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Key Factors Influencing Urban Regenerative Strategies in Public Open Spaces: A Case-Study in Lhasa

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Abstract. In the last decades, significant efforts have been made in urban construction to achieve rapid economic development. However, with climate change on the agenda, there is a growing recognition of the importance of urban sustainable development and of its potential impacts on residents. Reflection reveals that many policies, measures, and tools are inadequate; therefore, public open spaces are regarded as a potential target of urban regeneration strategies. This study explores users' perceptions of public open spaces through participatory methods. The developed methodology is applied to specific areas of Lhasa, the major city of the Tibet region, which was selected as a test-bed site. The survey involved a selected pool of participants and emphasized the coverage of different types of public open spaces. Investigate factors including personal background, overall satisfaction, user evaluation, usage preference, and willingness to change, analyze key factors based on quantitative survey results. Subsequently, identify the key regenerative design elements that require highlighting. The findings indicate that comfort and safety are emphasized by users of all types of public open spaces. Additionally, their initial impression upon entering a space significantly influences their overall satisfaction with it. Besides, although individual background differences play a role, they are not sufficient to significantly influence the user's evaluation of the space. However, variations in the purpose of space use result in differences in user evaluations and needs, impacting their attitudes based on the type of space. Finally, urban regeneration design strategies are proposed for various types of public open spaces and users.

Keywords: Regenerative Design, Adaptive Design, Public Open Spaces, Space Perception, Space User

1. Introduction and Literature Review

Effective urban regeneration strategies are closely related to meeting the Sustainable Development Goals (SDGs) and combating climate change (Shen et al., 2020), including the economic, environmental, and social benefits of developing greener, more livable, equitable, and sustainable cities (Faisal et al., 2022). Public open space is critical in this pathway as it covers more than half of urban areas (Boeri et al., 2022). Public open space are freely accessible open spaces (e.g., urban parks, squares, green spaces, lanes, etc.) that are typically found in the city center (Madanipour, 1999). In today's cities, public open space is frequently aggravated by misuse, inadequate facilities, and incompetence because of design, management, and regulatory difficulties. Measures such as strengthening management, enhancing the environment, and boosting safety awareness are required to reduce risks and assure the safety, hygiene, and order of public open space (Shan et al., 2023).



To sufficiently evaluate the context and important impacting variables of the research topic, a review of the current literature was carried out with a special emphasis on two major subject areas: public open space, and urban regeneration. Therefore, the following keywords are used, representing the main search areas and scopes: (*public* AND open* AND space*) AND (*urban* AND (*regenerative* OR adaptive*) AND (design* OR strategy*)), using SCOPUS and Web of Science as search engines. The types of papers include research, review, and conference articles, with the observation period ranging from 2013 to 2023, and the language standard must be limited to English. The results in Figure 1(c) reflect the multidisciplinary and complex field of study, and the distribution over time, as shown in Figure 1(a), shows exponential growth over the last 5 years, implying that public open space has been considered a potential setting and major progress period for urban regeneration strategies. Interestingly, as indicated in Figure 1(b), China has conducted the most research in recent years (Byrne et al., 2015; Mao et al., 2023). The summarized topic clusters can be easily identified by textual semantic analysis, as shown in Figure 1(d), demonstrating the interaction between “public open space”, “users”, “planning” and “strategy” is the most relevant term for linkage relationships (Jayakody et al., 2018), because unlike the blind urban expansion of the past few decades in order to achieve rapid economic development, as citizens gain more rights to participate in the urban planning process (Buck et al., 2015; Dongre et al., 2021; Kapsalis et al., 2024), the subjective evaluation of the city by space users and their participation in planning practices becomes more important, and the site-specific data generated can reveal facts about the perception and experience of space by space users (Gruosso, 2021; Mariano et al., 2022). These fundamental assumptions imply that the most important thing is to identify the actual demands of present space users in the public open space to enable the implementation of urban regeneration methods that can realize their full potential more effectively and promptly (Inam, 2019; Petruskeviciute, 2019).

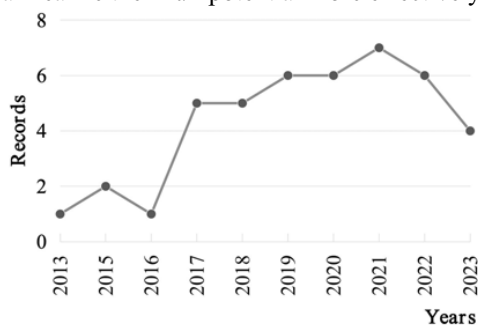


Figure 1(a). Time distribution of selected records.

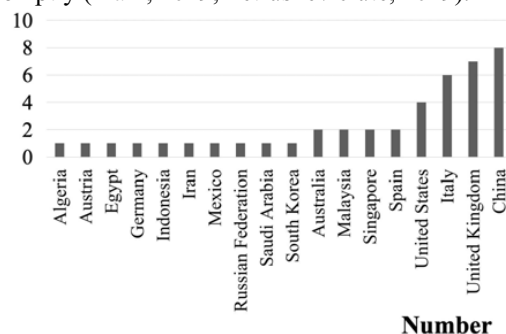


Figure 1(b). Top-ranking countries where selected records are published.

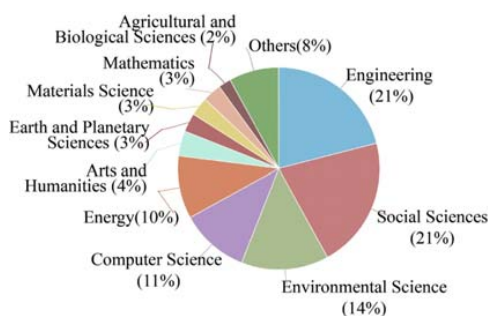


Figure 1(c). Research fields distribution of selected records.

