

COMPONENTS OF COMFORT IN RESIDENTIAL SPACE

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ABSTRACT

What kind of residential space will make people feel comfortable? How many factors will influence our feelings of comfort? This study is intended to study the elements that constitute the comfort in residential space, and provide the interior design industry a reference material. Methods used in this study are mainly “content analysis”. Through all the relevant literature collections of comfort that were proposed by scholars, the content is analyzed, aggregated, and then deduced to the home space comfort factor. In this study, the comfort factor of living space and its connotation is development through literature analysis. Through the analysis, the comfort of residential space is divided into “physical comfort” and “psychological comfort”, and it helped developing the facets and factors of home space comfort. The facets include “physical comfort of residential space” and “psychological comfort of residential space”. The factors and the intensions of these two facets are: 1. there are 5 factors and 21 items of the physical comfort of residential space. 2. There are 3 factors and 15 items of the psychological comfort of residential space. Ultimately, this study concludes recommendations and follow-up research study suggestions in the end.

KEYWORDS: Residential Space, Comfort, Psychological Comfort, Physical Comfort

INTRODUCTION

From the evolution of human development, humans have been constantly trying to improve the dwell environment and pursuit a more refined, safe, convenient and comfortable living environment. They consider the functions and comfort of home environment as a serious matter, hoping to create their own living space, and trying to make their home life more comfortable. People spend more than 90% of their lifetime in interior spaces.(Spengler & Sexton, 1983) Therefore, the good and the badquality of interior environmental can directly affect people's physical and mental health. As to residential space, the situation is also the same.Interior environment is closely related to people's lives, the World Health Organization (WHO) mentioned the living environment to meet “secure”, “health”, “comfort”, and “green”.Among these four elements, what does “comfort” mean? What kind of space will make people feel comforble? How many factors will effect the feeling of comfor.

At present, the domestic researchs about residential space comfort is tending to measure human comfort through the point of view of physics.Such as thermal comfort, light comfortable environment and so on.Most of the scholars use products or equipments to study residential space comfort, and the researches are in accordance with the measurement of the data in physics experiments. They measure comfort mostly through out the physical point of view, not many of them would do it through psychological angle. There must be a deep discussion which is for psychological aspect.Comfortable living space is what people would pursue. It is necessary to find the factors that affect the comfort of home space that it can provide a reference while creating a comfortable space. According to the above-mentioned statement, the purpose of this

study is: To present factors that constitute a comfortable home space, and to provide a reference for interior design to create a comfortable interior space.

RELATED DOCUMENTS

For users, “home” is what makes a house more meaningful. “Home”, in addition to family relations (family), It is also a concept of a familiar, warm, safe, and comfortable “nest.” “Home” is a place full of life memories, “home” is a “self built”, and a “self owned” space. You can do things that you want to do, it signifies safe and comfortable. (Hu Yow-Hwey, 1997) A home space is now no longer a place that only symbolize as a shelter, and it is also not only for dwelling as well. It is now a space where people can work, relax, rest and having entertainments. Residential home interior space is a three-dimensional space, it gives people a range of life safety and living comfort, which is beneficial for daily living, work and other daily activities. (Hou Ping-Chih, 1983)

Residential interior space is to give people a range of life safety and living comfort, which is beneficial for daily living, work and other daily activities. (Architecture and Building Research Institute, Ministry of the Interior, 2005). In General, a residential space can be divided into several different uses and independent space units: (1) Entry, (2) Living room, (3) Dining room, (4) Kitchen, (5) Master bedroom, (6) Children’s room, (7) Restroom or Toilet, (8) Bathroom, (9) Hallway, (10) Storage room, (11) Balcony, and some various function areas. In this distinct separations, a residential spaces can finally meet the needs of leisure, life, education, personal or family daily life.

In the physical environment of residential space, there are different evaluation systems between countries that can make life more healthier and more comfortable. In the US, they use LEED system. In Canada, they use GB-Tools system. And in Britain, they use BRERAM evaluation system. They are all equipped with interior environmental quality evaluation indicators. In Japan, there is a Residential QA Promotion Act that can assure the residential qualities. In Taiwan, there is a green building evaluation index, Taiwan residential properties benchmark index, and Taiwan wisdom health and comfortable housing index. It is also promoting domestic residential qualities. (Chiang Che-Ming, 2004) With all these indicators, the main reasons that will affect living space are physical environment, physical factors, thermal environment, sound environment, light environment, and air environment.

