

The Role of Urban Green Spaces Attributes in Enhancing Leisure Opportunities and Psychological Well-Being Among Older Residents

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Abstract

This study investigates how urban green space (UGS) attributes influence leisure opportunities and psychological well-being among older adults in Hong Kong. Using surveys (n=80) and interviews (n=25) conducted in Morse Park and Fung Tak Park, the research applies the Recreationist-Environment Fit (R-E Fit) model to assess the alignment between park features, older users' needs and psychological well-being. Quantitative findings indicate that accessibility, safety and maintenance significantly contribute to both perceived fit and emotional well-being. Qualitative results further underscore the importance of elderly-friendly facilities, shaded seating, and social functionality. Together, the findings highlight how well-designed UGS can meet both functional and affective needs, supporting active aging in high-density cities.

Keywords: urban green spaces, aging population, psychological well-being, leisure opportunities, Recreationist-Environment Fit

1. Introduction

The world is undergoing a significant demographic shift, with a rapidly increasing number of people entering older age. The United Nations (2023) projects this demographic – often termed the “urban aging” phenomenon due to its concentration in cities – to double by 2050, posing significant challenges for urban planners worldwide. Urban Green Spaces (UGS), such as parks, gardens, and greenways, have long been recognised for their potential to enhance the quality of life for urban residents. For older residents, these spaces are especially vital, often serving as primary venues for immediate recreational opportunities. Studies have long shown that access to green space is tied to better mental health, reduced stress, and sharper cognitive function (Kaplan and Kaplan, 1989). Physical activity in green settings can ease fatigue and lift mood (Bowler et al., 2010; Coon et al., 2011). These spaces are also places of encounter, which help ease loneliness and build a sense of belonging (Jennings and Bamkole, 2019).

Mirroring global trends, Hong Kong is grappling with the implications of a rapidly aging society. Projections from the Census and Statistics Department (2023b) indicate that by 2046, more than one-third of the city's population will be aged 65 or above. This demographic shift brings with it greater demand for healthcare and social services, as well as a need to rethink how public spaces can support later life. Despite the growing body of research on urban green spaces and aging populations globally (Tzoulas et al., 2007; Lee and Maheswaran, 2010; Artmann et al., 2017; Xu, Nordin and Aini, 2022), there remains a critical void in understanding how elderly residents in Hong Kong specifically perceive and utilise these spaces for leisure and well-being. An urgent need exists for a thorough and structured examination of their preferences, limitations, and ways they interact with these environments.

This study focuses on two parks in the Wong Tai Sin district: Fung Tak Park and Morse Park, aiming to address the gap by exploring how urban green space attributes influence the leisure opportunities and well-being of elderly residents. The objectives are threefold:

1. To assess how specific park features relate to physical activity, mental health, and social engagement among older adults.
2. To compare user preferences and usage patterns between the two parks, highlighting both shared needs and site-specific distinctions.
3. To provide evidence-based recommendations for improving the design and management of UGS in high-density urban settings, with a view to supporting aging-in-place and promoting health equity in the context of rapid urban demographic change.

This study is expected to make several contributions to the field of urban planning and gerontology. First, it provides empirical insights into the UGS attributes most valued by elderly residents in a unique high-density context like Hong Kong, informing the design and management of future green spaces to better serve an aging population. Second, the study contributes to the broader understanding of the relationship between urban green spaces, leisure opportunities and well-being among older adults, particularly in the context of a rapidly urbanising and aging society. Finally, the findings offer practical recommendations for policymakers, urban planners, and park managers to create more age-friendly environments that promote active aging and improve the quality of life for older residents.

2. Literature Review

Urbanisation has led to an increasing number of people living in urban environments. By 2014, 54% of the global population lived in urban areas, and this proportion is projected to rise to 66% by 2050 (United Nations, 2014). While urban areas offer many advantages, they also present unique challenges for the psychological well-being of elderly populations. Research has identified several key psychological challenges faced by older adults in urban settings. Among the elderly population, loneliness and social isolation are common issues, with approximately one in four older individuals experiencing social isolation (World Health Organisation, 2021). Major life transitions, such as retirement, illness, the death of a spouse or close friends, can drastically weaken an individual's social network (Nicolaisen and Thorsen, 2016). These events are not merely emotional turning points; they carry long-term health implications. Studies have linked social isolation in later life to a higher risk of cardiovascular disease, depression, and cognitive impairment (National Institute on Aging, 2024).

