

Semantics and Schema: A Visual Aesthetic Study of Aging Community Space

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Abstract

The viewing of community space by the elderly is the "involvement" of vision in the space. In the process of viewing, the "visual memory" of the elderly constructs a holistic "visual schema" for the attributes, structure, hierarchy and each part of the space and is used to "schema-proof" the physical space. Form a "scene schema representation". Transform vision from "physical-cognitive" to "cultural-aesthetic". By analyzing the "reference" theory in aesthetics and empirical evidence of the elderly, this paper elucidates the logical correlation between the semantics of "aesthetic words" and the visual schema and explores the germinal law and stage characteristics of visual aesthetics in the aging community space.

Key words: semantics, schema, referential theory, aging community space, visual aesthetics.

Introduction

According to data released by the National Bureau of Statistics of China in 2021, the population aged 60 and above will be 267 million in 2021, accounting for 18.9% of the national population, of which 200 million will be aged 65 and above, accounting for 14.2% of the national population. As the elderly population increases, a large number of communities are also gradually aging. Generally speaking, an aging community means that the elderly population in the community accounts for more than 12%. For an aging community, how should we update and transform it to make it more suitable for the elderly to live in? Scholars have almost overwhelmingly researched the functions of age-appropriateness and practicability of elderly care facilities. However, the community life of the elderly requires not only functions, but also humanistic care and aesthetic feelings for the community environment. When studying the design of aging communities, we must take into account the aesthetic issues of the elderly, and take the aesthetics of the elderly for community space as the research object.

The purpose of visual aesthetics research in aging communities is to understand the visual cognitive methods and visual aesthetic laws of the elderly's observation of community space, and to clarify the relationship between the semantics and visual schemas of the aesthetic words interpreted by the elderly. On the one hand, the visual schema of the elderly in the community is affected by the duality of spatial context and their own emotions (arousal state). On the other hand, by analyzing the semantics of aesthetic words, the staged characteristics of visual aesthetics of the elderly were found. This provides a reference and reference in the field of visual aesthetics for the visual research of the elderly and the renewal design of the aging community.

Theoretical frame

Theory of reference and aesthetic words

In the philosophy of language, the theory of reference mainly studies the meaning of the "reference relationship" between language and objective reality. Russell, one of the representatives of analytic philosophy, has long insisted on the theory of meaning reference, and he believes that if an objective entity only conforms to a certain qualified description, then the description refers to the objective entity. The meaning of a word is not only its referent, but also the relationship established between the word and its referent. Strawson believes that meaning and reference should be distinguished. Meaning is a function of sentences or words. Words cannot refer to objects, but people use words to refer to objects. Wittgenstein demonstrated in *The Philosophy of Language* the establishment of a referential relationship, that is, by repeating the referent word over and over again, a unique connection between the name and the referent occurs. He believes that the use of aesthetic words is "context-dependent", and in *"Aesthetics, Psychology and Religious Beliefs Lectures and Dialogues"* discusses the relationship between aesthetic words and their contexts:

What I'm saying is that when language is observed, it is only a wordform that is observed, not the usage made up of wordforms... It is not 'good' or 'beautiful' that we are concerned with. These words, which are completely uncharacterized, are generally regarded only as subject and predicate, but the occasions in which these words are spoken: in this far larger and more complex situation, the aesthetic expression acquires a place, in which, Representation itself is almost ignored.

Kripke further proposed the speaker-reference semantic reference theory. He was influenced by Wittgenstein and believed that language is public and there is no "private" language. When a person uses language to express a given meaning, it is premised that others understand the language. Kripke's shift from focusing on the meaning of words to focusing on the behavior of speakers using words has important

implications for our discussion of the interpretation of particular (aesthetic) words by specific groups of people (the elderly). Wollheim extended Wittgenstein's point of view on the "de-characterization" of aesthetic terms to aesthetic attitude. According to Wittgenstein's example of "soap", he distinguishes two ways of using words, "transitive" and "intransitive". The use of the former is characteristic and the use of the latter is non-characterized. This clears up ambiguities in aesthetic attitudes. (equating one phenomenon with another more specific phenomenon)

According to psychological research, a scene is actually a complex of languages, which is an artificial definition of people's scattered stimuli and backgrounds in the real world. Situational perception is the process of inputting stimuli and background into the brain and processing them cognitively through sensory systems such as vision as a hierarchical spatial structure.

