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Exploring Factors Affecting Residential Satisfaction in Old Neighborhoods and Sustainable Design Strategies Based on Post-Occupancy Evaluation

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Abstract: Residential satisfaction has always been a crucial concern in urban planning and community management. This paper conducts a study of key factors affecting residential satisfaction in settlements with multiple build periods coexisting in old neighborhoods. This study aims to comprehensively analyze the influencing factors of residential satisfaction in order to obtain the post-occupancy evaluation of the residential environment by residents in different communities and propose sustainable design strategies based on the evaluation analysis. By constructing an evaluation system of residential satisfaction with 19 evaluation indicators and based on the questionnaire, the sample frequency analysis, reliability and validity test, IPA analysis, and evaluation factor analysis of the data, the IPA mean distribution results of residential satisfaction in the four communities are obtained. The study reveals that residents are most satisfied with the surrounding services in their communities but generally less satisfied with the internal residential environment. Among the factors, fitness facilities and space in the community have a significant impact on residents' satisfaction; community activities and neighbor relationships are also key influencing factors, which become more prominent as the construction period of the community approaches. Additionally, community residents' self-organizational governance will affect their satisfaction with community conventions and social capital. Therefore, this study proposes improvement suggestions, including planning community life circles to fully utilize available resources in the surrounding area, establishing community self-organization for community governance and improving the quality of community life, and implementing mobile service stations to flexibly adapt to community space and service needs. This study provides a valuable reference for urban community renewal and sustainable development. The research findings are expected to provide practical guidance for improving the residential environment within old neighborhoods and enhancing residents' satisfaction.

Keywords: residential satisfaction; community design; post-occupancy evaluation; sustainable design; urban renewal

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1. Introduction

The rapid advancement of urbanization and changes in socioeconomic structure have led to many development challenges faced by old urban areas, including deterioration of the residential environment, aging infrastructure, and community governance issues [1–3], which directly affect residents' life satisfaction. Among them, residential satisfaction is an important reference indicator for urban community renewal, which reflects people's recognition of living conditions and evaluation of quality of life [4]. Residential satisfaction in old neighborhoods is related to the quality of life of residents and the inheritance of urban history and culture. However, most of the current research on old neighborhoods focuses on history, architecture, and tourist satisfaction, while in-depth research on the residential satisfaction of old neighborhood residents is still relatively insufficient. Residential

satisfaction is related to individual length of residence, physical environment [5], sense of community [6], and mobility [7]. By assessing residential satisfaction, it is possible to understand the aspects in which the residential area has a significant impact on residents' lives and provide a basis for further improvement and enhancement of residential quality of life [8,9]. Currently, community renewal has become a pivotal approach to achieving sustainable development in old urban areas [10], aiming to enhance the living standards and quality of life for residents [11].

As China has entered a period of transition, the urban form has evolved and has shifted from industrialized cities to modernized cities, i.e., urban forms with high-rise buildings and convenient and livable human communities. The urban form has had a powerful impact on how people interact, communicate, and collaborate in cities [12]. The scale of urban form includes individual buildings, streets, city blocks, neighborhoods, and cities. The community, as the basic unit of cities, has become a mirror for understanding the transformation of urban form in China. The transformation of community form leads to changes in the quality of community life, and the study of residential satisfaction of community quality helps to analyze the current status of community sustainability in the urban form with Chinese characteristics.

Currently, in response to the criticism of the homogenization of urban areas, there is an urgent need to focus on the construction of urban culture and environment in specific areas and to explore the renewal paths of sustainable community development in terms of social order and spatial quality [13]. The development trajectory of urban community revitalization in China since 1990 demonstrates a gradual reduction in the disruption of social environments and neighborly relationships caused by large-scale relocations. There is a growing emphasis on fostering residents' sense of identity and belonging within the community, highlighting the importance of enhancing residents' life satisfaction during the community revitalization process [14]. Residential satisfaction reflects the difference between residents' evaluations of their actual living conditions and their expected conditions within a residential area [15]. Understanding the factors that influence residential satisfaction forms the basis for community revitalization and neighborhood planning [16].

In the past two decades, POE has been regarded as an important tool for assessing residential satisfaction and was widely used. This method utilizes both subjective and objective data feedback to understand the strengths and weaknesses of the built environment during its use [17]. At the same time, Important-Performance Analysis (IPA) has proven to be an effective method for evaluating user satisfaction. IPA assessment offers valuable information regarding the areas of service that should be prioritized or immediately improved. This methodology finds application in diverse domains, such as the evaluation of residential satisfaction [18], sustainable city assessment [19], and architectural environmental quality evaluation [20]. Hence, building upon theoretical research and on-site investigations, this study integrates the POE and IPA methodologies to construct a comprehensive framework for evaluating residential satisfaction. The primary objective is to assess the similarities and differences in residential satisfaction among communities developed during different time periods, analyze the key factors and their relationships that influence residents' satisfaction, and provide optimization recommendations for the renewal and sustainable development of old neighborhoods.

Through this study, our aim is to furnish precise guidance for the sustainable design of old neighborhoods, ensuring alignment with the residents' needs. Furthermore, an in-depth exploration of residential satisfaction in old neighborhoods can offer valuable insights and experiences for urban planning and management, thereby fostering sustainable urban development.

2. Literature Review

2.1. Residential Satisfaction

Residential satisfaction refers to the level of satisfaction and comfort individuals experience in their residential environment. It is influenced by various factors, such

as housing quality, neighborhood amenities, and socio-demographic characteristics [21]. Research has shown that providing a residential environment that meets residents' needs and expectations is crucial to residential satisfaction [22].

After literature research, we are aware of the studies conducted by researchers on residential satisfaction from different perspectives (Table 1). Jiang et al. [23] analyzed the influencing factors of residential satisfaction and their effects on subjective well-being in a historic district. Mridha [24] explored the significant correlation of residential satisfaction with age, gender, and marital status, and Aksel et al. [25] noted that place attachment is positively related to residence satisfaction. In the study of residential satisfaction in historic urban quarters, Davoodi [26] incorporated multiple dimensions, including economic, social, cultural, and environmental factors, as determinants of residential satisfaction. It highlighted the need to consider various factors determining residential and environmental satisfaction from a sustainability perspective in urban renewal planning. Lee et al. [27] focused on its correlation with neighborhood environmental factors. Ren et al. [28] conducted a comparative analysis of residential satisfaction in different regions of China and found that it varies due to differences in economic, social, and physical conditions. Huang et al. [29] found that the main factors affecting residential satisfaction include neighborhood environment, public facilities, and housing characteristics. Erdogan et al. [30] compared housing satisfaction in modern and traditional neighborhoods and found that social and environmental living conditions positively affect overall housing satisfaction.

Table 1. Related literature research.

Research Focus	Method	Main Findings	Authors
Housing characteristics	Questionnaire; Literature review	Residents' satisfaction with their living environment is influenced by the built and social environment.	Jiang et al., 2023 [23] Davoodi et al., 2019 [26] Huang et al., 2015 [29] Erdogan et al., 2007 [30]
Neighborhood characteristics	Questionnaire; Literature review	Residents' perceptions of their neighborhoods are associated with indicators of well-being and residential satisfaction.	Aksel et al., 2020 [25] Davoodi et al., 2019 [26] Lee et al., 2017 [27] Huang et al., 2015 [29] Mridha, 2020 [24]
Socio-demographic characteristics	Questionnaire; Literature review; Multi-group structural equation model (SEM)	Exploring the effects of age, gender, and marital status on residential satisfaction	Lee et al., 2017 [27] Ren et al., 2017 [28]

The previous research mentioned above can sum up the research focus of residential satisfaction into three characteristics, namely, housing, neighborhood, and socio-demographic. This will provide a reference for the construction of a residential satisfaction evaluation framework. Abidin et al. [31] have proposed a conceptual framework for residential satisfaction, which includes housing characteristics, neighborhood characteristics, socio-demographic characteristics, and behavioral characteristics as fundamental components of residential satisfaction. Housing characteristics refer to the impact of the physical attributes of the dwelling on residential satisfaction. Neighborhood characteristics encompass the physical and social environment surrounding the residence, such as the quality of public spaces, availability of convenient facilities, and social cohesion. Among these, the social environment is identified as the most important factor influencing resident satisfaction. Socio-demographic characteristics involve personal attributes of residents, such as age, education, and family status. Studies have found that older adults tend to have higher residential satisfaction compared to younger individuals [16,32], while households with higher incomes typically exhibit greater satisfaction with their housing [33]. Residents' activities and behavioral characteristics also influence residential satisfaction, including their use of space, social interactions, and daily life patterns [34]. Expanding on the aforementioned conceptual framework, Mohit et al. [35] have provided a Multi-faceted

Framework for Residential Satisfaction, which includes socio-demographic characteristics, physical features of the house, housing support services, public facilities, neighborhood facilities, and social environment.

Residential satisfaction is the subjective evaluation of the residential environment, involving people's feelings and experiences regarding various aspects of their residential environment. Residential environment typically refers to the various environmental elements surrounding a living space, including natural conditions, infrastructure support, and social environment. It reflects people's pursuit of a livable living quality [36]. The World Health Organization (WHO) introduced the concept of livability in 1976, which includes four dimensions of the residential environment, namely, safety, health, convenience, and amenity. This four-dimensional concept has been widely adopted by countries around the world [37].

At present, there is no definitive general theoretical model for the concept of residential satisfaction. The key factors influencing residential satisfaction are not fixed but are specifically adjusted based on the research objectives. However, due to the coexistence of multiple housing periods in old neighborhoods, the residential satisfaction in these areas is easily influenced by complex and diverse factors. Therefore, a flexible and specific analysis of evaluation indicators tailored to the context of old neighborhoods is necessary. As the number of revitalization projects in old neighborhoods increases worldwide, integrating residential satisfaction as a reference point in community revitalization strategies becomes increasingly crucial. From the results of the literature review, there are still obvious shortcomings in research on residential satisfaction in old neighborhoods.