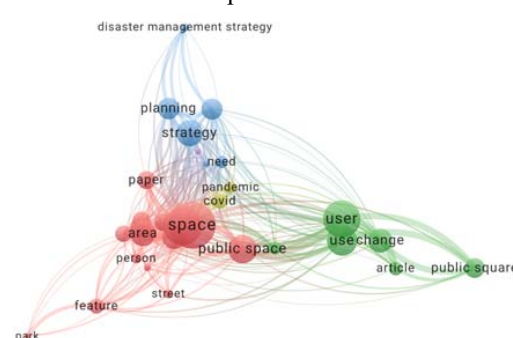


Figure 1(d). The co-occurrence of terms in the selected records, grouped by clusters.

Urban regeneration strategies in public open spaces are more focused on improving the city's quality and attractiveness (Jayakody et al., 2018), residents' quality of life (Boeri et al., 2022), promoting a

healthy and energetic lifestyle (Peng & Maing, 2021), enhancing community cohesion and social connection (Lovecchio et al., 2020), and so on, all of which have a significant impact on the city's long-term development and residents' quality of life by providing a positive spatial experience (Mao et al., 2023).

Thus, the goal of the study is to actively engage citizens in data collection and information generation with participatory methods (Schrenk et al., 2020), as well as to investigate users' attitudes and opinions toward public open space. This survey contributes to a better understanding of the complex relationship between spatial structure and user experiences and opinions, as well as how this approach can be used as an evidence-based design tool to regenerate public open space, which will help policymakers and stakeholders determine the direction of urban regeneration strategy implementation (Abdallah & Mahmoud, 2022; Ling, 2019). The study's specific aims were:

1. Investigate users' opinions and feelings toward public open spaces.
2. Determine users' willingness and preferences for public open space.
3. Check out how public open spaces influence users' daily actions.
4. Examine the key differences influencing users' individual cognition.

This will aid in determining the most efficient tools and incentives for policymakers and stakeholders.

2. Methodology

Within this framework, this research places particular emphasis on the positions of users in different types of public open space (Li et al., 2023), and the survey involves selected participants to extract and classify the impact of five different factors of personal background, location, safety, comfort, and richness by using the method of a geographical questionnaire, then quantify the results, finally analyze the key factors to identify the key regenerative design elements that need to be highlighted.

2.1. Case Area

As a pilot survey, Lhasa was chosen as the test site. As the capital of China's Tibet Autonomous Region on the Tibetan Plateau, Lhasa has become an invisible "magnetic field" in pilgrims' hearts, as has the hub of Tibetan Buddhism, like religious cities such as Rome, Mecca, and Jerusalem (Xiong et al., 2016). Lhasa's public open space has had an impact on the city's life and growth to some extent during the urbanization process, serving as a carrying area for some religious events (Wei & Wan, 2015). For example, Barkhor Street in the city center serves not only as a transportation, dwelling, living, and tourism center, but it is also a major turning point for Tibetan Buddhism and the site of many religious activities. The users of Lhasa's urban public open space are very diversified, including commuters, tourists, local residents, and prayer worshippers (Xiong et al., 2016).



Figure 2. A series of existing problems of public open space in Lhasa.

However, fast urbanization has brought great progress and prosperity to Lhasa, as well as several issues with public open space. On the one hand, most urban planning policymakers prioritize tourism, commercial growth, and the preservation of cultural heritage in traditional districts while failing to address the dynamic link between space and its users (Zhang & Wei, 2017). Modern public open space,

as an important area of urban social life, has undergone severe changes in material environment and function, as well as new space demand caused by modernization and changes in user living patterns (LUO, 2022). On the other hand, despite being one of the most popular outdoor areas in Lhasa, public open space lacks specific planning and design to offer meaningful direction for sustainable urban design; while extensive development and construction have produced a multitude of new architectural forms, the original purpose of the space has been lost (Ding et al., 2023), creating a subpar spatial experience (Figure. 2).

2.2. Data Collection Procedure

The data collection process was carried out from June 11 to 15, 2021, for a total of 5 days, including working and rest days, except for special holidays and emergencies. The types of public open spaces surveyed include traditional historical space, open street space, courtyard space, and modern commercial space (Figure 3). A total of 240 people participated, and they were asked to answer questions and make comments related to their location.



Figure 3 (a). Types of public open spaces for geographic survey.

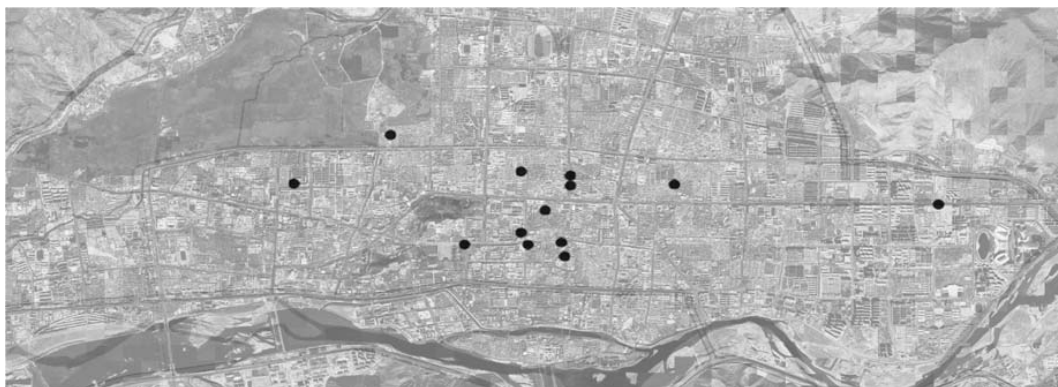


Figure 3 (b). Lhasa city map with geographical survey points.

