

Article

Evaluating the Experiential Value of Public Spaces in Resettlement Communities from the Perspective of Older Adults: A Case Study of Fuzhou, China

Yafeng Lai  and Pohsun Wang * 

Faculty of Innovation and Design, City University of Macau, Macau 999078, China; u22092110014@cityu.edu.mo

* Correspondence: phwang@cityu.edu.mo

Abstract: The experiential value derived from public spaces significantly influences social interaction, emotional belonging, and subjective well-being among older adults. As urbanization accelerates in China, resettlement communities have emerged rapidly, highlighting the importance of understanding how the experiential value of public spaces affects older populations, particularly regarding the reconstruction of social networks. Guided by experiential value theory, this study developed a comprehensive evaluation framework. Survey data obtained from selected resettlement communities were analyzed accordingly. The results indicate that experts perceive functional value (A) as the primary factor influencing older adults' experiences. However, older residents themselves place greater emphasis on contextual value (B), which scored 89.146. This finding underscores the significant role that environmental quality and social interaction play in relation to older adults' quality of life. Furthermore, although contextual value scored the highest overall, infrastructure (A2) received the highest score (91.034) among secondary indicators; this highlights that older residents still heavily rely on well-developed infrastructure in their daily lives. Consequently, optimizing public spaces within resettlement communities requires not only enhancing environmental quality and social interaction experiences but also improving infrastructure to ensure safety and convenience. The findings of this study provide theoretical support for age-friendly design in community public spaces, thereby contributing to improved life quality and strengthened social cohesion among older adults.



Academic Editor: Haifeng Liao

Received: 3 April 2025

Revised: 24 April 2025

Accepted: 27 April 2025

Published: 28 April 2025

Citation: Lai, Y.; Wang, P. Evaluating the Experiential Value of Public Spaces in Resettlement Communities from the Perspective of Older Adults: A Case Study of Fuzhou, China. *Buildings* **2025**, *15*, 1495. <https://doi.org/10.3390/buildings15091495>

Copyright: © 2025 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Keywords: resettlement communities; older adults; public spaces; experiential value; evaluation framework

1. Introduction

With accelerated global urbanization, the world's urban population exceeded the rural population for the first time in 2008. By 2050, approximately 68% of the global population is projected to reside in urban areas [1–3]. In China, the urbanization rate reached 65.22% in 2022 [4]. Urban expansion has driven large-scale rural land expropriation, leading to the emergence of government-led resettlement communities [5]. These resettlement communities represent a distinctive urban development pattern, accommodating large numbers of relocated rural residents. The relocated residents face significant disruptions to their social networks, identity, and lifestyle. Among these residents, older adults encounter particularly severe adaptation challenges [6]. Additionally, the decline in traditional public spaces and the disruption of familiar social structures have negatively impacted social cohesion and quality of life in resettlement communities [5].

In contemporary urban environments, public spaces play a critical role. They sustain urban livelihoods, allow for meaningful usage opportunities, and enrich individuals' emotional lives. For older adults in particular, community public spaces serve not only as venues for daily activities but also as vital platforms for maintaining social interactions and obtaining social support [7,8]. Serving as “generators” of social interactions, these public spaces facilitate social activities and help sustain social networks [9]. However, existing community public spaces lack a comprehensive evaluation framework. Specifically, there is insufficient understanding regarding the provision of community facilities, older adults' accessibility to these facilities, their usage patterns, and the relationships between these factors and older residents' well-being [10]. Thus, exploring the experiential value of public spaces for older adults and identifying their influencing factors holds significant practical importance. Such exploration can inform the creation of age-friendly communities and enhance the quality of life for older residents.

Although previous studies have primarily focused on the physical attributes of community public spaces, recent research has increasingly highlighted the importance of user experience in evaluating the value of these spaces. From the perspective of experience value, key considerations include whether residents feel comfortable and secure, whether the space facilitates social interactions, and whether it effectively meets residents' basic needs and emotional expectations. These considerations can be addressed through specific evaluation indicators, such as emotional value (e.g., a sense of identity and comfort) and functional value (e.g., service facilities and safety assurance). Systematic research on the experiential value for older adults in resettlement communities remains limited. In particular, there is a shortage of targeted theoretical frameworks and empirical analyses for constructing quantitative evaluation systems [11]. Therefore, developing a scientific and systematic evaluation framework for age-friendly experiences in public spaces is urgently needed to guide planning and optimization in resettlement communities.

This study addresses the following two key research questions: (1) How can an evaluation framework for the experiential value of public space be appropriately developed for the context of resettlement communities? (2) Which specific factors significantly influence older residents' spatial experiences in resettlement communities? To address the inherent uncertainty and subjectivity in evaluating experiential value, this study employed a triangulation approach. The approach integrated three fuzzy-based methodologies—the Fuzzy Delphi Method (FDM), the Fuzzy Analytic Hierarchy Process (Fuzzy AHP), and Fuzzy Comprehensive Evaluation (FCE). Firstly, the FDM was utilized to minimize inconsistencies and subjective biases among experts during the identification of key evaluation factors. Next, the Fuzzy AHP facilitated the quantification of linguistic variables and subjective judgments, thereby systematically managing the vagueness that is inherent in expert preferences. Finally, the FCE method synthesized multidimensional evaluation outcomes into a comprehensive score, ensuring a balanced and robust evaluation framework.

The innovative contributions of this study are twofold. Firstly, by introducing a theoretical perspective of experiential value, this research expands the analytical scope of community evaluations of public space. This fills an existing research gap regarding the experiential value of older populations within the context of resettlement communities. Secondly, on a methodological level, this study develops a scientific, systematic, and quantifiable evaluation framework for experiential value. This framework not only offers an operational set of indicators for the age-friendly design of public spaces in resettlement communities but also provides evidence-based support for urban planning practices and policy making. Ultimately, these contributions can facilitate the development of community public spaces that are more inclusive, age-friendly, and sustainable.

2. Literature Review

2.1. Age-Friendly Design of Community Public Spaces

In recent years, scholarly focus on public spaces has expanded beyond traditional functional facilities to include social integration, health and well-being, and age-friendly design [12]. Pieri et al. [13] emphasize the role of public spaces as “social incubators”, facilitating daily interactions that foster trust and a sense of belonging among residents. With the acceleration of aging among the global population, research on the age-friendly design of public spaces has emerged as an increasingly important academic focus [7,14]. Existing research highlights several critical features that characterize the age-friendly design of public spaces, including accessibility, environmental reachability, safety, opportunities for social interaction, and cognitive friendliness [15]. Chiang et al. [16] found that public spaces with well-developed age-friendly attributes effectively enhance social participation, reduce loneliness, and improve psychological health among older adults. Similarly, Cao [17] outlined that improved environmental accessibility and safety significantly enhance older adults’ willingness to engage in public activities and prolong their social interactions.

Although research on age-friendly community spaces began relatively recently in China, scholars have started examining how spatial design in urban renewal contexts influences social cohesion, inclusivity, and life satisfaction among older populations [18].

Despite the growing body of literature, significant research gaps remain. Firstly, existing studies predominantly emphasize barrier-free facilities and spatial safety from a functionalist perspective. As a result, factors such as psychological well-being, sensory experiences, and emotional interactions among older adults are frequently overlooked. Secondly, the insufficient integration of theoretical frameworks and practical applications limits the inclusivity and cultural adaptability of age-friendly designs. To address these gaps, this study incorporates experiential value theory to develop a multidimensional evaluation framework. By emphasizing contextual, emotional, and social dimensions, the proposed framework provides a more comprehensive understanding of older adults’ needs in age-friendly public spaces. Future research should strive to optimize barrier-free design to enhance accessibility and safety perceptions among older residents. Simultaneously, integrating green spaces, sensory design, and emotional experiences more thoroughly can help develop inclusive and culturally diverse age-friendly public spaces for communities.

2.2. Characteristics of Resettlement Communities

Internationally, research on resettlement communities has primarily focused on refugee populations, highlighting challenges such as language barriers, social identity issues, and employment instability [19,20]. In contrast, resettlement communities in China typically emerge due to urban expansion and land expropriation, involving two main relocation models—on-site and off-site resettlement. Residents in these communities are generally landless farmers or individuals displaced from urban villages [21]. Although their social structures resemble those of typical urban neighborhoods, these communities often retain certain rural social customs and practices [22].

Although resettlement communities play a crucial role in urban social integration and functional spatial planning, their development faces numerous challenges. Previous studies have revealed that residents encounter difficulties in adapting to new social networks, employment patterns, and lifestyle adjustments. Moreover, inadequate public services and lagging infrastructure further negatively affect residents’ living experiences and social integration [21]. While some researchers have proposed diversified planning strategies in relation to public spaces in order to facilitate social adaptation in resettlement communities, detailed studies specifically addressing age-friendly design to enhance older adults’ experiential value remain insufficient. Existing research primarily emphasizes physical

and functional aspects, such as infrastructure and accessibility. As a result, the social and emotional dimensions of older adults' experiences—which play a crucial role in fostering a sense of belonging and enhancing quality of life—are frequently overlooked. Therefore, future research should integrate comprehensive strategies involving economic support, cultural integration, and the age-friendly design of public spaces. Such an integrated approach would help improve social adaptation and life satisfaction among older residents in resettlement communities.

2.3. Definition and Dimensions of Experiential Value

Experiential value refers to the comprehensive value perceived by individuals during interactions with their environment, encompassing both the functional utility of products or services, as well as emotional and social experiences that exceed expectations [23]. Due to its increasing prevalence, the concept of the “experience economy” has been widely applied across diverse fields, including tourism, hospitality, and retail [24–26]; it has gradually expanded to be included in studies relating to urban public spaces and community environments [27,28]. The essence of experiential value lies in “environmental interaction”, which refers to when individuals perceive and evaluate the environment's functional, emotional, and social values through spatial interactions [29]. This interactive process not only influences individuals' satisfaction with the space but also shapes its psychological and behavioral impacts on users.

Current research investigating experiential value emphasizes its multidimensional structure [30]. Scholars generally support a binary classification framework, distinguishing intrinsic (hedonic) and extrinsic (utilitarian) values [31,32]. However, the dimensions of experiential value vary according to specific research contexts and needs. For instance, Yrjölä et al. [33], examining the restaurant industry, proposed a four-dimensional experiential value model comprising economic, functional, emotional, and symbolic dimensions. In contrast, Heskett and Sasser [34] argued that experiential value in community public spaces should encompass four core dimensions—functional, contextual, emotional, and social. Notably, Lai et al. [5] extended experiential value theory to the context of public spaces. Their study explored the theory's role in shaping social cohesion within resettlement communities, demonstrating its applicability beyond consumer and tourism research and reinforcing its conceptual relevance for evaluating community environments. Building upon these theoretical frameworks and considering the unique characteristics of community public spaces, the present study constructs an evaluation framework for experiential value. Specifically, this framework analyzes how the functional, contextual, emotional, and social dimensions of public spaces influence older adults' experiences in resettlement communities.