UGS have become an essential component in addressing the psychological challenges commonly experienced by aging populations. For older adults, psychological well-being is shaped by multiple, interrelated factors—social support, meaningful engagement, and exposure to restorative environments all play a role (Huxhold et al., 2013; Tung et al., 2022; Li et al., 2025). Among the theoretical frameworks that illuminate these restorative processes, two remain foundational: Kaplan's Attention Restoration Theory (ART) and Ulrich's Stress Reduction Theory (SRT). Each offers a distinct lens: ART from a cognitive perspective ; SRT from an affective one. Together, they explain how natural landscapes support mental recovery and emotional balance. Physiologically, exposure to natural environments has been shown to reduce stress responses such as elevated blood pressure and cortisol levels (Ulrich et al., 1991). Psychologically, it alleviates attention fatigue by allowing the brain's directed attention system to rest, while simultaneously fostering a sense of calm and positive affect (Kaplan and Kaplan, 1989).

Importantly, the benefits of UGS extend beyond the psychological. Access to green spaces promotes physical activity, supports informal leisure, and facilitates social encounters. Physically, green spaces provide essential opportunities for walking, jogging, and other exercises, and engaging in such green exercise offers numerous well-being benefits and has been proven through various studies to positively impact both mental and physical health (Pretty et al., 2005; Lahart et al., 2019; Aristi Tsokani et al., 2024). Specifically, green exercise can reduce negative emotions such as anxiety, tension, anger, depression, and fatigue, while also enhancing positive moods and feelings like vigor, comfort, a sense of connection with nature, and relaxation (Li et al., 2022). These spaces also provide opportunities for relaxation, socialising, and participating in recreational activities, which can effectively reduce stress and depressive symptoms while promoting feelings of happiness in later life (Godbey, 1981; Coleman and Iso-Ahola, 1993).

Findings indicate that leisure activities serve as a bridge connecting social relationships and health outcomes among older adults (Chang et al., 2014). Importantly, social connections and relationships are vital for the life satisfaction of older individuals (Chokkanathan and Mohanty, 2017). In particular, engaging in leisure activities fosters involvement, instills purpose, and helps individuals derive meaning from everyday experiences (Yen et al., 2023). Parks, gardens, and other shared green areas serve as informal yet essential sites for interaction among older adults; provide opportunities for community participation, encourage regular contact with peers, and mitigate the risks of social isolation and loneliness (Villeneuve et al., 2023). Scholarly investigations have reliably indicated that senior citizens living in more verdant residential areas are inclined to express more robust social

bonds and lower degrees of loneliness (Maas et al., 2009; Teig et al., 2009). When considered collectively, these outcomes highlight the multifarious benefits of UGS for the well-being of the older adults.

2.3 Theoretical Framework

Person-environment fit (P-E fit) is a foundational concept that is extensively utilised in the field of organizational management. It explains the relationship between individuals and their surrounding environment. A high level of P-E fit is associated with positive outcomes for individuals (Kristof, 1996). Extending this concept to the leisure and recreational domain, Tsaor, Liang, and Lin (2012) pioneered the Recreationist-Environment Fit (R-E Fit) framework. They highlight three distinct types of fit: (1) Supplementary fit refers to the compatibility that arises when recreationists and administrators hold similar values; (2) Demand-Ability fit occurs when the demands of the environment align with the abilities of the recreationists; and (3) Need-Supply fit is achieved when the environment can meet the needs of the recreationists. In the context of parks discussed in this article, the need-supply fit is being assessed. It is achieved when the park environment can meet the needs of the recreationists.

In order to better understand how parks can achieve this need-supply fit, it is essential to examine the attributes of recreational settings that contribute to the overall experience of visitors. Noe and Uysal (1997) introduced a dual-dimensional lens for understanding recreational spaces: instrumental and expressive attributes. In urban parks, instrumental attributes refer to concrete and functional, including elements, such as birdsong, artificial water features, and cultivated vegetation, that create a calming atmosphere conducive to rest and relaxation. Functional infrastructure, for instance, benches, restrooms, and sports equipment, further enhances usability by facilitating physical activity and prolonged stays. Collectively, these features provide the physical conditions through which visitors can achieve specific recreational goals.

