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Article

Citizen Assessment as Policy Tool of Urban Public Services: Empirical Evidence from Assessments of Urban Green Spaces in China

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Abstract: Efficient delivery and precision provision of urban public services concern quality of urban life and urban sustainability. Amid much debate regarding citizen assessments as a policy tool of public services, this study examines the validity of citizen assessments through user assessments of urban green spaces (UGSs) in Guangzhou, China. Users can distinguish the qualities of UGS across the dimensions and types, the assessment of individual UGSs matches the overall assessment of all UGSs in the city as a whole, and the overall assessment is only slightly influenced by personal backgrounds. Findings consistently support user assessments as a policy tool of UGSs and offer empirical evidence on the validity of citizen assessments. This positive evidence will encourage city managers to seriously consider citizen assessments and even institutionalize them as a standard management practice of (specific) urban public services, including UGSs, in China and abroad.

Keywords: citizen survey; citizen satisfaction; urban service delivery; public performance measure; UGS management; urban sustainability; urban park; Guangzhou

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1. Introduction

Citizen assessments or surveys, typically in the form of quality or satisfaction ratings, are frequently used to measure the performance of public services in Western cities [1–3]. A significant motivation for performing such assessments is to inform policy making [4]. In practice, however, assessment results are seldom used to guide policy making because of much debate about their validity [5,6]. Citizens' assessments are influenced by their general opinions of the community and their socio-demographic backgrounds [4]. Citizens are said to hold insufficient information about services to accurately evaluate their quality [7] and use general views on or overall satisfaction with the city or community to assess the quality of specific services [8,9]. Additionally, citizen assessments are self-reported expressed views, based on personal perceptions or judgments [3]. Personal backgrounds, such as gender, age, education, income, homeownership, and marital status, also influence assessment results [10–12]. Further, the effects have recently been associated with the complexity of the market and thus difficulties to penetrate for citizens with specific socio-economic characteristics in Behavioral Economics. For example, the elderly, the less educated, and those not employed reported lower satisfaction with particular utility services than their peers [13]. Because of the subjective label, citizen assessments are often treated as "a substandard, second-order category" [6].

Furthermore, studies comparing citizen assessments with objective measures (problematically) regarded as the gold standard [6] have presented mixed results. For example, no correlation has been found between police and fire service performance and citizen satisfaction with these services [1] and between citizen assessments of police services and crime rates, property recovery rates, or police personnel and budgetary data per capita [7]. Satisfaction levels and service levels are completely independent of each other [10]. However, both measures are sometimes related [14–16] and more recent studies also confirm this point [6]. For example, Im and Lee [17] found a positive relationship between both, however citizen satisfaction varies with the specific service. Citizen assessments can generate meaningful results when questions are specific and related to personal experience [7,18]. The appropriate part that citizen assessments should play in performance measures has been highlighted in many studies [6].

Urban green spaces (UGSs) may belong to such services. Because of close connections with their daily lives, citizens are typically familiar with UGSs and thus easily make (reasonable) assessments as opposed to other services, such as police services [7] and emergency medical services [4]. Moreover, in contrast to services (e.g., public transport) that are necessary for many city dwellers, patronizing urban green spaces is an optional activity. Although the various benefits of UGSs are widely recognized, such as social, eco-environmental, economic, and health benefits [19,20], how to manage and provide UGSs effectively to meet the various needs of citizens challenges city managers worldwide because of rapid urbanization and increasingly diversifying urban societies. This challenge concerns the quality of urban life and urban sustainability in the long term [21] and has attracted increasing attention [22,23]. Therefore, UGSs were selected as a case for analysis.

Citizen assessments can transmit accurate information about the status of community parks [4]. Observers can easily differentiate among urban scenes with some more attractive than others, and a high agreement among various groups lies in scenic evaluations of total urban landscapes [24]. Accordingly, local (daily) experiences of landscapes or neighborhoods are claimed as a legitimate

form of knowledge [25] or a valid source of information [26]. However, no relationships exist between citizen assessments of parks and objective indicators (e.g., distance to a park or park expenditures per capita) [7].