In the psychological environment aspect of residential space, according to environmental psychology to people, it includes personal space, territorial, crowding and privacy. (Wei Chih-Fen, 1995)

In interior space, the psychological level contains chromotherapy lighting, space design security, disaster prevention equipment and space structures, etc. Personal space, territorial, crowding and privacy are in category of environmental psychology, environmental psychology is a Applied Social Psychology which is used to study the relationship between the environment and human psychology and behavior. In the interior environment coloring and lighting, we know that colors can affect a person’s psychological statement. Colors in interior environments will not only impact on the vision directly, but also having a direct psychological effect, that will cause people a symbolic association. (Chen Chih-Peng translation, 2000) To the Construction performance, the items considered can prevent home environment being damaged by typhoon or earthquake.

What is comfort? Many scholars have put different views. If comfort is a subjective personal experience, then it should be a wide range of ideas, but from a historical perspective, for every age people will have some cozy consensus. Although comfort is a personal experience, but it is also widely influenced by contemporary norms. (Tam Tian

translation, 2008) Maybe comfort is a objective experience for people. While Nakamura Yoshifumi (2007) considered if a residential space is able to meet the occupant's condition would be a comfortable thing. This study integrated correlated books, summed up four points of comfort factors, and are described as follows: (1) Size: The reason people in space will feel comfort is because the full consideration to the size of the space and to the size of the human body activities. When it fits just right, people will feel comfortable. (XiaoYa-Wen translation, 2009). (2) Circulation: Circulation in Architectural terms means the connection of the points of people moving in interior or exterior. In interior circulation, it is not only to consider the circulation to different functional spaces, but also the circulation to use the equipment. (3) Function: Residential space covers people's basic life, including the required diet, sleep, people's basic living behavior and functional needs. (Xiao Ya-Wen translation, 2009). These rich functional spaces and equipments have accelerated the convenience of our lives. (4) Material: When you're in any part of the space, you will make contact of materials, whether you sit, lie or move around. The quality of the materials, regardless of how it looks or feels, for comfort is a very important component. (Lin Zheng Zhiyi translation, 2007).

Except for what has mentioned above, the historical aspect of feng shui is also deeply influenced the faith and the execution of comforts of home. (Huang Hui-Qi, 2011). Home comfort factors can be divided into physical comfort and psychological comfort. Home space physical environment affects the physical comfort, including the indoor temperature and humidity, air environment, light environment and sound environment. And physiological factors includes personal space, crowedness, privacy, interior environment color lighting, space safety design, feng shui and so on.

But these above points may not only be factors of the comfort in home space. Comfort can be translated into a data to express varying degrees of comfort, but it is also an abstract feeling, a sum by various feelings combined together. For personal cultural background, the lifestyle, personal habits, etc., will affect the feeling of the comfort of home. However, with time changes, people gradually have their own different thoughts about residential space comfort.

METHODS

The main purpose of this study is to draft the contents and factors of residential space comfort. In this chapter, there will be a brief description of the research methods to achieve the above purpose of mining, process, coverage and limitations, and other related contents.

Research Methods

Methods used in this study are mainly "content analysis", also known as "Document analysis" or "information analysis." It is a method that the researchers will not be interfered in things. In many areas of research, to obtain the information, it's essential to analysis existing literature. Therefore, this method is one of the important research methods of social sciences. Content analysis has objective, systematic, quantitative, and obvious characteristics. (Shi Mei-ling, 1997; Wu Shao-Chin, 2002). This research method is to make a set of programs from valid inferences of the documents contents, these inferences message is related to the message sender and recipient, or content of the message itself; and the inference method various from researchers' preference of theory or substantial research. (Weber, 1989). The application of content analysis nowadays are mostly applicable to any form of media, or any artificial shaping of society manufactures. For example: content of the book, discussions on the newspapers and magazines, writings, poems, implication of songs, painting expression, speech content, contents of the letter, news reports, journal articles, as well as legal provisions related systems, etc. That is, to analysis the content of these artificial products, and then interfere the product's meaning and its

background environment.

In the analysis method, content analysis must be divided into several stages; according to the general characteristics of research, the purposes must be clarified at first, or the research topic must be determined, and with the development of the design research with the theme. And then the information-gathering and analysis of information. The procedure of Content Analysis is also the same. (Wang Wen-Ke, 2003). The order of analysis process is: identify research topics → related data collection [determine study sample (object) → definition of the concept or unit → construct analysis category → define recording unit → vein unit → statistics] → decide analyzing object → decide analyzing program → reliability and validity test.

In this study, it will gather all the references related to comfort that were posted by scholars, and then analyze the content, aggregated, and finally deduce the factors of the residential comfort.