Expressive attributes, on the other hand, relate to social interaction and psychological well-being. Parks act as informal social arenas where visitors engage in casual conversations or form spontaneous bonds. As for psychological dimensions, parks allow individuals to temporarily disconnect from daily stressors and reconnect with a slower, more reflective pace of life. In doing so, they promote emotional regulation and mental clarity. A well-functioning park, therefore, is not defined solely by its physical structure but by its capacity to offer a needs-supplies fit. When instrumental and expressive attributes align with users' expectations and preferences, the park becomes more than a physical space.

3. Research Design

This study employs a comparative case study approach to examine how the quality of urban green spaces influences leisure opportunities and psychological well-being among older adults. The research is conducted in Wong Tai Sin District, which has a population of approximately 425,235 as of 2023, comprising 5.4% of Hong Kong's total population (Social Welfare Department, 2021). According to the latest census, 24.5% of the district's population is aged 65 or above, higher than the Hong Kong average of 21% (Census and Statistics Department, 2024). Given its significant elderly population, the district provides an ideal setting for this investigation. The results can function as an essential reference for developing age-friendly communities in other areas.

Two sites in the district were selected: Fung Tak Park and Morse Park. Fung Tak Park, located near a dense residential cluster and historical sites, is a mid-sized park known for its Journey to the West-themed cultural design. Morse Park, in contrast, is one of Kowloon's largest public parks, offering a variety of sports and recreational facilities and broader open spaces. This contrast offers an opportunity to explore how different configurations of park attributes affect user experiences.



Figure 1. Different areas in Fung Tak Park: (a) chess area, (b) exercise zone I, (c) exercise zone II, and (d) a map of the park



Figure 2. Different areas in Morse Park: (e) walking path, (f) seating area, (g) jogging track, and (h) a map of the park

Semi-structured interviews were conducted to explore elderly park users' subjective perceptions of park attributes, whether the park fits their needs and their relation to emotional and psychological well-being. Participants were selected based on the following criteria: (1) aged 65 or above, (2) regular users of either Fung Tak Park or Morse Park (at least once per week), and (3) cognitively able to communicate and provide consent. A total of 25 interviews were conducted, with 13 in Fung Tak Park and 12 in Morse Park. Each interview lasted approximately half an hour and was guided by open-ended questions covering themes such as tranquility, spatial comfort, social interaction, and facility adequacy.

A structured questionnaire was developed to quantitatively measure perceptions of park quality, whether the park fits surveyees' needs and its relationship with leisure opportunities and psychological well-being. Psychological well-being was measured using the validated WHO-5 Well-Being Index (Appendix I) and two questions related to social aspects. The survey was distributed via face-to-face paper forms and was assisted with filling out at both parks in May 2025, targeting elderly users who consented to participate. A total of 80 valid responses were collected through convenience sampling, with an equal distribution between genders: 50% male (n=40) and 50% female (n=40). This balanced gender representation supports the reliability of findings and ensures perspectives from both genders are equally reflected in the analysis.

Interview data were transcribed verbatim, translated from Chinese to English and analysed using thematic analysis. Themes were inductively generated and then categorised under the R-E Fit theory, focusing on how the compatibility between an individual's recreational preferences and environmental characteristics influences their internal states and psychological outcomes.

Survey data were analysed using SPSS. Descriptive statistics summarised demographic profiles and key variables. Independent-samples T-tests compared perceived park quality and well-being scores between Fung Tak Park and Morse Park users. Pearson correlation assessed the relationships between park attributes, R-E Fit and well-being indicators. Where applicable, multiple regression analysis was employed to identify the influence of park attributes and FIT on emotional outcomes.

4. Results

4.1 Demographic information and Usage pattern

Table 1 provides demographic information of respondents from Morse Park and Fung Tak Park. In terms of gender, the respondents are evenly split between male and female, with each group comprising 40 individuals (50% each). The age distribution reveals that the largest group is aged 70-79 years (43.8%), followed by those aged 80-89 years (32.5%), while respondents aged 65-69 years make up 20.0% and those aged 90 years and above account for 3.8%. Regarding living arrangements, 63.8% of respondents live with family, 28.8% live alone, and 7.5% have other living arrangements. In terms of self-rated health status, 43.8% of respondents rate their health as "Fair," 35.0% as "Good," while only 3.8% rate it as "Excellent" and 17.5% as "Poor." Overall, the data highlights a balanced gender distribution, a predominantly older age group, a majority living with family, and a general perception of moderate health status among the respondents. However, the two parks show little difference in the above aspects.

