行政院國家科學委員會專題研究計畫 成果報告

圖書館中餐飲服務與實質環境之調查研究
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摘要

近廿年來，國外有越來越多的圖書館設置了餐飲空間，這已成為圖書館另一種吸引和服務讀者的方式。國內這種服務的發展比較少，最早也最久的服務是在台北市圖總圖六樓的餐飲空間，也以有十餘年了。近年來也有一些圖書館增設了這種服務空間。這種服務適不適合國內的發展，以及它有那些發展的條件、限制與機會。本研究擬對這些議題進行全省性的館員和使用者的問卷調查，以瞭解他們對這種服務的看法。此外，本研究亦會對在港澳、大陸與本省已設有這種服務的館舍進行實地的查訪，將個案性的資料彙整出一套可供其它館舍參考的準則。研究工作的成果將為圖書館的管理者、設計者和服務工作的負責人提供相關的資訊，以便在思考、籌畫、設計、執行與營運時的參考。

關鍵字：圖書館建築、餐飲設施、簡餐、建築規劃。

Abstract

Providing food and drink facilities in the library becomes more popular in the world since the 80’s in last century. In Taiwan, most libraries seem did not pay much attention to this trend outside. This additional service for readers beyond considerations of librarians for its potential damage for books and other collections in the stacks. The purpose of this study intends to find out two things. By conducting a survey to librarians in all kinds of library in Taiwan, researcher wants to know the attitudes, methods and constraints which influence the development of that kind of service in the past and right now. Researcher also plans a series interviews with librarians and site survey in some libraries in HK, Macao, Chinese Mainland and Taiwan which had already made the café and snack service for their readers. The results of this study will offer some suggestions and guidelines in this service for those libraries which plan to enrich their services to the readers in the future.

Keywords：Library building, Food and drink facilities, Café and snack, Building programming

前言

近十餘年來，在日本、美國、加拿大、英國等較重視圖書館事業的國家，不少的大學與公共圖書館紛紛設置了供讀者享用餐飲的空間和服務。當圖書館在資訊服務的發展中，讀者已明顯有遠離館舍的現象，而圖書館的社會性功能又逐漸被重視的情形之下，這種趨勢特別值得重視，圖書館在這方面的服務有無其必要性。國外已有很多文章從館員和讀者的角度來討論這個現象，似乎支持與贊成的居多，反對的多持條件性的保留態度。但這並不意味著在國內也一定要朝這個方向發展，而發展的條件、環境和需要性皆值得探究。

二十年前，本人曾撰寫一文討論在圖書館中設置餐飲空間的問題（陳格理，1988）。該文當時並未引起圖書館界的注意，時至今日，國內也有一些圖書館在這方面有所動作，它們的作為、表現和成果，也會影響著其它圖書館的想法和做法。近半年以來，國內新完成的大學圖書館中，中興大學、暨南大學、嘉義大學、高雄醫學大學、昆山大學、嘉南醫藥大學等均未設置餐飲空間，館方對於設置餐飲空間有些什麼想法，是反對還是贊成，這都值得注意。國內有一些圖書館有著類似性的服務，但在類型與服務方式上還有一些差異，逢甲大學圖書館是採取館內的服務（空間），成大則是設置在館外（地下層），埔里鎮公共圖書館在館外的餐飲空間最明顯，案例雖然不多，但都值得加以研究。

研究目的

針對著這樣一個潮流與現象，本研究提出一個**議題**：國內（台灣）的各種圖書館（或圖書館界）如何看待這個趨勢，各館在這方面的態度、決策與做法如何？如果要進行這種服務，館方將如何準備。根據對相關現象與議題的陳述，本研究的**目的**是：