The survey consists of twenty questions, which are divided into five sections, each of which investigates a specific aspect.

Part 1: Users' personal information, such as gender, age, ethnicity, and address, to better understand the user's background and individual differences.

Part 2: The initial assessments of users when they enter the public open space to measure the overall attitude of the users.

Part 3: Users' use situation of public open space: purpose, type, frequency, and duration of use to understand users' usage habits.

Part 4: Users' preferences for using public open space, including comfort, safety, and richness, to better understand the forms of information that have the greatest impact on users' behavior and cognition.

Part 5: Users' preferences and assessments of spatial elements, with a focus on users' propensity and willingness to change in urban regeneration design and strategy.

Finally, 221 valid surveys were collected, with a comprehensive effective rate of 92.08%.

3. Results

3.1. Background information about the participants

Figure 4 depicts the results, which include 110 male and 112 female participants. Most participants were young people (60%), followed by middle-aged people (22%), and the elderly (13%). The Han population had a slightly lower participation rate in the survey than the Tibetan population. The most residential addresses in Lhasa are 43%; 17% of the population lives in this neighborhood; and 24% of the users' residential addresses are from other cities in China. Interestingly, 9% of users from other countries also participated in the survey, ensuring the sample's comprehensiveness.

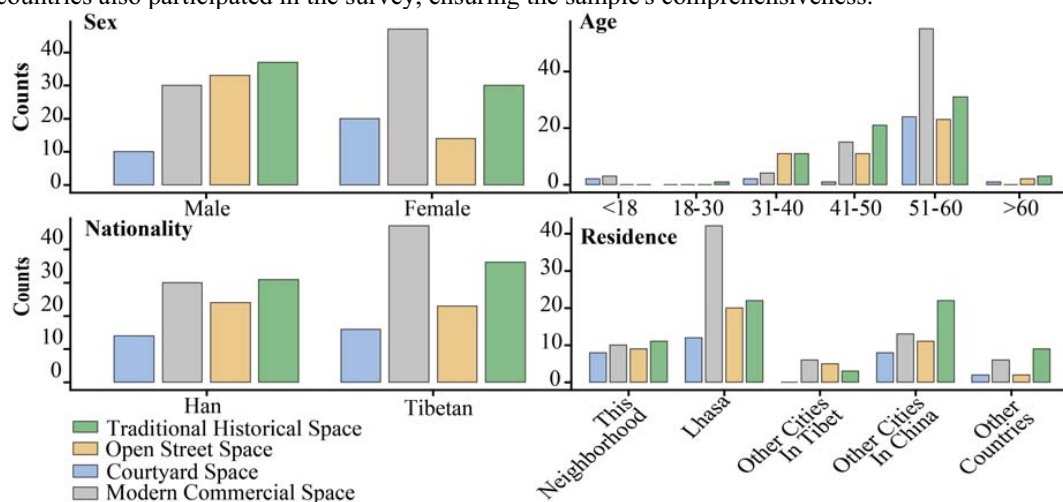


Figure 4. Background information about the participants.

3.2. Overall assessment

Figure 5 shows that, while most users' responses are positive, 5% of users keep performing to have a negative opinion. Among them, users with negative attitudes are mostly concentrated in open street space, 43% of users in traditional historical space are "very satisfied", followed by courtyard space.

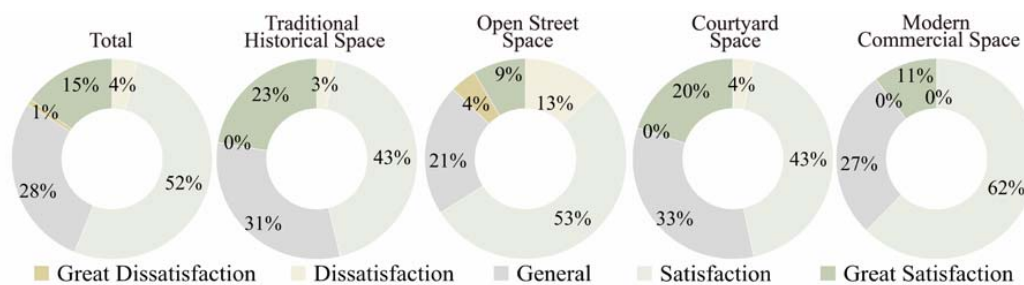


Figure 5. Overall assessment.

3.3. Use situation

As illustrated in Figure 6, 36% of users use the space rarely, while 23% and 21% use it every day or week. The most common use of space is for shopping or dining (38%), followed by tourism or passing

by (26%). The most preferred period was 1-2 hours (28%), and the shortest was long-term (6%). The period of use is primarily concentrated during the daytime, with the most time periods being 09:00-12:00 and 14:00-18:00, both accounting for 33%, and it is seldom used between 06:00-09:00.