Table 1 Demographic information of the respondents

Characteristics	Group	Morse Park(N=40)	Fung Tak Park(N=40)	Total(N=80)	Percentage (%)
Gender	Male	20	20	40	50.00
	Female	20	20	40	50.00
Age	65-69	10	6	16	20.00
	70-79	17	18	35	43.80
	80-89	11	15	26	32.50
	>=90	2	1	3	3.80
Living Arrangement	Living alone	12	11	23	28.80
	With family	27	24	51	63.80
	Others	1	5	6	7.50
Self-rated Health Status	Excellent	1	2	3	3.80
	Good	16	12	28	35.00
	Fair	16	19	35	43.75
	Poor	7	7	14	17.50

Table 2 presents the usage patterns of respondents regarding Morse Park and Fung Tak Park. In terms of visit frequency, the most common category is "Very Often (every day or more than 6 times)," accounting for 30.0% of respondents, followed by "Often (5-6 times a week)" at 28.8%. Regarding the duration of stay, the majority of respondents stay for "one to three hours" (55.0%), followed by "four to six hours" (36.3%). In terms of usual activities, "Walking" and "Chatting" are the most popular, each accounting for 21.8% of respondents. "Sitting and resting" is also common at 24.2%, while "Exercise" accounts for 16.1%, "Playing chess/cards" for 8.9%, and "Others" for 7.3%. Overall, the data indicates high visit frequency, longer durations of stay, and a diverse range of activities among park users.

Table 2 Usage pattern of the respondents

Question	Option	Morse Park (N=40)	Fung Tak Park (N=40)	Total (N=80)	Percentage(%)
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Average Visits per Week	Rarely (1–2 times a week)	4	6	10	12.50%
	Sometimes (3–4 times a week)	8	14	22	27.50%
	Often (5–6 times a week)	14	10	23	28.80%
	Very Often (every day or more than 6 times)	14	10	24	30.00%
Average Duration of Stay	Less than 1 hour	1	1	2	2.50%
	one to three hours	23	21	44	55.00%
	four to six hours	13	16	29	36.30%
	six hours above	3	2	5	6.30%
Usual Activities(multiple choice)	Walking	15	12	27	21.80%
	Exercise	10	10	20	16.10%
	Sitting and resting	14	16	30	24.20%
	Chatting	13	14	27	21.80%
	Playing chess/cards	4	7	11	8.90%
	Others	9	0	9	7.30%

4.2 Descriptive statistics

By conducting descriptive statistical analysis on the data from Table 3, we found that sense of fit has an average score of 3.94, accessibility is 4.19, safety is 4.00, maintenance is 3.81, WHO-1 is 4.15, and WHO-2 is 3.99. These figures indicate that both parks perform well in several aspects, including environmental fit, accessibility, safety, maintenance, and thus, leading to high well-being scores, all of which show positive evaluations.

Table 3 Descriptive statistics of park attributes, sense of fit, and psychological well-being

Variable	Measurement Item	Morse Park		Fung Tak Park		Overall	
		Mean	SD	Mean	SD	Mean	SD
Park attributes	Accessibility	4.25	0.54	4.13	0.52	4.19	0.53
	Safety	3.90	0.59	4.10	0.59	4.00	0.59
	Maintenance	3.83	0.75	3.80	0.65	3.81	0.70
	Landscapes	3.65	0.74	3.65	0.74	3.65	0.74
	Sound	3.55	0.71	3.60	0.81	3.58	0.76
	Smells	3.45	0.68	3.58	0.81	3.51	0.75
	Seating arrangements	3.88	0.40	3.48	0.78	3.68	0.59
	Shading	3.33	0.89	3.60	0.84	3.46	0.86
	Elderly-friendly facilities	3.68	0.80	3.58	1.01	3.63	0.90
Sense of fit	Facility fit	3.60	0.81	3.48	0.88	3.54	0.84
	Environment fit	4.00	0.45	3.88	0.76	3.94	0.61
	WHO-1	4.28	0.51	4.03	0.70	4.15	0.60
Psychological well-being	WHO-2	4.08	0.66	3.90	0.63	3.99	0.64
	WHO-3	3.63	0.77	3.60	0.63	3.61	0.70
	WHO-4	3.40	0.78	3.33	0.73	3.36	0.75
	WHO-5	3.30	0.79	3.33	0.89	3.31	0.84
	Feeling connected with people	3.73	0.82	3.70	0.88	3.71	0.85
	Feeling less lonely	3.85	0.70	4.05	0.68	3.95	0.69

As shown in Table 4, the correlation analysis in Morse Park significant positive relationships: specifically, between park attributes and participants perceived FIT ($r = .547, p < .001$), as well as between park attributes and Psychological well-being ($r = .467, p = .002$). These findings suggest that improved park attributes are associated with both a stronger sense of fit and enhanced emotional experiences for users. Additionally, there was a significant positive correlation between perceived FIT and Psychological well-being ($r = .378, p = .016$).