(1) 分析國外的文獻與案例，深入瞭解國外圖書館對此一工作的想法、做法、策略與成效，以做為國內圖書館界的參考。

(2) 研究華人地區（國內、港澳與中國大陸）設有該設施的館舍對這種服務工作的成果與意見。

(3) 廣泛收集國內圖書館界（館員和使用者）對於這種服務工作在觀念、做法與條件等方面的意見。

(4) 針對餐飲服務的設置，綜合各種研究資料詳細分析各種條件和影響因素，提出一份說明供國內各類圖書館未來在計畫、決策實施時的參考。

文獻探討

根據國外的文獻資料和個人的經驗，對於這種服務性的議題，國外的發展有下列幾種情形。

(1) 書店服務性的刺激。幾乎在世界各大城市中皆會出現傳統書店在力抗網路書店時，發揮市場行銷理念的做法，就是新書的陳設與咖啡休閒服務的出現。這些表現也一次次的刺激著圖書館的變革，其中對讀者的餐飲服務是最具挑戰性的工作。許多圖書館已經體認到書店在餐飲上的服務是一個很好的學習目標，但卻不是一個理想目標。(Trelease, 1996；Browne, 2000)

(2)營造吸引性。並不是在圖書館內（或旁）有了咖啡館就會有人去。名稱的改變首先建立了親切感，英國人稱它為 learning café, 大陸稱它為「書吧」而頗受學生歡迎(Watson, 2003)。在構思、布置和管理工作上，學生或其它使用者的參與更增加了它的成功性。(LaPointe, 2006；Arant, 1998；Wharram, 1994)

(3)服務性的安排。餐飲服務內容的簡化和精緻化對建立服務成效與特色有相當的影響(Myers, 1996)。而空間的安排與設計更應注意到五個因素：彈性、接近性、美感、適合性和接受性。(Boone, 2004)

(4)各國的發展性各有不同。在日本，鄉鎮圖書館中近七成有餐飲空間，城市中的圖書館反而較低些，只有六成三（餐飲設施，2006）。在英國，修（改）建的圖書館反而特別會去增設咖啡餐飲的服務設施(Mead, 1994)。最近的調查顯示，在英國高等教育機構圖書館的支持率相的高，有九成以上(West, 2005)。亦有不少圖書館反對，特別是美國的大學圖書館(Clement and Scott, 1994)。

(5)美國的狀況。SPEC(1998)對大學和研究性質的圖書所做館調查的結果顯示有 71%的館舍禁止餐飲行為，29%提供餐飲服務。在允許餐飲的館舍中，只有少數完全(4%)沒有限制，其餘是不准帶食物，只能攜帶有蓋容器的飲料，有的甚至只限攜帶白開水；或在電腦器材處都不可帶任何飲料。限制的理由以保護館藏為主，其它尚有：保持館內清潔健康的環境，保護地面材料（地毯）、家具、設備，或防止病菌。雖然如此，但在過去四年中有越來越多的圖書館對餐飲服務方面採取較開放的策略，有 42%的館舍表示對此項服務的策略有更寬容的傾向，44%則維持既有的做法。有蓋飲料罐的被允許攜入，則是順應了社會的潮流與需要。雖然管理規則依然未變，但執行上則變的較溫和了。一個有趣的情形是，有 71%的館舍反映，它們對食物和飲料的嚴格規定很難落實在館員身上。各館在這方面的規則都差不多，但執行方面則有不少的差異。另一個調查結果顯示館員對設置餐飲空間的支持度頗高(Siess, 2003)。只有少數館員嚴格執行讀者在公共區域中，禁止食物飲料的規定。有些學校甚至希望館方對此一規定予以放寬。

研究內容

本研究工作的主要內容如下：

(1) 瞭解國內圖書館在設置餐飲服務(空間)上的看法、態度、條件、做法和困難之處，而這些議題會涉及到管理、行政、空間、財務或使用的部分。

(2) 瞭解一些已經實施這種服務的館舍，它們的計畫、實施過程與成果，是什麼樣的資源或條件使其「成功」或「失敗」，如餐飲空間的位置、大小、環境、設備、運輸、室內設計、餐飲內容、服務項目、安全與衛生條件等，它們又作了那些調整來繼續的發展或停止這種服務。

