PSYCHOLOGICAL PREFERENCE ANALYSIS OF INTERIOR STRUCTURE DESIGN BASED ON COGNITIVE PSYCHOLOGY

Zhao Xu

Abstract

Psychological preference plays a very important role in the interior structure design. From the perspective of cognitive psychology, this paper probes deep into the interior structure design based through psychological preference analysis. First, the key points of interior structure design were identified, and interior structure was divided into different functional areas. Then, a questionnaire survey was carried out on residents in three cities of Shandong, China. On this basis, the author discussed how individual characteristics and individual needs affect psychological preferences, and summed up the correspondence between the difference of psychological preference and interior structure design. The results show that the key of interior structure design is to create a comfortable, healthy and environment-friendly indoor environment; the residents, especially elderlies, generally have high requirements for interior structure design; the residents focus the most on aesthetic degree of interior structure, followed by functionality; the difference in psychological preferences of the residents is resulted from both internal and external factors. The research results promote the analysis on psychological preference and rationality of interior structure design.

Key words: Cognitive Psychology, Psychological Preference, Interior Structure Design, Individual Needs.

INTRODUCTION

Along with the continuous improvement of China’s economic level and the continuous development of society, the pursuit of people at the material and spiritual levels is also constantly improved. Thus, people raise higher requirements for the interior space structure of residence or business places (Wettersten, 2014). Therefore, interior structure design in the architectural design industry has become a new concern. Cognitive psychology refers to the cognitive process of individual’s memory, perception, language, thinking and attention (Proctor, 2013). Cognitive psychology mainly studies the internal mechanism and development process that are difficult to observe, observing and inferring the psychological states of human in the process of input and output (Bocanegra, Gubi, & Cappaert, 2016). Preference is an important concept in economics theory, and it is the individual’s choice when facing different benefits and risks (Cockburn, Quinn, & Gutwin, 2017). Psychological preference based on cognitive psychology is a preference choice based on the individual’s cognition of things. For interior structure design, different groups of people have different space structure preferences for interior design. To meet the market requirement, it is important for designers to understand the psychological preferences of residents.

In existing researches, most hold that people’s cognitive psychological preference can significantly affect individual behavior (Johnsen, Kummervold, & Wynn, 2014). The human psychology can receive signals of the environment and visually collect information
contained in the environment (Zhang, 2016), such as color, shape, and application attribute (Xiaohu, Xun, Ershun et al., 2013). Then an individual preference can be obtained through comprehensive analysis (Buckley, 2011). For interior structure design, the sense of the individual to the space structure is also derived from vision (Wang and Li, 2015). Preference is formed by imaging the individual cognitive psychology through vision (Wei, Baiming, & Ying, 2013). Good interior structure design can improve individual’s comfort level to the overall space for people (Boehm, 2015). For houses, good interior structure design can enhance the functionality and aesthetic feeling (Adamowicz, Alevy, & List, 2010). Based on the theories of cognitive psychology and psychological preference, as well as 460 questionnaires, this study analyzes the key points of interior structure design, space division and function distribution. According to the investigation, this study probes into the influence of individual characteristics and needs on psychological preferences. In addition, it explores the application of psychological preference to interior structure design based on theories of cognitive psychology, so as to provide reference for further improvement of interior structure design.

CHARACTERISTICS OF INTERIOR STRUCTURE DESIGN BASED ON COGNITIVE PSYCHOLOGY

Key points of interior structure design
When a designer designs interior space, he/she tends to focus on the ceiling, the wall, and the ground (Bornemann & Homburg, 2011) before decorating and beautifying. However, this design concept often affects the use function of interior space, making it unable to fit the overall perception of beauty and function of residents or to reach the utility preferences of residents. In this study, the key points of interior structure design are shown in Figure 1.

Figure 1. Key points of interior structure design

(1) Comfortable indoor environment. As far as residential comfort is concerned, interior space structure can influence people’s psychological feeling, thus influencing residential comfort. When the space structure is open, the function is complete, and the decoration is pleasing, residents will approach the inner maximum utility.

(2) Healthy indoor environment. In terms of residential housing, the quality of indoor environment can directly affect the health of residents. Therefore, the psychological preferences of residents for interior design usually tend towards a healthy indoor environment.

(3) Environment-friendly indoor environment. The pursuit of environmental protection has become the current trend of the times, and the residents are no exception. An environment-friendly interior space structure design can not only contribute to the health of residents, but enhance the psychological sense of gain of residents, thus catering to the psychological preferences of residents.