For Fung Tak Park, Table 4 indicates that although the correlation between park attributes and Psychological well-being was not significant, there was a significant positive correlation between perceived FIT and Psychological well-being ($r = .521, p < .001$). A strong positive correlation was also observed between park attributes and perceived FIT ($r = .705, p < .001$). These findings indicate that park attributes and perceived FIT may positively influence visitors' Psychological well-being, with potential variations between the two parks.

Table 4 Correlation analysis results

	Morse Park(N=40)			Fung Tak Park(N=40)		
	P a r k attributes	Sense of fit	Psychological well-being	P a r k attributes	Sense of fit	Psychological well-being
Park attributes	--			--		
Sense of fit	.547**	--		0.214	--	
Psychological well-being	.467**	.378*	--	.705**	.521**	--

Notes: ** indicates significance at the 0.01 level; * indicates significance at the 0.05 level.

In Morse Park, regression analysis demonstrates, park attributes ($B=0.434, p=0.037$) positively predict emotional outcomes; however, after controlling for the influence of park attributes, the independent predictive effect of sense of fit on psychological well-being was no longer significant ($B=0.157, p=0.314$). The regression model has explanatory power ($R^2=0.240$, adjusted $R^2=0.198$, $F=5.827$). This outcome may suggest that the positive impact of park attributes on psychological well-being might largely encompass the explanatory power otherwise provided by sense of fit. This does not negate the intrinsic link between sense of fit and psychological well-being; rather, it suggests that in the specific context of Morse Park, improvements in the park's physical and functional attributes may largely suffice in promoting users' psychological well-being, with sense of fit not demonstrating additional independent contribution within this particular model.

Table 5 Regression analysis results in Morse Park sample

	B (Unstandardised)	Standard Error	β	t	Sig. (p)
(Constant)	1.540	0.651		2.366	0.023
Park attributes	0.434	0.200	0.371	2.168	0.037*
Sense of fit	0.157	0.153	0.175	1.021	0.314
R^2	0.240				
Adjusted R^2	0.198				
F	5.827*				

Notes: *** indicates significance at the 0.001 level; ** indicates significance at the 0.01 level; * indicates significance at the 0.05 level. The dependent variable is Psychological well-being.

In Fung Tak Park, regression analysis demonstrates, park attributes ($B=0.551, p<.001$) positively predict psychological well-being; sense of fit ($B=0.254, p<.001$) also significantly predicts psychological well-being. The regression model has strong explanatory power ($R^2=0.641$, adjusted $R^2=0.622$, $F=33.042$).

Table 6 Regression analysis results in Fung Tak Park sample

	B (Unstandardised)	Standard Error	β	t	Sig. (p)
(Constant)	0.722	0.370		1.953	0.058
Park attributes	0.551	0.089	0.622	6.172	<.001**
Sense of fit	0.254	0.066	0.388	3.850	<.001**
R ²	0.641				
Adjusted R ²	0.622				
F	33.042***				

Notes: *** indicates significance at the 0.001 level; ** indicates significance at the 0.01 level; * indicates significance at the 0.05 level. The dependent variable is Psychological well-being.

4.3 Interview interpretation

Unlike the quantitative questionnaire analysis described above, the interview provides more in-depth and rich data that can be used to complement a comprehensive picture of the impact of urban green spaces-parks on the psychological well-being of older residents. The study sites for the interview data remained Morse Park and Fung Tak Park, with a total of 25 older adults interviewed: 12 respondents in Morse Park and 13 in Fung Tak Park. Code A represents Fung Tak Park and Code B represents Morse Park. The data were translated from Cantonese to English. The corpus information was organised and thematically analysed. The results of the analysis were categorised into the following themes: (1) inadequate maintenance and lack of elderly-oriented facilities undermine park usability; (2) park facilities enable social connectivity; and (3) thermal comfort is a prerequisite for park usages. In addition, recommendations for improvement were made from the perspective of older adults.