(3) 館方如何處理讀者需求與管理工作間的關係？圖書館的餐飲服務和書店的餐飲服務應有那些差異？

(4) 在思考、草擬計畫和決策時，有那些值得注意及參考的項目，或衡量的準則。

研究方法

根據研究目的和預期工作成果，本研究所採用的研究方法有三種。

1.文獻分析。早在 1960 年代瑞典的圖書館中就出現餐飲的服務，歐洲各國的發展較早，但規模較小內容也較簡單。80 年代在美國逐漸興起，日本與亞洲諸國也在上世紀的 90 年代開始增設。因此，有必要將過去餐飲服務的發展狀況加以分析，以瞭解演變的歷程和各種影響因素服務，以做為論述國內狀況的參考。國內相關文獻資料的嚴重缺乏，一方面反映著這種服務性的開發工作在國內仍未受到注意，另一方面也顯示國內圖書館中管

理工作的要求，仍主導和影響著服務工作的發展。

2.現況與意見的調查。雖然在國內設置餐飲服務的圖書館仍然很少，但此一訊息已廣為學界所熟知。本研究擬對國內的大學圖書館、規模較大的公共圖書館以及部分鄉鎮圖書館的館員進行問卷的調查，以瞭解兩個重點：

(1) 該館的主事者（不一定是館長，除非其具專業工作能力）對於在圖書館中設置餐飲空間和相關服務工作的看法，其中包括設置、不設置、未設置的原因，以及該館對於這種服務工作所給予的協助和約束等。

(2) 該館現有的實質狀況（不論有無設置該空間），空間、使用狀況、管理方式、服務項目等，特別是餐飲空間的位置、大小、設備、環境、服務內容、管理項目、營收狀況、契約條款以及使用者的反映等。問卷結果將經由電腦統計，以交叉分析和關係驗證來說明目前國內圖書館界對於這項服務工作的看法與做法。

3.實地訪查。這是本研究的主要工作項目。因為各個圖書館的管理、實質環境與條件都不盡相同，所以有這種服務的館舍一定有其特殊條的條件，其服務成效也會各不相同。此外，同樣是對讀者的餐飲服務，有的服務空間是在館內（台北市圖、浙江大學），有的是在館外（同一棟建築物中）（澳門大學、成功大學、香港央圖、埔里鎮圖書館、深圳公共圖書館等）。服務的內容也各有不同，如簡餐、咖啡點心、全餐等，而管理的條件和服務的對象也會有著一些差異。此皆顯示圖書館在實現這種服務工作時，各館皆有著一些個別性的差異，這是值得做深入的勘查和訪談，以瞭解真實的狀況。

因此，本研究擬對國內幾個比較具有代表性的館舍進行現場的勘查、使用性記錄和對使用者和工作負責人（廠商）進行訪談，以瞭解該館在準備和實施過程中所遭遇到的問題、困難和阻礙，以及實施後的效果和調整措施。這些資料皆會成為討論和建議事項的主要內容，對其它館舍提供思考和計畫上的參考。

在國內的圖書館中設有餐飲部分的不多，經調查共有 28 所，再依館舍類別、樓層和服務狀況（招標中、計畫中、轉型中、營運中）分類顯示大專院校有淡江大學、成功大學、海洋大學、真理大學、南亞技術學院、逢甲大學和文藻外語學院等七所，公共圖書館則有國家圖書館、央圖分館、彰化縣文化局、石岡鄉圖書館、鳳山市圖書館、埔里圖書館、埔鹽鄉圖書館和泰山鄉圖書館等八所，再就各館的服務時間、規模和內容項目分析，最後決定就大專學校圖書館以成功大學、逢甲大學、海洋大學和高雄第一科大為對象，公共圖書館以國家圖書館、埔里圖書館和埔鹽圖書館為對象進行調查。針對餐飲部分的使用者每所圖書館發放了 50~60 份問卷，問卷收回後以 SPSS 統計和分析調查結果。