2.4. Evaluation Frameworks for Public Space Experiences

Community public spaces constitute a vital component of urban environments. The quality and user experience of these spaces directly impact residents' life satisfaction, community cohesion, and urban sustainability [35]. In recent years, scholars have extensively explored experience evaluation frameworks for community public spaces. These frameworks aim to analyze and enhance the efficiency and resident well-being that are associated with public spaces through comprehensive evaluation models [36]. According to the existing body of literature, the evolution of public space evaluation frameworks can be divided into the following three stages: early assessments focused primarily on physical environments; subsequent evaluations emphasizing social and cultural interactions; and contemporary assessments integrating digital technologies and smart evaluation methods [37]. Current studies emphasize integrated, multidimensional evaluation frameworks.

These frameworks incorporate physical environmental attributes (e.g., spatial layout, accessibility, and green coverage), social interaction indicators (e.g., resident participation and frequency of social interactions), and psychological and emotional factors (e.g., a sense of belonging and perceived safety) [38]. Additionally, developments in smart city technologies have facilitated the application of artificial intelligence, big data analytics, and Geographic Information Systems (GISs) to public space evaluations, enabling more refined and dynamic assessment methods [39,40].

Regarding evaluation methodologies, traditional practices primarily include questionnaire surveys, behavioral observations, and indicator system analyses [41]. The introduction of modern technologies has significantly improved the accuracy and timeliness of these evaluations. Studies indicate that big data and mobile data analyses can effectively identify residents' behavioral patterns [42]. Furthermore, GISs and spatial analytic tools provide precise evaluations of spatial layouts [5,40], while immersive and virtual reality (VR) simulations can predict user experiences and validate the feasibility of design proposals [43]. Key factors influencing public space experiences include spatial planning and design, sociocultural atmosphere, environmental psychology, and smart technology integration. Among these factors, a greater openness, accessibility, and multifunctionality are recognized as essential elements for enhancing experiential quality.

In summary, despite extensive research in relation to the age-friendly design and experiential evaluation of community public spaces, several critical gaps persist. Firstly, the existing evaluation frameworks predominantly focus on physical and environmental attributes, often neglecting the psychological and emotional experiences of older adults. Secondly, few studies have integrated advanced technologies—such as Geographic Information Systems (GISs), big data analytics, and virtual reality (VR)—into the evaluations of age-friendly public spaces. Employing these technologies could facilitate more dynamic and precise assessments. Finally, research explicitly addressing older adults' experiential value in resettlement communities remains notably limited. To bridge these gaps, this study applies a multidimensional experiential value framework and incorporates innovative methodologies. This integrated approach aims to yield valuable insights, enhancing both the design and evaluation of community public spaces tailored to older adults.

3. Materials and Methods

3.1. Study Area

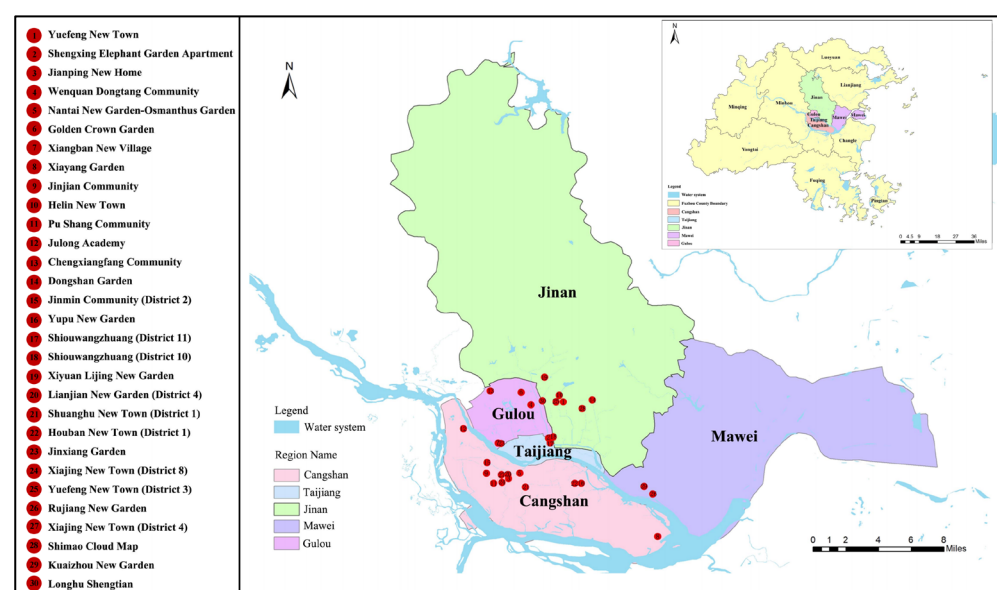
Fuzhou City, located on the southeastern coast of China and adjacent to the Taiwan Strait, serves as a crucial transportation hub that connects East and South China. The city possesses a rich cultural heritage, with Buddhism, Taoism, and Confucianism deeply integrated into local traditions. This profound cultural integration significantly influences residents' daily lives and community activities, offering a distinctive perspective for studying the social environment of community public spaces.

According to the relevant policy documents, including the “Urban Housing Demolition Management Regulations (1991)”, the revised version of these regulations issued in 2001, and the “Regulations on the Expropriation and Compensation of Housing on State-Owned Land (2011)” [44], resettlement practices in Fuzhou can be divided into three distinct historical periods, i.e., 1991–2001, 2002–2011, and 2012 to present. Based on official data compiled by government departments, this study systematically identified and summarized the number, resettlement patterns, and community profiles of resettlement communities in Fuzhou across these three periods (see Table 1).

Table 1. Fuzhou resettlement community information.

Demolition and Resettlement Era	Number of Communities	Placement Model	Community Overview
1991–2001	120	On-site resettlement	Residential buildings in these communities typically include walk-up apartments and apartment blocks with elevators that have been retrofitted at later stages. Such communities are characterized by densely built environments, limited public spaces, insufficient recreational areas, and a pronounced lack of essential infrastructure.
2002–2011	227	On-site resettlement and off-site resettlement	Depending on community scale, residential buildings include both walk-up apartments and elevator-equipped apartment blocks. Additionally, infrastructure such as public spaces, green belts, and landscape design has been subject to continuous improvement.
2012–Present	156	On-site resettlement and off-site resettlement	Characterized by high-rise apartment buildings equipped with elevators, these communities feature well-developed infrastructure. Notably, there has been a substantial advancement in the quality and availability of parks, gardens, and leisure facilities, resulting in marked improvements in overall environmental quality.

This research selected 30 resettlement communities located within Fuzhou’s urban area as study sites. Communities were stratified according to their construction period, geographic location, and community size. This stratified approach ensured the effective consideration of sample heterogeneity, enhancing the scientific rigor and validity of the community selection process (see Figure 1).

**Figure 1.** Study sample distribution.

3.2. Research Design

To ensure scientific rigor and reduce subjectivity, an integrated methodological approach combining the Fuzzy Delphi Method (FDM), the Fuzzy Analytic Hierarchy Process (Fuzzy AHP), and Fuzzy Comprehensive Evaluation (FCE) was adopted. The detailed methodological process is illustrated in Figure 2 and is described below.

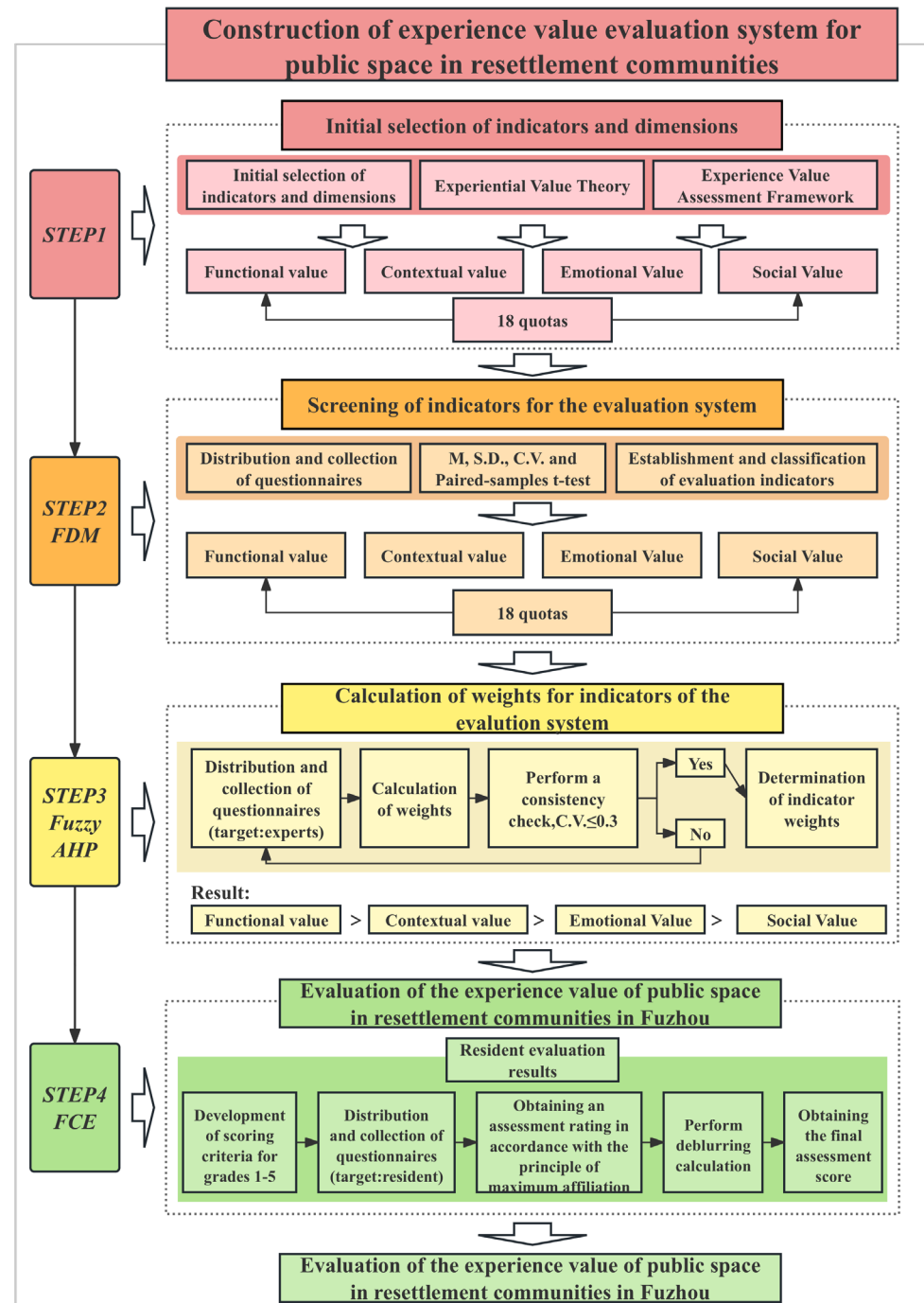


Figure 2. Research process.