Theme 1: Inadequate Maintenance and Lack of Elderly-Oriented Facilities Undermine Park Usability

Limitations were frequently noted in both parks. Some respondents criticised the cleanliness of surfaces (B3), insufficient toilets (B2, A11), and lack of elderly-specific facilities (B6, A7). Participants also mentioned long-standing maintenance issues such as unrepaired equipment (B5) and broken amenities (B8). The lack of diversity in facilities was especially apparent when comparing the studied park with others, as B6 mentioned "The place is big enough, but the facilities for the elderly are insufficient and very monotonous, not as diverse as Kowloon Tsai Park. This Park has not been improved for decades and only has some scattered facilities."

Respondents called for more fitness equipment (B7, A7), soft mats to prevent injuries (A7, A8), and designated activity areas like chess zones (A6).

Theme 2: Park Facilities Enable Social Connectivity

Several respondents described facilities as both functional and socially enabling. For instance, "I come here to exercise, there is a companion to accompany me and chat." (B8)

"I come here to exercise, ride an exercise bike, and breathe fresh air. Sometimes I chat with friends, sometimes we play together, do exercise together, and it's very happy. (B9)

"I feel happy when I come to the park. I find a seat and chat with old friends. I sit here (in the fitness area), other people see me and chat with me, and then they go to do exercise while I continue to sit here. Chatting with people is relaxing. Before other elderly folks come, I look around. When there is no one to chat with, I automatically doze off. If there are some acquaintances, I chat. Some elderly people are too lonely and there is no one to chat with at home." (A8)

Parks played a crucial role in supporting both solitude and sociability. Participants valued the park as a space where they could choose between interacting or being alone.

"It's not good to be with others all day, and it's not good to be alone. Sometimes I chat, sometimes I watch others play chess, and when I feel bored, I sit down and walk. So this park allows you to choose different social activities. Sometimes you like to be alone, and sometimes you chat with others and watch others play chess." (B2)

"In this park, I found some acquaintances to chat with. Lonely old people are like this. Walking and sitting, and then chatting. If I need to sit, there is a bench. If I like to walk, I will keep walking. If I like to find someone to chat with, I will find someone to chat with." (A1)

Seating areas enabled casual interaction, and inadequate bench availability was cited as a barrier to social exchange. Some respondents suggested enhancements that would increase the social functionality of parks.

"There are not enough benches when needed, like now, which affects chatting and communicating with people." (A5)

"It would be best if there were a bench, two more benches, and a few more tables and benches inside, so that the elderly can sit and chat. The most important thing here is to have a roof over our heads. It would be best if there were some sports equipment for the elderly too." (A12)

These features were seen not just as amenities but as means to anchor social connection in the everyday lives of older adults.

Theme 3: Thermal Comfort is a Prerequisite for Park Usages

Participants consistently emphasised the importance of thermal comfort when using park spaces. For instance,

"There are many shaded areas with trees, so it's not too hot or too shiny." (B2)

"If the sun is too hot, then I can go to a shaded place. There are trees all around." (B3)

"Now the trees are bare and cannot cover the sun. Earlier, the storm knocked down the trees, which were not replanted. We, of course, want the trees to be denser and to provide more shade." (B5)

"I stay in the pavilion when it's sunny and go outside to enjoy the sun when it's cold." (A11)

A6 proposed adding electric fans to improve airflow during hot weather, while A12 underscored the need for "a roof over our heads" to avoid direct sun exposure.

5. Discussions and Conclusions

The psychological well-being of the elderly population is a paramount concern in the context of urban development. This study investigates how the quality of urban green spaces influences elderly residents' sense of fit, thereby enhancing their leisure opportunities and psychological well-being.

Initial analyses of demographic characteristics and usage patterns in Morse Park and Fung Tak Park revealed a sticking consistency between both sites, with minimal variation in gender ratios, age groups, living situations, and self-assessed health showed. The high frequency of park visits (at least five to six times per week) and typical stays (one to three hours) underscore the embedded role of UGS in the daily lives of older adults in Hong Kong. Preferred activities, consistently identified as walking and casual social interactions with peers, further reinforce the centrality of parks as vital spaces for both recreation and informal social engagement among older urban residents, re-underscoring their importance as accessible community hubs in high-density urban settings.