This study aims to investigate residential satisfaction in different residential areas of the old neighborhoods, focusing on the common key factors that residents from both new and old communities consider when evaluating their residential environment within the same spatial region. The research seeks to explore the extent to which these factors influence residential satisfaction.

2.2. Post-Occupancy Evaluation (POE)

Post-occupancy evaluation (POE) is an assessment and analysis method introduced in the mid-1960s and a tool for evaluating the physical and social aspects of residential buildings in response to significant issues encountered in building performance [38]. POE involves investigating and assessing the behavior and satisfaction of residents in order to improve the quality of the living environment and provide valuable information for future design strategies [39,40]. The POE evaluation process helps identify building issues, promote accountability, and support decision-making in sustainable building design [41]. Preiser [42] defines POE as "a systematic and rigorous process of evaluating buildings that have been in use for a period of time". It provides insights into past design outcomes and helps in constructing better buildings in the future. Brown et al. [43] demonstrate through various research examples that POE has the potential to address key social issues and possesses social responsibility, inclusivity, and social criticality.

In the past decade, there has been a significant surge in research focused on the implementation of POE methods in residential construction. The satisfaction of residents, in particular, has emerged as the primary concern and is often assessed through resident surveys [44]. Ilesanmi [45] found a close correlation between the physical characteristics of public housing and resident satisfaction in their study using POE. Pereira et al. [46] proposed the use of POE methods as an effective tool for improving building maintenance and management, thereby enhancing residential satisfaction. Generally, POE methods include qualitative and quantitative data collection methods, such as questionnaire surveys, observations, physical measurements, and sensor technologies. Through these methods, POE can provide detailed information about the actual use of residential areas, offering insights for architects and facility managers to improve the design and operation of living environments [47]. Understanding the factors that influence resident satisfaction through POE is fundamental to the formulation of any successful housing policy [16]. In summary,

POE is an approach focused on accessing the gap between user satisfaction and the residential environment. Its value lies in its ability to refine the design of residential environments based on user feedback.

2.3. Importance–Performance Analysis (IPA)

The Importance–Performance Analysis (IPA) method was introduced by Martilla and James [48] in 1977 and initially applied to evaluating the effectiveness of marketing projects. The IPA method is a widely utilized analytical technique in user satisfaction management [49]. This approach involves comparing the importance and performance of measured factors to analyze the disparities between user expectations and actual perceptions, enabling the identification of key areas for product and service improvement.

Based on the IPA method, research data are placed in a 2 × 2 quadrant formed by the Importance–Performance matrix. The *X*-axis represents the evaluation of variable importance, while the *Y*-axis represents the evaluation of variable performance. With the origin set at the total mean values of importance and performance, the IPA matrix is divided into four quadrants: Quadrant 1 (H, H) represents high performance and high importance, suggesting the need for continued efforts; Quadrant 2 (L, H) indicates low importance and high performance, advising against deliberate pursuit and instead allowing natural progression; Quadrant 3 (L, L) signifies low performance and low importance, recommending inclusion in low priority tasks; and Quadrant 4 (H, L) represents high importance and low performance, suggesting focus and prioritization for improvement. In summary, IPA is a method used to identify areas for improvement based on users' perceptions and expectations and to determine their priority. Through the IPA method, the impact level of key factors in residential satisfaction can be assessed.

3. Methods

3.1. Research Area

This paper selects the old street area of Huanshi East Road in Yuexiu District, Guangzhou City, as the research area. Yuexiu District is the oldest central district in Guangzhou, and Huanshi East Road used to be the most prosperous commercial area in Yuexiu District. The old neighborhoods around Huanshi East Road and East Ring Road contain residential areas constructed in different periods. In this study, four residential areas within the street block were chosen, including the No. 466 Courtyard (built in 1983), the Geological Bureau Courtyard (built in 1992), the No. 6 Courtyard (built in 2001), and Dongshan Ziyuan (built in 2007). Figure 1 shows the geographical distribution of communities. The criteria for selecting research samples are as follows: (1) the selected communities are located on the same street and have a certain time interval in terms of their construction time (e.g., 7–10 years); (2) the surveyed residents cover comprehensive demographic characteristics, including age, family, education, etc.; (3) the respondents have lived in the community for at least three years to ensure the authenticity of residents' comprehensive evaluations of the residential area. These criteria aim to ensure that the selected samples reflect the current state of residential satisfaction among residents of different communities.

This research area belongs to communities with three different regeneration strategies in the context of changing urban form: a courtyard that maintains its traditional courtyard (No. 466 Courtyard), an older community that employs micro-renewal (Geological Bureau Courtyard, No. 6 Courtyard), and a modern high-rise residential community that has been completely renewed (Dongshan Ziyuan). The study focuses on the relationship between the physical spatial layout of old neighborhoods and the mobility needs of the residents and explores the residential satisfaction and sustainable development strategies of the neighborhoods under diversified community forms.

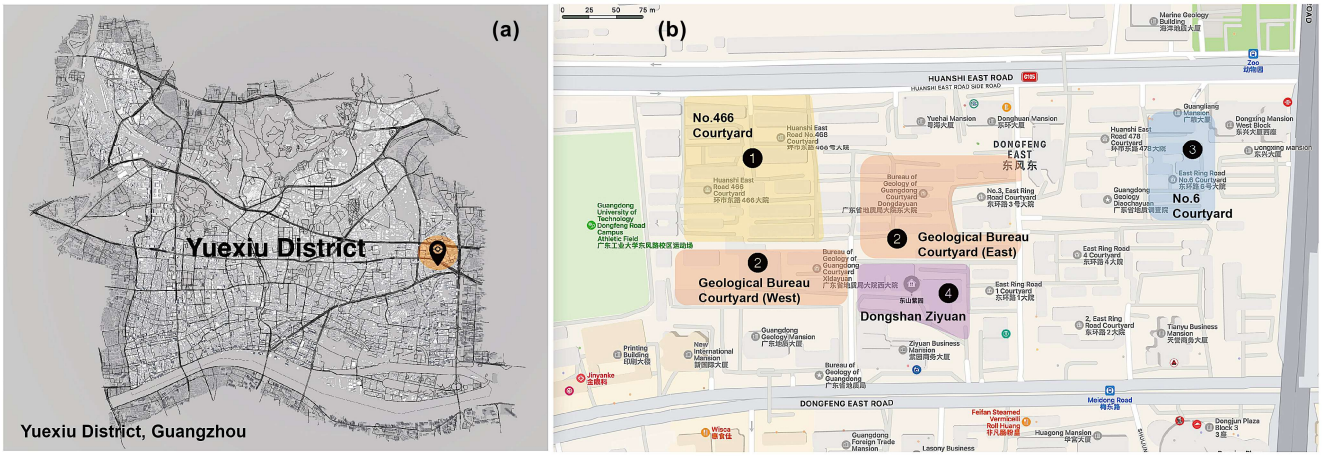


Figure 1. (**a**) The old neighborhood on the east side of Yuexiu District in Guangzhou. (**b**) Four case target communities within Huanshi East Road.

The urban form encompasses five expressive dimensions, including vitality, sense, fit, access, and control [50]. From the community level, vitality emphasizes the basic satisfaction of survival needs. Sense focuses on residents' sense of identity and belonging to the community. Fit reflects the degree of matching of community infrastructure to residents' needs and the adaptability of future actions. Access emphasizes the openness of the community and its ability to integrate surrounding resources. Control highlights the initiative of residents in the use of community space and the organization of activities. Control highlights residents' initiative in the use of community space and the organization of activities. In conclusion, the five dimensions of urban form can provide a reference for building sustainable communities.

3.2. Evaluation System and Research Process

3.2.1. Construction of Evaluation Index

Firstly, clearly defining the research problem and objectives and proposing the relevant elements for evaluating indicators based on theoretical research and on-site investigations is crucial. Secondly, establishing an evaluation indicator system and designing a questionnaire after consulting with experts and making necessary revisions should be performed. Figure 2 illustrates the process of constructing the evaluation indicators.

The literature review draws on existing evaluation standards, including the Standard for Urban Residential Area Planning and Design (GB50180-2018) [51], Evaluation Standards for Green Ecological Urban Districts (GB/T 51255-2017) [52], and Guidelines for the Construction of Complete Residential Communities [53] from China. It also included the United Kingdom's Housing Quality Indicators System (HQI) and the United States' Housing Quality Standards (HQS) [54]. Based on the aforementioned research, the evaluation indicators were selected by combining the concept framework of residential satisfaction and the dimensions of housing environment assessment proposed by the World Health Organization (WHO). Furthermore, field surveys and semi-structured interviews were conducted to supplement the evaluation indicators. Subsequently, three rounds of expert questionnaire consultations were performed using the Delphi method to modify and improve the evaluation indicators. Finally, a residential satisfaction evaluation indicator system was constructed, comprising 19 indicators across five dimensions: Residential Safety, Residential Health, Residential Convenience, Residential Amenity, and Residential Relationship (as shown in Table 2). This indicator system is adapted to studies related to the residential satisfaction of residents under the spatial area of old neighborhoods.

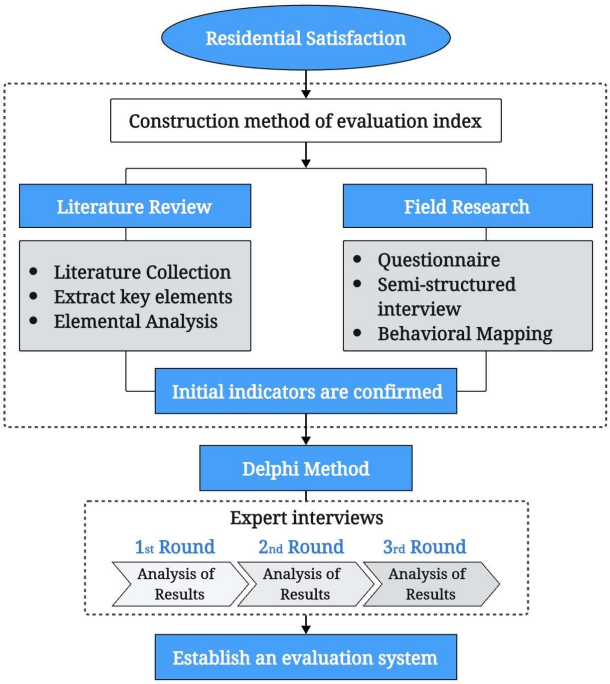


Figure 2. Indicator set establishment process.