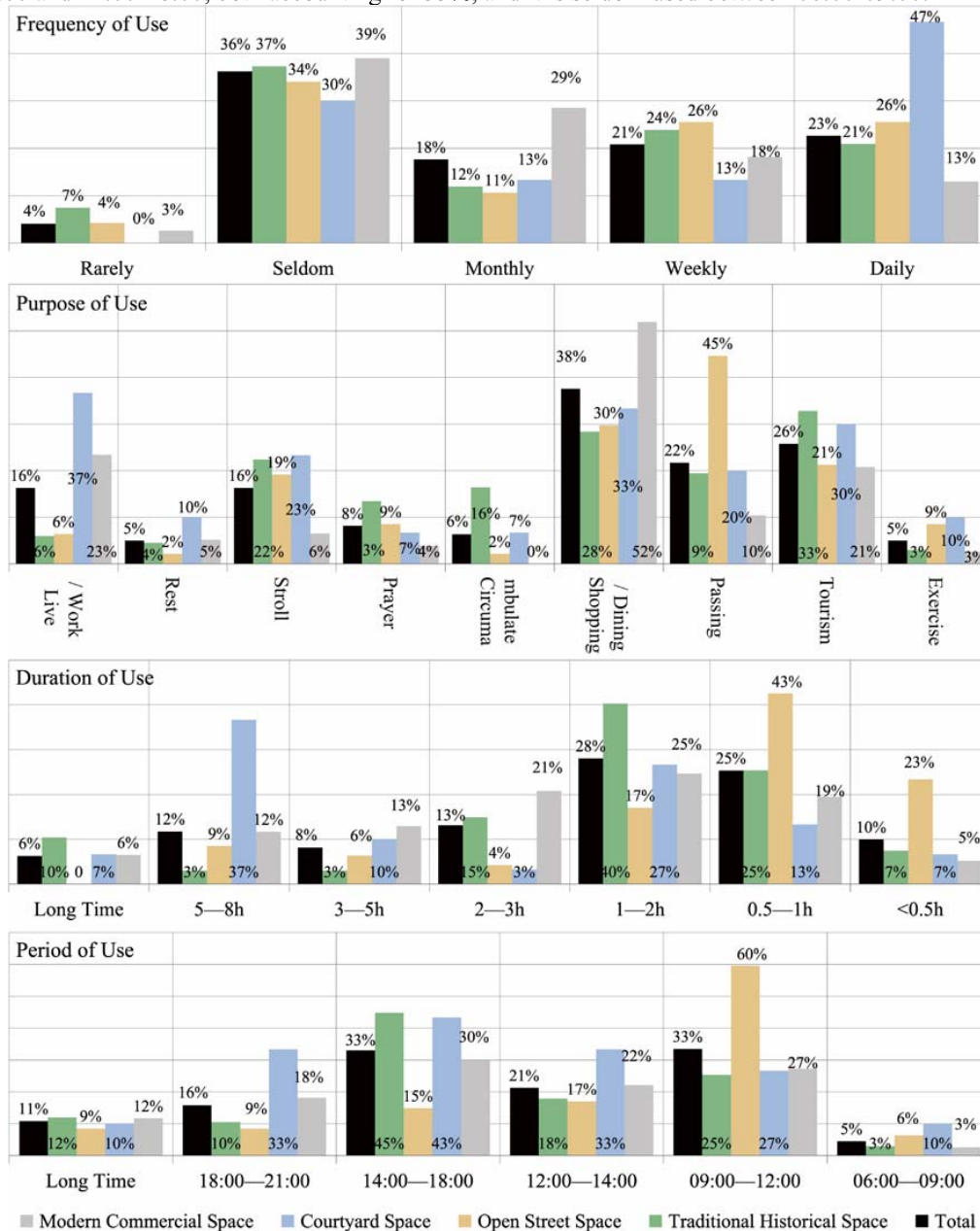


Figure 6. Use information.

3.4. Use preferences

As indicated in Figure 7, users are asked to score the space they are in for the evaluation of comfort, safety, and richness: "2", "1", "0", "-1", and "-2" equate to "great satisfaction", "satisfaction", "general",

"dissatisfaction" and "great dissatisfaction" respectively. For the evaluation of acceptable safety measures, the preference for the use of spatial elements, and the positive and negative evaluations, users can express their attitudes by selecting multiple options (Figure 8).

3.4.1. Comfort

Overall, more than 60% of users have a positive rating of the comfort of their space (cleanliness, public facilities, sense of direction, maintenance); about 30% are general, but 8% still have a negative attitude. Among them, the users who have a negative attitude toward cleanliness are basically located in open street space, while the positive evaluations are primarily distributed in courtyard space and modern commercial space. For public facilities, users with negative feedback are mostly concentrated in open street space (22%). Users with a substantially negative attitude toward sense of direction are primarily located in modern commercial space (11%), whereas users who are "great satisfaction" are primarily concentrated in courtyard space (27%). For maintenance, negative assessment is most used in open street space (15%), positive assessment is used in courtyard space and modern commercial space (73%).