Step 1: Initial Selection of Indicators and Dimensions

Based on experiential value theory and the relevant literature, four primary experiential value dimensions were identified—functional, contextual, emotional, and social. Initially, 18 evaluation indicators were selected under these dimensions.

Step 2: Screening of Indicators Using FDM

Expert questionnaires were conducted to refine the initial indicators. Statistical measures, including mean values, standard deviations, coefficients of variation, and paired-sample t-tests, were employed to assess each indicator. Indicators were screened based on consistency, clarity, and relevance, resulting in a refined set of representative indicators across the four experiential value dimensions.

Step 3: Weight Calculation Using Fuzzy AHP

A second round of expert questionnaires was distributed to determine the relative weights of the retained indicators. The Fuzzy AHP method was applied to quantify linguistic judgments and address uncertainty in expert evaluations. Consistency checks ($C.R. \leq 0.3$) were performed to validate the reliability of the weight assignments. The results indicated the perceived importance of each dimension, ranking “functional value” as the highest, followed by “contextual value”, “emotional value”, and “social value”.

Step 4: Empirical Evaluation Using FCE

Guided by the finalized evaluation framework, data were collected from older residents in selected resettlement communities in Fuzhou. A five-level scoring system was established, and the Fuzzy Comprehensive Evaluation method was applied for empirical analysis. By employing the principle of maximum affiliation and defuzzification calculations, final assessment scores were derived that reflected residents’ perceived experiential value of public spaces.

This multi-step methodological process provides a systematic, rigorous, and transparent approach for evaluating the experiential value of public spaces. By integrating expert input and resident perceptions, these findings can effectively inform age-friendly urban design practices.

3.2.1. Questionnaire Design and Determination of Evaluation Indicators

The questionnaire was structured into three distinct parts, as follows:

- (1) **Demographic Characteristics:** basic respondent information was collected, including name, occupation, area of specialization, age, educational background, professional experience, and contact details.
- (2) **Evaluation of Target Dimensions of Experiential Value in Public Spaces of Resettlement Communities:** Four primary dimensions—functional value, contextual value, emotional value, and social value—were evaluated. Respondents assessed the relevance and importance of each dimension.
- (3) **Evaluation of Indicators for Experiential Value in Resettlement Communities’ Public Spaces:** Specific design indicators were developed that were based on experiential value scales established by Varshneya et al. [25] and Wu et al. [45]. Through a literature review and preliminary screening, four dimensional indicators and eighteen detailed design criteria factors were identified (see Figure 3). These frameworks formed the basis of the expert questionnaire survey, allowing for further evaluation and refinement in order to ensure the scientific validity and applicability of the selected design indicators. These frameworks provided the foundation for the expert questionnaire survey, facilitating subsequent evaluation and refinement processes to ensure the scientific validity and practical applicability of the selected design indicators.

The Delphi method was employed in this study to ensure the scientific rigor and comprehensiveness of the design indicators and criteria. Experts from relevant fields—including the design of public spaces, sociology, and experiential value—were invited to participate. Expert selection followed two primary criteria. Firstly, professional expertise and practical experience were explored, ensuring insightful contributions to the issues under investigation; secondly, diverse professional backgrounds, comprising experts from both academia and industry, were included, thus guaranteeing broad representativeness.

At the same time, this study divides the evaluation indicators into two categories—benefit indicators (i.e., the higher the value, the better the performance) and cost indicators (i.e., the lower the value, the better the performance). This classification is crucial to ensure the accuracy of the standardization and weighting procedures in the multi-criteria evaluation process.

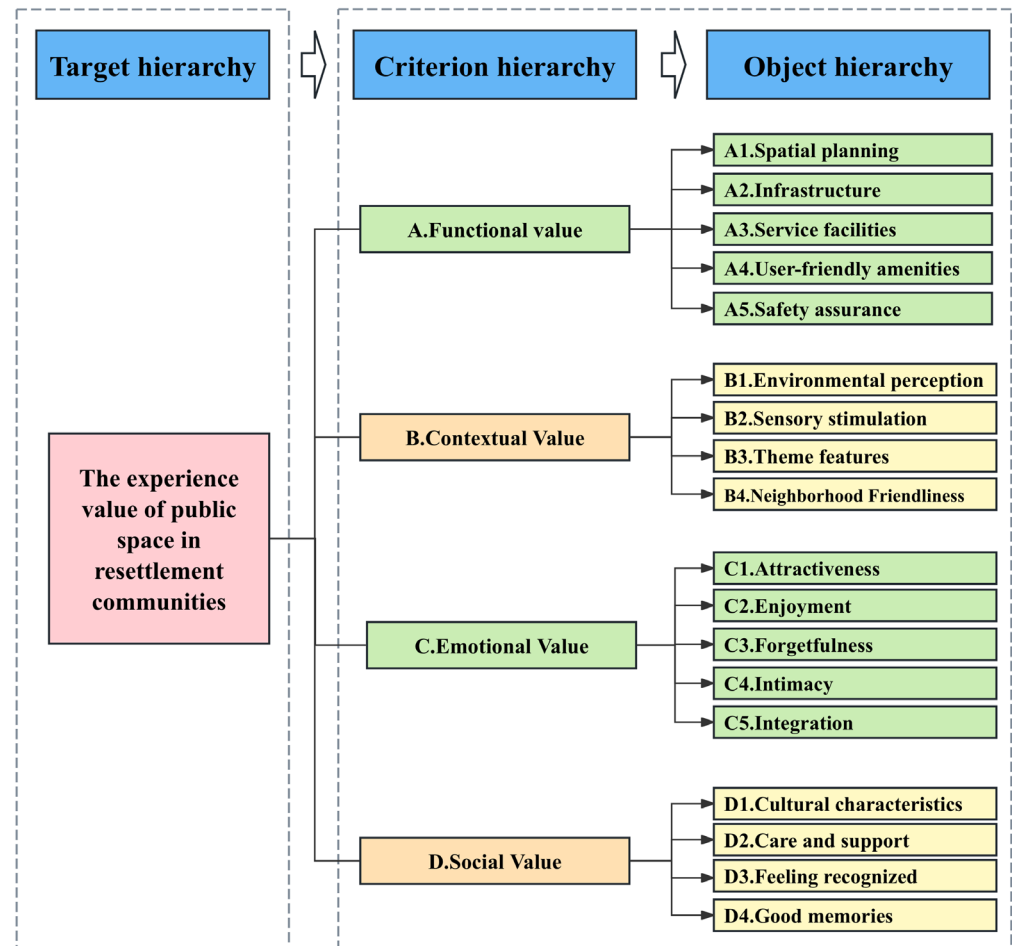


Figure 3. Preliminary evaluation index of public space experience value in resettlement communities.

A total of 20 experts participated in the evaluation, including 10 industry-based designers and 10 academic scholars (see Table 2). The expert questionnaire survey was conducted in two rounds. The first round (September 2024) focused on the preliminary indicator framework and open-ended questions, gathering expert suggestions regarding indicator structure and design criteria. The Delphi method was selected over simple expert consultations or single-round surveys in order to enhance scientific rigor and improve indicator reliability. The iterative nature of the Delphi approach allows for a gradual consensus to build among experts, effectively minimizing the influence of outlier opinions. This method is especially suitable in research contexts where direct empirical data are limited and expert knowledge plays a critical role in developing evaluation frameworks. Based on feedback from the first round, the second round of the survey (October 2024) concentrated specifically on assessing the appropriateness and importance of each indicator, ultimately facilitating consensus among the experts.

Table 2. Information about the experts.

Category	Code	Job Title	Professional Field	Age	Years of Professional Experience
Industry Expert	D01	Senior Designer	Urban Planning	31~40	0~5 years (inclusive)
	D02	Senior Designer	Design Studies	31~40	6~10 years (inclusive)
	D03	Senior Designer	Design Studies	31~40	11~15 years (inclusive)
	D04	Senior Designer	Design Studies	31~40	11~15 years (inclusive)
	D05	Senior Designer	Design Studies	31~40	11~15 years (inclusive)
	D06	Senior Designer	Architecture	31~40	11~15 years (inclusive)
	D07	Senior Designer	Landscape Architecture	31~40	11~15 years (inclusive)
	D08	Senior Designer	Urban Planning	31~40	11~15 years (inclusive)
	D09	Design Director	Urban Planning	41~50	16 years or more
	D10	Project Lead	Architecture	41~50	16 years or more
Academic Expert	S01	Lecturer	Design Studies	31~40	0~5 years (inclusive)
	S02	Lecturer	Landscape Architecture	31~40	6~10 years (inclusive)
	S03	Lecturer	Design Studies	31~40	6~10 years (inclusive)
	S04	Associate Professor	Design Studies	31~40	6~10 years (inclusive)
	S05	Associate Professor	Design Studies	31~40	11~15 years (inclusive)
	S06	Associate Professor	Sociology	41~50	16 years or more
	S07	Associate Professor	Architecture	51~60	16 years or more
	S08	Associate Professor	Architecture	41~50	16 years or more
	S09	Associate Professor	Urban Planning	51~60	16 years or more
	S10	Professor	Architecture	51~60	16 years or more

Note: industry experts are coded as D + serial number, while academic experts are coded as S + serial number.

3.2.2. Fuzzy Analytic Hierarchy Process (Fuzzy AHP)

The Fuzzy Analytic Hierarchy Process (Fuzzy AHP) is an extension of the Analytic Hierarchy Process (AHP) that integrates fuzzy set theory to effectively address uncertainty and ambiguity in decision-making contexts [46]. Specifically, this method replaces the precise numerical judgments used in traditional AHP with fuzzy numbers, thus better representing the fuzzy cognitive processes of decision-makers. The Fuzzy AHP has been widely applied to various complex decision-making problems, particularly those characterized by ambiguity, uncertainty, or subjective expert opinions. It has frequently been employed in fields such as environmental management, engineering project evaluation, supply chain management, and risk assessment as a powerful tool for comprehensive analysis and decision support [47].