Table 2. Post-occupancy evaluation of residential environment.

Target Layer	Field Layer	Index Layer
Post-occupancy evaluation of the residential environment	Residential Safety (A)	A1 Leisure facility safety A2 Ground travel safety A3 Spacious community
	Residential Health (B)	B1 Clean environment B2 Good fitness facility B3 Reduction of pests
	Residential Convenience (C)	C1 Community canteen C2 Garbage sorting C3 Community infirmary C4 Community express locker C5 Nearby convenient services
	Residential Amenity (D)	D1 Space beautification D2 Property services D3 Community culture D4 Community belonging
	Residential Relationship (E)	E1 Neighborhood interaction E2 Community activities E3 Convention autonomy E4 Social capital building

3.2.2. Functional Layout and Behavioral Activities of Community Space

Taking the community as the basic research unit, this paper explored the key variables that affect residential satisfaction and analyzed the similarities and differences in residential satisfaction between new and old communities in the same neighborhood. The residents of four communities were surveyed as the evaluation subjects, and the opinions of residents on the residential environment were obtained through the POE method, including behavioral mapping, semi-structured interviews, and questionnaires. Among them, behavioral mapping was used to record the interaction between community residents and their resi-

dential environment. Behavioral mapping is a method in environmental psychology that involves observing and analyzing the behaviors of space users, creating population density maps, and identifying the relationship between actors and activity spaces [55,56]. This study combines behavior mapping, plan marking, and data statistics to conduct a statistical analysis of the spatial layout and activity patterns in the four communities. These analyses serve as objective data for evaluating the utilization of the residential environment and analyzing residential satisfaction.

First of all, the residential area and functional layout should be determined. To facilitate comparison and observation, a plan map was created based on the research scope and on-site observations of the community. Some inaccessible areas are excluded from the survey. Next, information on residents' behavioral activities must be collected. Resident behaviors are classified into static activities (such as sitting, talking, and standing) and dynamic activities (such as walking and exercising). The observation period comprises both working days (3 days) and non-working days (2 days), divided into four periods (7:00–9:00, 11:00–13:00, 16:00–18:00, 19:00–22:00) based on preliminary research. People's activities and frequency are recorded within these time frames. Finally, the information was categorized and organized to create a distribution map of residents' behavioral activities (see Figure 3). Combining observations of resident behaviors with interview records, the spatial distribution of population activities in the four communities can be summarized as follows: (1) There are many elderly people in the old residential area. Due to limited space, there is a lack of recreational facilities for the elderly. This has led to the formation of some leisure areas that are not part of the original community planning, but rather, residents have placed seats to create chatting and resting areas. However, this has resulted in congestion at the entrance of the No. 466 Courtyard, occupying traffic routes and posing safety hazards. (2) The canteen in the Geological Bureau Courtyard experiences heavy foot traffic during lunchtime, and it is reported that the canteen and medical room are only available for use by the residents of this community and the employees of the Geological Bureau. (3) Dongshan Ziyuan, as a high-rise residential area, has well-equipped public service facilities and a complete functional layout for activity spaces. Among them, the swimming pool is an open project for outsiders, attracting the most intensive flow of people. In contrast, the community has fully equipped children's entertainment facilities, but they are not open to the public. During the observation period, it was found that the crowd density in this area was not high.

3.3. Data Collection

To obtain reliable data, the research team conducted on-site observations, resident interviews, and questionnaire surveys in the target residential area on Huan Shi East Road from 22 July to 20 August 2023. The data collection process involved face-to-face interviews and online questionnaires, with a total of 310 questionnaires distributed among a sample population size of 1046 households. A total of 284 valid questionnaires were collected, resulting in an effective response rate of 91.61% (72 questionnaires from No. 466 Courtyard, 68 questionnaires from Geological Bureau Courtyard, 66 questionnaires from No. 6 Courtyard, and 78 questionnaires from Dongshan Ziyuan). The questionnaire consisted of two parts. The first part gathered demographic information about the community residents, including gender, age, education, and residential area. The second part assessed the importance and performance of various aspects of the residential environment. Respondents were requested to rate the importance of 19 indicators on a five-point Likert scale, where '1' = Not Important at All; '2' = Not Important; '3' = Neutral; '4' = Important; and '5' = Very Important. Similarly, respondents used a five-point Likert scale to rate the performance of these attributes: '1' = Very Dissatisfied; '2' = Dissatisfied; '3' = Neutral; '4' = Satisfied, and '5' = Very Satisfied. After data collection, three types of analyses were conducted using SPSS 26.0 software, including descriptive statistics, reliability and validity analysis, and IPA analysis.

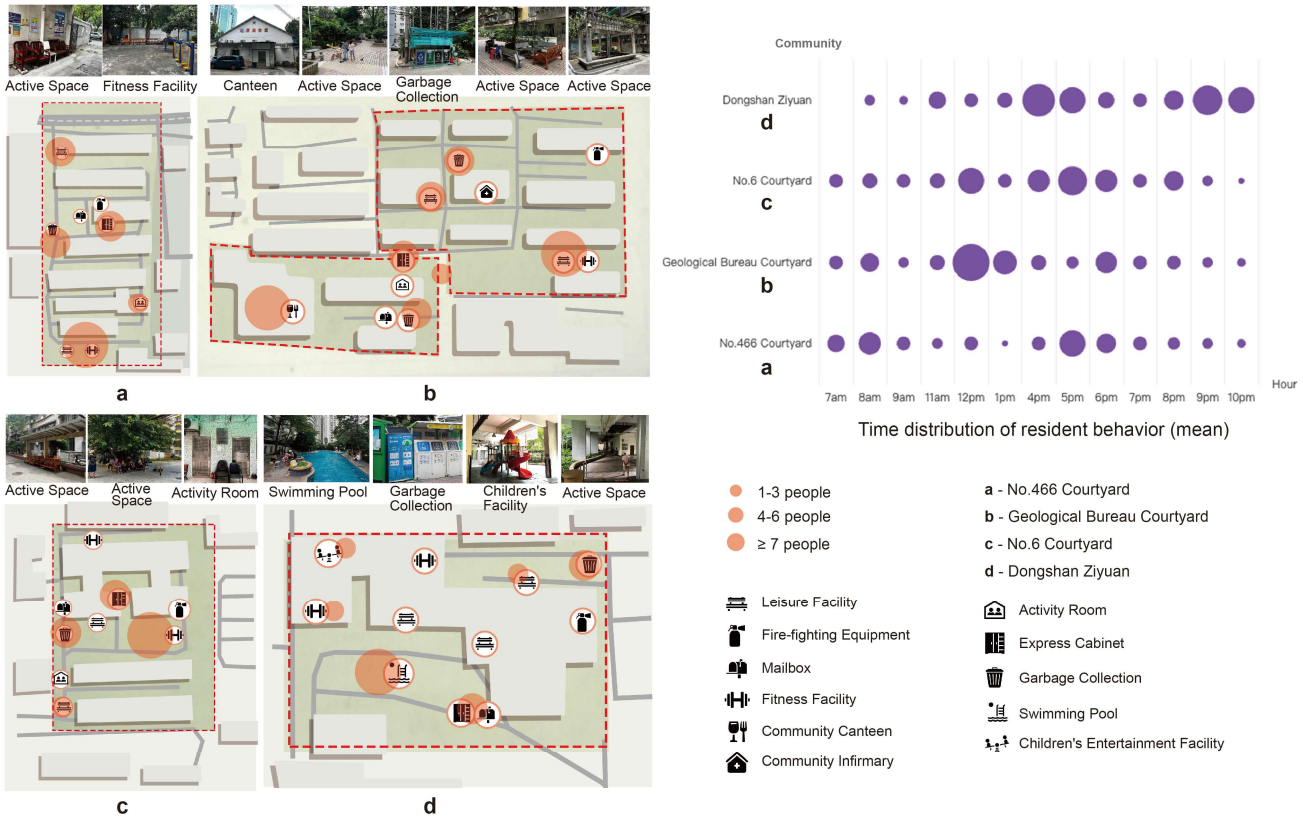


Figure 3. Spatial layout and behavior distribution of four communities. (Image source: captured by the study team): (**a**) No. 466 Courtyard; (**b**) Geological Bureau Courtyard; (**c**) No. 6 Courtyard; (**d**) Dongshan Ziyuan.

3.4. Reliability and Validity Analysis

3.4.1. Reliability Testing

To ensure the reliability of the collected data, a reliability and validity test is required. Reliability testing is used to assess the stability and effectiveness of the evaluation system developed for the questionnaire. The most widely used method for measuring reliability is the Cronbach α coefficient. The Cronbach α coefficient was used to conduct reliability testing on the valid questionnaires, and the calculation formula is as follows:

$$\alpha = \frac{q}{q-1}\left(1 - \frac{\sum pi^2}{pt^2}\right) \quad (1)$$

In the above formulas, q represents the total number of questionnaires distributed, pi^2 represents the within-group variance of the i-th question, and pt^2 represents the total score variance of all questionnaires. Normally, the value of the Cronbach α coefficient falls between 0 and 1. If the α coefficient is below 0.6, it is generally considered that the internal consistency reliability is insufficient. When it reaches 0.7–0.8, it indicates that the scale has reasonable reliability, and when it reaches 0.8–0.9, it signifies excellent reliability of the scale. Reliability testing was conducted on the performance and importance indicators in the questionnaire (Table 3), and the overall test result was found to be 0.920 > 0.6, indicating high reliability of the questionnaire data and enabling further analysis.

Table 3. Reliability test.