80%-90% of the information in a scene is acquired by the visual system. The stimuli that make up a situation in a community space are complex, with different shapes, colors, sizes, and meanings. Rensink believes that a real scene is composed of coherent, dynamic, and detailed stimuli, but human observation is often made in a non-coherent way of flickering, saccade, and film editing. Produces "change blindness". Therefore, the reasonable distribution and coordination of attention and the formation of a stable structure of attention can enable vision to perceive changes in the scene more effectively.

Some scholars believe that the formation of the visual schema of the elderly is that the light reflected by the stimuli in the scene enters the eyeball, forms an object image on the retina through the refraction of the lens and vitreous, and then transmits it to the visual center of the cerebral cortex along the optic nerve. The visual perception and cognitive ability of the elderly are aging and declining, and the time for searching and staring at the graphic information in space is long, but the priority of graphic feature processing is not different from that of the young. The elderly's cognition of the whole scene depends on the "Scene schema representation" established by "visual memory processing". Visual memory processing refers to the accumulation of detailed information in the stimulus when the eye moves from the stimulus in the scene to another stimulus. Visual short-term memory and long-term memory can be used to establish stable situational representations. In order to achieve high-level situational schema representation, the elderly not only need to understand and master the background and stimulus information (scale, shape, color, meaning, etc.), but also fully understand the semantic structure and relevance of each stimulus in the scene.

Visual aestheticians call it "picture sense". We rely on the visual research of representational viewing to analyze, Gombrich believes that this

sense of picture is actually a predetermined schema formed by the heart, "image-correction" of visible things. This is based on the application of Popper's "trial and error method" in art, he proposed: "Every artist must first know something and form a schema, and then he can adjust it to suit the needs of the depiction.." Arnheim thought that the perceptual process is the process of comparing the perceptual characteristics with the structure of the stimulus. When the vision observes the chaotic scenery, if there are branches and trunks composed of clear geometric shapes and color elements, such a schema is easy to be noticed by the eye. All "shapes" have semantics, and what is observed can convey one type of information. Arnheim's research is based on the theory of Gestalt psychology. He put forward the viewpoints of "physical balance" and "psychological balance", and brought the viewer's psychological and social preferences into the research framework. Nelson Goodman believes that both image and language are composed of symbols, and he is inspired by Carnap, Peirce, Morris's related discussion on "art is composed of symbols and logic". The influence of, further proposed five symptoms of aesthetics, which subdivided the image into coherent and ordered groups of symbols.

Method

Critical content analysis

The author's team took the FengYuan Street community in Liwan District, Guangzhou as an example. The elderly population in this community exceeds 17,000, accounting for 28% of the total population of the community. It is a typical aging community. We try to analyze the aesthetic terms that older people use to refer to the landscape of the community, and discuss the logical rationale of the semantics. For example, an elderly person described the landscape in the community (Figure 1): "The scenery here is particularly beautiful!" The "here" in the sentence refers to the only objective fact - the community landscape; "the scenery is particularly beautiful" conforms to objective logic. So this referential relationship is established, which is consistent with Wittgenstein's "bilateral correlation of language". Further analysis of the "special" in "special beauty", perhaps we will add: "the river is clear and meandering; the arched bridge becomes a circle under the reflection of the river". It can be seen that the word "special beauty" has the usage of transitivity and intransitiveness, and it can completely replace the description of transitivity when it is intransitive. Or it is an ambiguous use that replaces the "characterized" description with a "non-characterized" description.

Figure 1 Landscape of FengYuan Street Community in LiWan District, Guangzhou



Wittgenstein put forward the viewpoints of "language game" and "family resemblance" in his later discussion. Depends on whether the word "beautiful" is defined narrowly or broadly. For example, the elderly describe the community landscape as: "The scenery here is very beautiful! Because the rivers, bridges, buildings and trees are all beautiful!" The beauty of the landscape can be seen as a "big family", rivers, bridges, buildings, The beauty of trees can be seen as "family members" with relationships. However, each family member is similar but not the same, such as "river" with clear and meandering beauty; "small bridge" with delicate and virtual beauty; "architecture" with sequence and regular beauty; "tree" with lush and The beauty of vitality. These "non-universal" and "characterized" beauties constitute the beauty of the landscape as a whole. Further subdivision, each family member can be regarded as a more subtle "small family", and different "small family members" can be distinguished from the beauty form, size, color, material and so on. In this way we can think of aesthetic terms as a group of "class concepts" divided according to semantic distance and intimacy.