Regarding the general park environment, both sites were rated highly for accessibility and safety, with maintenance and seating arrangements also garnered positive feedback. These elements are instrumental

in shaping perceived usability. As Sugiyama et al. (2010) argue, the psychological well-being of older adults is positively correlated with their perceptions of safety and the functional quality of neighborhood green spaces. Design features such as unobstructed sightlines, well-maintained walking paths, and visible staff presence can significantly reduce environmental anxiety, fostering a sense of autonomy and control beyond mere hedonic comfort. In the case of Fung Tak Park and Morse Park, regular maintenance by the Leisure and Cultural Services Department (LCSD) ensures cleanliness and functionality, contributing to consistently high ratings for environmental quality. Benches are strategically placed along pathways and within shaded zones, providing frequent opportunities for rest and enabling longer, more comfortable visits. Accessibility is another key strength. Because the parks are located within residential neighborhoods and offer several entrances, elderly residents can easily reach and enjoy these green spaces. This aligns with Hong Kong's urban planning principles that prioritise accessibility in residential zones (Planning Department HKSAR, n.d.). Well-lit environments and on-site management, combined with even, obstacle-free paths in both parks, help minimise fall risks, which is crucial for older park-goers. These findings collectively highlight the fundamental importance of well-maintained, safe, and accessible UGS as a baseline requirement for promoting older adults' well-being, particularly in compact urban areas where outdoor leisure options are scarce.

The quantitative findings presented a nuanced picture of the relationships between park attributes, sense of fit, and psychological well-being across the two parks. In Morse Park, there was a significant positive correlation between park attributes and visitors' emotional experiences, suggesting that favorable park features enhance emotional outcomes. In Fung Tak Park, perceived sense of fit was significantly associated with psychological well-being, indicating that engaging in physical activities help improve mental states. Regression analyses further supported these findings. In Morse Park, the characteristics of the park were found to have a positive impact on visitors' emotional states. It highlights how environmental features and facilities can enhance visitors' emotions. Although sense of fit was correlated with emotional outcomes, it did not emerge as a significant predictor in the regression model. Conversely, in Fung Tak Park, both the park attributes and the sense of fit were found to be significant predictors of psychological well-being. This underscores the importance of park infrastructure and opportunities for physical activity in enhancing visitors' mental health.

The findings from Morse Park revealed an interesting discrepancy. Although park attributes and sense of fit were both significantly associated with psychological well-being, the regression analysis failed to identify sense of fit as a significant predictor. This contrasts with the results from Fung Tak Park, where sense of fit emerged as a statistically significant predictor of well-being. One likely explanation lies in methodological sensitivity. Regression models, particularly with smaller sample sizes, are prone to reduced statistical power, which may obscure meaningful predictive relationships. Yet, the presence of significant correlations in Morse Park should not overshadow the substantive implications. They still point to a consistent and theoretically grounded association among park quality, perceived fit, and mental well-being. This suggests that while the strong influence of existing park attributes in Morse Park might largely encompass the explanatory power otherwise provided by sense of fit in the multivariate model, fit remains a crucial underlying component of the overall user experience and well-being pathway. It is plausible that in an environment where fundamental park attributes are already highly favorable (as suggested by the positive general ratings for Morse Park), the direct impact of these attributes on well-being becomes dominant, potentially overshadowing the additional, albeit related, contribution of a perceived fit.

Drawing on the Recreationist-Environment Fit model, our findings collectively illustrate that psychological benefits accrue when individuals perceive congruence between their leisure needs and the characteristics of their environment. This match fundamentally relies on accessible, safe, clean and well-maintained UGS, which form the bedrock of environmental supply. These high quality features enable safe mobility, facilitate meaningful activity, and reduce environmental barriers, thereby cultivating a setting that supports autonomy, ease, and comfort. Older adults who perceive their environment suitable are more likely to engage in activities aligning with their interests and abilities. These repeated positive engagements can then cumulatively foster improved psychological well-being. The quantitative findings from this study reinforce this relationship, indicating that

perceived fit may partially mediate the connection between environmental characteristics and well-being outcomes. This posits that park attributes influence psychological health in two ways: (1) directly through immediate physical conditions ; (2) indirectly through their impact on subjective perceptions of fit. This dynamic is consistent with the core propositions of the Recreationist-Environment Fit (R-E Fit) model (Tsaur et al., 2012).