Citizen perceptions of the quality of UGSs play a key role in attracting visits [27,28], which are increasingly associated with health [29,30]. Hayward and Weitzer [31] argued that a park's image constitutes a substantial and consistent predictor of people's visits to the park. Citizens' assessments of UGSs can mirror the degree to which their needs are satisfied and reveal their preferences for UGSs [18]. An understanding of such assessments can benefit the effective management and provision of appropriate UGSs, which have special implications for compact cities with limited UGSs [32], particularly those in China.

Under a top-down bureaucratic administrative regime, government officials have long dominated public policy making in China but have neglected public opinion [33]. Officials in China generally distrust the public and believe experts from universities and institutes [34]. The policy-making approach largely depends on professional assumptions, which are increasingly criticized as patronizing or anachronistic [35,36]. Citizen assessments have been gradually used to evaluate the performance of Chinese local governments [37]. Because assessments are new to most Chinese officials, however, their results are still strongly questioned [37].

This study aims to examine the validity of citizen assessments as a policy tool of urban public services by using assessments of UGSs in China as a case. Because of the strong questioning of objective measures with contextual subjectivity [6] and the lack of objective measures or detailed official data, the present study focused on three key debates about citizen assessments or three critical aspects of the issue in the literature mentioned above rather than directly comparing them with objective performance measures as most previous studies have done.

(1) Can citizens differentiate variations in the quality of UGSs across dimensions and types? This question examines whether citizens can make reasonable judgments of the quality of UGSs.

(2) Do the (averaged) results of citizen assessments of individual UGSs (individual assessments) agree with the overall assessment of all UGSs in the city? A comparison between these two different (indirect *versus* direct) assessments facilitates the examination of whether the overall assessment is influenced by citizens' general views on or overall satisfaction with the city or community. More important, the agreement (if any) between these assessments will evidence both the reliability and validity of citizen assessments.

(3) Do socio-demographic factors influence the overall assessment? This questions concerns if and to what extent the overall assessment mirrors the quality of UGSs (*i.e.*, its validity).

As a pioneering city in the reform and opening-up and the seat of Guangdong Province in South China, Guangzhou has a free and open political climate and increased civic consciousness compared with other Chinese cities [33,38,39] and was thus chosen as the study area. Against validity challenges to the use of survey data from inexperienced or potential users, most citizen surveys, which frequently use telephone interviews, usually employ filter questions to limit assessment responses to only those having direct personal experience with the service (experienced or actual users). However, this strategy often results in a small sample size or a low percentage of experienced users of a certain service [18],

