by spatial properties, but intervened by non-spatial properties as well (Gärling et al., 1986). Spatial congition is constructed by different elements, which can help for better understanding of its impact on people's behavior. Baker (1987) categorizes these factors into three groups: (1) environmental factors, refering to noices, flavors and refreshness, plus air qualities like tempeture, humidity and ventilation; (2) social factors, meaning the number, apprearance and behaviors of users in the environment; (3) design factors, which could be futher divided into "functional factors" and "aesthetic factors" like architecture, colors, proportion, material, texture, forms, shapes, styles, accessories and so on.

2.2 Degree of Satisfaction

Huang(2003) thinks that degree of satisfaction refers to the extent that one feels content or discontent, which usually depends on the gap between what a customer perceives of a service and what the customer has expected. When the two match, the customer is content. When the perception exceeds expectation, the degree of satisfaction hightens. If it is the other way around, the customer

is discontent. Dorfman (1979) points out that the experience of satisfaction differs because of personal preferences, expectations, perceptions and motives, and is further complicated by different degrees of influence of variables in one experience. Bigne et al. (2001) consider that the degree of recreaitonal satisfaction is a visitor's integrated assessment of the entire recreation process. Day (1977) thinks that degree of satisfaction is an integrated and generalized concept that should only be used once to assess one experience. Because individual varaibles triggering recreational satisfaction are abstract and difficult to be conceptualized, this study adopts the assessment of degree of integrated satisfaction, which is eaiser to collect from visitors, to measure visitors' recreational satisfaction.

2.3 Behavioral Intention

Behavioral intention refers to people's subjective judgments of their future behavior tendency, and can be used to predict people's behaviors. It denotes the likelihood that a particular behavior will be undertaken by a consumer towards products or enterprises after consumption (Engel et al., 1995). Huang (2005) defines behavior intention as the likelihood that a visitor would purchase more, pay more or recommend to others after experiencing commodities, activities, and services relating to one particular visit. Wang (2005) takes the possibility of re-visiting, recommending, promoting and providing suggestions for improvement as constructs to measure visitors' loyalty. Zeithaml and Bitner (1996) propose thirteen dimentions when examing the quality-intention link, and, by factor analysis, extract five behavioral demensions: loyalty, propensity to switch, williness to pay more, external response and internal response. Loyalty and williness to pay more are positive results, while the other three are negative. In order to investigate users' behavioral intentions, the study adopts "re-visiting intention," "recommendation intention," "purpose intention," and "substitute intention" as questions for measurement.

2.4 Planning of Facilities in Urban Parks

Chen Chi-Wen (2002), by text analysis, investigated the underlying concepts and values of a park designer when drafting the blueprint, and found five hidden values: "real-use value," "experience value of landscape," "operation value of parks," "representative value of the society," and "urban value of site." In addition, Wu (1984) also mentioned that when designing a park, "practicality," "safety," "aesthetics," "nature," "education," "easiness of maintenance" are the six general principles that a designer should hold. Municipal Ordinance of Park Management of Kauhsiung City also requires that "landscape," "recreation," "game," "sports," "culture and eduction," "service and management," and "other necessary or ancillary" facilities should all be included in a park.

3. Research Design

3.1 Research Design and Hypothesis

According to the literature review, the study proposed a research structure as shown in Figure 1:

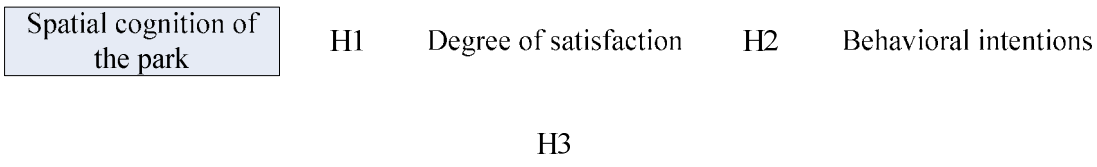


Figure 1. Research Design

According to the abovementioned research design and purpose, the study proposed hypotheses as below:

H1: Spatial cognition of the park affects users' degree of satisfaction

H2: Degree of satisfaction affects users' behavioral intentions

H3: Spatial cognition of the park affects users' behavioral intentions

3.2 Questionnaire Design

The study investigates the relationship among spatial cognition, behavioral intentions and degree of satisfaction. To guarantee a quality result, the study conducted a pilot test to secure the reability and validity of the survey. The questionnaire used in the pilot test went through analysis of items, factors, reliability and validy, and then formalized as the final version. Details of questionnaire design will be illustrated in the following part, with the questionnaire attached in appendix 1.

(1) Demographic information of users

This could help further understand different backgournd variables. Items included in this part are "gender," "age," "education degree," "profession," "major motive," and "most frequent visiting times".

(2) Scale of spatial cognition

Based on Baker's research (1987), the study categorized the spatial cognition attributes of a park into "environmental factors," "social factors" and "design factors," and presented them in three different scales, which contain 26 items in total. Items include either positive or negative statements, and the degree of agreement is measured with Five-point Likter Scale. "Strongly agree," "Agree," "Neither agree nor disagree," "Disagree," "Strongly disagree" are represented by five, four, three, two, and one point respectively. The average score of the sum of all points in different items represents the repondant's spatial cognition of the park. The higher the score, the more positive the spatial cognition.

(3) Scale of degree of satisfaction

The scale is constructed based on items proposed in Municipal Ordinance of Park Management of Kauhsiung City, in combine with an adjusted version of questionnaire designed by Li (2005). The scale include two aspects, "Degree of satisfaction towards space facilities" and "Degree of satisfaction towards space design," containg 10 itmes in total, with degree of agreement measured by Five-point Likter Scale. "Strongly agree," "Agree," "Neither agree nor disagree," "Disagree," "Strongly disagree" are represented by five, four, three, two, and one point respectively. The higher the score, the more satisfied the repondant.

(4)Behavioral intention

Behavioral intention indicates users' behaviors in a recreational space. Users' behavioral intentions are evaluated by their extent of agreement on four statements: "I am willing to use this park space next time," "I am willing to recommend this park to my friends," "In general, I received what I need in this park," and "In my heart, this park is not easily sustituted by another."

3.3 Data Collection

After pilot test and correction, formal survey was launched in Dr. Thomas Barclay Commemorative Park, Tainan City, in January 2010. Questionnaires were disseminated to park users randomly by convenience sampling at park gates, and collected at the spot. The survey lasted for one day, one slot in the morning and the other in the afternoon. Among 426 questionnaires that were disseminated, 403 were valid- meaning validity rate reached 95%.

3.4 Data Analysis

The study employed SPSS 12.0 to conduct descriptive statistics, the path analysis model is then verified by LISREL v8.51.

4. Results

4.1 Demographic Analysis of Users

From Table 1, it could be inferred that male is the dominant gender, accounting for 51.5% of all respondents. Age group "under 20", "31-40" and "41-50" are the three largest, occupying the same proportion, 22.6%, of respondents. 49.1% of respondents hold university degrees, followed by senior high school or vocational school degrees (21.6%). Students account for 29.3%, with 13.4% people serving in other professions, mostly retirees. The "major motive" for 50.9% of respondents is recreational sports, followed by 14.9% people aiming for releasing pressure. 33.7% of respondents' "most frequent visiting time" is 2-5pm in the afternoon, while 21.8% prefer 8-11am in the morning.