Extending this mechanism further. Leisure opportunities themselves appear to operate as critical mediators within this process. Specific park attributes, such as well-maintained paths, elderly-friendly facilities, and safe environments, directly provide the necessary space and infrastructure to support various leisure activities. As engagement in these activities expands, psychological needs related to autonomy, competence, and connection are increasingly met. These meaningful experiences reinforce the perception that the park aligns with one's lifestyle and preferences. In turn, this heightened sense of environmental fit contributes to improved emotional and mental well-being. The process reflects a recursive, positive feedback loop: high-quality park attributes promote engagement in leisure, which enhances perceived fit; this improved fit fosters well-being, which then further strengthens users' positive perceptions and sustained use of the space.

Interview interpretations further complemented the quantitative findings. Participants generally appreciated accessible entrances, seating, and safe environments. However, the effectiveness of park facilities was undermined by a lack of adequate facilities for older adults and inconsistent maintenance. These limitations indicate a gap between environmental facilities and user needs, which hinders the park's ability to support sustained and meaningful engagement. The situation is particularly influential in the context of urban parks, where the quality of sports and fitness facilities is vital for older users who depend on this equipment to stay physically active (Chow, 2013; Copeland et al., 2017; Onose et al., 2020). This highlights a crucial practical implication: even generally well-regarded parks can fall short if specific age-appropriate facilities are lacking or inconsistently maintained. Such mismatches reduce the "supply" dimension in the Need-Supply Fit framework, ultimately limiting older adults' opportunities for enriching and health-promoting leisure experiences.

A salient observation from the study is the multifunctionality of specific design elements. Exercise zones, for instance, were not just places for physical activity, but also emerged as points of social convergence. This aligns with Di Bartolomeo and Papa's (2019) observation that physical activity can simultaneously support individual development and foster a sense of community. These spaces enabled users to stay active while engaging with others, illustrating how park infrastructure can meet both personal and social needs. Similarly, seating zones facilitated rest and passive observation, and when designed well, they also enabled conversation. Gehl (2010) proposed that positioning benches at a slightly open angle would allow people to choose whether to sit together or alone, thus facilitating the option for conversation. Seating areas with shade have also been proven to enhance social interactions (Wong, 2019). In addition to meeting immediate physical needs, these spatial features nurtured affective connections. In this way, the parks functioned as a flexible environment that supported both sociability and solitude. This dual functionality reflected a high degree of environmental affordance, facilitating diverse modes of engagement. Crucially, it empowered older adults to regulate their engagement based on personal mood, preference, or physical condition. The flexibility to initiate contact or remain alone contributes meaningfully to their sense of autonomy and overall well-being.

With regard to thermal comfort, the findings indicate a clear preference among older adults for parks that provide ample shaded areas. These physical conditions are a prerequisite for engaging in light physical activity, resting, or remaining in the space for even short durations. When such environmental features are absent, such as inadequate tree cover or exposure to direct sunlight, participants reported avoidance or limited engagement, indicating a clear disruption in perceived fit. The R-E Fit framework helps explain these behavioral patterns by highlighting how environmental insufficiencies inhibit the actualization of recreational intent. Rather than viewing thermal comfort as a background condition, this study reinforces its role as a decisive factor in enabling or constraining elderly park use. This aligns with previous studies that the quality of the outdoor thermal environment is considered a significant factor influencing residents' attendance and activities in open spaces (Martinelli et al., 2015; Shooshtarian et al., 2018). Thermal discomfort does not merely reduce enjoyment;

it obstructs the realization of the park's intended function as a space for leisure, relaxation, and mild exercise. In conclusion, based on the comprehensive findings of this study, it can be clearly stated that the key attributes of urban parks: general features (accessibility, safety and maintenance), park facilities, and thermal comfort significantly enhance both the sense of R-E fit and the psychological well-being of older adults. These attributes not only directly affect their satisfaction with the park environment, but also indirectly promote their overall psychological health and life satisfaction by enhancing their leisure experience and social interaction opportunities. This study provides valuable empirical evidence for promoting age-friendly urban environments in high-density contexts, emphasising the critical role of well-designed and managed green spaces in supporting healthy and active aging.

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Appendix I: WHO-5

WHO-1	Visiting this park makes me feel happy
WHO-2	Visiting this park makes me feel calm and relaxed
WHO-3	After activities in this park, I feel more energetic
WHO-4	Participating in park activities help me sleep better
WHO-5	I find things that interest me in this park