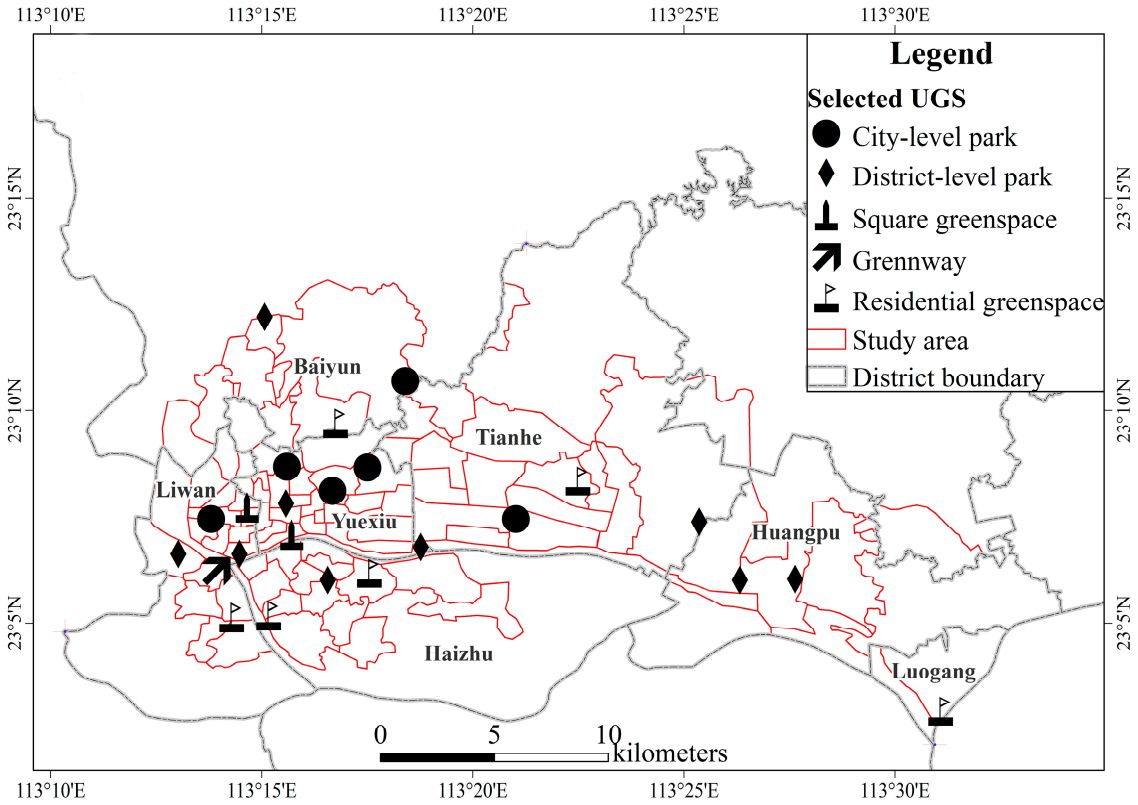
engendering the representativeness problem. To overcome this problem, the current study recruited a direct survey method, namely, on-site face-to-face interviews with actual users of UGSs.

2. Background and Methods

2.1. Background

The study area focused on the built-up areas of the eight central districts of Guangzhou (Figure 1). This area constituted 23.4% of the total area of the city and had a high population density of over 13,000/km^2 [40]. Green spaces in urban Guangzhou accounted for one third of the land area in 2005, with an area of public UGSs per capita of 11.3 m^2 [40]. As the two most important official assessment indicators of UGSs in China, both the green ratio and per capita level are slightly higher than the corresponding national standards of 30% and 10 m^2, respectively. The per capita level of public UGSs is only about one third of the average level (30.4 m^2 per person) of 13 US cities with high population density [41] (p. 9) and far lower than the criterion of 40.5 m^2 per capita recommended by the US National Recreation and Park Association [41] (p. 9).

Figure 1. Study area with the sampled green sites in Guangzhou.



In 2005, there were more than 30,000 residents per park, and each resident had a park area of approximately 4 m^2 (Table 1). The area per capita was smaller than the mean level (4.5 m^2) of seven municipalities with an over 5,000,000 population in China [42]. This situation reflects the limited provision of UGSs (particularly parks) in the study area.

The Guangzhou municipal government, similar to other Chinese city governments, is in charge of policy making on UGSs in accordance with national and provincial legislations and laws.

Corresponding to city and district governments, a two-level management approach to UGSs is adopted in Guangzhou—an approach also widely applied in Chinese cities. Under the management structure, public UGSs are divided into city- and district-level hierarchies managed by city and district governments, respectively, through their corresponding affiliated bureaus for UGSs [33]. These hierarchies constitute the main body of UGSs in the city along with residential green spaces as well as squares and greenways. Given the greater quantity of management resources, larger area, more diverse vegetation, and richer facilities, city-level parks generally have better quality than district-level and other types, with the latter usually sharing similar quality [43].

Table 1. Park number and area of central districts in Guangzhou (2005).

District [a]	Park Number	Park Area (hm^2)	Park Number per 10,000 Persons	Park Area per Capita (m^2)
Liwan	12	79.07	0.17	1.12
Yuexiu	14	458.19	0.12	3.98
Tianhe	23	574.98	0.37	9.28
Huangpu	14	67.27	0.73	3.49
Haizhu	9	192.11	0.10	2.19
Baiyun	48	356.36	0.63	4.68
Total	120	1727.98	0.28	3.99

Source: [40,42]. [a] Fangcun and Dongshan were merged into Liwan and Yuexiu, respectively, because of the administrative district adjustment in Guangzhou (also see Figure 1).