Table 1. Data Analysis of Samples

Items	Groups	Sample numbers	Proportion (%)
Gender	Male	208	51.5
	Female	195	48.5
Age	Under 20	91	22.6
	21-30	57	14.1
	31-40	91	22.6
	41-50	91	22.6
	51-60	50	12.4
	Over 61	23	5.7
Education degree	Elementary school	18	4.5
	Junior high school	32	7.9
	Senior high/vocational school	87	21.6
	University	198	49.1
	Graduate Institute and above	68	16.9

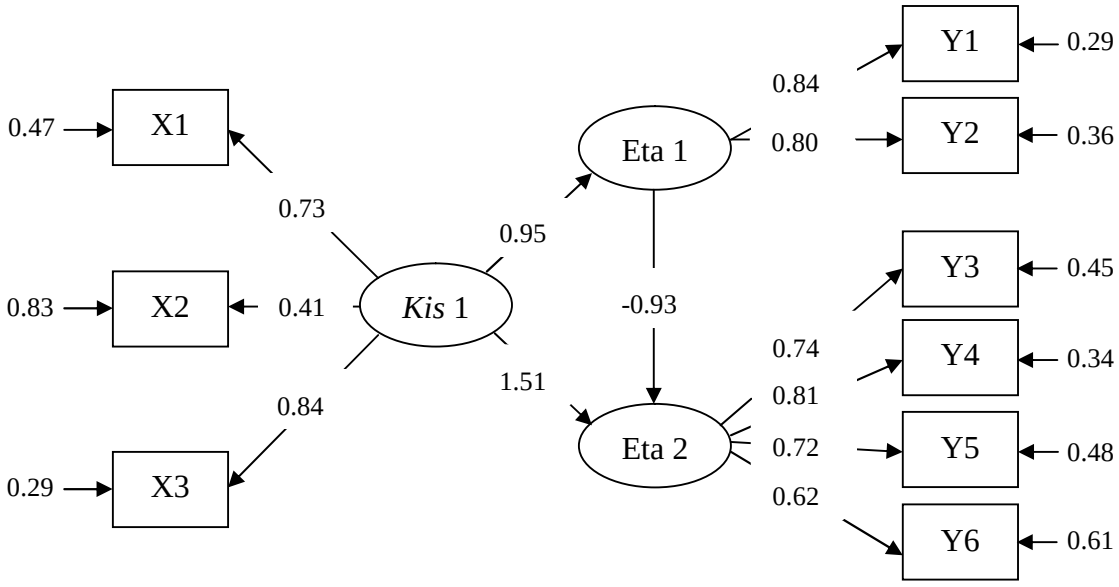
Occupation	Student	118	29.3
	House-keeping	41	10.2
	Services	48	11.9
	Military	5	1.2
	Public officials	24	6.0
	Teacher	43	10.7
	Manufacturing	45	11.2
	Commerce	25	6.2
	Primary sectors	0	0
	Others	54	13.4
Major Motive	Recreational sports	205	50.9
	Social activities	12	3.0
	Release pressure	60	14.9
	Kill time	25	6.2
	Connect with nature	26	6.5
	Enhance family bound	27	6.7
	Escape from urban life	1	0.2
	Enjoy solitary	2	0.5
	Find inspiration	4	1.0
	Shoot photos	11	2.7
	Refresh memory	7	1.7
	Satisfy curiosity	2	0.5
	Ecological education	2	0.5
	Conduct survey	3	0.7
	Others	16	4.0
Most frequent visiting time	5-8am	57	14.1
	8-11am	88	21.8
	11am-2pm	26	6.5
	2-5pm	136	33.7
	5-8pm	75	18.6
	Others	21	5.2

4.2 Result Analysis of Hypothetical Model on the Influence of Spatial Cognition and Degree of Satisfaction on Behavioral Intentions

In order to ensure the consistency of the result, the measuring unit of variables was standardized, and the parameters were assessed and estimated by maximum likelihood (ML). Figure 2 illustrates the path diagram of the hypothetical model of spatial cognition, degree of satisfaction and behavioral intentions. X1 to X3 are three endogenous variables: environmental factors, social factors and design factors. Y1 to Y4 are six exogenous variables, ranging from degree of satisfaction to behavioral intentions, with Ksi 1 representing spatial cognition, Eta1 representing two measured variables on degree of satisfaction, and Eta2 representing four measured variables on behavioral intentions.