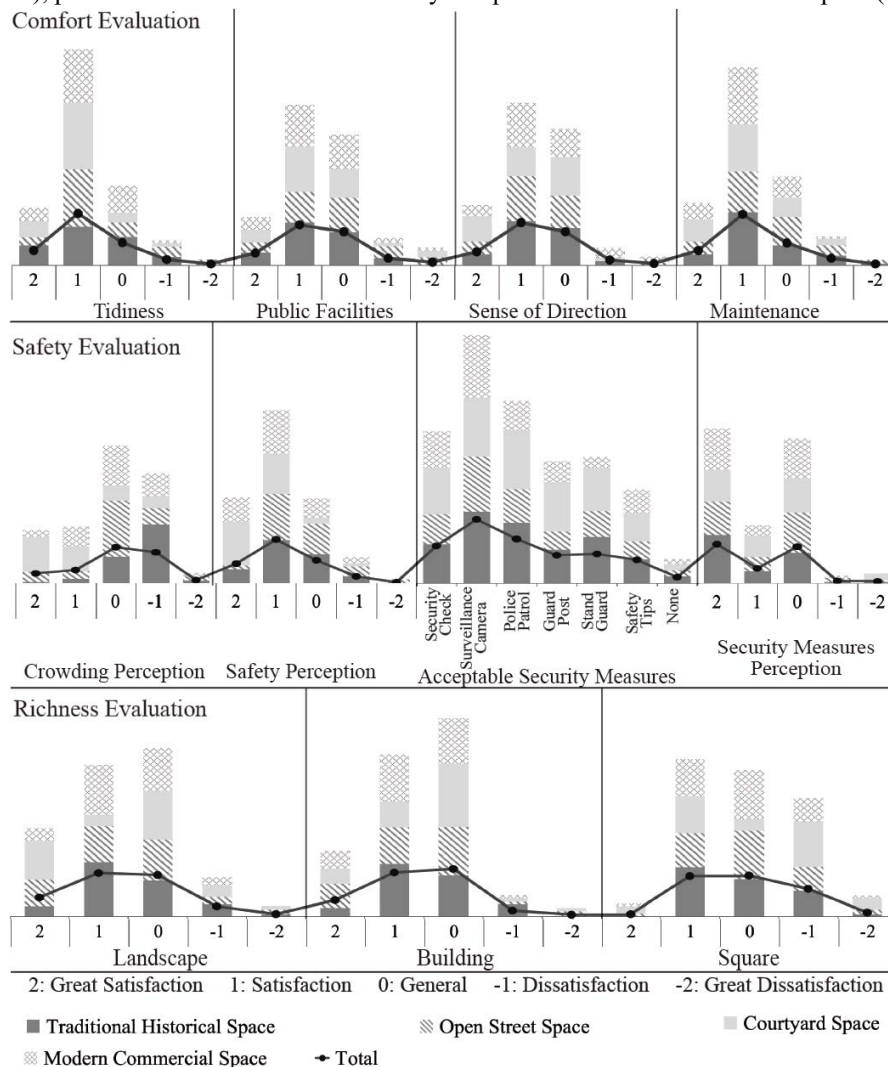


Figure 7. Use preferences.

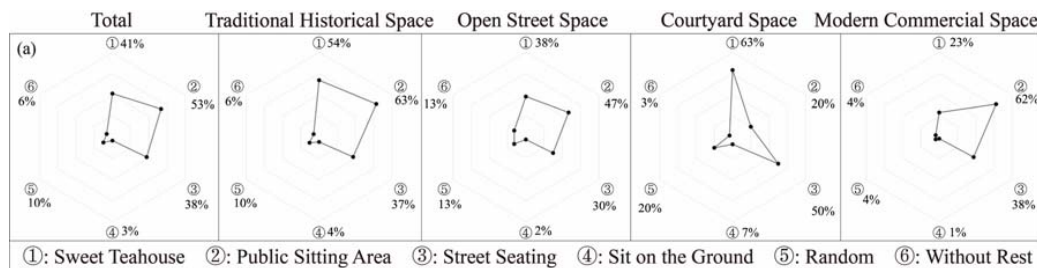


Figure 8 (a). Preference of space elements.

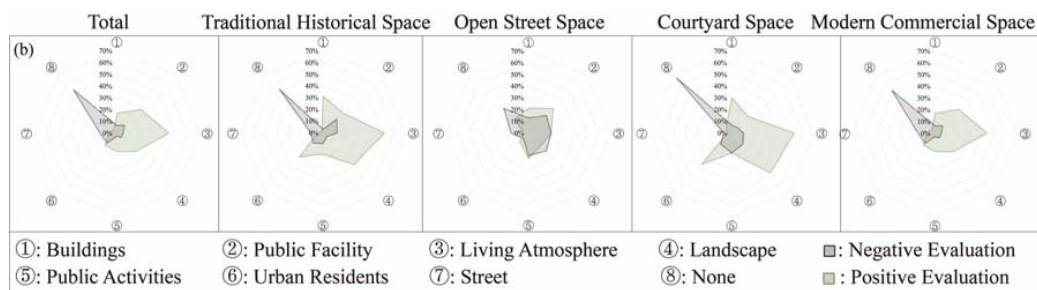


Figure 8 (b). Evaluation of space elements.

3.4.2. Safety

In terms of crowding perception, there were notable differences across different space types, with the majority having a general attitude (38%). However, it's important to note that the negative evaluation (36%) was still higher than the positive evaluation (24%); 67% of users expressed "dissatisfaction" in traditional historical space, indicating that over half of users felt crowded; positive evaluations were concentrated in courtyard space, where over 60% of users felt there was no sense of crowding.

In terms of safety perception, most users have a positive (68%) or "general" (24%), and only 8% have a negative perception of safety, with users who believe they are very unsafe being concentrated in the open street space (4%), and the positive evaluation of the courtyard space reaches 90%, implying that the vast majority of users believe the space is safe.

In terms of acceptable security measures, the top three acceptable security controls were surveillance cameras (68%), police patrols (47%), and security checks (40%). In terms of evaluating security measures, 58% of users had a positive attitude, which means "increased security," and only 2% of users had a negative attitude, which means "slightly uncomfortable" or "privacy violation." The users who felt "increased security" were the most in traditional historical space (51%), and 7% of users felt "privacy violated" in courtyard space.

3.4.3. Richness

For landscapes, users generally assess landscape richness is mostly positive (38%) or "general" (36%). Among them, most users who chose "great satisfaction" were concentrated in the courtyard space (33%), 48% of users chose "satisfaction" in traditional historical space. For buildings, occupants are mostly "general" (42%), or "satisfaction" (38%), with only 6% of the ratings negative. For the square, most users expressed "general" (36%) or "satisfaction" (35%), but some users still expressed "dissatisfaction" (24%) or "great dissatisfaction" (3%), among which the negative evaluation was mostly

concentrated in the courtyard space (50%), while the positive evaluation was mostly concentrated in the traditional historical space (43%).

3.4.4. Preference and evaluation of space elements

Figure 8 shows that the most popular space elements chosen by users are "public sitting area" (53%), "sweet teahouse" (41%), and "street seating" (38%). More than half of the users chose the "sweet teahouse" in the traditional historical and courtyard space, more than 60% chose to rest in the "street seating" in the modern commercial and traditional historical space, and most of the users who chose "sit on the ground" were distributed in the courtyard space (7%).