2.2. Methods

The questionnaire in this research was derived from related studies [27,28,44–46] and with the input of local UGS officials. The questionnaire included individual assessments, overall assessment, and socio-demographic variables. Because of the advantages of specific subjective indicators over overall assessments [7,18], individual assessments were derived from respondents' ratings of the 34 quality indicators of UGSs (Appendix Table A1) on a five-point Likert scale from very positive (coded as 1) to very negative (5). These indicators constituted the five dimensions of vegetation condition, supporting facilities, environmental amenities, landscape aesthetics, and site management and maintenance (Appendix Table A1). The scores of the individual assessments and dimensions were calculated by averaging the scores of corresponding indicators included within them. Unlike the individual assessments using composite indicators, the overall assessment was gleaned by directly asking respondents to assess the current whole conditions of UGSs, rather than individual UGSs, in Guangzhou, on a six-scale measurement from very satisfactory (coded as 1) to very unsatisfactory (6). Despite the complexity of the concept [3], the main objective of the current study is not to measure the overall assessment or satisfaction. For the sake of simplicity, therefore, a direct rather than synthetic measure of the overall assessment is employed in this study. The socio-demographic variables solicited in the survey included gender, age, marital status, education level, household monthly income per capita, occupation, and place of residence (by urban districts).

After a pilot test, the main survey was completed in June 2006 at 24 green sites selected across the city (Figure 1) with the assistance of four undergraduate students from a local university. These assistants

were trained in the procedures and etiquette of performing the survey and were particularly asked not to choose visitors preferentially from a certain social group or visitor type. The survey was conducted throughout weeks from 9:00–17:00 at strategic locations of UGSs, such as exits. Green sites were determined along with local UGS managers and experts so that major UGSs in the city were included to ensure their representativeness. For each district, selected green sites typically consisted of one city-level park, one district-level park, and one another type of UGS (e.g., residential green areas or greenways), if possible (Figure 1). For Dongshan, however, a lack of other types resulted in the inclusion of two city-level parks and one district-level park. As two outlying districts, Fangcun and Huangpu held few city-level parks, and Fangcun has only one district-level park.

A stratified random sampling scheme was employed in this study. The sample was first stratified according to the population of the districts, with the most updated census data used as a sampling frame [47]. The target sample size (500) was allocated to individual districts largely based on their population size. Visitors over 15 years old were then randomly selected as respondents on site at two consecutive intervals [48]. All visitors who refused to participate after being chosen were recorded as non-respondents to calculate the response rate. The respondents completed the questionnaire independently, and explanations were offered if needed.

Data were analyzed using SPSS 17. Frequency distributions and mean scores described the general results of the individual and overall assessments. MANOVA revealed the assessment differences among the dimensions and types of UGSs, whereas regression analysis examined the socio-demographic effects on the overall assessment.

3. Results

3.1. Characteristics of the Sample

A total of 582 visitors were invited, with 513 successfully interviewed, producing a response rate of 88%. Twelve questionnaires (2.3% of the total) were eliminated because of missing key items, such as socio-demographic information, or respondents living outside the study area. The 501 valid questionnaires were analyzed.

Five socio-demographic variables depicted the sample characteristics (Table 2). Male respondents accounted for the majority with almost 57%. For age, the 30–49 group (35%) exceeded other groups, followed by 15–24 (30.2%) and 25–29 (18.4%). The two older groups constituted only 6.9% (50–59) and 9.5% (≥60), suggesting the greater number of young people in the sample. For education level, 41.2% of respondents held a university or higher degree, the most frequent group. Respondents who had completed upper secondary school accounted for 36.6%, whereas those with a lower education level accounted for 22.2%. The level of household monthly income per capita represented a normal distribution, with RMB1000–3000 per month (US$1.00 = RMB6.17) in the middle the most (42.8%) and <RMB1000 and ≥RMB3000 at two ends with 36.4% and 20.8%, respectively. For districts, several noticeable variations were found, with Dongshan (−4.9%), Liwan (−3.1%), and Tianhe (−4.7%) underrepresented and Fangcun (+6.1%) and Huangpu (+6.2%) overrepresented.