After analyzing with LISREL, a structural equation modeling tool, the study demonstrates the assessment of goodness of fit as Table 2. It shows that in addition to the commonly used P-value generated by X^2 test, the model's goodness of fit is assessed with many other test values. The main reason was to prevent a biased X^2 statistic due to the observation number, thus multiple test values

were preferred when assessing the goodness of fit. Putting the goodness of fit and the path diagram together, it is certain that the hypothetical model is explanatory.



Chi-Square=79.68， df=24， P-value=0.0000， RMSEA=0.076

Figure 2 Path Diagram on the Hypothetical Model of Spatial Cognition, Degree of Satisfaction and Behavioral Intentions

4.3 Overall Model Fit Analysis

The study uses LISREL v8.51 to conduct model confirmation in order to investigate the compatibility of the model and the input data. The higher the goodness of fit, the more compatible the model is. The overall analysis of the study's linear structural model is based on the standard proposed by Huang (2007) and Chiou (2006). Table 2 shows the overall model fit after assessed with 11 measuring indicators, revealing that the path-model fit of the study is good.

Table 2 Goodness of Fit of Hypothetical Model of Spatial Cognition, Degree of Satisfaction and Behavioral Intention- Summary

Measurement Model: hypothetical measurement model			
measuring indicator	ideal value	measured value	measuring standard
X^2/df	3-5	3.32	reached
RMSEA	.05 - .08	.076	reached
RMR	< .1	.046	reached
GFI	> .9	.96	reached
AGFI	> .9	.92	reached
NFI	> .9	.95	reached
NNFI	> .9	.94	reached
CFI	> .9	.96	reached
PNFI	> .5	.63	reached
PGFI	> .5	.51	reached
CN	> 200	213.14	reached

4.4 Path Analysis of the Hypothetical Model

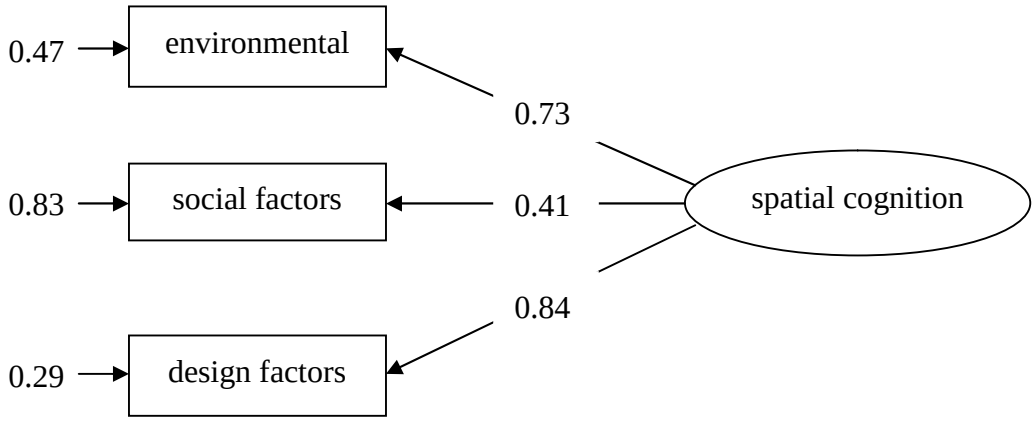
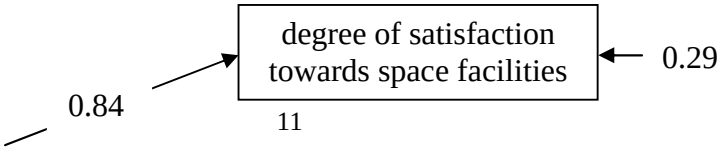


Figure 3 Path Diagram of Measured Variables on Spatial Cognition

Figure 3 reveals that environmental factors, social factors and design factors all have positive influence on users' spatial cognition. Among them social factors has the lowest path coefficient of direct effect (X2＝0.41, p＜.001), environmental factors ranking the second (X1=0.73, P＜.001), and design factors claiming the first (X3=0.84, P＜.001).