Previous studies indicate that compared with the traditional AHP method, the Fuzzy AHP exhibits greater adaptability in addressing ambiguity and uncertainty when handling multiple decision criteria and assigning weights. The Fuzzy AHP enables the incorporation of linguistic variables and vague judgments, effectively capturing the nuanced cognitive processes of experts when evaluating qualitative indicators. In contrast, the traditional AHP method typically relies on exact numerical inputs, potentially oversimplifying subjective preferences. Thus, fuzzy logic provides a more realistic representation by explicitly addressing ambiguity and uncertainty in expert judgments. With the continuous advancement of fuzzy set theory, the scope of Fuzzy AHP applications continues to expand, gaining increased acceptance among scholars and practitioners alike.

To ensure consistency and minimize bias, this study assigned equal weights to all expert participants during the Delphi and Fuzzy AHP processes. Although the experts differed in their professional backgrounds and levels of experience, all participants satisfied predefined selection criteria and demonstrated substantial expertise in relevant domains. Given the relatively limited sample size ($n = 20$) and the balanced composition of academic and industry experts, equal weighting was considered appropriate to maintain method-

ological simplicity and to reduce the potential subjectivity that is associated with assigning differential influence to individual experts.

3.2.3. Fuzzy Comprehensive Evaluation (FCE)

The Fuzzy Comprehensive Evaluation (FCE) method, which is based on fuzzy mathematics theory, converts qualitative indicators into quantitative analyses through the principle of fuzzy relational synthesis, enabling the effective evaluation of complex systems involving multiple factors and hierarchical levels [48]. This method not only systematically assesses the membership levels of evaluated objects but also demonstrates notable advantages in dealing with uncertainty and incomplete information.

Given the inherent subjectivity and ambiguity involved in community residents' evaluations of experiential value in public spaces, this study employed the FCE method. A five-point Likert scale was adopted in the questionnaire, ranging from "very dissatisfied" to "very satisfied", corresponding to quantitative scores of 60, 70, 80, 90, and 100, respectively.

To accommodate diverse resident groups, the questionnaire was distributed simultaneously through online and offline channels. Online questionnaires were made accessible via digital platforms such as mobile devices and community WeChat groups, allowing residents accustomed to digital interactions to conveniently participate. Offline paper questionnaires were distributed through community management departments and resident meetings, specifically targeting residents that were unfamiliar with online operations.

A pilot survey was conducted from September to October 2024 in Jin'an District, Fuzhou City, which collected 98 valid responses. Based on the pilot results, the questionnaire was subsequently refined and optimized. The formal survey was scheduled for March 2025, using convenience sampling methods to distribute questionnaires among relocated residents in 30 research units. In total, 280 questionnaires were completed, from which 48 invalid responses were excluded after rigorous screening and validation, resulting in a final dataset of 232 valid questionnaires. The effective response rate was 82.8%.

4. Research Results

4.1. Selection of Evaluation Indicators

The final evaluation indicator system was obtained using the Delphi method after two rounds of expert questionnaires (see Figure 4). The specific type for each evaluation criterion is clearly presented in Table 3. Based on expert feedback, seven specific indicator factors were revised—namely B1 to B4, C3, D3, and D4—which are highlighted in Figure 4 in red font with an underline. Statistical analyses were conducted to examine the validity and consistency of each indicator; detailed results are shown in Tables 4 and 5.

The final hierarchical structure consists of three distinct levels, as follows:

Level 1 (Goal Level): evaluation indicators of public space in resettlement communities from the perspective of experiential value.

Level 2 (Dimension Level): this includes the following four primary indicator dimensions:

- A. Functional Value;
- B. Contextual Value;
- C. Emotional Value;
- D. Social Value.

Level 3 (Indicator Factor Level): eighteen detailed indicator factors are organized under the following four dimensions:

A1–A5: spatial planning, infrastructure, service facilities, user-friendly amenities, and safety assurance.

B1–B4: environmental perception, sensory experience, stylistic design, and neighborhood interaction.

C1–C5: attractiveness, enjoyment, comfort, intimacy, and sense of identity.

D1–D4: cultural characteristics, care and support, intergenerational interaction, and community participation.

This hierarchical structure not only provides a solid foundation for subsequent empirical research but also ensures the scientific rigor and practical applicability of the evaluation indicator system.

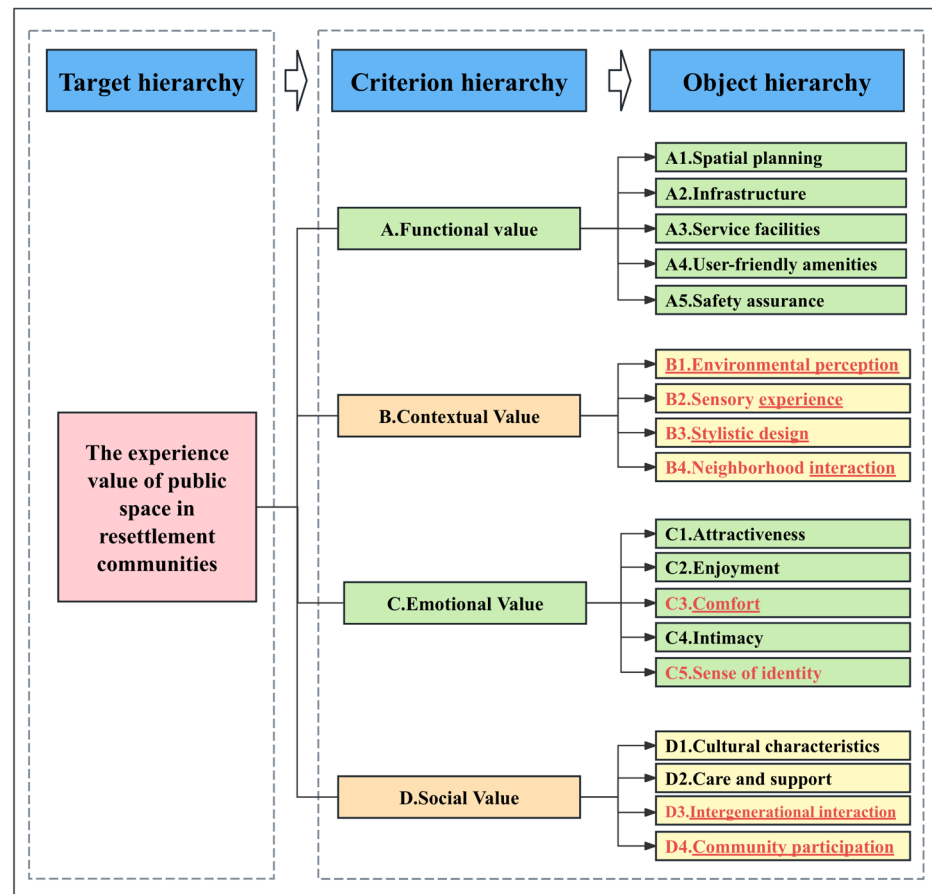


Figure 4. Final evaluation indicators for experience value in resettlement community public spaces. Note: modifications are highlighted in red font with an underline.

Table 3. Evaluation indicators of public space experience value in resettlement communities.

Criterion	Definition	Type	References
A. Functional Value	Perceptual evaluation of the use and design of community public space functions.	Benefit	[29,45]
A1. Spatial planning	The layout of the community public space is reasonably planned according to the functional requirements in order to ensure convenient traffic routes and to pay attention to the continuity and interaction of space.		[35]
A2. Infrastructure	The extent to which infrastructure such as road traffic, streetlights, communication services, safety facilities, and education and medical facilities are established within the community.		[5]
A3. Service facilities	The completeness and service quality of catering, recreation, community service facilities (such as community centers), and sanitation and cleaning facilities within 1 km of the community.		[49,50]

Table 3. Cont.

Criterion	Definition	Type	References
A4. User-friendly amenities	The community public space is equipped with age-appropriate and child-friendly facilities to ensure that the functional areas are reasonably planned and smoothly connected.		[51,52]
A5. Safety assurance	The public space of the community is equipped with safety guarantee designs such as emergency buttons, sentry settings, and streetlight illumination design to ensure the perfect and effective implementation of safety protection measures.		[53,54]
B. Contextual Value	Perception and evaluation of situational elements such as environmental atmosphere and interactive scenes created in community public spaces.	Benefit	[29,45]
B1. Environmental perception	The overall perceptual experience of community public space is shaped by multidimensional factors such as physical design, environmental esthetics, and social interaction.		[55]
B2. Sensory experience	The communal spaces of the community allow residents to have a rich sensory experience, including sight, hearing, smell, etc.		[56]
B3. Stylistic design	The stylistic design of the community public space should maintain coherence and consistency.		[37]
B4. Neighborhood interaction	Community public spaces provide areas that promote neighborhood interaction, support community events and gatherings, and provide an environment for residents to connect.		[57]
C. Emotional Value	The perception and evaluation of residents' common emotional experience in community public space.	Benefit	[29,45]
C1. Attractiveness	Activities in the public spaces of the resettlement community continue to engage residents (e.g., community fitness activities, holiday celebrations, etc.).		[5]
C2. Enjoyment	Participating in community-organized activities (e.g., sports days and folk festivals) keeps residents happy.		[5]
C3. Comfort	In the resettlement community public space, a comfortable environment can promote physical and mental relaxation and emotional regulation so that residents can obtain emotional healing and psychological peace.		[5]
C4. Intimacy	Within the scope of the resettlement community, intimacy may be formed by the interaction between property management personnel, security guards, community party branches, and residents.		[5]
C5. Sense of identity	Participate in resettlement-oriented community volunteer activities (such as environmental protection and cleaning and helping disadvantaged groups) to make residents feel that they belong to the community.		[5]
D. Social Value	Perception and evaluation of the relationship with neighbors in the public space of the community.	Benefit	[29,45]

Table 3. Cont.

Criterion	Definition	Type	References
D1. Cultural characteristics	Residents of the community can feel the unique culture of the region (temples, theaters, etc.).		[58]
D2. Care and support	In the public space, residents can form an informal network of social relationships, such as the elderly and children through activities in squares and parks, as well as receiving support and care from neighbors.		[59]
D3. Intergenerational Interaction	The community public space provides a platform for residents of different ages to engage in common activities and exchanges, promoting intergenerational interaction.		[59]
D4. Community participation	Residents participate in community affairs through community public space, accumulate social capital, and promote the improvement of community autonomy and governance capabilities.		[55]

Table 4. Statistical results of the indicator dimension importance survey (sample size: n = 20).

Target Dimension	First Round: Importance			Second Round: Importance			Paired-Sample Test	
	Mean	S.D.	C.V.	Mean	S.D.	C.V.	t-Value	p-Value
A. Functional value	4.6	0.95	0.20	4.8	0.41	0.09	−1.073	0.297
B. Contextual value	3.9	1.17 *	0.30	4.05	0.51	0.13	−0.645	0.527
C. Emotional value	3.8	1.15 *	0.30	4.15	0.67	0.16	−1.437	0.167
D. Social value	4.3	0.86	0.20	4.35	0.59	0.14	−0.213	0.834

Note: A mean value (M) of 4 or above indicates high agreement among respondents. A standard deviation (S.D.) below 1 reflects a low degree of dispersion. A coefficient of variation (C.V.) equal to or less than 0.3 indicates high consistency among expert opinions. A *p*-value greater than 0.05 suggests consistency in the responses provided by the same expert across questionnaire rounds. An asterisk “*” indicates values exceeding the established standard thresholds.