結果與討論

因為調查的項目甚多，結果甚為豐富。茲將較重要的發現或較具意義的事證說明如下。

一． 餐飲服務空間在使用和管理上的問題，大學圖書館和公共圖書館有不少的差異。

（一）大學圖書館

除了餐飲類型上的差異之外，餐飲設備和服務內容方面的不同亦影響著人們去該處的目的和行為表現。在餐飲的「空間與設備」的項目中，對該空間使用行為的影響性依序為座位數量、空間大小、樓層位置、空間氛圍、光線照明、出入動線等。影響到「使用行為」的因素依序為使用目的、使用時段、使用時數、使用性質、使用族群等。「服務內容」對使用行為的影響性依序為餐點內容、餐點品質、影業時間、價位取向、服務項目等。影響「使用行為」的因素依序為使用目的、使用時段、使用時數、使用性

質等。綜合而言，對使用行為影響最大的是「座位數目」,「隔音效果」和「服務項目」的影響性較低。這樣的結果和一般人的認知，有不少的差異值得注意和反思。

（二）公共圖書館

在餐飲「空間與設備」的項目中，對該空間使用行為的影響性依序為出入動線、設置樓層、家具形式、空間氛圍、空間大小、隔音效果、座位數目、光線照明等。影響「使用行為」的因素依序為使用時段、使用時數、使用族群等。「服務內容」對使用行為的影響，依序為餐點內容、營業時間、餐點品質、服務項目、價位取向等。影響「使用行為」的項目依序為使用目的、使用時段、使用時數、使用族群等。綜合而言，以「餐點內容」最具影響性，反而「座位數目」和「光線照明」等較不具影響性。

二．餐飲空間在管理上的問題

（一）因為使用性質和目的上的不同，造成在使用時數上的差異，即出現佔位子的情形，而影響到使用性質的發揮。

（二）使用者因為不滿意餐飲服務的價位，即價格過高，但又偏愛該區域的休息條件，遂會自備飲料入內使用（即外食問題），對業績造成另一種的影響。

（三）「管理規則」的鬆散程度會影響到人們對該餐飲空間的使用性。對該空間滿意度較高者，該空間的管理規範較少。

三．讀者的使用行為、態度、需求和餐飲服務關係

（一）讀者平日是否有飲茶會或咖啡的習慣和去餐飲空間的行為無關，但和常去茶店或咖啡館的習慣有一些關係。

（二）圖書館中出現餐飲空間對圖書館的形象有正面的影響。讀者在該空間中的活動會因時間、群體和目的而有不同，這是館方或餐飲業者不易預料的。來館「自修閱讀者」是餐飲空間的主要使用者。

（三）該餐飲空間常會被讀者當作是討論空間和休閒空間，這是該空間當初在規劃時未被期望的結果。

（四）「不定時」的使用時間和時段，反映著該空間的服務性仍為被充分的認知和利用。

（五）常來圖書館的讀者較常使用該館的餐飲空間。

（六）餐飲空間吸引使用者的條件為有較佳的舒適性、家具形式和數量，家具形式是指四人以下的座位。

（七）多樣的服務，如早餐的提供或具自修和討論條件的空間，是使用者較喜歡服務條件。

（八）在消費價格方面，使用者一般的反應是飲品在 35-50 元，點心在 25-50 元，餐點在 80-120 元左右較能接受。

四．圖書館在設置餐飲空間時，多可接受較新的服務觀念，但在做法上則較保守。在決策和條件上，既有空間的條件是主要的考慮因素，廠商參與意願較低的現象和校方（館方）在合約中的利益要求和條件不無關係。公共圖書館則反映設置「經費」的影響較大。