A chi-square test comparing the sample and population (Table 2) indicated no significant differences for gender, age, and household monthly income. However, significant differences were found for

education level and district. More respondents (X^2 = 52.96; p = 0.000) held university and higher education than the general population, similar to the finding of another local study [35]. The reason for this difference was that people aged <15 were excluded from the survey and more educated people were interested in the subject and keen to respond. The sampling biases in districts may be attributed to the distinct geographical location and composition of UGSs in the hierarchy. Although the use of UGSs tends to be localized, city-level parks in the study area attract more distant visitors than other UGSs because of their better quality [35]. As a legacy of urban development, these city-level parks largely concentrate on the urban center, where Dongshan, Liwan, and Tianhe are located or adjoin (Figure 1).

Table 2. Characteristics of respondents and comparison with 2000 Guangzhou census data.

Variable [a]	Category	Survey (%)	Census (%)	Difference [b] (%)
Gender (X^2 = 0.71; p = 0.400)	Male	56.8	52.8	4.0
	Female	43.2	47.2	−4.0
Age (X^2 = 2.25; p = 0.691)	15–24	30.2	24.5	5.7
	25–29	18.4	16.4	2.0
	30–49	35.0	39.6	−4.6
	50–59	6.9	8.1	−1.2
	≥60	9.5	11.4	−1.9
Education level (X^2 = 52.96; p = 0.000)	Lower secondary school	22.2	53.4	−31.2
	Upper secondary school	36.6	29.3	7.3
	University or higher	41.2	17.3	23.9
Household monthly income per capita (RMB) (X^2 = 1.16; p = 0.560)	<1000	36.4	34.3	2.1
	1000–3000	42.8	47.9	−5.1
	≥3000	20.8	17.8	3.0
District (X^2 = 16.11; p = 0.024)	Baiyun	14.8	14.0	0.8
	Dongshan	7.4	12.3	−4.9
	Fangcun	11.0	4.9	6.1
	Haizhu	21.2	21.6	−0.4
	Huangpu	14.2	8.0	6.2
	Liwan	7.4	10.5	−3.1
	Tianhe	16.4	21.1	−4.7
	Yuexiu	7.8	7.6	0.2

Source: [35,47]. [a] Results of chi-square tests are presented in parentheses under corresponding variables; [b] The difference is calculated by subtracting census% from survey%.

3.2. Assessment of UGSs

3.2.1. Individual Assessments' Variation across Dimensions and Types of UGSs

Generally, the individual assessments of UGSs were positive (Table 3). On average, 45.2% of the respondents assessed UGSs as very positive or positive and 36.4% as neutral, and a grand mean score of 2.64 was almost positive (1.8–2.6 on a five-point Likert scale).

Table 3. Assessment variation across dimensions of urban green spaces (UGSs) (percentage of valid respondents) [a].

Assessment Dimension	Respondent Rating [b]					Mean [c]
	1	2	3	4	5	
Vegetation conditions	13.01	40.02	36.69	5.49	0.67	2.38
Supporting facilities	5.25	34.28	36.98	17.12	3.67	2.79
Environmental amenities	8.18	38.52	30.87	12.11	4.46	2.66
Landscape aesthetics	7.19	39.59	45.11	6.12	1.46	2.55
Management and maintenance	11.33	45.31	30.59	9.83	1.15	2.43
Overall average	7.76	37.43	36.36	12.80	2.72	2.64

[a] The score of each assessment dimension was derived by averaging the scores of corresponding indicators within it; [b] 1 = very positive; 2 = positive; 3 = neutral; 4 = negative; 5 = very negative; [c] Interpretation of mean score: <1.8 = very positive, 1.8–2.6 = positive, 2.6–3.4 = neutral, 3.4–4.2 = negative, and >4.2 = very negative.