Index	Cronbach α Values	Number of Items
Importance–Performance	0.920	38
Performance	0.862	19
Importance	0.899	19

3.4.2. Validity Testing

Validity testing measures the effectiveness of the questionnaire, reflecting the degree of alignment between the questionnaire results and the research subjects. The Kaiser–Meyer–Olkin (KMO) measure and Bartlett's sphericity test were applied to the collected data. The KMO value obtained was 0.880, exceeding the generally accepted threshold of 0.6 (as shown in Table 4). This indicates that the data meet the prerequisites for factor analysis. Additionally, the data passed Bartlett's sphericity test ($p < 0.05$), suggesting that the research data are suitable for factor analysis and has a high level of validity.

Table 4. KMO and Bartlett's test.

KMO Value		0.880
Bartlett spherical degree test	Approximately chi-squared	5718.048
	df	703
	p-value	0.000

4. Result Analysis

4.1. Sample Information

According to the social demographic statistics (Table 5), the proportion of females is slightly higher than males, with females accounting for 53.2% and a relatively balanced gender ratio. In terms of age distribution, the highest percentage is observed among individuals aged 51–60, accounting for 25.0%. The proportion distribution across different age groups is relatively balanced, without any significant skewness. The surveyed population is evenly distributed among the four communities, with Dongshan Ziyuan having the highest number of respondents. The age group of the surveyed population in Dongshan Ziyuan is concentrated between 31 and 40 years old, indicating that it is a relatively newer community among those surveyed. In terms of educational background, 59.2% of the population has received a college or higher education. Therefore, the surveyed population exhibits both representativeness and diversity, providing insights into the characteristics of each community's population.

4.2. Residential Satisfaction IPA Analysis

4.2.1. Overall IPA Analysis

The overall IPA analysis primarily focuses on the five dimensions, using the mean values of expectations and perceptions for each dimension as the data for importance (I) and performance (P) (see Table 6). Through data analysis, it was found that the mean value of the "Residential Convenience" and "Residential Safety" dimensions are the highest. At the same time, the mean value of "Residential Health", "Residential Convenience", and "Residential Safety" is also the highest in terms of importance. In comparison, both the importance and performance levels of "Residential Amenity" and "Residential Relationship" are relatively low.

Table 5. Background information of respondents.

Item	Value	Number	Percentage (%)
Sex	Male	133	46.8%
	Female	151	53.2%
Age (years)	18 and lower	0	0.0%
	18–25	11	3.9
	26–30	14	4.9
	31–40	64	22.5
	41–50	67	23.6
	51–60	71	25.0
	61 and higher	57	20.1
Education level	Junior school and below	62	21.8
	High school	54	19.0
	Junior college	50	17.6
	Undergraduate	84	29.6
	Master's and above	34	12.0
Residential area	Geological Bureau Courtyard	68	23.9
	Dongshan Ziyuan	78	27.5
	No.466 Courtyard	72	25.4
	No.6 Courtyard	66	23.2

Table 6. Overall IPA analysis.

Dimension	Performance (P)		Importance (I)		Mean Difference	t	*p*
	Mean	Rank	Mean	Rank			
Residential Safety (A)	3.795	2	4.491	2	−0.70	−18.349	≤0.001
Residential Health (B)	3.454	3	4.501	1	−1.05	−25.808	≤0.001
Residential Convenience (C)	3.863	1	4.320	3	−0.46	−15.898	≤0.001
Residential Amenity (D)	3.220	4	3.894	4	−0.67	−23.767	≤0.001
Residential Relationship (E)	2.944	5	3.779	5	−0.84	−22.777	≤0.001

By calculating the mean values of P (3.795, 3.454, 3.863, 3.220, 2.944) and I (4.491, 4.501, 4.320, 3.894, 3.779) for each dimension, the origin of the overall IPA analysis coordinate system was determined (x = 4.20; y = 3.46). An IPA analysis quadrant chart was constructed with I on the *X*-axis and P on the *Y*-axis (see Figure 4). "Residential Safety" and "Residential Convenience" are located in the first quadrant, indicating that they can be further improved. "Residential Amenity" and "Residential Relationship" are situated in the third quadrant, highlighting the need for continuous improvement. "Residential Health" falls in the fourth quadrant, signifying a critical area that requires focused improvement. In terms of the overall mean differences (P–I), it is evident that the expectations for all dimensions relative to their importance have not been met to a satisfactory extent. Therefore, further enhancements and improvements are necessary.

4.2.2. Evaluation Factor IPA Analysis

Importance and performance scales of evaluation factors (indicator level) were analyzed for mean and standard deviation using SPSS 26.0 software, and the analysis results are shown in Table 7. A higher average value indicates a higher agreement level with the indicator, while the standard deviation represents the magnitude of differences among respondents for the same indicator. Among them, "C5 Nearby convenient services", "B2 Good fitness facility", and "A3 Spacious community" obtained the highest scores in terms of importance, indicating that these factors are highly valued by the respondents. During our field research, residents frequently mentioned the lack of community activity space, particularly expressing strong dissatisfaction with the old and poorly maintained fitness facility in the community, resulting in the lowest level of performance. Furthermore, the performance levels for "E2 Community activities", "E4 Social capital building", and "D3

Community culture" were low and require improvement. According to the research, on the one hand, the elderly population, particularly those aged 51 to 60, who constitute the majority in the old urban areas, have more leisure time after retirement and desire a more diverse range of community activities and culture. On the other hand, due to the lack of resident self-organized efforts in the communities and the absence of organizations such as homeowner associations, even in relatively newer communities like Dongshan Ziyuan, there are few cultural activities to meet resident demands, resulting in a deficiency of social capital in the communities. Nonetheless, these communities, situated in prime locations in Guangzhou's old urban areas, have relatively well-developed municipal public facilities, and some basic infrastructure within the community received positive evaluations from residents, as indicated by "C2 Garbage sorting", "C4 Community express locker", "A1 Leisure facility safety", and "B1 Clean environment". Additionally, most of the standard deviations are within 1.1, suggesting that the degree of evaluation by respondents has a relatively small fluctuation range and demonstrates a certain level of stability. To visually observe the relationship between the importance and performance of evaluation factors in the five dimensions of residential satisfaction, a visual chart depicting the factor relationships was created, as shown in Figure 5.

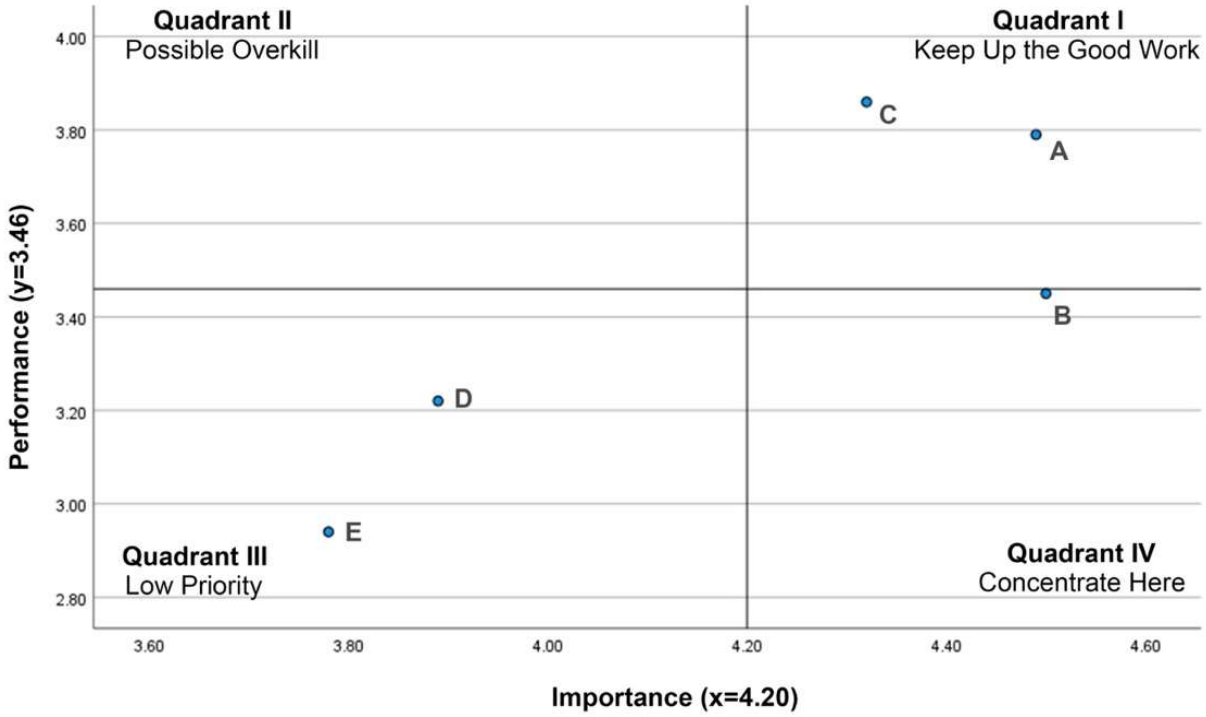


Figure 4. Overall IPA analysis chart based on five dimensions. The five dimensions include: residential safety (A), residential health (B), residential convenience (C), residential amenity (D), residential relationship (E).

Table 7. Analysis of the difference between importance and performance by categories.

