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Research on the Design of Elderly Space from the Perspective of Environmental Psychology

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Abstract: With the aggravation of the degree of aging in China, the residential design of the elderly is also getting more and more attention. However, the current residential design in China is not comprehensive enough to consider the needs of the elderly, and modern residential areas bring many inconveniences to the lives of the elderly. How to meet the needs of the elderly and better adapt to the aging society has become an urgent problem in residential design. Based on the perspective of environmental psychology and the physiological and psychological characteristics of the elderly, this paper attempts to conduct a preliminary exploration of residential design for the elderly.

Keywords: Environmental Psychology; Senior Living Space; Interior Space.

1. Introduction

The mental activity of older persons can be characterized in both positive and negative terms. Positively, older people's ability to understand increases, they think more deeply about things and their wisdom increases. On the negative side, the memory of the elderly decreases, their learning ability decreases, their character becomes suspicious, stubborn, stereotyped, and emotionally indifferent, and they have a sense of loss and loneliness. Social factors also affect the psychological causes of the elderly, and the most influential factor for the elderly is the change of social roles and the loss of relatives and social relationships. Due to the change in social status and interpersonal relationships, a sense of loss and loneliness will gradually arise. Research has shown that the personality characteristics of the elderly in China can be broadly categorized as loneliness, anxiety, reduced activity, reminiscence, and a preference for comfort and security.

2. Environmental Psychology

The term "environmental psychology" was formally introduced at the meeting of the American Hospital Association (1964). Harvard University and the Massachusetts Institute of Technology (MIT) offered courses in environmental psychology, and in 1968 the City University of New York (CUNY) began to enroll doctoral students in environmental psychology; the first textbook on environmental psychology was published in 1970. The American Psychological Association (APA) formally established the Division of Population and Environmental Psychology in 1978. The International Federation of Applied Psychology (IFAP) also established a Division of Environmental Psychology, and the International Society for the Study of Man and his Physical Environment (ISSMEP) was founded in Europe in 1981, along with the Journal of Environmental Psychology; although the issues involved are relatively specific, they reflect the fact that researchers have been constantly summarizing and reflecting on relevant research. Summarizing the theories (e.g., on crowding, cognitive development) that began to develop in the 1970s since the emergence of this problem-oriented discipline in the late 1960s, environmental psychology entered an era of dynamic growth in the 1980s.

Environmental psychology is the study of the relationship between the environment and human psychology and behavior in an applied social psychology field, also known as human ecology or ecopsychology. The reason why environmental psychology has become a social psychology an applied field of study is that social psychology studies human behavior in the social environment, and from a systems theory perspective, the natural environment and social environment are unified, and both have an important influence on behavior. Although the study of the environment has attracted people's attention for a long time, environmental psychology as a discipline is still after the 1960s. Environmental psychology is an important branch of psychology, which is an emerging fringe discipline that has developed rapidly in the last two decades. It involves architecture, urban planning, landscape architecture, interior design, psychology, sociology, anthropology, human ecology, and other interdisciplinary disciplines. Environmental psychology is the study of individual behavior and the environment between the interrelationship of the discipline, it is mainly research on the environment and psychological interrelationship, that is, the use of psychological methods to analyze the human experience, activities, and its social-environmental interactions and impacts, to reveal a variety of environmental conditions under the law of the development of human psychological occurrence. In its definition and connotation, the concept is very broad, such as Bell (1978) in their first edition of the textbook "Environmental Psychology" that "environmental psychology studies the interrelationships between behavior and the man-made and natural environments." Houlihan (1986) provides a similar description, "Environmental psychology studies the interrelationships between the physical environment and human behavior and experience." Prosharsky (1990) was more explicit: "Environmental psychology is the discipline concerned with the interactions and interrelationships between people and their environments." Currently, a more recent definition suggests (2014) that environmental psychology is the theory, research, and practice aimed at improving the relationship between human beings and the

natural environment and making the man-made environment more humane. The content of environmental psychology includes theories related to environmental perception, environmental cognition, personal spatial behavior, personality and environment, scene and place, etc., and the theories applicable to spatial design include theories of perception, cognition, personal spatial behavior, and place attachment.