For the positive evaluation of space elements, overall, the two most popular elements chosen by users are "living atmosphere" (43%), "landscape environment" (29%). Among them, more than 50% of users choose "living atmosphere" in traditional historical space, while in open street space, users prefer to choose "public activities" and "public facilities." The users who chose the "landscape environment" and "urban residents" were in the courtyard space, whereas the users who chose the "road" element the most were in the modern commercial space.

In general, the most negative evaluation option for space elements was "none" (50%), however, 13% of users still chose "roads" or "public facilities". Among them, the users who chose "roads" and "public facilities" were the most distributed in the courtyard space, and the least in the open street space. While for the "buildings" and "landscape environment" the users of the open street space expressed more negative evaluations, only about 3% of the users made negative evaluations of these two elements in the traditional historical space.

4. Discussion

4.1. Nonlinear correlation and consistency test of indicators

The Spearman rank correlation coefficient is used to assess the nonlinear relationship and closeness between the user and all types of spatial cognition, and the results are shown in Figure 9 as a heat map, with the color shade representing the direction and intensity of the correlation and the text markers representing the correlation's specific value. The results are presented in the following formats: "Overall Satisfaction" , "Maintenance" , "Tidiness" , "Public Facilities" , "Sense of Direction" , "Safety Perception" , "Square" , "Landscape" , "Building" , "Purpose of Use" , "Period of Use" , "Acceptable Security Measures" and "Nationality" , their Spearman correlation values were all greater than 0.35, indicating that the above indicators were significantly related and may be utilized as analysis indicators for users to impact various types of spatial assessment.

4.2. Analysis of influencing factors

For all types of spaces, there are some significant common factors that affect users' perception and evaluation. (1) Overall satisfaction is the most essential factor. This means that, while there is a chance that users will develop new perceptions of space as a result of being asked to answer a series of evaluation questions about the space in which they are located throughout the geographical survey process, the user's initial overall rating of the space still heavily influences their attitude toward it. (2) Maintenance, tidiness, and public facilities, which can be collectively referred to as the comfort features of the space, have a strong positive correlation between the comfort of the space and the user's assessment of the space, indicating that the more pleasant the environment, including the facilities in the space, and the greater the level of maintenance and aesthetics, the more likely it is that users will be able to use and get around in the space. (3) followed by a sense of direction and safety perception, which largely represent the space's safety features. When users get into a space, a good sense of direction can make them more confident in dealing with risks, whereas some unsafe perception factors might restrict the user's access because they consider their own safety is not guaranteed.

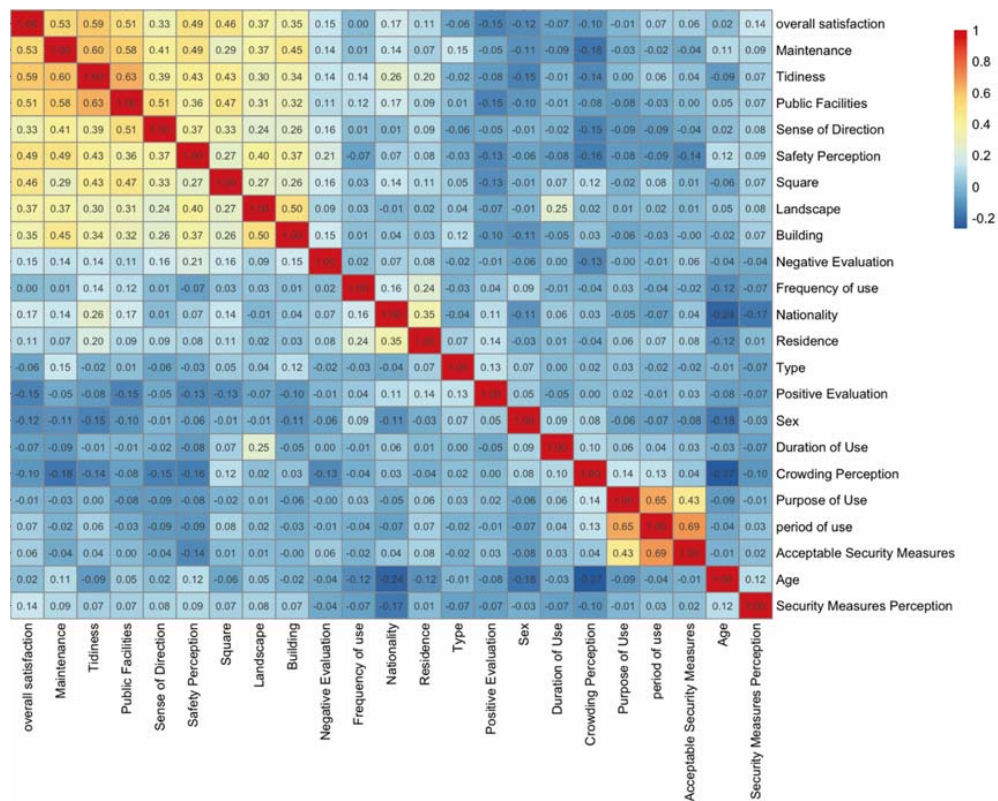


Figure 9. Spearman rank correlation coefficient test results of all types of space and user cognition.

Ordered logistic regression analysis was then used to examine the differences between users in different types of spaces, and the results are reported in Table 1.

Estimate reflects the estimated value of the threshold parameter. SE represents the standard error of the threshold parameter's estimated value. P-value shows that if the p-value is less than a predefined significance level (e.g., 0.05), the null hypothesis (i.e., the threshold parameter is zero) can be rejected and the threshold declared significant. Odds ratio is a ratio of the threshold parameter that illustrates the change in relative risk upon passing the threshold, with values greater than one indicating increased risk and values less than one suggesting decreased risk.