Evaluation Factor	Importance			Performance			Mean Difference	t	IPA Index	Satisfaction
	Mean	Rank	Standard Deviation	Mean	Rank	Standard Deviation				
A1 Leisure facility safety	4.48	7	0.670	4.09	4	0.848	0.391	−9.378	8.72%	Satisfied
A2 Ground travel safety	4.48	8	0.632	3.87	7	0.954	0.606	−11.687	13.53%	Neutral
A3 Spacious community	4.51	3	0.637	3.42	8	1.145	1.092	−18.573	24.21%	Dissatisfied
B1 Clean environment	4.49	5	0.659	4.08	5	0.828	0.405	−8.952	9.02%	Satisfied
B2 Good fitness facility	4.53	2	0.603	2.37	19	0.902	2.155	−33.878	47.57%	Very dissatisfied
B3 Reduction of pests	4.49	6	0.632	3.90	6	0.898	0.581	−11.229	12.93%	Neutral
C1 Community canteen	4.04	11	0.903	3.14	15	1.174	0.898	−13.528	22.23%	Dissatisfied
C2 Garbage sorting	4.40	9	0.663	4.12	3	0.739	0.278	−7.353	6.32%	Satisfied
C3 Community infirmary	4.05	10	0.826	3.18	14	1.012	0.870	−13.569	21.28%	Dissatisfied
C4 Community express locker	4.50	4	0.603	4.38	2	0.695	0.127	−4.376	2.82%	Very satisfied
C5 Nearby convenient services	4.61	1	0.600	4.50	1	0.701	0.109	−3.513	2.36%	Very satisfied
D1 Space beautification	4.02	12	0.675	3.27	12	0.739	0.750	−17.890	18.66%	Neutral
D2 Property services	3.76	18	0.761	3.23	13	0.891	0.528	−12.276	14.04%	Neutral
D3 Community culture	3.94	14	0.701	2.99	16	0.834	0.954	−16.637	24.21%	Dissatisfied
D4 Community belonging	3.85	17	0.621	3.38	9	0.701	0.461	−11.444	11.97%	Neutral
E1 Neighborhood interaction	3.86	16	0.613	3.34	11	0.756	0.518	−11.291	13.42%	Neutral
E2 Community activities	3.97	13	0.597	2.39	18	0.962	1.574	−25.872	39.65%	Very dissatisfied
E3 Convention autonomy	3.88	15	0.654	3.35	10	0.875	0.532	−9.797	13.71%	Neutral
E4 Social capital building	3.40	19	0.689	2.69	17	0.791	0.718	−13.746	21.12%	Dissatisfied

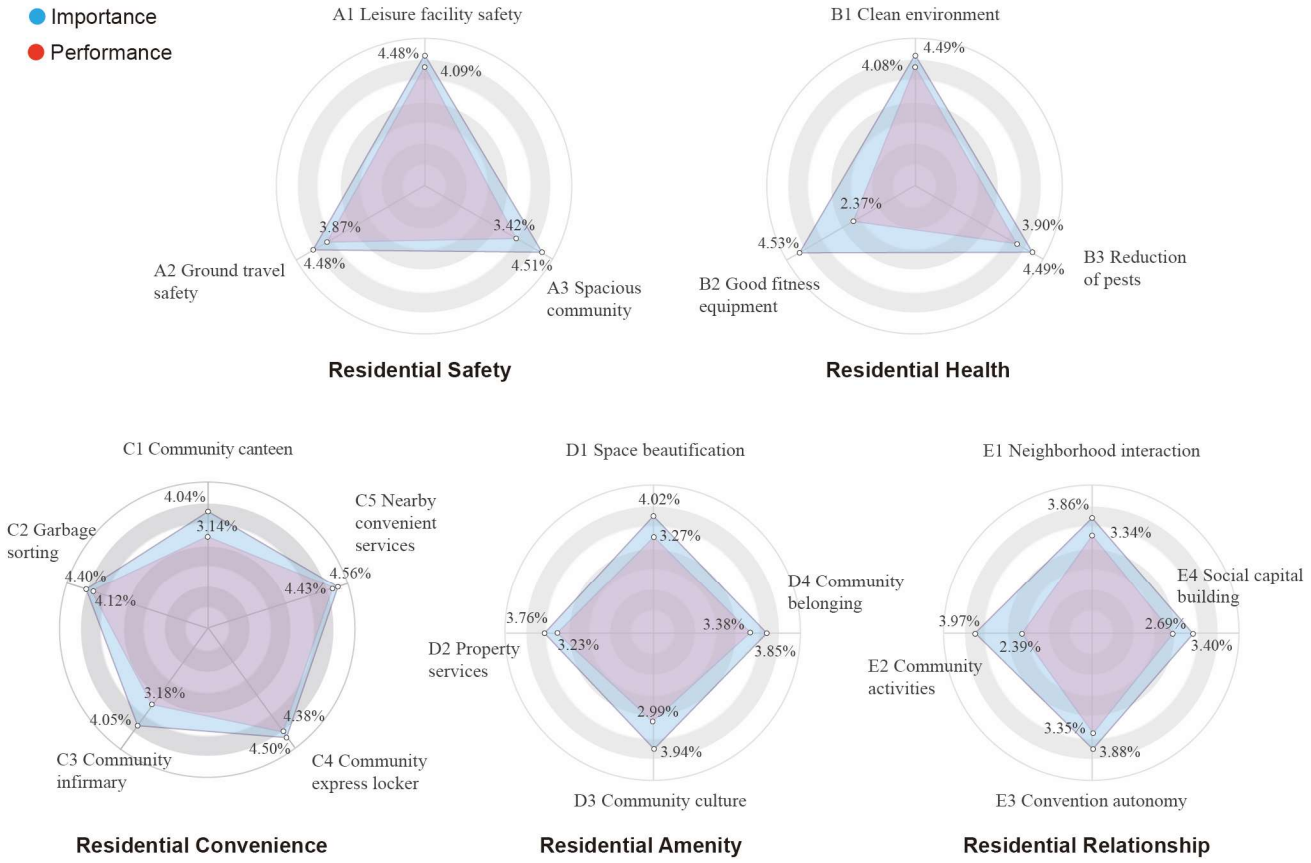


Figure 5. Multidimensional data diagram of evaluation factors in five dimensions.

To objectively and quantitatively reflect the difference between importance and performance, the IPA index is constructed, and its measurement formula is IPAI = (I − P)/I × 100%. A lower IPA index indicates higher performance. To observe the impact of different indicators on performance, the IPA index is divided into five levels: Very satisfied (≤5.00), Satisfied (5.01–10.00), Neutral (10.01–20.00), Dissatisfied (20.01–30.00), and Very dissatisfied (≥30.01). Analyzing the mean difference (I-P) and IPA index values of the 19 indicator layers, the distribution of performance is as follows (Figure 6): (1) Very satisfied: C4 Community express locker, C5 Nearby convenient services. (2) Satisfied: A1 Leisure facility safety, B1 Clean environment, C2 Garbage sorting. (3) Neutral: A2 Ground travel safety, B3 Reduction of pests, D1 Space beautification, D2 Property services, D4 Community belonging, E1 Neighborhood interaction, E3 Convention autonomy. (4) Dissatisfied: A3 Spacious community, C1 Community canteen, C3 Community infirmary, D3 Community culture, E4 Social capital building. (5) Very dissatisfied: B2 Good fitness facility, E2 Community activities.

Based on the residential satisfaction feedback from the community on the aspect of hardware services, the constrained community space results in widespread dissatisfaction with inadequate activity spaces, public services, and infrastructure (A3, B2, C1, C3). On the other hand, concerning software services, the absence of community organizational strength, coupled with insufficient activity spaces, contributes to residents' discontent with community events, community culture, and social capital development (D3, E2, E4). From the analysis, it can be inferred that there are more dissatisfied indicators than satisfied indicators among the aforementioned evaluation factors. The overall data indicate that respondents from the four communities express varying degrees of dissatisfaction with their living satisfaction, requiring targeted improvements in the future.

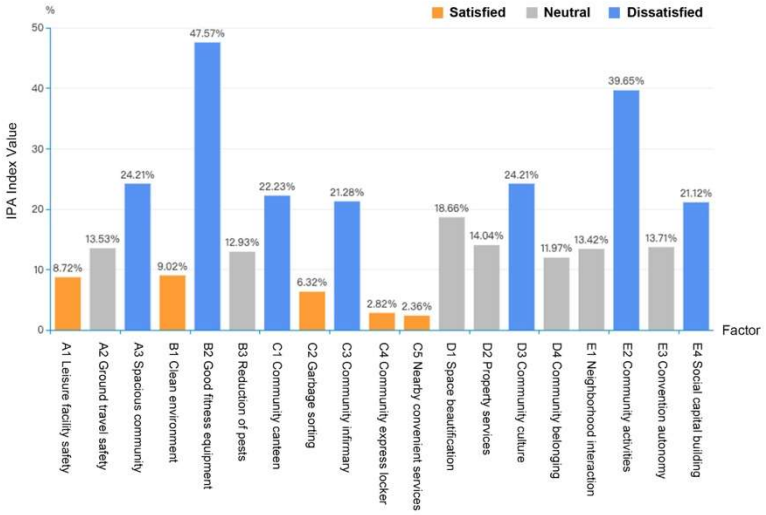


Figure 6. Satisfaction score of index layer factors.

Based on the analysis above, an IPA quadrant chart (Figure 7) is constructed to provide an overall analysis of the evaluation factors for the indicator levels. Using the mean values of I and P (x = 4.17; y = 3.46) as the intersection point, where 'I' represents the X-axis and 'P' represents the Y-axis, an analysis matrix is established, and the mean values of the 19 indicators are placed within it for analysis as follows:

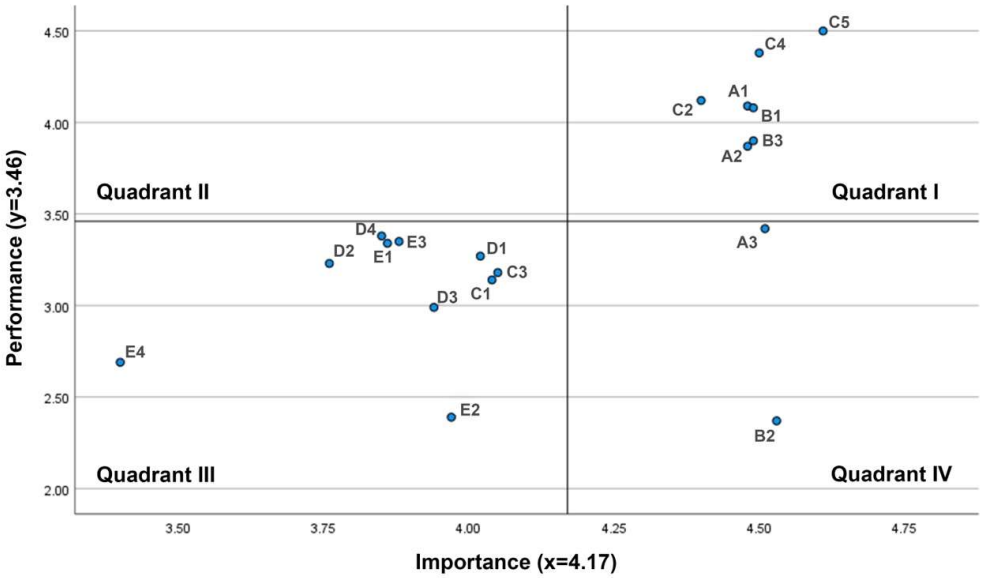


Figure 7. Importance-performance analysis matrix.