2.1. Environmental Perception

Environmental perception focuses on the immediate and direct responses that individuals or groups have to environmental information. Presence, immediacy, and immediacy represent space, time, and mode of perception. Environmental perception is generally accompanied by a stimulus and is interconnected with past relevant knowledge and experience possessed by the individual; such as the influence of individual experience, personality, etc., and is somewhat subjective. Such as in the case of a stimulus, we will extract and compare the experience in our memory, which also means that the process of environmental perception contains cognition. Characteristics of environmental perception: environmental perception begins with the processing of individual stimuli in the environment. It usually goes through the process of stimulus awareness, stimulus discrimination, stimulus recognition, and stimulus rating. Environmental perception includes cognitive (thinking), affective (emotional), interpretive, and evaluative components, and an individual's perceptual sensitivity to the environment changes as exposure time increases. If the stimulus is constant, an increasingly weak response is called habituation. This habituation can occur due to olfactory stimuli, gustatory stimuli, noise, light, pressure, temperature, etc., and is related to adaptation to the environment.

2.2. Environmental Cognition

Environmental cognition is the process by which a person stores, processes, understands, and recombines environmental stimuli to recognize and understand the environment. Perception theorists generally believe that memory and cognition are interrelated, as in the case where we are confronted with a stimulus, we first extract and compare the experience in our memory, which implies that the process of environmental perception involves cognition. According to psychology, "We humans can recognize and understand the environment clearly because of the image of the environment that is reproduced in our brain memory. And this image reproduction in the brain of what has been perceived is called a representation, while the image reproduction of a specific spatial environment is called a 'cognitive map'". In Imagery of the City Lynch argues that cognitive maps consist of five basic elements.

The path is the road used by people in the environment, with certain continuity and direction, and is the skeleton of the cognitive map. The use of paths in the institutionalized elderly interaction space can be reflected in the space of the traffic route, such as vertical traffic, floor plan traffic planning, etc., according to the behavioral cognition of the elderly, spatial cognition of the overall planning of the traffic route, so that the structure of the internal space, the direction of the clear, so that the elderly on the institutionalized elderly interaction space cognition is more familiar, comfortable; signs refer to the attention-grabbing target, generally are Signs refer to attention-grabbing targets, which are general references with obvious visual characteristics and can be fully visible, eye-catching and guiding. It is a very important visual reference and guidance, which can make people recognize their spatial directionality in the ambiguous environment, and can assist their path as an important manifestation. Institutionalized elderly in the internal and external space can be used to guide the logo, respectively, using different materials, colors, shapes, sizes and other different markers of institutionalized elderly interaction space to guide the elderly groups in space for the directionality of different spaces have a certain guidance and reference role, to give the elderly better spatial cognition and feelings; the above-mentioned path is a one-dimensional element, is our The path mentioned above is a one-dimensional element, which is the road we use every day, with continuity and directionality, while the node is a two-dimensional element, such as the train station, plaza, and intersection crossings, etc. are nodes, where pedestrians must concentrate on sensing their surroundings and make their own direction choices. In the institutional elderly interaction space in the nodes, such as outdoor, indoor and between the nodes of each space (traffic junction, intersection) to set up some markers, such as can be representative of the old objects furnishings, color jumping, bright background wall color block, etc. as a sign to guide the elderly groups better, more convenient, more recognizable awareness of the nature of the space qualities, and the sign is similar to the spatial Can help the elderly group to guide the direction, assisting people for further understanding and cognition of space; area refers to a specific spatial range of commonality, that is, spatial similarity, such as parks, dormitories, plazas, etc., and in a larger spatial scale, the similarity of the space that is the commonality of the space will become a specific spatial range of distinctive personality embodiment, play a role in identifying the role of It is easy for people to regard this area as a whole. In the institutionalized elderly interaction space area design, the design of each area should take into account the use of different areas and their functional characteristics to carry out, different spatial areas have different plan layouts, material selection, space planning, functional positioning, etc., so that the institutionalized elderly interaction space for each area has its different characteristics, but with a certain degree of regional identification, so that the elderly groups in their different areas of space have a different sense of experience and regional immersion, so that the elderly groups in their different regional space has a different sense of experience and regional immersion. Different sense of experience and regional immersion; Boundary refers to a demarcation line between different regions or spaces, according to the different regions or spaces with different division needs, the boundary has a certain limitation and closure characteristics but also has a certain continuity, such as riverbanks, walls, highways and so on. In the space for the division of the region's boundaries, you can use different materials, shapes, sizes, types, etc. to divide the boundary, according to the functional nature of different regional spaces to determine the elements of the boundary division. Such as privacy of the region can be used in the form of a multi-faceted enclosure of the border, the use of partition walls or partitions and other materials for the division; while the public space of the border division is not too strengthened, you can use some indoor greenery and other additions to increase the spatial embellishments also play a certain effect of the border division processing, creating a sense of place in the space area.