Assessment Variation across Dimensions of UGSs

Among the five assessment dimensions, vegetation conditions attracted the most positive assessment (mean = 2.38), and more than half (53%) of the respondents assessed the dimension positively or very positively (Table 3). This result indicates that the respondents were satisfied with the vegetation status of UGSs in Guangzhou.

Supporting facilities, including information boards, tables/benches, shelters, dustbins, and toilets, received the most negative assessment (2.79), with only 39.5% of the respondents according positive or very positive assessments (Table 3). Because of the lack of official data in this regard, field observations were performed and then found to uphold the unsatisfactory result. For example, a toilet was rarely found, and in tropical cities, almost no shelters were observed in many UGSs.

Environmental amenities denoted the general environmental quality of UGSs. The assessment result was unfavorable (2.66), with less than half (46.7%) of the respondents making positive or very positive assessments. Landscape aesthetics was assessed as positive (2.55), with 46.8% of the respondents giving positive or very positive assessments. Management and maintenance also received a positive assessment (2.43), second only to vegetation conditions; 56.6% of the respondents rated the dimension (very) positively (Table 3).

Assessment Variation across Types of UGSs

The assessment variations across the types of UGSs in all the five dimensions shared the same pattern despite differences in several cases (Table 4). City-level parks were assessed the best in all the dimensions, followed by district-level parks, whereas residential green spaces and squares and greenways were rated lower.

Further, a MANOVA test revealed that vegetation conditions and environmental amenities achieved the same striking results. Except the comparison between residential green spaces and squares and greenways (p = 0.913), all comparisons recorded significant differences (Table 4). The vegetation conditions and environmental amenities of city-level parks were assessed significantly better than those of district-level ones. The latter excelled in both dimensions of residential green spaces as well as squares and greenways, which were similarly rated the worst.

Table 4. Assessment variation across types of UGSs according to MANOVA.

Assessment Dimension	Type of UGSs [a] (Pillai's Trace = 0.21; p = 0.000)						
	1 (32.3%)	**2** (27.9%)	**3** (23.2%)	**4** (16.6%)	**F Value (df = 3)**	***p***	***p* in Scheffe Comparison**
Vegetation conditions	2.16	2.35	2.58	2.63	22.55	0.000	p [b](3,4) = 0.913
Supporting facilities	2.52	2.88	2.89	3.05	24.91	0.000	p(1,2), p(1,3), p(1,4) = 0.000
Environmental amenities	2.37	2.63	2.92	2.99	16.12	0.000	p [b](3,4) = 0.985
Landscape aesthetics	2.42	2.56	2.63	2.66	6.28	0.000	p(1,3) = 0.010, p(1,4) = 0.003
Management and maintenance	2.19	2.51	2.52	2.66	13.46	0.000	p(1,2), p(1,3), p(1,4) = 0.000

[a] 1 = city-level parks; 2 = district-level parks; 3 = residential green spaces; 4 = squares and greenways; The percentage of respondents for each type of UGSs is presented in parentheses under corresponding types.
[b] All differences are significant ($p < 0.05$) except otherwise indicated.

Supporting facilities shared the same results with management and maintenance (Table 4). Significant differences were found only between city-level parks and the other three types (p = 0.000). This finding indicates that in terms of supporting facilities and management and maintenance, city-level parks were notably superior to the other types of UGSs, which received similar assessments.

Two significant differences were found in landscape aesthetics, both associated with city-level parks again (Table 4). City-level parks were perceived more beautiful than residential green spaces (p = 0.010) and squares and greenways (p = 0.003). District-level parks were similar to the other types of UGSs, and no notable variations were found between residential green spaces as well as squares and greenways.