五．未設餐飲空間的圖書館所擔心的問題，在已設置餐飲空間的館舍中均未出現。特別是在管理上的問題、館藏與設備無破壞的情形、無髒亂情形及讀者的抱怨聲。

六．圖書館與餐飲業者間的關係，並不夠融洽，由此而多少影響到服務的品質、成效與使用者的反映。

七．管理者對餐飲空間和服務工作的意見是：餐飲品質與價位、類別同樣的重要，在位置

上則希望與館設有所區隔，家具應具有相當的舒適性。

八．未設置餐飲空間的圖書館館方表示，「廠商參與意願的低落」是主要的原因，背後則是雙方在契約方面的認知差異，特別是在立場上和對利益回饋的要求。館舍本身所提供的資訊，如位置、大小、營業時間、價位、品質之間的差異等皆會影響廠商的參與性。

九．未來改善的方向

（一）餐飲空間的設置會影響館舍形象和服務成效（如館舍使用率），宜善加利用。

（二）餐飲空間會影響和改善館舍的空間特質。

（三）對餐飲空間的設置應以服務讀者為先，而非以館方的考量為主，如此才能發揮其效能。

（四）館方應在空間上（位置、大小）給予餐飲服務最大的機會與條件，而展現該服務的表現性。

（五）重視使用者的意見，適時調整服務內容和環境條件，以營造更具吸引力的餐飲空間。

（六）館方應給予服務廠商較寬裕的條件，以服務讀者為前提，安排各種服務內容。

（七）在實質條件方面：位置以館外一樓較佳，空間大小在 100 ㎡左右較佳，家具形式宜有多種，二人座和四人座較佳。

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研究成果自評

在收集和分析完調查資料後，就發現這個研究的意義已經顯露出來。分析的結果中有很多值得探討的項目，這些僅僅是國內的調查資料，未來會再加上對國外個案資料的討論，研究的價值將會更高。此外，館方（或校方）與廠商所議定（簽訂）的合約對該空間的服務成效（如價格和品質）都會有很大的影響，這亦值得做進一步的研究。相信許多圖書館都可以藉著這些資料，對未來館舍中是否設置餐飲設施會有較佳的抉擇。綜合性的結果，可能會以三篇文章，或是一本小冊子的方式加以發表，以發揮其在應用性上的貢獻。

附件一

出席國際會議心得報告

本人於 2008 年十月 16 日到 18 日在北京參加清華大學所舉辦的第八次「環境行為研究學會」(Environment-Behavior Research Association, EBRA)國際學術研討會。這次會議共有兩百多位來自世界各國的學者參加，會議主題分成十組，環境教育與理論發展，環境認知，都市生態、環境保護、永續發展，公共空間的行為與價值，景觀、環境與地點關係，文化樣態與遺產保存，住宅與鄰里品質，高齡、幼童與其他族群的環境校園，校園、辦公室、醫院和其他環境等。這次會議國內有逢甲、銘傳、東海等校建築系師生近廿人參加，共發表論文十二篇。

本人係第四次參加這個會議。本次所提的論文是「圖書館尋路與認知地圖(英文)」(Cognitive Map and Wayfinding in Library)。這是本人對圖書館尋路問題多年的研究中，有關認知地圖的觀念性討論。以往對認知地圖的討論多是心理學者從都市環境來分析，其所得的結果常侷限在都市大尺度的範圍中，而容易忽略了該環境在設置或規劃上的條件，而不容易放在建築物中加以討論。換言之，從圖書館中尋路行為研究的成果可以增加環境心理學中對認知地圖的說明性，這是這篇論文的價值與意義。

在這次會議中，接觸到不少各國的學者，其中尤以中國新生代的學者為最多，他們的研究工作和成果雖然不是很理想，但在研究的熱誠和功夫上是值得重視的。相形之下，台灣的學者就比較鬆懈，這次的會議給我們不少警惕，這是大家一致的看法。

論文全文如後。

附件二 會議發表之論文

Cognitive Map and Wayfinding in Library

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摘要

認知地圖是環境心理學中研究環境認知與尋路行爲的重要工具，過去對建築物中的研究較少。現以一個圖書館爲案例，其中並加入一些可能的影響因素如地圖的觀察，利用讀者在尋路後所繪的尋路地圖和對尋路過程的描述，再檢視並比較各個受測結果的差異與意義。從而得到一些初步的結果，諸如一些會影響到尋路成效、圖繪內容與環境設施上的關係，這些結果還需要從多個圖書館的案例中做進一步的驗證。