In traditional historical space, purpose of use, overall satisfaction, acceptable security measures and building will have a significant positive impact on users' perception and evaluation of space. One possible explanation is that since the main purpose of use of this type of space is tourism, circumambulate, and prayer, and the stay time is mostly 1-2 hours, users' first impression of the space when they enter impacts their overall satisfaction with it. Furthermore, as there are so many colorful traditional Tibetan buildings in this type of place, it serves a variety of user needs, including culture, tourism, trade, and religion. Therefore, in the process of designing regeneration strategies (Figure 10):

- As much as possible to meet the needs of different uses, to form a complex space function. For example, the Tibetan prayer passage is divided into times, on the morning of the 5th, 8th, 10th, 15th, and 30th of each month in the Tibetan calendar (LUO, 2022), there is a large-scale crowd of people turning around the prayer path, or when religious activities are held, the prayer path completely restores its religious function, but the prayer path generally exists as a traffic space during normal times. As a result, it is proposed that areas with narrow roads and low traffic flow be subjected to motor traffic control measures in the morning and during religious activities, and that daily traffic road use continue in the afternoon.

Table 1. Ordered logistic regression results.

Variable	Traditional Historical Space			Open Street Space			Courtyard Space			Modern Commercial Space						
	Estimate	SE	p-value	Odds ratio	Estimate	SE	p-value	Odds ratio	Estimate	SE	p-value	Odds ratio	Estimate	SE	p-value	Odds ratio
Nationality	0.557	0.501	0.267	1.745	0.191	0.614	0.755	1.211	0.328	0.688	0.633	1.389	-0.361	0.508	0.478	0.697
Purpose of Use	0.123	0.044	0.005***	1.131	0.131	0.068	0.055*	1.14	-0.153	0.084	0.068*	0.858	0.28	0.063	0.000***	1.324
period of use overall satisfaction	0.079	0.108	0.466	1.082	0.304	0.156	0.051*	1.356	0.017	0.1	0.862	1.018	0.131	0.107	0.219	1.14
Tidiness	0.714	0.252	0.005***	2.041	0.55	0.441	0.212	1.733	-0.55	0.363	0.13	0.577	0.726	0.351	0.039**	2.067
Public Facilities	0.178	0.246	0.469	1.195	0.329	0.446	0.461	1.389	-0.457	0.332	0.169	0.633	-0.237	0.284	0.405	0.789
Sense of Direction	0.153	0.263	0.56	1.166	0.401	0.354	0.257	0.669	0.13	0.227	0.566	1.139	0.825	0.317	0.009***	2.281
Maintenance	0.363	0.279	0.193	1.438	0.671	0.512	0.19	0.511	0.168	0.313	0.591	1.183	0.06	0.332	0.857	1.062
Safety Perception	-0.184	0.256	0.472	0.832	0.408	0.57	0.475	1.503	0.247	0.331	0.456	1.28	0.277	0.268	0.301	1.319
Acceptable Security Measures	-0.314	0.312	0.314	0.731	1.203	0.399	0.003***	0.3	-0.454	0.407	0.265	0.635	-0.03	0.206	0.885	0.971
Landscape	0.143	0.04	0.000***	1.153	0.398	0.085	0.000***	1.489	0.062	0.049	0.206	1.064	0.051	0.044	0.25	1.052
Building	-0.109	0.23	0.636	0.897	1.171	0.471	0.013**	3.225	0.337	0.339	0.32	1.401	1.183	0.362	0.001***	3.263
Square	0.457	0.269	0.089*	1.579	0.464	0.267	0.083*	0.629	-0.212	0.246	0.389	0.809	-0.631	0.403	0.117	0.532
	0.306	0.224	0.173	1.357	1.41	0.402	0.000***	4.095	0.536	0.262	0.041**	1.709	0.099	0.252	0.695	1.104

Note: Significance levels: * p < 0.10, ** p < 0.05, *** p < 0.01.



Figure 10. Regeneration strategies for traditional historical space.

- Furthermore, on the premise of respecting the inheritance of traditional culture (Algilani, 2020), the focus is on optimizing the architectural form; for some less continuous spaces, the internal roads and buildings along the road can be constructed through splicing to create a continuous space interface, such as the entrance steps of the building, as a unique social activity space (Zhang & Wei, 2017), which can be optimized through renovation to increase its attractiveness and promote social communication.
- In popular tourist sites such as Barkhor Street and Xiaozhao Temple, appropriately improving safety control measures, developing an intelligent management system, and standardizing public order can significantly improve users' perceptions of safety in the area.

In open street space, acceptable security measures, landscape, square, overall satisfaction, acceptable security measures, purpose of use, and period of use will have a significant positive impact on users' perception and evaluation of space. While safety perception and building have a significant negative impact, these findings indicate that users in this type of space emphasize safety and richness, and at the same time, a diverse group of people and activities can promote a positive perception of the space by boosting its vitality. Therefore, in the process of designing regeneration strategies (Figure 11):

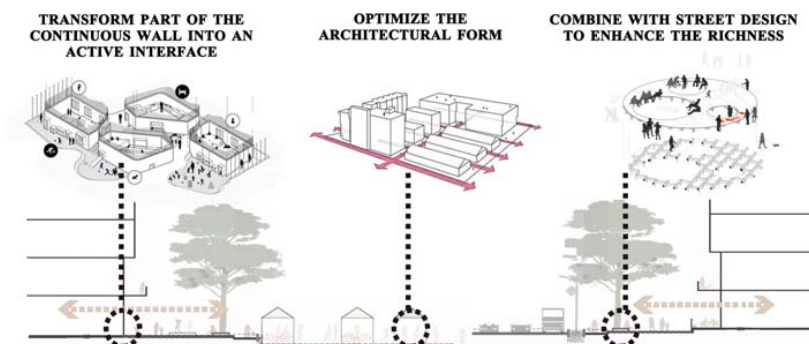


Figure 11. Regeneration strategies for open street space.