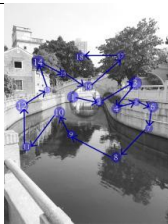

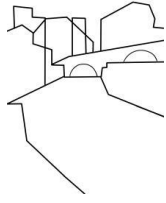

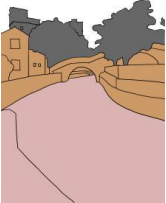
Data collection and analysis

Based on the above-mentioned aesthetic and psychological viewpoints, we set up the experimental framework of the elderly's viewing of community space, and established the spatial schema of the elderly's situational perception from the results of the observation experiment (Figure 2). Mainly divided into five observations:

1. Line of sight and breakpoints. The order of viewing the spatial scene and the stop point of the eyes of the elderly;
2. Spatial awareness. The proportions of the solid and void parts of all stimuli in the spatial context;
3. the space level. The sequence relationship formed by the distance of space is divided into three levels: far, medium and near;
4. Visual dwell time. The time that the eyes of the elderly are fixed on a stimuli;
5. Gestalt structure extrapolation. Geometric symbolization of stimulus contours and gestalt complement of occluded parts.

The analysis of the visual schema shows that the viewing sequence of the old people's viewing of the scene extends from the central object to the surrounding. The stimuli that are closer to the geometric shape are viewed preferentially, and the stimuli that are closer to the natural form are viewed later. Due to the degeneration of visual function, the eyes of the elderly stay longer on stimuli with long distances and complex outlines, and stay on stimuli with short distances and simple outlines for a short time; Phenomenon, eye saccade will simplify the outer contour into a geometric shape, which will help to grasp the overall structure. However, it takes a long time to master and distinguish the details. The elderly's perception of the relationship between space and reality and the depth of space has not deteriorated significantly, and their understanding of the structure and hierarchy of space is clearer.

Figure 2 One of the visual patterns of landscape space in FengYuan Street community

Scene image	Visual path	Visual stay	Gestalt structure	Spatial perception	Spatial hierarchy
					

Discussion

Visual aesthetic analysis of aging communities

According to the content displayed by the visual schema, we further analyze the germinative law of the visual aesthetics of the community space for the elderly. Community space is a complex aesthetic object, which contains two types of objects, man-made and natural. (Or in other

words, the stimuli in the scene have natural properties and man-made properties.) Therefore, a question needs to be clarified first: what is the difference between the aesthetic appreciation of works of art and the aesthetic appreciation of the natural environment? Hepburn believes that "detachment" and "involvement" are two modes of appreciation that distinguish the appreciation of art and nature. The former has a frame and boundary, has a specific form and is clearly distinguished from the environment; the latter has no frame and boundary, the form is uncertain, the viewer and the viewing object are integrated, and the aesthetic experience is more intense and full. Under the premise of "physical objects as hypotheses", Wohlheim discusses two object attributes of "aesthetic interest" and "non-aesthetic interest". The aesthetic properties of physical objects will change over time, but artworks will not. What we need to determine is when a physical space becomes an artwork. This is consistent with Goodman's shift from "what is art" to "when is art", that the stable properties of art depend on its discontinuous function to be understood.

When the elderly are enjoying the community scenery, they only have aesthetic interest in some objects in the scene, and have no aesthetic interest in other objects. Or in a certain season or a certain time period, the scenery is considered to have aesthetic attributes, and in other seasons and time periods, the scenery is considered to have no aesthetic attributes. In fact, the skills and abilities of aesthetic perception are discovered and nurtured through various aesthetic tastes, and Wohlheim's emphasis on the need for viewers to have appropriate viewing experience and understanding of the creator's intentions has shifted the focus of research to relationship between the viewer and the viewing object. He used the example of "observing blue blocks on white cloth" to discuss the double attention of vision in representational works: seeing the representational properties of works, he also saw the physical properties of the medium. From the perspective of the relationship between semantics and schema, the viewer is driven by his own knowledge system, and sees and understands the semantic structure of representational objects and physical objects from the schema.