Table 5. Survey results on the importance of design criteria for public spaces in resettlement communities (sample size: n = 20).

Design Criteria	First Round: Importance			Second Round: Importance			Paired-Sample Test	
	Mean	S.D.	C.V.	Mean	S.D.	C.V.	t-Value	p-Value
A1. Spatial Planning	4.5	0.51	0.11	4.85	0.37	0.08	−2.333	0.031
A2. Infrastructure	4.7	0.57	0.12	4.6	0.50	0.11	0.567	0.577
A3. Service Facilities	4.1	1.12 *	0.27	4.05	0.51	0.13	0.195	0.847
A4. User-friendly Amenities	4.5	0.69	0.15	4.35	0.59	0.14	0.900	0.379
A5. Safety Assurance	4.45	0.51	0.11	4.35	0.67	0.15	0.525	0.606
B1. <u>Environmental Perception</u>	3.95	0.51	0.13	4	0.46	0.12	−0.326	0.748
B2. <u>Sensory Experience</u>	3.25	1.45 *	0.45 *	4	0.46	0.12	−2.263	0.036
B3. <u>Stylistic Design</u>	3.65	0.88	0.24	3.85	0.67	0.17	−1.000	0.330
B4. <u>Neighborhood Interaction</u>	4.35	0.75	0.17	4.5	0.51	0.11	−1.000	0.330
C1. Attractiveness	3.9	1.12 *	0.29	4.1	0.72	0.18	−0.639	0.530
C2. Enjoyment	3.45	1.15 *	0.33 *	4.05	0.76	0.19	−2.259	0.036
C3. <u>Comfort</u>	3.3	1.03 *	0.31 *	4.5	0.61	0.14	−3.835	0.001
C4. Intimacy	3.35	1.31 *	0.39 *	4	0.56	0.14	−2.041	0.055
C5. <u>Sense of Identity</u>	3.6	1.19 *	0.33 *	4.25	0.72	0.17	−2.096	0.050
D1. Cultural Characteristics	3.95	1.10 *	0.28	4.1	0.79	0.19	−0.531	0.614
D2. Care and Support	4.2	0.62	0.19	4.05	0.60	0.15	0.767	0.453
D3. <u>Intergenerational Interaction</u>	-	-	-	4	0.79	0.20	-	-
D4. <u>Community Participation</u>	-	-	-	4.1	0.77	0.18	-	-

Note: A mean value (M) of 4 or above indicates high agreement among respondents. A standard deviation (S.D.) below 1 reflects a low degree of dispersion. A coefficient of variation (C.V.) equal to or less than 0.3 indicates high consistency among expert opinions. A *p*-value greater than 0.05 suggests consistency in the responses provided by the same expert across questionnaire rounds. An asterisk “*” indicates values exceeding the established standard thresholds.

4.2. Establishment of the Evaluation Indicator System

The evaluation indicators for experiential value in the public spaces of resettlement communities were identified through the previously mentioned Fuzzy Delphi Method (FDM). These indicators form a multi-level evaluation framework consisting of three distinct hierarchical levels—the goal level, the criteria level (A–D), and the sub-criteria level (A1–A5, B1–B4, etc.). This structured framework provides a solid foundation for subsequent weight computation and decision-making analyses.

By constructing a fuzzy pairwise comparison matrix, decision-makers compared risk factors in a pairwise manner, as shown in Table 6. This approach quantitatively captures experts' subjective judgments and cognitive processes, systematically transforming them into quantifiable and ranked information, resulting in the formation of a fuzzy complementary judgment matrix.

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & \dots & \dots & \dots \\ a_{n1} & a_{n2} & \dots & a_{nn} \end{bmatrix}$$

Then, $A = (a_{ij})_{n \times n}$ can be defined as a fuzzy judgment matrix, which represents the fuzzy relationship between the i -th element in the lower layer and the j -th element.

Table 6. Quantitative scale standard for judgment (0.1–0.9).

Scale Value	Definition	Explanation
0.5	Equally Important	Two evaluation indicators are equally important.
0.6	Slightly Important	Between two indicators, the former is slightly more important than the latter.
0.7	Clearly Important	Between two indicators, the former is clearly more important than the latter.
0.8	Strongly Important	Between two indicators, the former is strongly more important than the latter.
0.9	Extremely Important	Between two indicators, the former is extremely more important than the latter.
0.1–0.4	Inverse Comparison	Between two indicators, there is an inverse comparison: $a_{ij} = 1 - a_{ji}$.

$$\begin{cases} a_{ij} = 0.5, & i = j \\ a_{ji} = 1 - a_{ij}, & i \neq j \end{cases}$$

If the elements in the matrix satisfy $a_{ij} + a_{ji} = 1$, matrix A is known as a fuzzy complementary judgment matrix.

Based on the fuzzy scoring data provided by experts, a corresponding judgment matrix is constructed for each evaluation indicator. Expressed in matrix form, this is represented as follows:

Matrix A represents the pairwise comparison among the four main criteria, i.e., functional value, contextual value, emotional value, and social value.

Matrix A₁ corresponds to the sub-indicators under functional value.

Matrix A₂ corresponds to the sub-indicators under contextual value.

Matrix A₃ corresponds to the sub-indicators under emotional value.

Matrix A₄ corresponds to the sub-indicators under social value.

These matrices form the foundation for calculating the fuzzy weights of each indicator, ensuring consistency and objectivity in the multi-criteria evaluation.

$$\begin{aligned}
 A &= \begin{bmatrix} 0.5000 & 0.5476 & 0.5381 & 0.6238 \\ 0.4524 & 0.5000 & 0.5333 & 0.6286 \\ 0.4619 & 0.4667 & 0.5000 & 0.6095 \\ 0.3762 & 0.3714 & 0.3905 & 0.5000 \end{bmatrix} \\
 A_1 &= \begin{bmatrix} 0.5000 & 0.6762 & 0.6333 & 0.5429 & 0.5381 \\ 0.3238 & 0.5000 & 0.5190 & 0.5524 & 0.6524 \\ 0.3667 & 0.4810 & 0.5000 & 0.6429 & 0.6714 \\ 0.4571 & 0.4476 & 0.3571 & 0.5000 & 0.7190 \\ 0.4619 & 0.3476 & 0.3286 & 0.2810 & 0.5000 \end{bmatrix} \\
 A_2 &= \begin{bmatrix} 0.5000 & 0.5524 & 0.5190 & 0.5333 \\ 0.4476 & 0.5000 & 0.5905 & 0.5476 \\ 0.4810 & 0.4095 & 0.5000 & 0.6190 \\ 0.4667 & 0.4524 & 0.3810 & 0.5000 \end{bmatrix} \\
 A_3 &= \begin{bmatrix} 0.5000 & 0.6619 & 0.7190 & 0.6476 & 0.6333 \\ 0.3381 & 0.5000 & 0.5762 & 0.5381 & 0.5857 \\ 0.2810 & 0.4238 & 0.5000 & 0.5619 & 0.5619 \\ 0.3524 & 0.4619 & 0.4381 & 0.5000 & 0.5714 \\ 0.3667 & 0.4143 & 0.4381 & 0.4286 & 0.5000 \end{bmatrix} \\
 A_4 &= \begin{bmatrix} 0.5000 & 0.6667 & 0.6286 & 0.5571 \\ 0.3333 & 0.5000 & 0.6143 & 0.5286 \\ 0.3714 & 0.3857 & 0.5000 & 0.5667 \\ 0.4429 & 0.4714 & 0.4333 & 0.5000 \end{bmatrix}
 \end{aligned}$$

After constructing the fuzzy judgment matrices, this study applied the fuzzy AHP method to calculate and derive the weight values, which were subsequently verified through consistency checks. The results are shown in Table 7.

Table 7. Aggregate weight values of evaluation indicators.

Primary Criterion	Weight	Secondary Criterion	Local Weight	Global Weight
A. Functional Value	0.2675	A1. Spatial Planning	0.2195	0.0587
		A2. Infrastructure	0.2024	0.0541
		A3. Service Facilities	0.2081	0.0557
		A4. User-friendly Amenities	0.1990	0.0532
		A5. Safety Assurance	0.1710	0.0457
B. Contextual Value	0.2595	B1. Environmental Perception	0.2587	0.0671
		B2. Sensory Experience	0.2571	0.0667
		B3. Stylistic Design	0.2508	0.0651
		B4. Neighborhood Interaction	0.2333	0.0606
C. Emotional Value	0.2532	C1. Attractiveness	0.2331	0.0590
		C2. Enjoyment	0.2019	0.0511
		C3. Comfort	0.1914	0.0485
		C4. Intimacy	0.1912	0.0484
		C5. Sense of Identity	0.1824	0.0462
D. Social Value	0.2198	D1. Cultural Characteristics	0.2794	0.0614
		D2. Care and Support	0.2480	0.0545
		D3. Intergenerational Interaction	0.2353	0.0517
		D4. Community Participation	0.2373	0.0522

4.3. Empirical Analysis

4.3.1. Descriptive Statistics of the Sample

The demographic characteristics of the sample, obtained through a descriptive statistical analysis of the questionnaire data, are presented in Table 8.

Table 8. Descriptive statistical analysis.

Name	Options	Frequency
Gender	Man	97
	Woman	175
Children	Have children	226
	Childless	6
Educational Attainment	High School and Below	136
	College Specialty	67
	Bachelor's Degree	23
	Graduate Student or Above	6
Occupation	Housewife/Husband	12
	Freelance Work	36
	Retirement	92
	Public Institutions or Civil Servants	20
	Business Personnel	72
Length of Residence	Less than 1 year	3
	1–5 years	21
	6–10 years	32
	More than 10 years	176
Frequency of Participation Space/Monthly	Never	7
	Occasionally (1–2 times)	69
	Frequently (3–5 times)	99
	Every day	57
Sum		232

4.3.2. Evaluation Results of Public Space Experiential Values in Resettlement Communities

Table 9 presents the evaluation results of elderly residents' experiential values regarding public spaces in the resettlement communities of Fuzhou City. The overall score obtained is 88.826, indicating a relatively high overall satisfaction level of residents towards community public space experiences. Specifically, the "Functional Value" scored 89.113, while the "Environmental Value" received the highest rating of 89.146. The "Emotional Value" also scored 89.113, while the "Social Value" was comparatively lower at 87.77.