Quadrant I (H, H): Keep up the good work. This quadrant represents high scores in both I and P, indicating the need to maintain and improve performance. Within this quadrant, residents have rated "C5 Nearby convenient services" the highest. The surveyed residential areas are located in the old urban area of Huanshi East Road, surrounded by excellent public infrastructure and services, such as supermarkets, hospitals, schools, and parks. Additionally, both new and old communities are equipped with express lockers, facilitating residents' package deliveries and resulting in high performance with the "C4 Community express locker" category. Regarding residential safety, residents are overall satisfied with "A1 Leisure facility safety" and "A2 Ground travel safety". However, it is worth noting that the elderly population in No.466 Courtyard and Geological Bureau Courtyard expressed concerns and dissatisfaction regarding vehicle access and the

space occupied by vehicles within the community, which is also reflected in the "A3 Spacious community" indicator located in Quadrant IV. In terms of residential health, residents have expressed satisfaction with "B1 Clean environment" and "B3 Reduction of pests". The Huanshi East Road neighborhood, where the residential area is situated, is a bustling commercial area in Yuexiu District, Guangzhou. The overall cleanliness of the surrounding community environment is commendable, and residents are content with "C2 Garbage sorting".

Quadrant III (L, L): Low priority. This quadrant falls within the improvement area, characterized by low I (importance) and low P (performance), indicating the need for continuous advancement. Within this quadrant, "E2 Community activities" and "E4 Social capital building" received the lowest performance scores from residents. Through our research, we discovered that No. 466 Courtyard, No. 6 Courtyard, and Geological Bureau Courtyard are equipped with "retiree activity rooms" that offer recreational activities such as reading and board games. However, these facilities are exclusively available to retirees and not accessible to all residents. Moreover, behavior observation studies indicated low utilization rates for these activity spaces. Similarly, feedback from Dongshan Ziyuan residents highlighted a lack of community events and ineffective organization among resident representatives, including the homeowner association. These findings not only reflect the deficiency in social capital within the community but also underscore the widespread dissatisfaction with "E1 Neighborhood interaction", "E3 Convention autonomy", "D3 Community culture", and "D4 Community belonging". Furthermore, older residential areas like No. 466 Courtyard and No. 6 Courtyard lack property services, resulting in deteriorating community environments, such as crumbling walls and other physical issues. Consequently, surveyed residents expressed dissatisfaction with "D1 Space beautification" and "D2 Property services". What is more, a significant portion of the elderly population emphasized the importance of and their discontentment with the provision of "C1 Community canteen" and "C3 Community infirmary" facilities.

Quadrant IV (H, L): Concentrate here. This quadrant belongs to the critical improvement area, characterized by a significant disparity between high importance (I) and low performance (P). Based on the physical spatial characteristics of the four communities, it can be inferred that there is a common problem of insufficient space in the communities. During the interviews, it was found that residents were dissatisfied with the "A3 Spacious community", mainly due to the narrow community space being arbitrarily occupied by private cars, shared bicycles, and other vehicles, leaving very limited space for leisure activities for the elderly and children. It is worth noting that the four communities expressed strong dissatisfaction with the "B2 Good fitness facility" in the residential area. On one hand, due to the lack of community space, it is not possible to provide diverse fitness facilities. On the other hand, the existing fitness facility is old and poorly maintained, which not only hinders regular use but also poses safety hazards.

Simultaneously, through a comparison of the IPA mean values across the four communities and an analysis of communities with different construction periods and spatial scales, some commonalities and specificities were identified (Figure 8). In terms of commonalities, the overall performance is lower than the importance, indicating that the residents' satisfaction with their living conditions needs to be improved. Among them, B2 has the largest mean difference, reflecting a higher demand for fitness facilities among residents in both new and old communities in the old street area. Due to the location of the block in the commercial area, the accessibility to surrounding services is better, resulting in a higher mean satisfaction level for C5. At the same time, it was observed that as the construction time of the communities differed (1983–2007), the mean differences for E1, E2, and E3 also gradually increased (E1: 0.39–0.41–0.50–0.74, E2: 1.27–1.47–1.75–1.81, E3: 0.14–0.31–0.37–1.22), reflecting a more prominent dissatisfaction among residents with neighborhood relationships and community activities in newly built communities, which have not been effectively improved. In addition, the satisfaction levels of some indicators have gradually improved in recently constructed communities, such as A1, A2, A3, B1, B3,

D1, and D2. These changes reflect the gradual improvement of community infrastructure over time. In terms of particularities, E4 in the Geological Bureau Courtyard has the highest satisfaction compared to other communities. Through follow-up visits, it was found that the presence of a canteen in the community facilitates frequent interactions among residents and employees, who share their life experiences and resources, contributing to the accumulation of social capital.

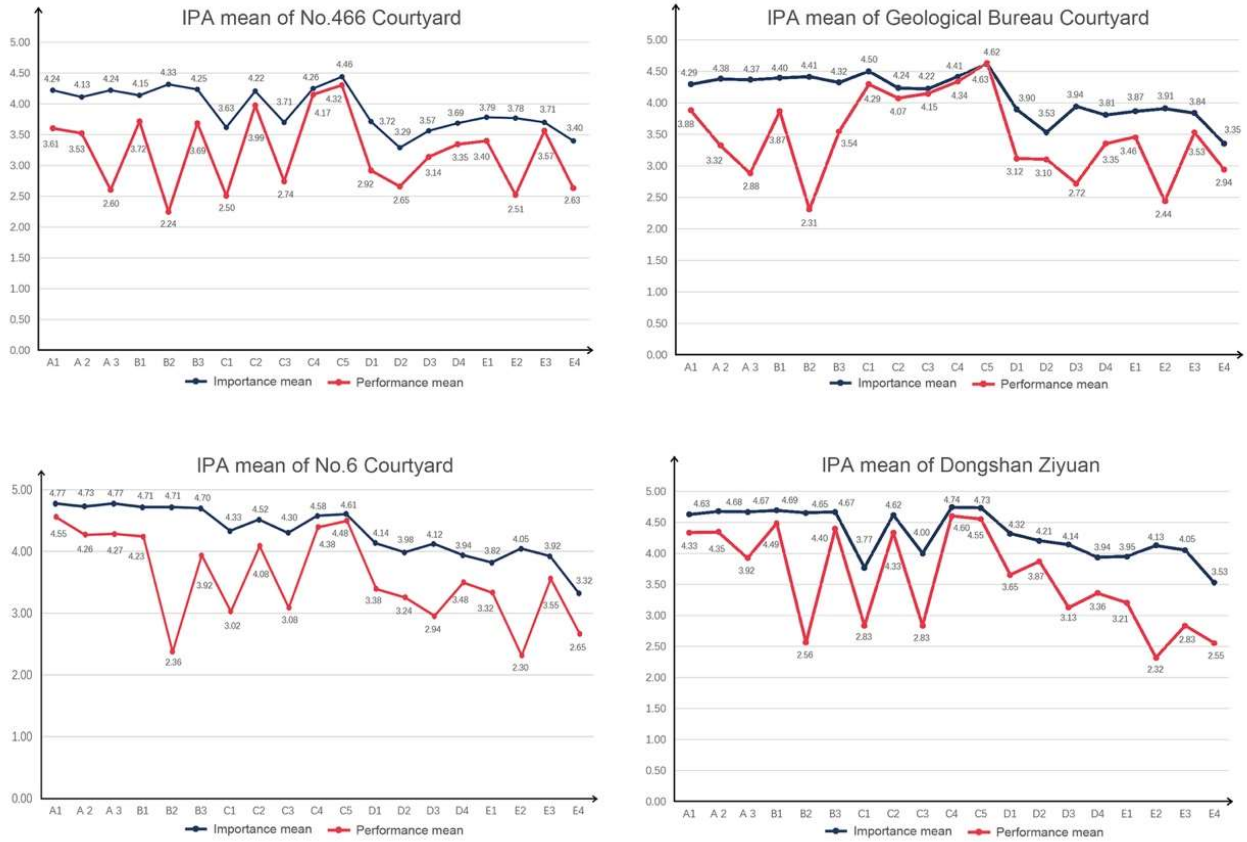


Figure 8. Comparison of IPA means across four communities.

5. Discussion

Through the study and analysis of the residential satisfaction in four old and new communities in Guangzhou's Old Street area, it was found that residents generally have a low level of satisfaction with their living environment. Further analysis shows that residents' needs include both hardware aspects, such as space and facilities, as well as software aspects, including culture and activities. In terms of differences, the demand for hardware services, such as infrastructure in old communities, is generally stronger, such as C1-community canteen and C3-community infirmary. New communities have the biggest difference in satisfaction with software services such as community relations, such as E1-neighborhood interaction, E2-community activities, E3-convention autonomy, and E4-social capital building. Therefore, improving residents' satisfaction in old neighborhoods requires a comprehensive approach, considering both the hardware (such as space and facilities) and software (such as culture and activities). The sustainable development of future communities should be committed to comprehensively improving the living experience of these communities and targeting sustainable community renewal programs based on residential satisfaction as the basis for community renewal design strategies.

In the overall IPA analysis, C5 (M = 4.61), B2 (M = 4.53), and A3 (M = 4.51) had the highest mean importance values, indicating the importance residents placed on hardware services. According to the field survey, the main users of community spaces in old neighbor-

hoods are usually the elderly and children. They emphasize the convenience of community services, the availability of activity spaces, and the adequacy of infrastructure.