In contrast, the older people's viewing of community space is in the reverse mode—obtaining visual schemas (representational properties) from community space (physical properties). We assume that the elderly in the community already have quite rich viewing experience, and have formed a clearer visual schema in their brains. The viewing of space is mainly based on "situation reconfirmation" and "visual information update". The visual schema performs "schema-proofing" in the physical space to achieve a balanced state of psychology and the outside world. It is not only affected by physical attributes, but also by psychological factors. Arousal theory holds that psychologically reaching an appropriate level of arousal and a good emotional state are the key

factors in determining "mood", which is the result of the interaction of subjective and objective. Generally speaking, when the arousal level of the elderly is above the average, and the emotional nature is biased towards the pleasant dimension, it is more likely to produce expressions such as "joy", "wonderful", "beautiful", "joyful", "interesting" and "comfortable" Emotions. The point of view of empathy aesthetics usually believes that the basis of aesthetics is the transference of human emotions on foreign objects. The visual gaze on the stimuli in the space transfers the upward power of the heart to the stone pillar, so that the stone pillar also has the same "personality".

We discussed that the elderly build visual schemas by relying on the superposition of visual memories to generate images for matching and proofreading spatial contexts—that is, M (the viewer) sees an X (visual schema) of equal value from the Y (physical context).). The aesthetic function is to produce an aesthetic effect on X, and its composition is not only constrained by the physical constraints of Y, but also by the degree of arousal and emotional form of M. Therefore, the analysis of visual aesthetics is also the analysis of the "visual screening mechanism", and the key to trigger the aesthetic function is not "what to see", but "what to see".

Aesthetic semantics and visual schemas in aging communities

The author's research team recruited 30 elderly people over the age of 65 in the FengYuan Street community to conduct a viewing experiment in the community space, and recorded the experimental data with questionnaires, interviews, observations, and tracking. The content of the experiment is that each elderly person chooses three "beautiful" space scenarios in the community to watch according to their own preferences (Figure 3), and uses "aesthetic words" to briefly describe the scenarios. The research team collected and analyzed these descriptive words, screened out the statistics about the frequency of aesthetic words (Table 1), analyzed their referents and semantic structure, and then drew the visual schema of the elderly's viewing of community space.

Figure 3 spatial scene distribution of the elderly in FengYuan street community



After the first round of selection of space scenarios, a total of 43 spaces were selected, and the research team selected 10 representative ones (community entrance, community plaza, public foyer, main street, inner lane, porch space, river water body, etc.) space for further analysis. In terms of descriptive words, a total of about 1,276 words describing space were collected, and the research team screened 50 words that appeared more frequently and were related to aesthetic experience. The research team also took into account factors such as the elderly's family background; education; behavioral habits; living conditions, and found that different backgrounds, personalities, and habits will affect the elaboration of aesthetic words, and the semantic structure is a vague and complex phenomenon. A description of a space will use diametrically opposed words, or describe two very different spatial situations with similar words.








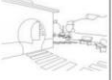











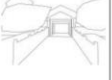






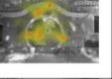
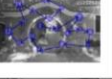




















Table 1 number of aesthetic words and references of the elderly

scene	Aesthetic words	word frequency	referent
1	Less quiet; more shade; dense trees; comfortable; green; large space	17	Space scale, trees, community courtyards
2	More seats; can rest; beautiful ground; wide space; breathable comfortable; excellent scenery	12	Landscape structures, seats, and space scale
3	Open space; more green; distinctive; beautiful environment	6	Landscape structures, seats, and space scale
4	More lively; green; cool; space is very breathable	12	Arbor, trees
5	Signature; good-looking shape; charming	11	Moon gate
6	Quiet; lively; a good place to move; have the smell of life	10	Main street
7	Open space; nostalgic sense; convenient to gather; comfortable	13	Small square
8	Fine potted landscape; many seats; neat floor; beautiful corridor; wide space; beautiful environment	9	Potting, corridor, environment

For example, the elderly have a pair of antonyms for the adverbial words of space scene 6 (Main Street): "lively" and "quiet". The one who describes "lively" is an old man who lives alone, who usually likes to play chess and cards with three or five people; the one who describes "quiet" lives with six members of his family, and usually likes to listen to operas and chat. Although "lively" and "quiet" are semantically opposite, they are both in the context of "emotional arousal". Another example is the descriptions of space scene 1 (community courtyard), such as "more shade", "green", and "thick trees". These words with similar semantics are in the context of "green and lush". For descriptions that do not use scenes and referents, the similarity of their contexts should be analyzed. For example, the descriptions of space scenario 2 (landscape structures) are "wide space" and "breathable and comfortable"; the descriptions of space scenario 4 (gazebo) are "the space is very breathable". The former is in the context of "enclosing a transparent space with structures"; the latter is in the context of "the spatial permeability of the structure itself". The two contexts are similar. Regardless of the semantics or context of words, the elderly's aesthetic description of spatial situations presents a network structure of "family similarity". However, the "non-characterized" description of some words will mask the aesthetic characteristics, which needs to be analyzed in conjunction with the visual schema.