Environmental cognition is the process of recognizing and

understanding the environment after a series of processes such as stimulation of the external environment, which is possible because we reproduce the image of the environment we have experienced in our memory. Elderly people have been living in familiar and emotional family environments for decades, when they enter the institutionalized elderly environment space, there will be a certain degree of discomfort and exclusion in the new environment, and seek more strongly for their familiar space environment; the concept of environmental cognition enables us to incorporate the feedback from elderly people in the design of institutionalized elderly environment space with the corresponding problems, and create the space into an environmental space with emotional belonging. The concept of environmental cognition enables us to combine the feedback we receive from the elderly with the corresponding problems in the design of institutionalized elderly environment space and create the space into an environmental space with emotional belonging.

2.3. Spatial Behavior

The concept of "spatial behavior" mainly includes aspects such as personal space, privacy, domain, crowdedness, etc. It is mainly used to study the inherent ways in which groups of people communicate and interact with each other in the spatial environment, and reveals the psychological need for personal space associated with this concept. In interpersonal interactions, different interpersonal relationships have different distances thus forming different miniature personal spaces. Such as dining in a restaurant to choose a location, if someone is already in a four-person sitting position, then the next person in the case of another space basically will not choose to share a table with others, and even if it is the case of sharing a table, will choose the opposite or diagonally across the table, generally do not choose to sit side by side, which is a certain miniature personal space. There is a certain appropriateness in personal space. Hall (Hall, 1966) based on which he generalized and defined four types of interpersonal relationships, namely: "intimate distance, personal distance, social distance, and public distance." Psychologist Oltman (1974) defines that "privacy refers primarily to selective control over proximity to oneself or one's group." In the institutional aged care interaction space, the design of private space is particularly important, it can increase the sense of well-being of the elderly living in the space; its design should be fully understood to grasp the psychological and behavioral characteristics of the elderly to design. In addition to the design of private space in addition, the separation of the border should also consider the sound insulation measures to better create a private space; psychologist Oltmann (1974) for the field definition of sex: "individuals or groups to satisfy a certain need to own or occupy a place or an area, and to personify and defend the behavioral patterns. In the early process of human evolution, there is such a manifestation of the domain, that each tribe or group will have their territory to prevent others from invading; in addition to human society, another animal kingdom also has their own domain space. The domain is divided into three types, namely: "primary domain, secondary domain, and public domain"; the corresponding interpersonal space can be corresponding to the private space, semi-private space, and public space. In the bedroom space of the elderly carry out the corresponding spatial personalization design, increase the sense of spatial domain, and enhance the satisfaction of the elderly for the space, so that they have a greater sense of happiness and sense of belonging. The concept of spatial behavior is an important theoretical basis for the rationality and efficiency of spatial functional zoning, and different interpersonal interactions and relationships require different spatial behaviors; one of the important theoretical factors that must be taken into account when designing the space environment for institutionalized elderly interaction. It can effectively enhance the happiness and satisfaction of the elderly group in the space.

3. Environmental Design of Living Space for the Elderly

The family is the most important life activity of the elderly space, is an important support for their later life, and should be combined with the psychological and physiological characteristics of the elderly, as far as possible to meet the needs of the elderly in the internal environment of the residence, the elderly should have ventilation and good lighting characteristics of the living room, because the elderly due to physical changes, action is slower, so the elderly in the living room will be longer, so the elderly living room should have ventilation characteristics, which can not only ensure indoor air circulation, but also can promote the circulation of various body functions. So, the requirements of the elderly living room should have the characteristics of ventilation, which can ensure indoor air circulation, but also promote the circulation of the body functions of the elderly, secondly, the elderly like to sunbathe, so the elderly living room lighting play is also very high, more sun is conducive to the absorption of calcium in the elderly, can reduce the probability of osteoporosis and other diseases. Elderly living room floor materials should choose the friction of the floor material if a layer of carpet will be relatively good. For the stairs and the design of the indoor passage, due to the decline in the eyesight of the elderly and other reasons, you can use special color tiles and signs, which are conducive to the elderly to better identify the direction. The design of doors and windows for the elderly should also be designed according to the characteristics of the elderly, and should not be designed too high or too low, otherwise, it will increase the inconvenience of the elderly to open and close the doors and windows.