On the other hand, B2 (M = 2.37), E2 (M = 2.39), E4 (M = 2.69), and D3 (M = 2.99) had the lowest mean performance values, reflecting that residents are more dissatisfied with soft services compared to hardware services. The survey reveals that while most communities are equipped with activity rooms, a dearth of organizational efforts has resulted in a scarcity of culturally enriching and entertaining activities within these spaces. This research finding once again underscores the significance of enhancing and fortifying soft services such as community communication, social capital, and the diversification of community activities.

It is noteworthy that C5 (nearby convenient services) received the most positive feedback among the respondents, indicating that residents in the old neighborhoods placed significant emphasis on the accessibility of convenient services. However, some facilities are not yet open to residents to provide service. For example, in the interviews, some community residents suggested that the playgrounds of nearby schools could be opened to residents at specific times. This implies that capitalizing on the value of peripheral services can be one of the strategies to deal with underserved communities and keep them sustainable.

In summary, in the future, sustainable community renewal strategies aimed at enhancing residential satisfaction should encompass both hardware and software services to meet residents' comprehensive quality of living needs. Strengthening hardware services, such as upgrading fitness facilities and community activity spaces, contributes to fulfilling residents' expectations for infrastructure. Simultaneously, prioritizing improvements in software services, including bolstering interactive communication, social capital, and community activities, enhances residents' sense of place. Consequently, we think that sustainable communities, addressing both hardware and software services, represent the future trend in community development. Confronted with the intricate challenges of old neighborhoods, it is essential to explore the key factors influencing the sustainable development of such communities during the process of revitalizing existing neighborhoods. This study focuses on residential satisfaction as the basis for studying these influencing factors and provides design strategies for the sustainable renewal of future communities.

6. Sustainable Design Strategies

6.1. Sustainable Life: Planning Community Life Circles

The service improvement strategy of incorporating the concept of "life circle" into residential areas is to closely integrate the spatial problems of old residential areas with people's living needs and behavioral habits and provide daily life service circles with suitable walking time and distance (e.g., 5 min, 10 min, and 15 min) [57]; in other words, expanding the spatial range of services available in the residential area and utilizing convenient service facilities in the surrounding area to make up for the lack of services within the community. Specifically, according to the actual situation of the old community on Huanshi East Road, the living circle can be divided into three levels: within the community (5 min), between communities (10 min), and beyond the community (15 min). Among them, "within the community (5 min)" refers to the existing residential area within the courtyards, where basic life services for the elderly and children should be adequately provided. It should undergo age-friendly and user-friendly transformations to create a living environment that is friendly to the elderly and children. For example, underutilized retiree activity rooms can be opened to all residents in the community, and the roads within the residential area should be designed to separate pedestrians and vehicles, providing necessary safety assurance for the residents.

"Between communities (10 min) " refers to maintaining openness and promoting resource sharing between different communities, such as sharing service facilities and spaces. During on-site investigations, we found that the Geological Bureau Courtyard is equipped with a community canteen, which only provides meal services for the staff of the unit and residents of this community but is not open to residents of surrounding communities. Similarly, the

Geological Bureau Courtyard also has a community clinic, but due to the closed management of the community, these services are currently only available to residents of this community. However, such life services are particularly important for the elderly in nearby neighborhoods, as they make the most frequent use of these services and have limited mobility. Communities can engage in cooperative models to facilitate service sharing between neighboring community residents, which not only brings convenience to residents in the vicinity but also helps strengthen neighborhood relationships.

"Beyond the community (15 min)" refers to establishing a walking and cycling network between residential communities, connecting several communities to create a fifteen-minute living circle. This involves coordinating facilities, such as schools, nursing homes, hospitals, sports venues, and parks within a service radius of 800–1000 m, aligning with the management and service scope of the neighborhoods. The surrounding area of Huan Shi Dong Road has well-established service facilities, and joint efforts between communities, neighborhood committees, and relevant organizations can be made to plan a living circle route that meets the service needs of the community. For example, university and primary/secondary school sports grounds can be opened to residents of surrounding communities to address issues, such as insufficient community activity space and outdated fitness facilities.

6.2. Sustainable Endogenous Power: Establishing Community Self-Organization

With the ongoing transformation of old urban areas, traditional institutional compounds have been replaced by residential communities in cities. This has resulted in a change in the network of social relationships among neighbors, weakening the function of mutual assistance. Therefore, in the process of community renewal, emphasis is placed on self-organization to encourage active participation and collective decision-making by community residents in order to promote community development.

Based on mutual trust and respect, self-organizing members should share common goals, such as improving the community environment and enhancing the quality of community life. At the same time, members should have the ability and awareness of autonomous decision-making and be able to participate in discussions and decision-making regarding community affairs [58]. The establishment of self-organization can be achieved through various means. One approach is organizing community gatherings and discussion activities to collectively formulate community regulations, such as discussing issues regarding improper parking and space utilization within the community. Another approach is to establish a community homeowners' committee, which can represent residents in negotiating community affairs with property management organizations.

By promoting community self-organization, mobilizing residents' decision-making, fostering co-construction and shared outcomes, repairing neighborly relationships, and cultivating a shared community culture, we can enhance residents' sense of belonging to the community. Through active participation in co-creation within the community, members can gain a better understanding of and meet their own needs, thus increasing residential satisfaction.

6.3. Sustainable Service: Mobile Service Stations

In response to the limited space for renovation in aging communities and the diverse needs of residents, we propose the design concept of a Mobile Service Station. Firstly, compared to traditional fixed service spaces, mobile service stations offer greater flexibility and adaptability. It can be precisely configured and adjusted based on the specific conditions of different communities, providing residents with more convenient and efficient services while meeting their diverse needs. Secondly, mobile service stations can effectively cater to the needs of special groups within the community. For instance, elderly individuals or persons with disabilities who have higher dependencies on mobility and services can benefit from the presence of mobile service stations within the community (e.g., health mobile service stations). Furthermore, mobile service stations facilitate topic-based interac-

tions and communication among community residents. These interactions not only fulfill residents' social needs but also enhance their sense of community belonging.

7. Conclusions

Residential satisfaction in urban old neighborhoods is a complex and diverse issue influenced by various factors, and it is also one of the criteria for judging the effectiveness of community sustainable development. First, this paper innovatively investigates the key elements of residential satisfaction in both old and new communities within old neighborhoods and constructs a residential satisfaction evaluation system including five dimensions and 19 indicators. Second, through questionnaire, interview, and IPA mean value analysis, the POE of residential environments in old neighborhood communities was conducted. The results show that old communities have a relatively stronger degree of demand for hardware services, such as spatial infrastructure, due to the predominance of the elderly and children, while residents in new communities with a diversity of residents have the largest gap in satisfaction at the level of software services, such as residential relationships. In other words, the factors affecting community residential satisfaction go beyond the physical aspects, such as community facilities and spaces, and also include software factors like community activities, culture, and self-governance.

The study found that the five dimensions of residential satisfaction varied among neighborhoods at different stages of completion. Among them, modern high-rise residential communities had better IPA ratings for infrastructure than traditional courtyards in the dimensions of safety, health, and amenities. However, in terms of neighborhood interaction, community activities, and convention autonomy in the dimension of residential relationships, the modern high-rise residential community has not improved significantly, and even its dissatisfaction level is more prominent. The crux of the problem is the lack of self-organizing forces and opportunities for interaction in the community. In addition, residents of both new and old communities place a high value on nearby convenient services.

Finally, building upon the findings of this study, sustainable design strategies for community improvement were made, including the planning of community life circles, the establishment of self-organization, and the creation of mobile service stations. The limitations of this study lie in the fact that the survey is only carried out in four communities, which may lack a comprehensive representation of the diversity of old neighborhoods in Guangzhou. Future research efforts could consider expanding the coverage of samples to include wider communities so as to obtain more diverse feedback. In addition, by combining objective indicators with residents' subjective satisfaction evaluations, the credibility and comprehensiveness of the study could be enhanced. Through these research efforts, we can better guide urban renewal and sustainable development of communities, providing better residential environments for residents in old neighborhoods and enhancing their residential satisfaction.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Academic Committee of Guangdong University of Technology (protocol code GDUTXS2023211and 10 September 2023).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