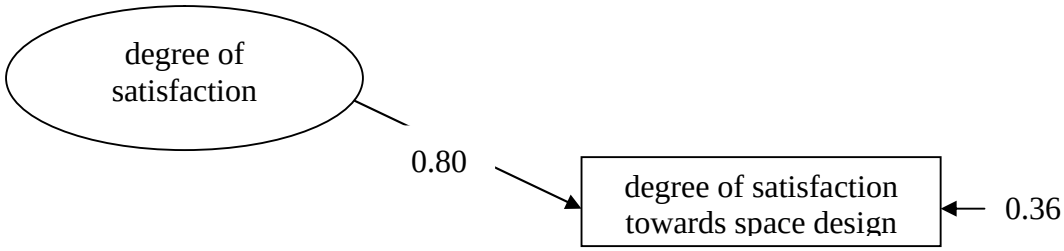


Figure 4 Path Diagram of Measured Variables on Degree of Satisfaction

Figure 4 demonstrates that the exogenous variables, Y1 and Y2, show positive influence. The path coefficient of direct effect of "degree of satisfaction towards space facilities" is 0.84 (Y1=0.84), while that of "degree of satisfaction towards space design" is 0.80 (Y2=0.80, p< .001).

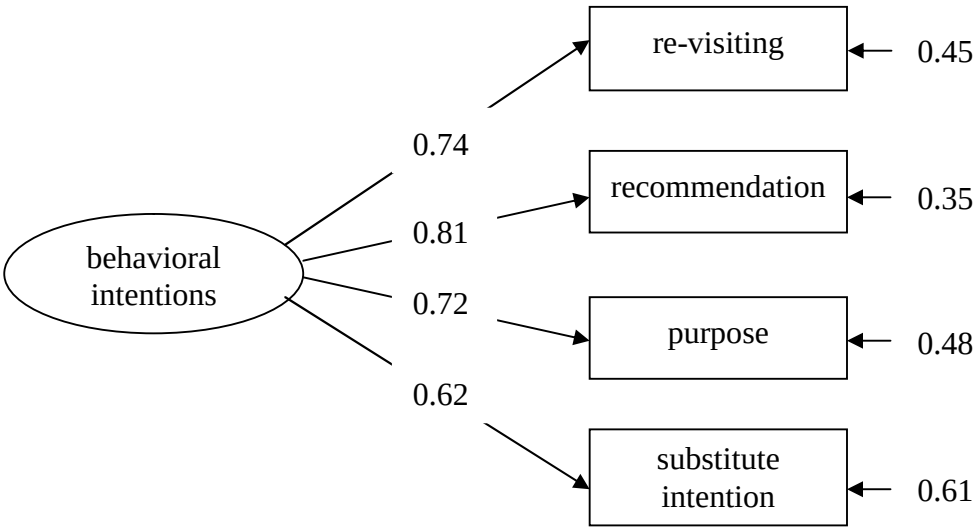


Figure 5 Path Diagram of Measured Variables on Behavioral Intentions

The four exogenous variables on behavioral intentions in Figure 5 show positive influence. Among them, "recommendation" enjoys the hightst path cofficient of direct effect (Y4=0.81, p<.001), followed by "re-visiting" (Y3=0.74), "purpose" (Y5=0.72, p<.001), and "substitute intention" is at the bottom (Y6=0.62, p<.001).