According to the comprehensive weights derived from the evaluation framework for public space experiential values in Fuzhou's resettlement communities (as shown in Table 6), experts placed the greatest importance on "Functional Value", followed by "Environmental Value". However, the Fuzzy Comprehensive Evaluation (FCE) results suggest that elderly residents, in their actual experiences, focus slightly more on "Environmental Value" compared to "Functional Value". This phenomenon suggests that within the community's environmental quality, factors such as "Environmental Perception" (90.388), "Sensory Experience" (89.742), and "Neighborhood Interaction" (89.484) have a stronger impact on residents' quality of life, even surpassing the effects of "Infrastructure" (91.034) and "Service Facilities" (87.802).

Moreover, despite the lower overall performance of "Social Value", the indicators "Care and Support" (89.482) and "Intergenerational Interaction" (88.622) achieved relatively high scores. This demonstrates that elderly residents particularly value opportunities for

care services and intergenerational exchanges provided by the community. Conversely, the low score of “Cultural Characteristics” (85.172) reflects that there is room for improvement in community cultural development.

Table 9. FCE scores of elderly residents in resettlement communities.

Hierarchy Level	Evaluation Score	Primary Criterion	Evaluation Score	Secondary Criterion	Evaluation Score	Ranking
Experiential Value	88.826	A. Functional Value	89.113	A1. Spatial Planning	89.138	9
				A2. Infrastructure	91.034	2
				A3. Service Facilities	87.802	14
				A4. User-friendly Amenities	90.258	4
				A5. Safety Assurance	87.113	15
		B. Contextual Value	89.146	B1. Environmental Perception	90.388	3
				B2. Sensory Experience	89.742	5
				B3. Stylistic Design	86.939	17
				B4. Neighborhood Interaction	89.484	7
		C. Emotional Value	89.113	C1. Attractiveness	88.577	12
				C2. Enjoyment	89.571	6
				C3. Comfort	91.467	1
				C4. Intimacy	87.026	16
				C5. Sense of Identity	89.009	10
		D. Social Value	87.77	D1. Cultural Characteristics	85.172	18
				D2. Care and Support	89.482	8
				D3. Intergenerational Interaction	88.622	11
				D4. Community Participation	88.19	13

These findings differ from the conventional “function-oriented” community planning model emphasized in previous research. Consequently, the future optimization of community spaces should pay greater attention to environmental and social factors—particularly by enhancing environmental perception, fostering neighborhood interactions, and strengthening social support—to better meet the lifestyle needs of elderly residents in resettlement communities.

4.3.3. Analysis of Evaluation Dimensions

(1) Functional Value: Good Infrastructure; Service Facilities Need Improvement

“Functional Value” scored 89.113, reflecting that community infrastructure essentially meets elderly residents’ basic needs. Among these, “Infrastructure” (91.034) and “User-friendly Amenities” (90.258) received high scores, indicating that the community has achieved a satisfactory level of age-friendly design and convenient barrier-free environments. However, scores for “Service Facilities” (87.802) and “Safety Assurance” (87.113) were relatively lower, suggesting room for improvement in public service facilities such as healthcare and recreational amenities, as well as community safety measures.

(2) Environmental Value: High Environmental Perception; Stylistic Design Needs Optimization

The “Environmental Value” dimension scored 89.146, indicating elderly residents’ general satisfaction with the overall environmental quality of the community. Specifically, indicators such as “Environmental Perception” (90.388) and “Sensory Experience” (89.742) scored highly, demonstrating substantial optimization in aspects like greenery, lighting, and noise control. However, “Stylistic Design” (86.939) had a relatively lower score, suggesting that there is still room for improvement in the esthetic and personalized architectural design and spatial layout of resettlement communities. Additionally, “Neighborhood Interaction” (89.484) scored highly, indicating community public spaces effectively facilitate social interactions among residents.

(3) Emotional Value: Comfortable Spaces; Sense of Intimacy Needs Strengthening

The “Emotional Value” dimension obtained a score of 89.113, suggesting community spaces can meet elderly residents’ emotional needs to a certain extent. “Comfort” (91.467) scored the highest, indicating reasonable arrangements of seating, shading facilities, and ventilation, making the public space comfortable for residents. However, relatively lower scores for “Intimacy” (87.026) and “Attractiveness” (88.577) imply that enhancements in community cultural atmosphere and spatial vitality are necessary to strengthen elderly residents’ sense of belonging and emotional identification.

(4) Social Value: Weak Cultural Characteristics; Community Participation Needs Improvement

The “Social Value” dimension received the lowest aggregate score (87.770), indicating significant shortcomings in promoting social interactions and cultural identity within the studied resettlement communities. The low score of “Cultural Characteristics” (85.172) can be attributed to disruptions in traditional cultural practices following relocation, a lack of culturally appropriate communal facilities, and insufficient institutional support. Elderly residents, originally from rural or urban village backgrounds, previously relied on collective cultural events and rituals for social cohesion; thus, the absence of these sociocultural infrastructures weakens their cultural identity and sense of community belonging. Additionally, although “Community Participation” (88.119) scored relatively highly, it remains lower compared to other dimensions, reflecting limited elderly engagement due to passive participation habits and insufficient governance mechanisms that are specific to the elderly population. Therefore, future interventions should emphasize culturally sensitive community design and enhance elderly participation channels to strengthen residents’ social cohesion and cultural integration.

The findings suggest that resettlement communities perform relatively well in relation to infrastructure development, environmental perception, and emotional care, but still face notable challenges concerning inadequacies in service facilities, spatial planning, and social interactions. These shortcomings arise partly from standardized spatial designs that neglect community-specific sociocultural needs, insufficient amenities that are oriented towards the elderly population, and limited resident engagement opportunities. To effectively enhance residents’ quality of life and sense of belonging, future interventions should focus specifically on expanding community services and facilities that are oriented towards the elderly population, optimizing spatial planning to accommodate residents’ daily routines and preferences, strengthening participatory governance to actively involve elderly residents, and facilitating traditional cultural exchanges and social activities tailored to residents’ sociocultural backgrounds.

4.3.4. Sensitivity Analysis of Evaluation Results

To assess the robustness of the evaluation results, a sensitivity analysis was conducted. Specifically, the weights assigned to the primary criteria—functional, contextual, emotional, and social—were systematically adjusted within a $\pm 10\%$ range. This margin was selected based on established practices in prior sensitivity analyses, as it is effective in testing model stability without introducing excessive variability [60]. The remaining weights were proportionally redistributed to ensure that the total sum remained equal to 1. The impacts of these adjustments on the final rankings of experiential values in public spaces were then analyzed. The results indicated that minor adjustments in criteria weights led to limited changes in the final rankings, confirming that the evaluation model was relatively stable and robust. Notably, alterations to the weighting of “Contextual Value” produced the most significant effects, highlighting its critical importance within the overall evaluation framework.

5. Discussion

Based on elderly residents' experiences with public spaces in resettlement communities, this study constructs a comprehensive evaluation framework consisting of four dimensions—"Functional Value" (A), "Environmental Value" (B), "Emotional Value" (C), and "Social Value" (D). Empirical analysis was conducted to comprehensively explore the performance of these dimensions. The findings not only verify the scientific validity and applicability of the proposed evaluation framework but also reveal the current strengths and weaknesses of public spaces in resettlement communities.

5.1. Research Findings and Theoretical Contributions

(1) Research Findings

With the global intensification of aging populations, higher standards have emerged for community planning, rendering age-friendly community construction an essential topic. The results of this study indicate that public spaces in resettlement communities excel particularly in "Functional Value" and "Environmental Value". Elderly residents exhibit high satisfaction levels specifically concerning "Infrastructure", "User-friendly Amenities", and "Environmental Perception". This finding supports the conclusions of Subramanian et al. [61] and Serrano-Jiménez et al. [62], which state that accessibility and usability are important determinants of satisfaction among older residents. However, while these studies focused primarily on the physical aspects of accessibility, this study provides further evidence of the importance of integrating emotional and social dimensions. When emotional closeness and social connection are lacking, older residents' satisfaction is significantly reduced, and previous research has not paid sufficient attention to these aspects.

Furthermore, the study reveals that although "Emotional Value" and "Social Value" obtained relatively high overall scores, some indicators within these dimensions—such as "Intimacy", "Cultural Characteristics", and "Community Participation"—scored comparatively lower. Many elderly residents are relocated from familiar environments, which can lead to social disconnection resulting from the loss of previous neighborhood ties. Moreover, limited opportunities for structured social activities and inadequate community management mechanisms further constrain residents' meaningful participation and weaken social cohesion. This suggests that while current resettlement communities adequately meet elderly residents' physical space requirements, there remains considerable room for improvement in social interactions, cultural belonging, and resident participation.

Consistent with the work of Chang et al. [63], who identified a common limitation in traditional community planning—namely, the tendency to prioritize physical infrastructure while overlooking residents' emotional and social needs—this study further extends these insights by explicitly examining resettlement communities characterized by disrupted social networks. Unlike Chang et al., whose analysis did not fully address how social and emotional isolation might be effectively mitigated, our findings indicate that structured community activities and improved governance mechanisms significantly alleviate emotional isolation and enhance social engagement among elderly residents. This extension underscores the importance of community management practices beyond spatial and physical design, providing a more comprehensive understanding of how to improve social integration and overall quality of life in resettlement contexts.

(2) Theoretical Contributions

At the theoretical level, the evaluation indicator system developed in this study integrates four core dimensions—physical environment (functional), spatial experience (contextual), individual emotions (emotional), and social interactions (social). This research makes three key contributions to the existing field, as follows:

Firstly, experiential value theory, which is traditionally applied in consumer and tourism contexts, is extended to the domain of public spaces in resettlement communities, which possess unique spatial, social, and cultural characteristics. This contextual extension addresses a gap in the literature relating to public spaces, which rarely considers the lived experiences of displaced or relocated populations. Secondly, Fuzzy Comprehensive Evaluation methods were incorporated into the analysis to quantify subjective perceptions. The use of these methods enables a more nuanced and systematic assessment of older residents' experiential feedback. This methodological integration significantly improves the objectivity and applicability of experience-based evaluation frameworks within urban planning research. Thirdly, by specifically examining older adults in resettlement communities, the evaluation framework highlights the differentiated needs of this vulnerable demographic group. Moving beyond generalized user models, the framework provides targeted insights that are essential for effective age-friendly community development.

Compared to previous studies that primarily focus on physical facilities or environmental perceptions [64], this research emphasizes the importance of residents' subjective experiences within community planning. Consequently, it offers a more comprehensive analytical framework for investigating public spaces in age-friendly communities. Additionally, in contrast to studies such as the study by Serrano-Jiménez et al. [62], this study demonstrates that older residents' experiences of community public spaces depend not only on physical infrastructure but also on the environmental atmosphere, social interactions, and emotional belonging. This insight suggests a targeted direction for future community improvements. Specifically, community planning should not only prioritize infrastructure improvements but should also emphasize the creation of more human-centered social and cultural spaces.