Research Procedure

The main purpose of this study is: to draft home space comfort factor contents. To achieve this purpose, the order of this institute's research design process is: 1. Identify research issues and research purposes. → 2. Aggregate references analysis and discussion. → 3. Content Analysis. → 4. The establishment of living space comfortable elements. → 5. Present conclusions and recommendations.

Research Scope and Limitations

In this study, the range of the space includes only interior home environment, the external environment is not included. Therefore, there will be no any discussion on exterior spaces, such as public facilities, parks, transportation conveniences, neighborhood relations, etc.

DATA ANALYSIS AND AGGREGATION

This study plans out the theory research framework according to the research purposes and literature discussion. The question to be explored is: factors constitution of the home spaces, its dimensions include "physical comfort of home space" and "psychological comfort of home space." In this study, all references are in accordance with comfort theories proposed by scholars. To divide a comfortable living space into "physical comfort" and "psychological comfort", and then develop home space comfort factor. There is currently no any major research in residential space comfort related topic. Therefore, this study analyzed the factor items and the facets of home space comfort according to the literature.

The Dimensions of Home Space Physical Comfort

In the "home space psychological comfort", There are five factors, they are "size", "circulation", "function", "material", and "physical environment". The constitution of the connotation are explained below, refer to Table 1:

- **Size:** It represents the activities related to the size of the section in space, such as the opening space size of Ping, space height, the size of windows and doors, furniture size and reserved spaces. It is aggregated of five connotations through the literature analysis, they are: "the ping of floor space", "space height", "size of the opening", "furniture size" and "reserved size." And then they are all renamed as "spacial scale" according to the content.
- **Circulation:** the routes that people move inside the house, such as the route to each space, or on the road of living

functions, such as the pattern of the configuration. There are three connotations which were aggregated through literature: “inerior circulation”, “interior pattern” and “arrangement.” According to the project content, they are renamed as “spacial circulation.”

- **Function:** Indicates the furniture and equipment features of home space, such as the cooking function of electric pot, the accessibility of a sofa. There are 4 items aggregated from literature connotation: “Furniture and equipment”, “storage space”, “barrier-free space” and “the wisdom of science and technology.” According to the project content, they are renamed as “spacial function.”
- **Material:** represents material properties used in the home space, such as heat insulation, sound-absorbing and so on. Or the texture of materials, such as the feeling of touch. There are 4 connotations aggregated through literature analysis: “heat insulation”, “sound-absorbing”, “touch” and “chemical concentrations.” And according to the project content they are all renamed as “construction material.”
- **Physical Environment:** that the physical environment of the home space, including lighting, ventilation, temperature and humidity, noises and so on. There are 5 connotations aggregated through the literature, namely: “daylights and lighting”, “ventilation”, “indoor temperature and humidity”, “noise” and “cleanness.” In accordance with its program content, it’s renamed as “physical environment.”

Table 1: Facets of Physical Comfort of Living Space

Facets	Factor	Contents	Named
Physical comfort of living space	Measurement	Square feet	Spatial dimension
		Height	
		Size of the opening	
		Size of the furniture	
		Reservation space	
	Traffic flow	Traffic flow	Traffic flow
		Indoor pattern	
		Arrangement	
	Functions	Furniture and equipment	Functions of space
		Storage	
		Accessible environment	
		Modern technology	
	Materials	Insulation	Material conformation
		Sound insulation and absorption	
		Tactile impression	
		Chemical concentration	
	Physical environment	Lighting	Physical environment
		Ventilation	
		Indoor temperature and humidity	
		Noise	
Purifying			

Source: Finishing in this study.

Facets of psychological comfort of living space. Facets of psychological comfort of living space which impact on people’s psychologically comfort, including "Beauty", "Security" and "Environmental psychology." Table 2 is the contents

of facets.

- Beauty : It represents the shapes, colors, styles, or using of planting, and other artwork of interior living space to enhance the beauty, and showing the visualization beauty of the landscape. Aggregated through a literature connotation four projects, namely: "Color profile", "Spatial modeling", "Decorative landscaping" and "Texture." And renamed "Decorative beauty" according to the Project content.
- Security : It represents indemnity of lives and safety of the equipment in living space. Aggregate the four projects connotation through literature, namely: "Disaster Prevention," "Escape," "Security," and "Structural safety." And renamed "Home Safety" in accordance with its program content.
- Environmental psychology : It represents psychological impact on people in living space, including population density, family interaction, the identity of the family and so on. Aggregated by the project documentation 7 connotation, namely: "Feel at home", "Interior population density", "Nostalgia", "Privacy", "Family Interaction", "Neighborhood" and "Interior Feng Shui." And renamed "Mental Space" according to the project content.