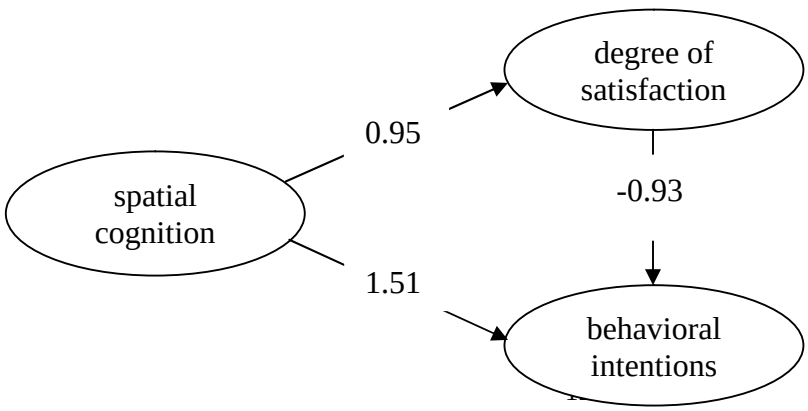


Figure 6 Hypothetical Model of Relationship among Spatial Cognition, Degree of Satisfaction and Behavioral Intentions

The study focuses on constructing a model to assess the extent to which behavioral intentions are influenced by spatial cognition and degree of satisfaction. Figure 6 shows that spatial cognition has greatest direct influecne on behavioral intentions, with path coefficient of direct effect reaching 1.51 ($p<.05$) and is significant. It also has direct influence on degree of satisfaction, with path coefficient reaching a significant 0.95 ($p<.001$). However, the path coefficient of the direct effect of degree of satisfaction on behavioral intentions is -0.93, non-significant. It was probably because that users' spatial cognition is more influential than degree of satisfaction when it comes to behavioral intentions. Another possible reason was that the selected park has few facilities, so users do not have an explicit assessment on wheather they are satisfied with the facilities or not, which leads to a non-significant relationship between degree of satisfaction towards facilities and behavioral intentions.

Table 3 Path effects of Variables on Spatial Cognition, Degree of Satisfaction and Behavioral Intentions

Parameter	Path Coefficient of Direct Effect	t-value
spatial cognition - behavioral intentions	1.51	2.26*
spatial cognition - degree of satisfaction	0.95	17.67***
degree of satisfaction - behavioral intentions	-0.93	

5. Conclusions and Recommendations

5.1 Conclusion

Based on valid observations, the study draws conclusions as below:

(1) SEM analysis shows that H2, degree of satisfaction has positive influence on behavioral intentions, is not sustained due to non-significant relation. But in addition to that, both H1 and H3 are valid, meaning that spatial cognition has positive influence on both degree of satisfaction and behavioral intentions. The reason that H2 is not sustained, probably because that the selected park, Dr. Thomas Barclay Commemorative Park, features ecological landscapes with few facilities, so park visitors did not come for facilities. Therefore there is no positive relationship between satisfaction towards space facilities and behavioral intentions.

(2) After conducting empirical research, the study found that most visitors to the park were aiming for recreational sports. The result also shows that users are more satisfied with "environmental factors" and "design factors," but not as much with "space design." The study believes

that users, mostly residents in the neighborhood, are not content with facilities because "sport facilities" are not diversified enough. Respondents also showed their discontent with "parking space." The result shows that current facilities in the park have to be reviewed and re-planned to elevate degree of satisfaction.

5.2 Recommendations

(1) Conduct in-depth interviews with park designers and local government authority of urban planning

By conducting in-depth interviews with park designers and government officials in charge of urban planning, we can explore the possible changes that could be done from the supply side. On the other hand, surveys on park visitors' needs should also be conducted in order to understand what their real demands are. After analyzing and comparing opinions from both the supply and demand sides, we will discover the future direction of urban park design.

(2) Compare different urban park facilities

Compare different urban parks from a user's perspective, and analyze different users' spatial cognition, degree of satisfaction and impressions on park facilities, so to propose suitable space design plans for different types of urban parks.