- In addition to adopting the design strategy of traditional historical space, to reduce the psychological discomfort caused by users' activities in the space, it is recommended to transform part of the continuous wall of the building into an active interface, for example, the gray space can be used to extend part of the space to the interior of the building to enrich the user experience (Shan et al., 2023).
- According to the above analysis, users are unconcerned about the form of the rest area, whether it is a public rest area, a staircase in front of the building, or a flower bed, any place where people can sit down and rest can meet their physiological and psychological needs, so in areas with adequate rest space, it can be combined with street design to enhance the richness of the space.



Figure 12. Regeneration strategies for courtyard space.

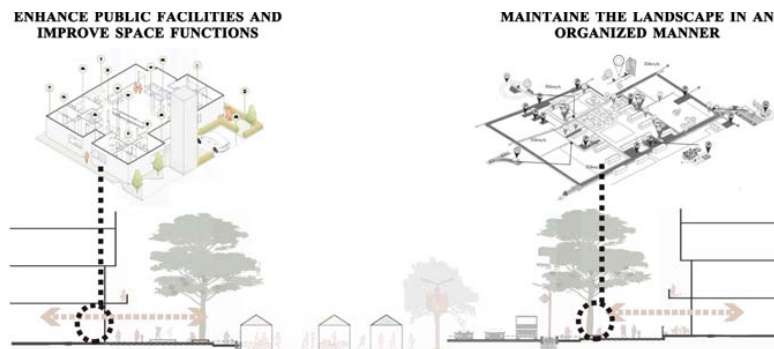


Figure 13. Regeneration strategies for modern commercial space.

In the courtyard space, square has a substantial positive impact on the user's impression and assessment of the space; however, however purpose of use has a significant negative impact. The results reveal that the square in the courtyard space represents the major feature in promoting space use (Gruosso, 2021), and users prefer a peaceful and uncomplicated use environment, the mixing of users may have a negative effect on space cognition. Therefore, in the process of designing regeneration strategies (Figure 12):

- Due to the influence of Tibetan living habits, users prefer to sit under the big trees and do rest activities at the steps of the square, so in the design of the urban space regeneration strategy, attention should be paid to improving the quality of the square in the space and increasing public activities and rest facilities to meet the needs of users.
- For the design and maintenance of a green landscape, the seasonal changes of plants should be considered, and part of the square green space should be reserved in each season to supplement the lack of space for users' activities (Palomo Amores et al., 2023). In the summer, the artificial shading facilities added to the square should focus on the functions of humidification, rain, and sunshade (Abdallah & Mahmoud, 2022), while in the winter, the square should focus on avoiding the shade of trees and the shading area of the building, resulting in an area without direct sunlight to reduce thermal comfort.
- Attention should also be paid to preventing the phenomenon of excessive concentration of activity facilities in some areas (Leng et al., 2020), which will occupy too much activity space and cause a sense of crowding and psychological discomfort.

In modern commercial space, purpose of use, overall satisfaction, public facilities, and landscape will have a significant positive impact on users' perception and evaluation of space. As a space with a clear purpose of use (mostly shopping and dining), the use period is 1-3 hours, and the first impression

of users entering the space impacts their overall satisfaction with the space. Therefore, in the process of designing regeneration strategies (Figure 13):

- Focus on enhancing public facilities, improving space functions (Mariano et al., 2022).
- Maintaining the landscape in an organized manner, then improving space comfort to attract user activities.

5. Conclusion

This study adds to the current literature by looking into users' perceptions and assessments of public open space, as well as their preferences and willingness to change. These findings highlight the crucial role of users' perceptions of space in urban public open spaces with religious contexts. Although the results vary slightly for different types of spaces, the results suggest that users of all kinds of spaces need a comfortable and safe environment and that their first impression of entering a space influences their overall contentment with the space. Furthermore, a good sense of direction can boost their confidence in dealing with dangers, and some dangerous perception variables may limit users' access since they consider they are not safe. However, the analysis results also show that in addition to the cultural customs of Tibetan people, which affect their choice of space elements to a certain extent, the differences in individual background, cultural customs, and ethnicity are not enough to completely affect the users' evaluation of space.

There are still subtle variances in users' attitudes toward different types of spaces, and associated elements may influence users' perceptions of space. For example, in traditional historical space, open street space, and modern commercial space, the more diverse the use purposes, the more users are encouraged to use the space, promoting their positive evaluation of the space; however, in the courtyard space, users prefer a quiet and simple space environment, so the diversity of use purposes may become a barrier to users' access to the space. In addition, in the more open spaces, such as traditional historical spaces and open street spaces, users pay more attention to their own safety, while in more closed courtyard spaces and modern commercial space, users prioritize the diversity of spatial functions and landscapes. Recognizing these differences is essential for a comprehensive understanding of the impact of urban open space on users, as well as providing guidance for the development of targeted urban regeneration strategies. It also emphasizes the importance of sustainable urban planning and proposes targeted design strategies to promote users' equitable access to space use rights while meeting the needs of all types of space users.

The above findings highlight that in future research and the development of urban regeneration strategies, it is not only the presence of public open space that must be carefully considered, but also the level of awareness of users, which should be considered accessible, safe, and appealing to maximize their full cultural, social, and economic functions. This is especially essential in cities with religious and cultural histories, such as Kathmandu, New Delhi, and Bangkok, because the development of religious activities has a significant impact on the purpose of using the space, the time, and the preference of users (Sengupta, 2023). As a result, understanding how public open space interacts with users is critical for equitable and effective urban regeneration design, and the findings of this study can help policymakers and urban regeneration strategies balance the greatest economic, functional, and health benefits with existing urban constraints.

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