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

References

1. Youssoufi, S.; Houot, H.; Vuidel, G.; Pujol, S.; Mauny, F.; Foltête, J.-C. Combining visual and noise characteristics of a neighborhood environment to model residential satisfaction: An application using GIS-based metrics. *Landsc. Urban Plan.* **2020**, *204*, 103932. [CrossRef]
2. McCormick, K.; Anderberg, S.; Coenen, L.; Neij, L. Advancing Sustainable Urban Transformation. *J. Clean. Prod.* **2011**, *50*, 1–11. [CrossRef]
3. Baumgartner, R. Critical perspectives on sustainable development research and practice. *J. Clean. Prod.* **2011**, *19*, 783–786. [CrossRef]
4. Terzano, K. Residential satisfaction. In *Encyclopedia of Quality of Life and Well-Being Research*; Michalos, A.C., Ed.; Springer: Dordrecht, The Netherlands, 2014.
5. Mesch, G.S.; Manor, O. Social ties, environ- mental perception, and local attachment. *Environ. Behav.* **1998**, *30*, 504–519. [CrossRef]
6. Hur, M.; Morrow-Jones, H. Factors that influence residents' satisfaction with neighborhoods. *Environ. Behav.* **2008**, *40*, 619–635. [CrossRef]
7. Mudege, N.; Zulu, E. In their own words: Assessment of satisfaction with residential location among migrants in Nairobi slums. *J. Urban Health* **2011**, *88*, 219–234. [CrossRef]
8. Wu, F.; Liu, Y.; Zeng, Y.; Yan, H.; Zhang, Y.; Li, L.-H. Evaluation of the Human Settlements Environment of Public Housing Community: A Case Study of Guangzhou. *Sustainability* **2020**, *12*, 7361. [CrossRef]
9. Cao, X.J.; Wang, D. Environmental correlates of residential satisfaction: An exploration of mismatched neighborhood characteristics in the Twin Cities. *Landsc. Urban Plan.* **2016**, *150*, 26–35. [CrossRef]
10. Pennen, T.V.D.; Bortel, G.V. Exemplary urban practitioners in neighbourhood renewal: Survival of the fittest. . . and the fitting. *Volunt. Int. J. Volunt. Nonprofit Organ.* **2015**, *27*, 1323–1342. [CrossRef]
11. Cai, Y.N.; Yang, X.J.; Li, D.L. Micro-transformation: The renewal method of old urban community. *Urban Dev. Stud.* **2017**, *24*, 29–34. (In Chinese)
12. Qian, Z.; Li, H. Urban morphology and local citizens in China's historic neighborhoods: A case study of the Stele Forest Neighborhood in Xi'an. *Cities* **2017**, *71*, 97–109. [CrossRef]
13. Pang, W.K. Urban morphology of traditional Chinese cities in the context of modernization: A Case Study of Suzhou. In Proceedings of the 42nd ISOCARP (International Society of City and Regional Planners) Congress, Istanbul, Turkey, 14–18 September 2006.
14. Zhou, W. Sustainable Urban Renewal in China Since 1990: A Systematic Review. In Proceedings of the 2022 7th International Conference on Social Sciences and Economic Development (ICSSED 2022), Wuhan, China, 25–27 March 2022; Atlantis Press: Amsterdam, The Netherlands, 2022; pp. 1138–1148.
15. Galster, G.C.; Hesser, G.W. Residential Satisfaction: Compositional and Contextual Correlates. *Environ. Behav.* **1981**, *13*, 735–758. [CrossRef]
16. Lu, M. Determinants of Residential Satisfaction: Ordered Logit vs. Regression Models. *Growth Chang.* **1999**, *30*, 264–287. [CrossRef]
17. Cooper, B.A.; Ahrentzen, S.; Hasselkus, B.R. Post-occupancy evaluation: An environment-behaviour technique for assessing the built environment. *Can. J. Occup. Ther.* **1991**, *58*, 181–188. [CrossRef] [PubMed]
18. Yin, J.; Cao, X.J.; Huang, X.; Cao, X. Applying the IPA–Kano model to examine environmental correlates of residential satisfaction: A case study of Xi'an. *Habitat Int.* **2016**, *53*, 461–472. [CrossRef]
19. Lee, S.W.; Seow, C.W.; Xue, K. Residents' sustainable city evaluation, satisfaction and loyalty: Integrating importance-performance analysis and structural equation modelling. *Sustainability* **2021**, *13*, 6766. [CrossRef]
20. Agyekum, K.; Akli-Nartey EE, K.; Kukah, A.S.; Agyekum, A.K. Importance-performance analysis (IPA) of the indoor environmental quality (IEQ) of an EDGE-certified building in Ghana. *Int. J. Build. Pathol. Adapt.* **2023**, *41*, 73–95. [CrossRef]
21. Amérigo, M.; Aragones, J.I. A theoretical and methodological approach to the study of residential satisfaction. *J. Environ. Psychol.* **1997**, *17*, 47–57. [CrossRef]
22. Emami, A.; Sadeghlou, S. Residential satisfaction: A narrative literature review towards identification of core determinants and indicators. *Hous. Theory Soc.* **2021**, *38*, 512–540. [CrossRef]
23. Jiang, Y.; Chen, L.; Xie, Y.; Li, Y.; Li, T. Subjective Well-Being of Historical Neighborhood Residents in Beijing: The Impact on the Residential Environment. *Sustainability* **2023**, *15*, 1847. [CrossRef]
24. Mridha, M. The effect of age, gender and marital status on residential satisfaction. *Local Environ.* **2020**, *25*, 540–558. [CrossRef]
25. Aksel, E.; İmamoğlu, Ç. Neighborhood location and its association with place attachment and residential satisfaction. *Open House Int.* **2020**, *45*, 327–340. [CrossRef]
26. Davoodi, T.; Dağlı, U.U. Exploring the determinants of residential satisfaction in historic urban quarters: Towards sustainability of the Walled City Famagusta, North Cyprus. *Sustainability* **2019**, *11*, 6261. [CrossRef]
27. Lee, S.M.; Conway, T.L.; Frank, L.D.; Saelens, B.E.; Cain, K.L.; Sallis, J.F. The Relation of Perceived and Objective Environment Attributes to Neighborhood Satisfaction. *Environ. Behav.* **2017**, *49*, 136–160. [CrossRef]
28. Ren, H.; Folmer, H. Determinants of residential satisfaction in urban China: A multi-group structural equation analysis. *Urban Stud.* **2017**, *54*, 1407–1425. [CrossRef]

29. Huang, Z.; Du, X. Assessment and determinants of residential satisfaction with public housing in Hangzhou, China. *Habitat Int.* **2015**, *47*, 218–230. [CrossRef]
30. Erdogan, N.; Akyol, A.; Ataman, B.; Dokmeci, V. Comparison of urban housing satisfaction in modern and traditional neighborhoods in Edirne, Turkey. *Soc. Indic. Res.* **2007**, *81*, 127–148. [CrossRef]
31. Abidin, N.Z.; Abdullah, M.I.; Basrah, N.; Alias, M.N. Residential satisfaction: Literature review and a conceptual framework. *IOP Conf. Ser. Earth Environ. Sci.* **2019**, *385*, 012040. [CrossRef]
32. Chapman, D.W.; Lombard, J.R. Determinants of neighborhood satisfaction in fee-based gated and nongated communities. *Urban Aff. Rev.* **2006**, *41*, 769–799. [CrossRef]
33. Frank, B.; Enkawa, T. Economic drivers of dwelling satisfaction: Evidence from Germany. *Int. J. Hous. Mark. Anal.* **2009**, *2*, 6–20. [CrossRef]
34. Abdullah, M.I.; Abidin, N.Z.; Basrah, N.; Alias, M.N. Conceptual framework of residential satisfaction. *Environ. Behav. Proc. J.* **2020**, *5*, 229–235. [CrossRef]
35. Mohit, M.A.; AlKhanbashiRaja, A.M.M. Residential satisfaction-concept, theories and empirical studies. *Plan. Malays.* **2014**, *12*, 47–66.
36. Skalicky, V.; Čerpes, I. Comprehensive assessment methodology for liveable residential environment. *Cities* **2019**, *94*, 44–54. [CrossRef]
37. Higasa, T. *Urban Planning*; Kiotitz Corporation Press: Tokyo, Japan, 1977.
38. Preiser, W.F.E.; Rabinowitz, H.Z.; White, E.T. *Post-Occupancy Evaluation*; Van Nostrand Reinhold: New York, NY, USA, 1988.
39. Preiser, W.F.E. Post-occupancy evaluation: How to make buildings work better. *Facilities* **1995**, *13*, 19–28. [CrossRef]
40. Zhao, Y.; Yang, Q. Development of an ontology-based semantic building post-occupancy evaluation framework. *Int. J. Metrol. Qual. Eng.* **2021**, *12*, 19. [CrossRef]
41. Meir, I.A.; Garb, Y.; Jiao, D.; Cicelsky, A. Post-occupancy evaluation: An inevitable step toward sustainability. *Adv. Build. Energy Res.* **2009**, *3*, 189–219. [CrossRef]
42. Preiser, W.F.E.; White, E.; Rabinowitz, H. *Post-Occupancy Evaluation (Routledge Revivals)*; Routledge: Abingdon, UK, 2015.
43. Brown, T.L. A critical assessment of the place of post-occupancy evaluation in the critique and creation of socially responsible architecture. *Intell. Build. Int.* **2018**, *10*, 182–193. [CrossRef]
44. Li, P.; Froese, T.M.; Brager, G. Post-occupancy evaluation: State-of-the-art analysis and state-of-the-practice review. *Build. Environ.* **2018**, *133*, 187–202. [CrossRef]
45. Ilesanmi, A.O. Post-occupancy evaluation and residents' satisfaction with public housing in Lagos, Nigeria. *J. Build. Apprais.* **2010**, *6*, 153–169. [CrossRef]
46. Bento Pereira, N.; Calejo Rodrigues, R.; Fernandes Rocha, P. Post-Occupancy Evaluation Data Support for Planning and Management of Building Maintenance Plans. *Buildings* **2016**, *6*, 45. [CrossRef]
47. British Standards Institute (BSI). *Building Performance Evaluation of Occupied and Operational Buildings (Using Data Gathered from Tests, Measurements, Observation and User Experience)*; British Standards Institute (BSI): London, UK, 2022.
48. Martilla, J.A.; James, J.C. Importance-performance analysis. *J. Mark.* **1977**, *41*, 77–79. [CrossRef]
49. Matzler, K.; Sauerwein, E.; Heischmidt, K. Importance-performance analysis revisited: The role of the factor structure of customer satisfaction. *Serv. Ind. J.* **2003**, *23*, 112–129. [CrossRef]
50. Lynch, K. *Good City Form*; MIT Press: Cambridge, MA, USA, 1984.
51. *GB50180-2018*; Standard for Urban Residential Area Planning and Design. MOHURD: Beijing, China, 2018.
52. *GB/T 51255-2017*; Assessment Standard for Green Eco-District. China Architecture & Building Press: Beijing, China, 2017.
53. MOHURD. *Guidelines for the Construction of Complete Residential Communities. [2021] No. 55*; MOHURD: Beijing, China, 2022.
54. Sinha, R.C.; Sarkar, S.; Mandal, N.R. An Overview of Key Indicators and Evaluation Tools for Assessing Housing Quality: A Literature Review. *J. Inst. Eng. Ser. A* **2017**, *98*, 337–347. [CrossRef]
55. Ittelson, W.H. *The Use of Behavioral Maps in Environmental Psychology*; Rinehart & Winston: New York, NY, USA, 1970.
56. Campos, A. Urban Public Spaces: A Study of the Relation between Spatial Configuration and Use Patterns. Ph.D. Thesis, UCL (University College London), London, UK, 2000.
57. Allam, Z.; Nieuwenhuijsen, M.; Chabaud, D.; Moreno, C. The 15-minute city offers a new framework for sustainability, liveability, and health. *Lancet Planet. Health* **2022**, *6*, e181–e183. [CrossRef]
58. De Moor, A. A community network ontology for participatory collaboration mapping: Towards collective impact. *Information* **2018**, *9*, 151. [CrossRef]

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