(3) In-depth analysis and understanding of the constructs of spatial cognition of urban park spaces

The study concludes that environmental factors are a crucial attribute in special cognition, while design and social factors are not as important. It might have a lot to do with the nature of the selected park, which is non-profit-seeking. In the future, in-depth research is suggested to conduct in different types of urban park, in order to explore the relationship between spatial cognition and degree of satisfaction. In addition, the three attributes (environmental, social and design factors) proposed by the study could serve as independent subject for further research, so to better understand their individual implications.

Bibliography

1. Baker, J., (1987), "The Role of the Environment in Marketing Services: the consumer perspective." In *The Services Challenge: integrating for competitive advantage*, by John A. Caepeil, Carole A. Congram and James Shanahan, 79-84. Chicago: The American Marketing Association.
2. Bigne, J. E., Sanchez, M. I. and Sanchez, J. (2001), Tourism Image, Valuation Variables and after Purchase Behavior: inter-relationship, *Tourism Management* , Vol. 22, no. 6: 607-616.
3. Chen, C. W.(2002), The Cognitive Model of Park Design: the case of urban parks in Taipei, Master Dissertation, Department of Architecture, TamKang University, Taipei.
4. Chiou, H. J.(2006), *Structural Equation Modeling: the theory, technology and application of LISREL*. Taipei: Yeh Yeh Book Gallery.
5. Day, R. L.(1977),"Alternative Definitions and Designs for Measureing Consumer Satisfaction." In *The Conceptualization for Consumer Satisfaction and Dissatisfaction*, by H. Keith Hunt. Cambridge, MA: Marketing Science Institute.
6. Dorfman, P. W. (1979), Measurement and Meaning of Recreation Satisfaction: a case study of

camping, *Environment and Behavior* ,Vol.11, no. 4: 483-510.

7. Engel, J. F., Blackwell, R. D. and Miniard, P. W.(1995), *Consumer Behavior.* 8th. New York: Holt, Rinehart & Winston Inc..
8. Gärling, T., Book, A. and Lindberg, E. (1986), Spatial orientation and way finding in the designed environment：A conceptual analysis and some suggestions for post occupancy evaluation, *Journal of architectural and planning research*, Vol.3, no. 3: 55-64.
9. Hempel, D. J. and Tucker, L. R. (1979), Citizen Preference for Housing as Community Social Indicators, *Environment and Behavior*, Vol.11, no. 3: 399-428.
10. Huang, F. M.(2007), *Structural Equation Modeling.* 5th. Taipei: Wu-Nan Culture Enterprise.
11. Huang, J. H. (2005), *The Relationship among Experiential Quality, Satisfaction and Behavior Intention: a case study of Hwatao kiln.* Master Dissertation, Leisure Serves Management, Chao Yang Technology University.
12. Huang, J. Y. (2003), *The World of Marketing.* Taipei: Common Wealth & Vision.
13. Kaplan, S. and Kaplan, R.(1981), *Cognition and Environment Functioning in an Uncertain World.* Ann Arbor: Ulrich's Bookstore Press.
14. Kuipers, B. (1978), Modeling Spatial Knowledge, *Cognitive Science* , Vol. 2: 129-153.
15. Li, M. C. (2005), The study of effecting the factors of user’s satisfaction for residents of Chia-Yi city in different types of park design ideals. Master Dissertation, Department of Horticultural Science & Graduate Institute of Horticulture of Architecture, National Chiayi University, Chiayi.
16. Moore, G. T. and Hart, R. A.(1976), "Extracts from the Development of Spatial Cognition." In *Environmental Psychology, People and Their Physical Settings*, by H. M. Proshansky, W. H. Ittelson and L. G. Rivlin, 258-281. Holt: Rinehart & Winston Press.
17. Scott, D. and Jackson, E. L. (1996), Factors that Limit and Strategies that might Encourage People's Use of Public Parks, *Journal of Park and Recreation Administration* , Vol.14: 1-17.
18. Urban Development Bureau, Kaohsiung City Government(2005), *Municipal Ordinance of Park Management of Kaohsiung City.* Kaohsiung City: Kaohsiung City Government.
19. Wang, B. W. (2005), *A Study of the Relationship among Leisure Experience Models, Tourism Image and Tourist's Loyalty: the B&B case study of Fencihu.* Master Dissertation, Graduate Institute of Tourism Management, Nan Hua University.
20. Wu, L. Y., (1984), General Principles of Park Design." *World Construction & Architecture*, Vol. 4: 74-80.
21. Zeithaml, V. A. and Bitner, M. J. (1996), *Service Marketing.* New York: McGraw-Hill.