From the analysis of the relationship between the semantics and schemas of words, the elderly explained that the semantics and visual schemas of aesthetic words are the relationship of mutual formation and mutual appearance in information, that is, semantics is the language presentation of schemas, and schemas are the visual representation of semantics. content. By drawing the visual schemas of 10 spatial scenarios (Table 2), the phasic characteristics of aesthetic germinance can be found.

Table 2 Visual schema of FengYuan street community space

scene	Scene perception	End type structure	Visual stay	visual pathway	Image perception	Spatial level
1						
2						
3						
4						
5						
6						
7						
8						

When the elderly view community space, they first focus on local objects, most of which are close to geometric objects, such as door and window holes, building openings, square floor tiles, vertical railings, etc. The second focus is on irregular local objects, such as the parquet on the floor, the sundries in front of the door, the exterior walls of buildings, green plants, etc. Then there is the outline of the overall space. The sequence of visual paths is from local to local, and then from local to whole, and most of them spread from the center of the spatial scene to the surrounding. Objects of moderate size, bright colors, and complete graphics are preferentially seen. At this time, the visual schema of the elderly is still in the stage of local matching and viewing

the physical properties of space. For example, the words in Space Scenario 2 are "more seats", "can sit and rest", and "beautiful ground"; in Space Scenario 8, the words "exquisite bonsai", "many seats", "neatly paved floor", "beautiful corridors" "; the words "beautiful bridge" and "beautifully carved railings" in space scene 10 indicate that vision is in the stage of scene sketch representation.

When the visual memory of the elderly supplements the visual schema with information, the content of viewing is transformed into an overall space, the details of the objects in the scene are gradually outlined clearly, and the meaning of the objects begins to be clarified. For example, the words in Space Scenario 1 are "very comfortable in the cool", "green", and "large space"; the words in Space Scenario 2 are "wide space" and "breathable and comfortable"; in Space Scenario 9, the words "wide space", "suitable for gathering activities" " etc. show that vision is in the stage of situational structure representation.

The visual memory of the elderly has completed the accumulation of information, the visual schema and the spatial context have been matched to a greater extent, the contextual information has been updated, the cerebral cortex has shown a "picture sense", and emotions have begun to be transferred into the space. At this time, the aesthetic words of the elderly have shifted from physical descriptions to cultural descriptions, such as the words of space scene 2 "excellent scenery"; the words of space scenes 3 and 8 "beautiful environment"; the words of space scene 5 "with charm" ; the words "taste of life" in space scene 6; the words "pleasant scenery" in space scene 10 indicate that vision is in the stage of scene schema representation, that is, the stage of visual aesthetics.

Conclusions

The design of the aging community should not only improve the functional design, but also pay attention to the aesthetic design for the elderly. When the vision of the elderly is projected on the community space, emotions will act on this space, giving the space aesthetic value and meaning. The elderly generate visual duality through aesthetic practice and articulate it using aesthetic terms. The aesthetic phenomenon of the elderly can be divided into three processes:

1. Physical presentation. The vision of the elderly outlines the outline of the object and space, and then produces a detailed view of the details of the space, so that the perception achieves a physical balance. Clear understanding of space and physical properties of local objects (such as scale, quantity, material, color, function, etc.), and grasp the physical meaning of space.

2.Schema reproduction. The spatial schema generated by the visual memory of the elderly in the brain repeatedly matches and proofreads the spatial objects, supplements the blank parts in the space through imagination, simplifies the complicated information, symbolizes and visualizes the spatial situation, and reproduces it as the elderly. The spatial schema familiar from the aesthetic experience and cultural cognition.

3. Emotional transfer. In the process of aesthetic practice for the elderly, the physical and aesthetic properties of the space can be seen visually at the same time. At this time, the space as an aesthetic object is no longer the space itself, but is imaged through visual observation and emotional attention. object.

Visual research on the elderly can provide more space types and perceptual experiences in the design of aging communities, and bring more healthy and pleasant lives to the elderly.

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Journal of Namibian Studies, 33 S2(2023): 3081–3094 ISSN: 2197-5523 (online)

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