關鍵字：認知地圖、圖書館建築、尋路行爲、位置性地圖、環境行爲學。

Abstract

Although less mentioned in past research in buildings, the cognitive map is an important tool in environmental psychology for studying environmental cognition and wayfinding behavior. This article shows results from a case study of a library in which several possible factors, such as readings of the maps, are added, and with the maps drawn by the readers and their accounts of finding ways in the library, the test results are examined and compared. The results from the examinations and comparisons, such as the relations between wayfinding and facilities in the environment, need more confirmative evidence from other libraries' cases.

Key words: Cognitive maps, Llibrary buildings, Wayfinding behavior, Environment behavior.

Preface

Wayfinding behavior and sign systems of a building are closely related. When this relation is being discussed, the cognitive map is often referred to its role in user-oriented wayfinding research. In the past there were few studies in which the researchers investigated the relation between the cognitive map and surroundings with reference to library wayfinding behavior. The writer now attempts to find the meanings of the cognitive map in terms of wayfinding in buildings. In order to do that, the writer conducted a survey in a library, as well as the readers' cognition of the surroundings (interview data) and the maps drawn by them (showing the ways they took in particular wayfinding tasks).

Cognitive map and wayfinding

The cognitive map is a tool for psychologists to understand mental activities with respect to cognition of surroundings. It is material drawn from memory according to the drawer's cognition of the surroundings. Such material has some effect on people's wayfinding behavior. The cognitive map is often used by environmental-behavior researchers to study wayfinding behavior and to discover hidden factors that are related to it.

The cognitive map (data) in one's mind is often an obscure image of space, and although not thorough, it contains some important environmental information. The thoroughness of the cognitive map does not necessarily affect the effectiveness of wayfinding because people do not always use it thoroughly, i.e., they do not always use every detail of the cognitive map. Poponis (1990) and Murakoshi's (2000) research shows that even from an incomplete cognitive map way-finders can still gain wayfinding information so long as they have rather clear memories of the characteristics of the place. In other words, the whole point of the cognitive map is about marking changes, characteristics, or differences of a place rather than being detailed and thorough.

The accuracy of a cognitive map is more important than its thoroughness. Accuracy means the degree to which the drawer has specifically plotted on a map the information that will affect wayfinding behavior (decisions). Accuracy is subject to the complexity of the surroundings, the map drawer's personal experiences, and how many times he or she has been to that place. Complexity means the degree to which routes intersect one another or the compactness of a route system. A higher degree of complexity usually implies lower accuracy of the cognitive map. In general, the accuracy of a map can be determined by the correctness of the mappings of places, corners, connections, etc.

Wayfinding in library

Case studies of libraries show that there is no clear connection between the presence of the cognitive map and the effectiveness of wayfinding. Almost all those who encounter difficulties in finding their ways in library are first-timers using the library or its services. They have no idea (cognitive maps) about this library (or certain parts of it) in their memory to refer to, and thus the only helpful image resources are their experiences in other libraries (or their spatial impressions of those libraries). For a way-finder in an unfamiliar place, before they enter the library the only chance to produce a cognitive map is, they can refer to the library's maps then have a clear memory of them. Unless the reader is specifically object-oriented (i.e. having a way-finding goal), it is not easy for him or her to establish a clear

cognitive map of a library building.