無衍生研發成果推廣資料

98 年度專題研究計畫研究成果彙整表

計畫主持人：張曜麟	計畫編號：98-2410-H-041-006-
計畫名稱：從空間認知觀點探討都市公園使用行為之研究	

成果項目			量化			單位	備註（質化說明：如數個計畫共同成果、成果列為該期刊之封面故事...等）
			實際已達成數（被接受或已發表）	預期總達成數(含實際已達成數)	本計畫實際貢獻百分比		
國內	論文著作	期刊論文	0	1	0%	篇	
		研究報告/技術報告	0	0	100%		
		研討會論文	1	1	100%		
		專書	0	0	100%		
	專利	申請中件數	0	0	100%	件	
		已獲得件數	0	0	100%		
	技術移轉	件數	0	0	100%	件	
		權利金	0	0	100%	千元	
	參與計畫人力（本國籍）	碩士生	2	2	100%	人次	
		博士生	0	0	100%		
		博士後研究員	0	0	100%		
		專任助理	0	0	100%		
國外	論文著作	期刊論文	0	1	0%	篇	
		研究報告/技術報告	0	0	0%		
		研討會論文	1	1	100%		
		專書	0	0	100%	章/本	
	專利	申請中件數	0	0	100%	件	
		已獲得件數	0	0	100%		
	技術移轉	件數	0	0	100%	件	
		權利金	0	0	100%	千元	
	參與計畫人力（外國籍）	碩士生	0	0	100%	人次	
		博士生	0	0	100%		
		博士後研究員	0	0	100%		
		專任助理	0	0	100%		

其他成果 (無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。)	無

	成果項目	量化	名稱或內容性質簡述
科教處計畫加填項目	測驗工具(含質性與量性)	0	
	課程/模組	0	
	電腦及網路系統或工具	0	
	教材	0	
	舉辦之活動/競賽	0	
	研討會/工作坊	0	
	電子報、網站	0	
	計畫成果推廣之參與（閱聽）人數	0	

國科會補助專題研究計畫成果報告自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估

■達成目標

□未達成目標（請說明，以 100 字為限）

□實驗失敗

□因故實驗中斷

□其他原因

說明：

2. 研究成果在學術期刊發表或申請專利等情形：

論文：□已發表 □未發表之文稿 ■撰寫中 □無

專利：□已獲得 □申請中 ■無

技轉：□已技轉 □洽談中 ■無

其他：(以 100 字為限)

本計畫初步成果已投稿於 International Symposium on Urban Planning 2010（通過全文審查），並被收錄於 Journal of International City Planning 中。

目前並已準備投稿於 Cities 期刊。

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）（以 500 字為限）

透過整個模式之建置與實證結果，證明本研究之模式設定具有可行性及良好的解釋能力，有助於釐清目前都市公園之使用者行為；藉由了解影響都市公園使用之決定因素，研究結果便可作為規劃過程中公園空間設計之參考，以及決策者在制定政策時之參考，作為都市規劃之基礎，將有助於提供更宜人之居住環境。

後續將進一步結合相關軟體來進行空間模擬，期能獲得更佳之成果。