Table 2: Facets of Psychological Comfort of Living Space

Facets	Factor	Contents	Named
Facets of psychological comfort of living space	Beauty	Color profile	Decorative beauty
		Spatial modeling	
		Decorative landscaping	
		Texture	
	Security	Disaster prevention	Home Safety
		Escape	
		Security	
		Structural safety	
	Environmental psychology	Feel at home	Mental Space
		Interior population density	
		Nostalgia	
		Privacy	
		Family Interaction	
Neighborhood			
Interior Feng Shui			

Source : Finishing in this study.

CONCLUSIONS

The main purpose of this study was to explore the factors constituting of comfortable living space, the development of comfortable living space by analyzing factors and connotation of document. The comfortable living space is divided into "physical comfort" and "psychological comfort." Aggregated by documentation and analysis, development of a comfortable living space facets and factors which dimensions include "physical comfort of living space" and "psychological comfort of living space." Factors and implications of these two facets included from:

- Physiological comfortable living space with five factors 21 contents, which constitute the following:
 - Spatial dimension: Square feet, Height, Size of the opening, Size of the furniture, Reservation space

- Traffic flow: Traffic flow, Indoor pattern, Arrangement
- Functions of space: Furniture and equipment, Storage, Accessible environment, Modern technology
- Material conformation: Insulation, Sound insulation and absorption, Tactile impression, Chemical concentration
- Physical environment: Lighting, Ventilation, Indoor temperature and humidity, Noise, Purifying
- Psychological comfortable living space with three factors 15 contents, which constitute the following:
 - Decorative beauty: Color profile, Spatial modeling, Decorative landscaping, Texture
 - Home Safety: Disaster prevention, Escape, Security, Structural safety
 - Mental Space: Feel at home, Interior population density, Nostalgia, Privacy, Family Interaction, Neighborhood, Interior Feng Shui

Comfortable living space is to satisfy our live requirement of human nature, but there are many factors which affect us. When we pursue the comforts of home, we can first assess the physiological environment of home. From the results of this study, that the first condition of achieving to comforts of living space in physical living environment, whether homebuyers or upholstery, home for the physical environment should be carefully assessed when all reached their standard, nature can achieve physical satisfaction. But the pursuit of physical comfort of home reached equilibrium, not only physical comfort, but also to the pursuit of psychological comfort.

On the following suggestions, this study suggests questionnaires and statistical analysis as research tool for research method. Aiming the “personal property”, “home space physical comfort,” “psychological comfort of home space” and “lifestyle” to proceed correlation analysis. On the scope of the research, this study suggests that the coverage can be expanded to the exterior home environment, in order to find more comfort influence factors, that may let the residential comfort more improved.

REFERENCES

1. Architecture and Building Research Institute, Ministry of the Interior (2005) *Green Building* Wang Wen Ke (2003) *Educational Research*, Taipei: Wunan
2. Nakamura Yoshifumi (2007) *My Dream House*, Taiwan: Suncolor press
3. Jiang Zhe Ming (2004) : *Introduction to sustainable building*, Taipei : Architecture Intelligence Quarterly magazine
4. Lin Yi Nan translation, (obert, P. Weber., 1989) *Basic Content Analysis*, Taipei: Chuliu Press
5. Lin Zheng Yi translation (2007) Nakamura Yoshifumi writing. *Residential Reader*, Taipei: Left Bank Culture
6. Wu Shao Qun (2002) *Content Analysis Method and its Application in Librarianship Studies*, *Bulletin of Library and Information Science*, 40, 47-61.
7. Wei Zhi Fen translation. Francis T. McAndrew writing. *Environmental Psychology*. Taipei: Wunan
8. Yow-Huey Hu (1997) *Co-Habitation among Three Generations*. Taipei: Times Publishing Co.

9. Chen Chie-Peng (2000) The Study of the Relationships between the Aesthetics of Colors and Urban-rural Landscape. Color application and color Sciences Symposium
10. Shi Mei Ling translation. (Michael, S.writing)(1997) Mass Communication Research.Taipei:Wunan
11. Hang Hui Qi (2011)A Discourse of Home Comfort: The Feng-Shui
12. Perspective.Department of Business Administration,Tunghai University graduate School paper
13. Xiao Ya Wen translation. (Mitsui Haruko, 2009) Handling homes 2 : the mature of my own house,Taipei: suncolor press
14. Spengler, J.D., & Sexton, K. (1983).Indoor Air Pollution: A public health Perspective, 121, 9-17.