Construction and results

The process and the means of constructing a cognitive map are related. Because it is information from an individual's memory, there is no way to display this information through someone else's intellect or material. There are two ways to construct a cognitive map:

1. Beginning with maps on hand. This is about cognizing and memorizing
   Information on a map, whose scales, details, and ways of expressing its contents (such as use of colors) can all affect the construction of the cognitive map. The reader's ability to read and way of reading have direct influence on the cognition, comprehension, and memorization of the information on a cognitive map. Other factors include:
   - The way or the order of reading will affect the direction in which one sees the contents of a cognitive map.
   - The context in which one reads the map will have effects on which contents will be selectively memorized, and on the relationships among those contents.
   - The results are obviously different from having read only one map and from having read more maps.
   - Past experiences with spaces and their comparisons with present maps will affect the construction of the cognitive map.
   - Notes made by the reader while reading the map will affect the completeness of his or her memory about the map.
   - Map reading includes recognizing and memorizing the surroundings of the goal.
   - The cognition of a map's contents is mainly based on turns of routes, secondly on landmarks or directional information. It is more difficult to establish a sense of distance.
   - Arrangements on the other floors are important tools for facilitating the memorizing of information.
   - A bird's-eye-view map helps way-finders see the relationship between the starting point and the destination, especially in recognizing wayfinding information about the return trip.
   - When finding their ways, way-finders may neglect or mistake information while converting the two-dimension actual map into the three-dimension cognitive map.
2. Establishing the cognitive map by experiencing the environment. This means

the cognitive map constructed after the way-finder has experienced the environment.

- Learning from mistakes (e.g. getting lost or walking the same way over and over again) can establish a correct cognitive map more easily.
- Being getting lost means the way-finder has a wider scope of cognition and goes through a more complex route system. In other words, experiences of being lost will enrich contents of cognitive maps.
- Using maps to find ways can help construct the cognitive map more correctly and faster.
- In a cognitive map, recognition of the routes is mainly based on the number and directions of the turns. The locations of the turns are recognized mostly with the aid of landmarks or landscapes around the turns.
- Information given by other people will become part of the cognitive map as well.
- Other wayfinding tools (e.g. the compass) can speed up the processes of cognizing and memorizing environmental information.
- The cognitive map shows directions mainly at turns of the routes, less focusing on the direction of the whole area.
- Cognition and memory of landmarks around the routes may speed up the return.
- The cognitive map is highly abstract. All the distances and lengths on it are relative, abstract, and simple.
- Cognitive maps constructed this way can stay in memory longer..
- Past experiences with spaces or similar cognitive maps may help the way-finder to form and memorize a new cognitive map.
- Sign systems in an environment may affect completeness of information on the cognitive map.
- When the three-dimension cognition of space (the cognitive map) is presented on a two-dimension surface (paper), information of routes become abstract, simple, directional, and ordinal.
- Changes of environmental conditions (weather, day/night) may affect people's use and establishment of the cognitive map.

The two ways of constructing a cognitive map are much affected by personal factors. Such factors can be divided into two categories. One is background factors, including age, education levels, personal experiences, etc. The other category is consisted of personal abilities, such as observational ability, imagination, and the

ability to distinguish. Information in the environment is also influential in terms of richness, complexity, and clarity on the contents of cognitive map.

Cognitive maps of urban environments and those of insides of buildings are slightly different in terms of construction, but the differences have not gotten much attention from environmental psychologists. Influenced by Lynch's (1960) study, many researchers have accepted the five key elements in constructing cognitive maps of urban environments—routes, locations, nodes, landmarks, and the regions—and applied them in studies of cognitive map construction within buildings. In fact, in laboratory some wayfinding researchers have tended to highlight on wayfinder's cognitive maps the locations of the buildings' main entrances and exits, or the locations of the elevators and staircases on each floor, indicating the bases or starting points of that space, from which connections among directional changes are established (Perry and Boekholt, 1982). This is different from the "location" seen on the urban map.

Cognitive map and environment

Research in library wayfinding behavior shows that cognitive maps, sign systems, and route arrangements have close connections with one another. Three points shall be mentioned. (Chen, 2006)

1. Cognitive map and interior

(1) Environmental characteristics

In concepts, environmental characteristics can help way-finders fully understand "the whole interior" (mainly multi-level buildings). In fact, however, wayfinding behavior occurs only within a small part of the space. Important environmental characteristics should be arranged along the main wayfinding routes. In other words, the placing of environmental characteristics should be taken into consideration along with the arrangements of space and routes.