Table 1. Division and function distribution of interior structure

| Area       | Features                                           |
|------------|----------------------------------------------------|
| Hall       | The first place to get started is to cushion.      |
| Living room| Carry out daily living and reception guests.        |
| Dining hall| Daily meal.                                        |
| Kitchen    | It is divided into an operation area and a storage area for food storage and processing. |
| Bedroom    | Carry out daily rest, dressing and storage.        |
| Bathroom   | Daily cleaning and storage.                        |

Figure 2. General residential floor plan
This study takes residential design as an example to describe the division and function distribution of interior structure design, so as to analyze the effect of psychological preference in cognitive psychology on the interior space structure of residential housing, and better combine the residents' needs with space structure design. Table 1 shows division and function distribution of interior structure design. The space structure of the residential housing is divided into a hall, a living room, a dining hall, a kitchen, a bedroom and a bathroom. The hall is the first area to enter, which can play a certain role in buffering; the living room is mainly used for daily living and reception of guests, and should be designed with a large space and beautiful decoration; The dining hall is mainly used for daily meals; the kitchen takes into account the functions of storage and food processing; the bedroom considers the function of daily rest and storage; the bathroom is for daily cleaning and storage, but the bathroom should arrange space reasonably for closestool and bathtub (if the area is too small, it can be omitted).

INFLUENCE OF RESIDENTS’ PSYCHOLOGICAL PREFERENCES ON INTERIOR STRUCTURE DESIGN

After consulting psychologists, management scientists, interior designers and consumers, this study develops questionnaires on the influence of individual psychological preferences on interior structure design. The respondents are mainly the citizens of Jinan City, Qingdao City and Yantai City of Shandong Province. A total of 600 questionnaires are distributed and 527 questionnaires are collected with a recovery rate of 87.29%, of which 460 are valid. The contents of the questionnaire relate to the influence of psychological preferences of individual characteristics, interests and regions on the interior structure design.

Influence of individual characteristics on psychological preference

According to the results of the questionnaire survey (as shown in Figure 3 and Figure 4), the majority of the respondents have high requirements on interior structure design; most respondents who have high requirements for space structure are elder and male ones, while young and female residents raise relatively low requirements. The possible reason is that elder people often have worked for many years and have a certain economic strength to afford a space structure design with high requirement, while young residents usually have insufficient economic strength and are unable to buy large-area houses and their requirements for space structure are also relatively low. Gender differences also have obvious differences in the psychological preference of interior structure, which shows that men have obvious differences in the aesthetic and functional needs of interior structure, leading to different psychological preferences of men and women.

![Figure 3. Respondents’ requirements for space structure](image)

![Figure 4. Differences in psychological preferences between different ages and genders](image)
reasonable and it is easier to reach the psychological preferences of residents. According to Maslow’s Demand Theory, there are five levels of human demand: physiological demand, safety demand, emotion and attribution demand, respect demand and self-realization demand. Interior structure design can perfectly reflect these five levels of demand.

According to the needs of the respondents for interior structure design (Figure 6), the respondents raise the highest requirement for aesthetic degree of interior structure design, followed by functionality and then others. Few respondents choose “I don’t care”. It can be seen that the psychological preferences of residents for interior structure design mostly start from the angle of aesthetic degree and functionality. Therefore, designers should also mainly start from the above two points in the actual design process. The functionality of the space structure should be improved as much as possible under the condition that the interior space structure is sufficiently beautiful so as to meet that needs of residents.

**Figure 5. Maslow’s Demand Theory**

![Maslow’s Demand Theory Diagram]

**Figure 6. Respondents’ needs for interior structure design**

![Respondents’ needs for interior structure design]

**CORRESPONDENCE BETWEEN THE DIFFERENCE OF PSYCHOLOGICAL PREFERENCE AND INTERIOR STRUCTURE DESIGN**

As far as residence is concerned, each resident has a different psychological preference, and the difference of this psychological preference mainly comes from internal factors and external factors which include several sub-factors (Figure 7). The differences of preferences can affect the psychology and behavior of residents, which requires designers to explore psychological preferences of residents, so that interior space structure design can meet the needs of residents.