5.2. Practical Implications

The findings of this research hold significant practical implications for optimizing public spaces in resettlement communities. Future planning efforts should ensure the continued improvement of infrastructure while simultaneously enhancing the social functions of spatial design. Specifically, practical initiatives can be taken in relation to the following four areas:

(1) Improving Service Facilities and Enhancing Spatial Diversity

Although "Infrastructure" and "User-friendly Amenities" performed well, there remains room for improvement in public "Service Facilities", such as healthcare and leisure amenities. This study indicates a high demand among elderly residents for community-based medical care, rehabilitation centers, and recreational facilities. Thus, future developments should incorporate multifunctional spaces, such as community health management centers and elderly activity centers, in order to meet residents' diverse needs.

(2) Optimizing Spatial Design to Enhance Environmental Quality

The relatively low score for "Stylistic Design" suggests that improvements are needed in community architectural aesthetics, spatial layouts, and visual experiences. Research has demonstrated that incorporating local cultural elements into community design significantly enhances residents' sense of belonging and satisfaction. Therefore, future community developments could enhance landscape design and integrate local cultural elements, creating distinctive community environments that improve residents' visual experiences and cultural identity.

(3) Strengthening Social Interactions and Promoting Cultural Identity

The low scores for "Cultural Characteristics" and "Community Participation" indicate shortcomings in promoting social interaction and cultural identity within the community.

To address these challenges, planners should consider implementing community facilitation programs, including neighborhood mediation services and community organizing initiatives. Such programs can actively build trust and encourage social interaction among residents. Additionally, promoting bottom-up community governance and supporting resident-led cultural initiatives may empower elderly residents. These approaches can help older adults develop a sense of ownership over their social environment, ultimately enhancing their social participation and sense of belonging.

(4) Enhancing Safety Measures to Create Livable Environments

“Safety Assurance” scored relatively low, indicating elderly residents’ ongoing concerns regarding community safety. Studies suggest that intelligent surveillance systems, improved nighttime lighting, and 24 h security patrols can effectively enhance residents’ sense of security. Future efforts should strengthen community safety measures to ensure public spaces are secure, thus enhancing elderly residents’ comfort and sense of belonging.

5.3. Research Limitations and Future Prospects

This study has developed a relatively comprehensive evaluation framework for the value of elderly residents’ experiences in public spaces within resettlement communities and has validated the applicability of the framework through empirical analysis. However, several limitations remain.

Firstly, the research sample primarily originates from Fuzhou City. While this location provides a certain degree of representativeness, resettlement communities in different regions may vary significantly in terms of cultural contexts, spatial layouts, and policy environments. Future research could expand the sample size to include resettlement communities from multiple cities to enhance the generalizability of the conclusions.

Secondly, the evaluation criteria in this study were developed and weighted using the Fuzzy Delphi method and the Analytic Hierarchy Process (AHP). Although these methods effectively integrate expert opinions and reduce decision-making uncertainties, they have inherent limitations. The Fuzzy Delphi method can be influenced by the number and representativeness of experts, individual subjective biases, and the subjective selection of fuzzy membership functions. Similarly, the AHP relies heavily on pairwise comparisons by experts, where subjectivity and an inconsistency in judgments may affect the accuracy of outcomes. Additionally, the hierarchical structuring process may oversimplify complex interactions among criteria. Future research could integrate additional quantitative or qualitative methods to further validate and enhance the current approach.

Thirdly, this research primarily focuses on elderly residents’ experiential values, yet community spaces are also utilized by middle-aged adults, youth, and children. Future research could further investigate the diverse needs of different user groups to develop more inclusive community public space optimization strategies, providing comprehensive, inclusive solutions for spatial optimization.

6. Conclusions

Drawing on the relevant literature and adhering to scientific evaluation principles, this study developed a comprehensive evaluation framework for analyzing the experiential value of public spaces in resettlement communities. The framework, integrating four dimensions—functional value, environmental value, emotional value, and social value—incorporates the practical conditions of resettlement communities and ultimately selected 18 evaluation indicators. The construction of this evaluation framework utilized a combination of the Fuzzy Delphi Method (FDM) and the Fuzzy Analytic Hierarchy Process (AHP), with the FDM being employed for indicator selection and the AHP being employed for establishing indicator weights. Subsequently, residents’ evaluations of public spaces

were gathered through a questionnaire survey, and the comprehensive experiential value for public spaces in Fuzhou's resettlement communities was calculated using Fuzzy Comprehensive Evaluation (FCE). This study conducted a systematic analysis of community public space experiential value from multiple perspectives, including infrastructure, spatial design, social interaction, and cultural atmosphere.

The findings indicate that within the evaluation framework, "Functional Value" had the highest weight (0.2675), followed closely by "Environmental Value" (0.2595); however, "Social Value" had the lowest weight (0.2198). Moreover, based on the comprehensive FCE scores, the concerns most prominently identified by residents included "Cultural Characteristics" (85.172), "Stylistic Design" (86.939), "Safety Assurance" (87.113), and "Service Facilities" (87.802). These findings reveal substantial opportunities for an improvement in community efforts to enhance social interaction, cultural belonging, and service amenities.

With the ongoing development of urbanization and the aging population, governments increasingly recognize the importance of constructing age-friendly communities, highlighting significant potential for optimizing public spaces in resettlement communities. Although this study was conducted specifically within the context of Fuzhou, the evaluation framework and findings may provide valuable theoretical insights and methodological references for other Chinese cities with similar urbanization patterns, demographic characteristics, and resettlement community contexts. Future research can further validate and adapt this framework to different geographic areas, thereby enhancing residents' quality of life and social belonging, as well as moving urban communities towards a more inclusive, healthier, and sustainable model of aging.

Author Contributions: Conceptualization, methodology, investigation, formal analysis, and writing—original draft: Y.L.; investigation and writing—review and editing: Y.L. and P.W. All authors have read and agreed to the published version of the manuscript.

Funding: This research was supported by the Science and Technology Development Fund of the Macao Special Administrative Region (Project No.: 0036/2022/A).

Data Availability Statement: No new data were created or analyzed in this study. Data sharing is not applicable to this article.

Acknowledgments: We would like to express our sincere gratitude to everyone who contributed to this research. Additionally, we also acknowledge the financial support provided by the Science and Technology Development Fund of the Macao Special Administrative Region (Project No.: 0036/2022/A), which made this study possible.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. United Nations. *Revision of World Urbanization Prospects*; United Nations: New York, NY, USA, 2018; p. 799.
2. Zhang, Q.; Liu, S.; Wang, T. Urbanization Impacts on Greenhouse Gas (GHG) Emissions of the Water Infrastructure in China: Trade-Offs among Sustainable Development Goals (SDGs). *J. Clean. Prod.* **2019**, *232*, 474–486. [CrossRef]
3. Muttarak, R. Demographic Perspectives in Research on Global Environmental Change. *Popul. Stud.* **2021**, *75* (Suppl. 1), 77–104. [CrossRef] [PubMed]
4. National Bureau of Statistics. Statistical Communiqué of the People's Republic of China on the 2022 National Economic and Social Development. Available online: <https://is.gd/A2a6rr> (accessed on 15 January 2024).
5. Lai, Y.; Wang, P.; Wen, K. Exploring the Impact of Public Spaces on Social Cohesion in Resettlement Communities from the Perspective of Experiential Value: A Case Study of Fuzhou, China. *Buildings* **2024**, *14*, 3141. [CrossRef]
6. Seebauer, S.; Winkler, C. Should I Stay or Should I Go? Factors in Household Decisions for or Against Relocation from a Flood Risk Area. *Glob. Environ. Chang.* **2020**, *60*, 102018. [CrossRef]
7. Yung, E.H.K.; Conejos, S.; Chan, E.H.W. Social Needs of the Elderly and Active Aging in Public Open Spaces in Urban Renewal. *Cities* **2016**, *52*, 114–122. [CrossRef]