When it comes to interior space color design for seniors, seniors need a home with color, just as brightly colored clothing lifts their spirits. Color is a motivator and symbol for human beings, it is considered as a reaction and behavior. It can define the style of an interior space, and color can also indicate temperature, with red high temperatures and blue representing low temperatures. The role of interior color environment is crucial and color plays a major role in interior design. Each color represents a mood, and each color influences each mood, not only emotionally conveying a wide range of information but also influencing the attitude of people living in the interior space. Therefore, according to the age, gender, emotion, and other characteristics of the elderly people on the color design of their living space give the following suggestions. First of all, the most important is the room where the elderly live and rest, a sleeping environment with suitable color can change the quality of sleep better. Due to the difference of groups, the sleep quality of the elderly is poorer, so they have higher requirements for the sleep environment, and the aesthetics and personalization of the room's decoration and so on can not directly improve the quality of sleep. A simple, plain, and quiet style is preferred

by the elderly. Room curtains, bedding, cabinets, etc. should be in light colors. Therefore, we need to pay more attention to this aspect when creating space for the elderly for them to have a good lifestyle. In the color design of the living room, most of the elderly in China like Chinese red, the living room is a meeting area, and the elderly like a lively atmosphere, we are obliged to fit their psychological needs to create a warm, pleasant and comfortable living room environment for them. Most of the decoration nowadays is painting the walls white, which is monotonous and boring. To maintain the humor of the elderly, it is advisable to use a room that is clear and warm, where colors such as pale yellow, yellow, and beige can be used instead of senseless white. Many people elderly suffer from dementia, rheumatism, and other diseases that can be stimulated in the brain by proper color choices that can also help them to recover their health.

In the elderly interior space furniture design, the first should consider the comfort of the elderly, because the family appliances generally do not have to pay attention to the efficiency of the work, but the first need to consider is the ease of use. So the family furniture, especially kitchen utensils, cabinets, and sanitary equipment design, take care of the use of the elderly is very important. The safety of furniture and supplies is also very important, the house should not have unstable furniture, such as swaying chairs. In walkways, do not place floor coverings that are slippery or easy to trip on. Floor coverings should be fixed and not placed in such a way that they can be moved by the force of walking. Place furniture and other items in the house in such a way that they do not interfere with the elderly person's ability to walk. Install handles that can be touched at the bathtub, shower, and flush toilet, whether the scale of the item is appropriate, whether the operation of lifting, gripping, and pulling is in line with the man-machine requirements of the elderly, whether there is a surface texture that irritates the human skin, etc. Door knobs should be avoided to avoid static electricity so that they do not bring comfort to the elderly when they use them. The sound insulation effect of the elderly decoration must be good, to seek a quiet overall living atmosphere, the elderly love quiet, the most basic requirements for a home are the doors, windows, walls, and sound insulation effect, not subject to external influences, to be relatively quiet every old man's room should be arranged as far as possible away from the living room and dining room. Interior design in the operation interface should give full consideration to the behavioral ability of the elderly, the most simple, the most energy-saving, the most secure, the most accurate to achieve the purpose of use, to maximize the satisfaction of the elderly desire, such as light switches should be easy to identify, door handles, household appliances, plug location should be moderate, the location of the telephone, first aid items to be placed to be taken into account. In terms of product design, it highlights aging and intelligence: based on the barrier-free space, the aging-friendly design penetrates every corner that the elderly may touch. For example, the setting of barrier-free bathrooms, one-way card access control, etc.; such as furniture using environmentally friendly materials, rounded design furniture, intelligent mattresses, to eliminate potential safety hazards; and then into more intelligent facilities, fresh air systems, central air conditioning, intrusion alarm, building automation, wireless networks, wearable devices, etc., so that every detail is fully considered the comfort and convenience of the elderly life. Building automatic control (building automation) system refers to the building of electrical equipment, such as elevators, pumps, fans, air conditioning, etc., the main nature of its work is a strong electric drive. Usually, these devices are in open working condition, that is to say, there is no formation of a closed loop circuit. As long as the power supply is connected, the equipment is working, as for the working state, process, energy consumption, etc., can not get online timely data, not to mention the rational use and energy saving. Now the building's automatic control system is the above electrical equipment for online monitoring, through the setting of the corresponding sensors, travel switches, photoelectric control, etc., the working state of the equipment detection, and through the line return signal to the control room of the central computer, the computer analysis results, and then return to the equipment terminal for adjustment.

4. Conclusion

Owing to changes in the structure of life and living space, older persons have fewer opportunities for social interaction. In addition, many older persons have become "empty nesters" because their children have grown up and left the family one after another, making them psychologically vulnerable to a sense of loss and abandonment. They are afraid of becoming a burden to their families and society, and they have a sense of loneliness and isolation, and they have a sense of depression and anxiety because of physical aging. Since the residential environment is important for maintaining the physical and mental health of the elderly, it is important to take into account the diminished and lost physical abilities of the elderly when designing the residential environment and try to provide them with a beautiful, safe, and free activity environment. It is very important to study the use of environmental psychology in the design of living spaces for the elderly, because it makes the relationship between the user and the living space more harmonious, and better expresses the harmony and unity of people and the environment, fully embodying the design concept of "people-oriented".

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