(2) Route arrangements

Route arrangements are the main content in a cognitive map. In the same story, differences in route types or levels may affect correctness and complexity of the contents and construction of the cognitive map.

(3) Sense of direction

A. The impressions of the entrance and exit. Either at the main door on the first floor or the elevator doors at each floor, the directions which these doors are facing are very important for the establishment of a sense of direction because they are a starting point of a wayfinding map.

B. Circularity. The circularity of a space or route system is the most

important factor that influences or impairs the sense of direction. It causes directional confusion in a cognitive map.

2. Cognitive map and sign systems

(1) Conditions of construction. Survey shows that cognitive maps are often constructed with the instructions of sign systems. In other words, almost all changes of routes and positions in a cognitive map are based on the instructions of the sign system and the verification of the wayfinding behavior.

(2) Planning and designing of the sign system (types, contents, location, and environmental conditions) have great influences on completeness and correctness of the cognitive map. Wayfinding problems are often found in cognitive maps drawn by users in an environment with an imperfect sign system.

(3) The cognitive map and the actual map. Few users reported that their cognition of the interior (cognitive maps) is based on map reading, but the cognitive maps drawn by users who have read actual maps show correctness of position, especially users who have read You-Are-Here maps.

(4) The main factor affecting construction of the cognitive map is interior sign systems. The guiding function of a library's sign system can be tested by cognitive maps.

3. Cognitive map and wayfinding

(1) The relationship between wayfinding problems and the cognitive map is manifold but not necessary.

A. In the same story, the cognitive maps drawn by readers who have had problems finding ways are more complex than those by readers who have not.

B. There is no certain connection between the cognitive map and whether the way-finder succeeds or fails. Even a reader without a cognitive map may still successfully find his or her way in a library since there are other ways to solve wayfinding problems (such as asking other people for directions or reading and map).

C. The effectiveness of wayfinding behavior (exactness and being timesaving) has connections with the cognition of directions, turns, and landmarks on the cognitive map drawn by the way-finder.

(2) Personal factors. Personal spatial experiences, sensitivity, memory, intellectual capacity, personalities, etc. can affect wayfinding behavior, abilities to construct cognitive maps, and use of them.

Conclusion

The readers' drawings of their cognitive maps after they found ways in the library clearly reflect the relationship between cognitive maps and environments within library buildings. Spaces in the library are very much different from those in other places where wayfinding problems may occur, such as the hospital and the exhibition center. There are fewer rooms in the library and its routes vary a lot, which gives special meanings to the cognitive map. The results of the study are as follows.

1. Differences in ranks and arrangements of routes may affect wayfinding behavior and are reflected by the cognitive map.
2. Construction of the cognitive map is mainly based on service of sign systems. Planning and designing of a sign system have influences on the reader's cognition of directions and routes as well as construction of the cognitive map.
3. The cognitive map is not a comprehensive map. It is a linear drawing mainly consisted of routes with one end representing the destination or the goal. It contains no detailed descriptions of space, direction, and distance. In fact, it is a linear drawing of mere routes, unlike the ordinary map.
4. In wayfinding research, phenomena that are hard to explain can be attributed to individual differences if the cognitive maps are of the same environment and the same goal.
5. Maps in the library, especially those showing locations, have clear effect on first-timers' wayfinding strategies, forming cognitive maps, and wayfinding speed.

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CHAPTER III

ENVIRONMENTAL COGNITION

Cognitive Map and Wayfinding in Library

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ABSTRACT

Although less mentioned in past research in buildings, the cognitive map is an important tool in environmental psychology for studying environmental cognition and wayfinding behavior. This article shows results from a case study of a library in which several possible factors, such as readings of the maps, are added, and with the maps drawn by the readers and their accounts of finding ways in the library, the test results are examined and compared. The results from the examinations and comparisons, such as the relations between wayfinding and facilities in the environment, need more confirmative evidence from other libraries' cases.

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Congnitive map and wayfinding

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