8. Zhang, Z.; Yu, J.; Tian, J. Community Participation, Social Capital Cultivation and Sustainable Community Renewal: A Case Study from Xi'an's Southern Suburbs, China. *J. Knowl. Econ.* **2024**, *15*, 11007–11040. [[CrossRef](#)]
9. Oldenburg, R. *The Great Good Place: Cafés, Coffee Shops, Bookstores, Bars, Hair Salons, and Other Hangouts at the Heart of a Community*; Paragon House: New York, NY, USA, 1989.
10. Wang, S. Older People's Neighborhood Satisfaction and Well-Being: A Capability Approach Framework for Community Facility Planning in Urban Old District. *Land* **2023**, *12*, 16257.
11. Yashadhana, A.; Alloun, E.; Serova, N.; de Leeuw, E.; Mengesha, Z. Place-Making and Its Impact on Health and Wellbeing among Recently Resettled Refugees in High-Income Contexts: A Scoping Review. *Health Place* **2023**, *81*, 1–12. [[CrossRef](#)]
12. Wolch, J.R.; Byrne, J.; Newell, J.P. Urban Green Space, Public Health, and Environmental Justice: The Challenge of Making Cities 'Just Green Enough'. *Landsc. Urban Plan.* **2014**, *125*, 234–244. [[CrossRef](#)]
13. Pieri, N.; Díaz-Foncea, M.; Marcuello, C.; Tortia, E. *Social Incubators and Social Innovation in Cities: A Qualitative Analysis*; CIRIEC International, Université de Liège: Liège, Belgium, 2020.
14. Zhu, B.W.; Zhang, J.R.; Tzeng, G.H.; Huang, S.L.; Xiong, L. Public Open Space Development for Elderly People by Using the DANP-V Model to Establish Continuous Improvement Strategies towards a Sustainable and Healthy Aging Society. *Sustainability* **2017**, *9*, 420. [[CrossRef](#)]
15. Salmistu, S.; Kotval, Z. Spatial Interventions and Built Environment Features in Developing Age-Friendly Communities from the Perspective of Urban Planning and Design. *Cities* **2023**, *141*, 104417. [[CrossRef](#)]
16. Chiang, Y.C.; Gao, D.R.; Lee, C.Y.; Li, X.; Sun, X.Y.; Chen, C.T. Influence of Promoting an "Age-Friendly Cities" Strategy on Psychological Capital and Social Engagement Based on the Scenario Method. *J. Aging Soc. Policy* **2023**, *35*, 463–485. [[CrossRef](#)] [[PubMed](#)]
17. Cao, Y.; Heng, C.K.; Fung, J.C. Using Walk-Along Interviews to Identify Environmental Factors Influencing Older Adults' Out-of-Home Behaviors in a High-Rise, High-Density Neighborhood. *Int. J. Environ. Res. Public Health* **2019**, *16*, 4251. [[CrossRef](#)] [[PubMed](#)]
18. Kong, J.T.; Yang, N.; Xu, F.; Xing, Y.X. Research on the Evaluation and Optimization of Community Public Spaces under a Multi-Dimensional Health-Oriented Approach—A Case Study of Jialingdao Area, Nankai District, Tianjin. *South Archit.* **2023**, *3*, 12–21.
19. Lee, S.K. The State, Ethnic Community, and Refugee Resettlement in Japan. *J. Asian Afr. Stud.* **2018**, *53*, 1219–1234. [[CrossRef](#)]
20. Fozdar, F.; Hartley, L. Refugee Resettlement in Australia: What We Know and Need to Know. *Refugee Surv. Q.* **2013**, *32*, 23–51. [[CrossRef](#)]
21. Yang, C.; Qian, Z. Urbanization through Resettlement and the Production of Space in Hangzhou's Concentrated Resettlement Communities. *Cities* **2022**, *129*, 103846. [[CrossRef](#)]
22. Xu, Y.; Tang, B.S.; Chan, E.H. State-Led Land Requisition and Transformation of Rural Villages in Transitional China. *Habitat Int.* **2011**, *35*, 57–65. [[CrossRef](#)]
23. Holbrook, M.B. *Consumer Value: A Framework for Analysis and Research*; Psychology Press: London, UK; New York, NY, USA, 1999.
24. Nysveen, H.; Oklevik, O.; Pedersen, P.E. Brand Satisfaction: Exploring the Role of Innovativeness, Green Image and Experience in the Hotel Sector. *Int. J. Contemp. Hosp. Manag.* **2018**, *30*, 2908–2924. [[CrossRef](#)]
25. Chen, Z. A Qualitative Pilot Study Exploring Tourists' Pre- and Post-Trip Perceptions on the Destination Image of Macau. *J. Travel Tour. Mark.* **2019**, *36*, 330–344. [[CrossRef](#)]
26. Kim, H.; So, K.K.F. Two Decades of Customer Experience Research in Hospitality and Tourism: A Bibliometric Analysis and Thematic Content Analysis. *Int. J. Hosp. Manag.* **2022**, *100*, 103082. [[CrossRef](#)]
27. Sheth, J.N.; Newman, B.I.; Gross, B.L. Why We Buy What We Buy: A Theory of Consumption Values. *J. Bus. Res.* **1991**, *22*, 159–170. [[CrossRef](#)]
28. Williams, D.R. *Notes on Measuring Recreational Place Attachment*; Williams, D., Ed.; Rocky Mountain Research Station: Fort Collins, CO, USA, 2000; Unpublished Report.
29. Varshneya, G.; Das, G. Experiential Value: Multi-Item Scale Development and Validation. *J. Retail. Consum. Serv.* **2017**, *34*, 48–57. [[CrossRef](#)]
30. Tuominen, P. Measuring the Effects of Multi-Sensory Stimuli in the Mixed Reality Environment for Tourism Value Creation. Ph.D. Thesis, Manchester Metropolitan University, Manchester, UK, 2023.
31. Batra, R.; Ahtola, O.T. Measuring the Hedonic and Utilitarian Sources of Consumer Attitudes. *Mark. Lett.* **1991**, *2*, 159–170. [[CrossRef](#)]
32. Babin, B.J.; Darden, W.R.; Griffin, M. Work and/or Fun: Measuring Hedonic and Utilitarian Shopping Value. *J. Consum. Res.* **1994**, *20*, 644–656. [[CrossRef](#)]
33. Yrjölä, M.; Rintamäki, T.; Saarijärvi, H.; Joensuu, J.; Kulkarni, G. A Customer Value Perspective to Service Experiences in Restaurants. *J. Retail. Consum. Serv.* **2019**, *51*, 91–101. [[CrossRef](#)]

34. Heskett, J.L.; Sasser, W.E. *Southwest Airlines: In a Different World*; Harvard Business School Case 910–419; Harvard Business School Publishing: Boston, MA, USA, 2010.
35. Gehl, J. *Life between Buildings: Using Public Space*; Island Press: Washington, DC, USA, 2011.
36. Mehta, V. Evaluating Public Space. *J. Urban Des.* **2014**, *19*, 53–88. [\[CrossRef\]](#)
37. Carmona, M. Principles for Public Space Design, Planning to Do Better. *Urban Des. Int.* **2019**, *24*, 47–59. [\[CrossRef\]](#)
38. Whyte, W.H. *The Social Life of Small Urban Spaces*; Conservation Foundation: Washington, DC, USA, 1980.
39. Batty, M. Big Data, Smart Cities and City Planning. *Dialogues Hum. Geogr.* **2013**, *3*, 274–279. [\[CrossRef\]](#)
40. Geertman, S.; Allan, A.; Pettit, C.; Stillwell, J. *Planning Support Systems and Smart Cities*; Springer: Cham, Switzerland, 2017.
41. Pafka, E.; Dovey, K. The Urban Density Assemblage: Modelling Multiple Measures. *Urban Des. Int.* **2017**, *22*, 66–76.
42. Zhang, L.; Li, X. Big Data and Machine Learning for Urban Planning: A Comprehensive Review. *Sustain. Cities Soc.* **2020**, *63*, 102466.
43. Shin, D. How Do Users Experience the Interaction with an Immersive Screen? *Comput. Hum. Behav.* **2019**, *98*, 302–310. [\[CrossRef\]](#)
44. Yu, J.K.; Zhang, X.L. Discussion on the Historical Evolution of Urban Housing Demolition Systems. *Constr. Budg.* **2014**, *4*, 35–37.
45. Wu, H.C.; Li, M.Y.; Li, T. A Study of Experiential Quality, Experiential Value, Experiential Satisfaction, Theme Park Image, and Revisit Intention. *J. Hosp. Tour. Res.* **2018**, *42*, 26–73. [\[CrossRef\]](#)
46. Kato, M. Fuzzy AHP and Its Application to Risk Evaluation. *J. Jpn. Soc. Fuzzy Theory Syst.* **1991**, *3*, 123–134.
47. Wu, J.G.; Wang, X.L.; Li, G. Application of Fuzzy Analytic Hierarchy Process in Supply Chain Management. *Mod. Manag. Sci.* **2022**, *40*, 78–85.
48. Zadeh, L.A. Fuzzy Sets. *Inf. Control* **1965**, *8*, 338–353. [\[CrossRef\]](#)
49. Simiyu, S.N.; Kweyu, R.M.; Antwi-Agyei, P.; Adjei, K.A. Barriers and Opportunities for Cleanliness of Shared Sanitation Facilities in Low-Income Settlements in Kenya. *BMC Public Health* **2020**, *20*, 1632. [\[CrossRef\]](#)
50. Simiyu, S.; Antwi-Agyei, P.; Adjei, K.; Kweyu, R. Developing and Testing Strategies for Improving Cleanliness of Shared Sanitation in Low-Income Settlements of Kisumu, Kenya. *Am. J. Trop. Med. Hyg.* **2021**, *105*, 1816–1825. [\[CrossRef\]](#)
51. Szewiola, H. Child-Friendliness of Urban Space in the Example of Łabędy. *Archit. Civ. Eng. Environ.* **2023**, *16*, 31–41. [\[CrossRef\]](#)
52. van Zyl, B.; Cilliers, J.; Lategan, L. Spatial Planning Guidelines for Child-Friendly Spaces: An African Perspective. *Rural Soc.* **2022**, *31*, 179–195. [\[CrossRef\]](#)
53. Kim, K.H.; Hwang, T.; Kim, G. The Role and Criteria of Advanced Street Lighting to Enhance Urban Safety in South Korea. *Buildings* **2024**, *14*, 2305. [\[CrossRef\]](#)
54. Kim, W.; Park, J. Illuminating Safety: The Impact of Street Lighting on Reducing Fear of Crime in a Virtual Environment. *Int. J. Hum.–Comput. Interact.* **2025**, 1–15. [\[CrossRef\]](#)
55. Guan, S.; Wang, J. Research on the Optimal Design of Community Public Space from the Perspective of Social Capital. *Sustainability* **2023**, *15*, 9767. [\[CrossRef\]](#)
56. Jin, T.; Lu, J.; Shao, Y. Exploring the Impact of Visual and Aural Elements in Urban Parks on Human Behavior and Emotional Responses. *Land* **2024**, *13*, 1468. [\[CrossRef\]](#)
57. Jiang, M.; Hu, J.; Gao, X. Community Life Circle, Neighbourly Interaction, and Social Cohesion: Does Community Space Use Foster Stronger Communities? *Land* **2024**, *13*, 1094. [\[CrossRef\]](#)
58. Redaelli, E.; Hansen, L.E.; Djupdræt, M.B. Museums as Public Spaces in the City: Insights from Aarhus, Denmark. *Cities* **2025**, *159*, 10577. [\[CrossRef\]](#)
59. Eichinger, M.; Görig, T.; Georg, S.; Hoffmann, D.; Sonntag, D.; Philipp, H.; König, J.; Urschitz, M.S.; De Bock, F. Evaluation of a Complex Intervention to Strengthen Participation-Centred Care for Children with Special Healthcare Needs: Protocol of the Stepped Wedge Cluster Randomised PART-CHILD Trial. *Int. J. Environ. Res. Public Health* **2022**, *19*, 16865. [\[CrossRef\]](#)
60. Vinogradova-Zinkevič, I.; Podvezko, V.; Zavadskas, E.K. Comparative Assessment of the Stability of AHP and FAHP Methods. *Symmetry* **2021**, *13*, 479. [\[CrossRef\]](#)
61. Subramanian, D.; Jana, A. Assessing Urban Recreational Open Spaces for the Elderly: A Case of Three Indian Cities. *Urban For. Urban Green.* **2018**, *35*, 115–128. [\[CrossRef\]](#)
62. Serrano-Jiménez, A.; Blandón-González, B.; Barrios-Padura, Á. Towards a Built Environment without Physical Barriers: An Accessibility Assessment Procedure and Action Protocol for Social Housing Occupied by the Elderly. *Sustain. Cities Soc.* **2022**, *76*, 103456. [\[CrossRef\]](#)
63. Chang, J.; Lin, Z.; Vojnovic, I.; Qi, J.; Wu, R.; Xie, D. Social Environments Still Matter: The Role of Physical and Social Environments in Place Attachment in a Transitional City, Guangzhou, China. *Landsc. Urban Plan.* **2023**, *232*, 104680. [\[CrossRef\]](#)
64. Ahrentzen, S.; Tural, E. The Role of Building Design and Interiors in Ageing Actively at Home. *J. Hous. Elder.* **2015**, *29*, 362–377. [\[CrossRef\]](#)

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.