**Figure 7. Sources of differences in psychological preferences**

![Sources of differences in psychological preferences Diagram]

As can be seen from Figure 7, the internal factors that influence the residents’ psychological preferences for interior space structure mainly consist of individual interests, personality characteristics and aesthetic preference. The individual interests formed by the residents’ own long-term cognition can make people obtain the emotional satisfaction. Different people have different growth environment, education level and age, so their interests are also different, so that there are differences in psychological preferences. Personality characteristics reflect the values and world outlook of residents. Some people only pay attention to the functionality of interior structure, while others pay more attention to the aesthetic sense of interior structure. The aesthetic bias is that there are differences in the visual perception brought by the residents to
different space structures. The external factors that influence residents’ psychological preferences for interior space structure are mainly composed of regional culture, age difference and gender difference. The regional culture represents the different growth environments of residents, and there are significant regional differences. For example, the yurts in Inner Mongolia and the earthen buildings in Fujian are very regional. Age difference means that there are different psychological preferences in different age groups, and the elderly prefer mature decoration design and wide space structure while young people often have smaller housing areas due to insufficient funds and other reasons, and the interior design is more inclined to a younger style. Gender difference is reflected in the different aesthetic preferences of men and women.

CONCLUSIONS

Based on the psychological preference theory of cognitive psychology and 460 questionnaires, this study analyzes the application of psychological preference in the interior structure design, and draws the following conclusions:

(1) The key points of interior structure design are comfortable indoor environment, healthy indoor environment and environment-friendly indoor environment. In this study, a residential building is divided into a hall, a living room, a dining room, a kitchen, a bedroom and a bathroom in the structural division and function distribution of indoor space. The comprehensive design of each functional area can make the residential space structure meet the psychological preferences of residents in terms of aesthetic degree and functionality.

(2) Residents have high requirements on interior structure design. Most residents who have high requirements for space structure are elder and male ones, while young and female residents raise relatively low requirements. Residents have the highest requirement for the aesthetic degree of interior structure design, followed by functionality. Therefore, the psychological preferences of residents for interior structure design mostly start from the angle of aesthetic degree and functionality.

(3) The differences of residents’ psychological preferences mainly come from internal factors and external factors. Internal factors mainly refer to individual interests, personality characteristics and aesthetic preferences, while external factors refer to regional culture, age differences and gender differences. Therefore, residents’ psychological preferences can be analyzed from these aspects.

REFERENCES

Adamowicz, V., Alevy, I., & List, J. (2010). How can behavioral economics inform non-market valuation? an example from the preference reversal literature. Artefactual Field Experiments, 87(3), 365-381.

Bocanegra, J. O., Gubi, A. A., & Cappaert, K. J. (2016). Investigation of social cognitive career theory for minority recruitment in school psychology. School Psychology Quarterly, 31(2), 241-255.

Boehm, S. (2015). Facilitating comprehension, connection and commitment to environmentally responsible design. International Journal of Art & Design Education, 34(1), 73-88.

Bornemann, T., & Homberg, C. (2011). Psychological distance and the dual role of price. Journal of Consumer Research, 38(3), 490-490.

Buckley, M. (2011). Gender and housing in soviet russia: private life in a public space. Journal of Historical Geography, 37(1), 140-140.

Cockburn, A., Quinn, P., & Gutwin, C. (2017). The effects of interaction sequencing on user experience and preference. International Journal of Human-Computer Studies, 108, 89-104.

Johnsen, J. A. K., Kummervold, P. E., & Wynn, R. (2014). Media preferences in scenarios involving relationship closeness and information valence: evidence of strategic self-presentation and sex differences. Psychological Reports, 114(1), 217-30.

Proctor, R. W. (2013). Special section: applications of research in cognitive psychology to training in the real world. The American Journal of Psychology, 126(4), 387-388.

Wang, D., & Li, F. (2015). Daily activity space and exposure: a comparative study of hong kong’s public and private housing residents’ segregation in daily life. Cities, 59, 148-155.

Wei, S., Baiming, C., & Ying, Z. (2013). Typical survey and analysis on influencing factors of village-hollowing of rural housing land in china. Geographical Research, 32(1), 20-28.

Wettersten, J. (2014). New social tasks for cognitive psychology; or, new cognitive tasks for social psychology. The American Journal of Psychology,
Xiaohu, Z., Xun, Z., Ershun, Z., Shaohua, W., & Ji, Z. (2013). Study on the spatial structure and driving force of urban areas in Beijing based on building space structure. Geographical Research, 32(11), 2055-2065.

Zhang, D. (2016). Courtyard housing in North America: Chinese design for health and happiness. URBAN DESIGN International, 21(4), 281-297.