3.2.2. Overall Assessment and Socio-Demographic Effects

Nearly two thirds of the respondents (65%) assessed the whole situation of UGSs in Guangzhou to be somewhat satisfactory (Figure 2). Among these respondents, interviewees choosing somewhat satisfactory constituted the majority (41.5%). The respondents selecting (very) unsatisfactory represented almost 16%, and those selecting neutral represented 17.1%. The mean score of 3.26 showed that the overall assessment result tended to be somewhat satisfactory (2.7–3.5 on a six-point scale). The results indicated that the whole situation of UGSs in the city was simply moderately satisfactory.

A multiple linear (stepwise) regression analysis of the significant variables, found in bivariate analyses between the overall assessment and all the seven socio-demographic variables examined, indicated that the combined effects of the variables were insignificant, explaining only 1% of the variance of the overall assessment despite the derivation of a significant model (p = 0.010) (Table 5). Only marital status was kept in the model. This result shows that the effects of personal backgrounds on the overall assessment were limited, and relevant variations could come from other factors, such as the quality of the UGSs themselves.

Figure 2. The overall assessment of the UGSs by respondents.

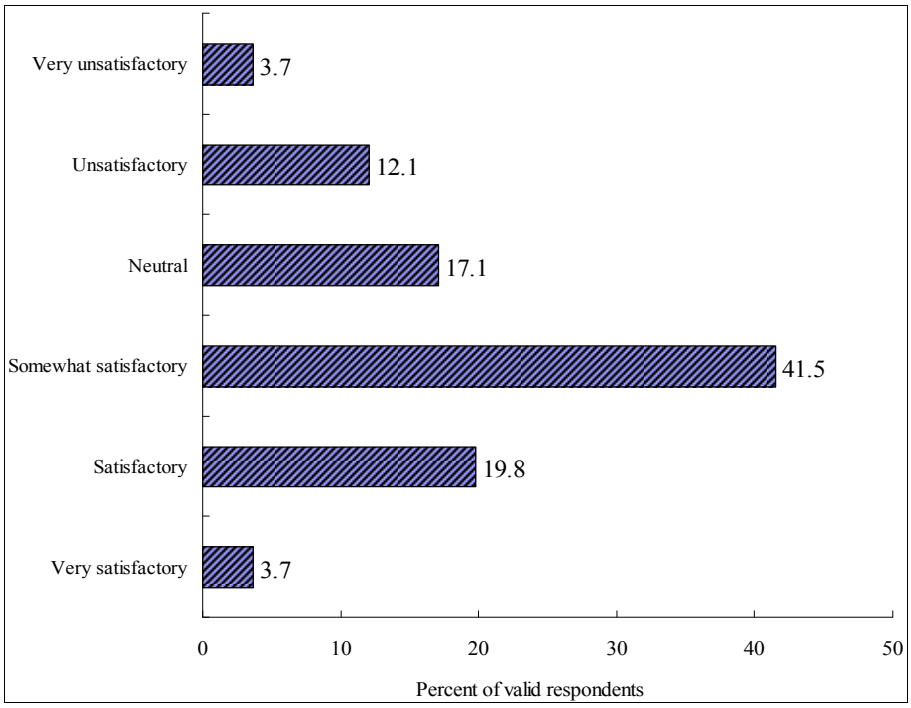


Table 5. Socio-demographic effect on overall assessment according to multiple regression analysis.

Variable	Beta	t	*p*
Marital status [a]	0.11	2.58	0.010
New and old districts	−0.07	−1.79	0.074
Occupation	0.05	1.25	0.211

Adjusted $R^2 = 0.01$; F(df = 1) = 6.64; $p = 0.010$; [a] Included in the model.

4. Discussion

For all the three key debates on citizen assessments presented in the introduction, the assessment results offer consistently positive answers. For the first question concerning whether citizens can differentiate variations in the quality of UGSs across dimensions and types, vegetation conditions and management and maintenance captured high assessments (Table 3).

This is consistent with another local study [49] focusing on resident perceptions of and attitudes toward UGSs. This result shows the benefits of the specific bioclimatic condition in the tropical city and the efforts of the city government in urban greening. Landscape aesthetics gained moderately positive assessments, echoing the favorable satisfaction with landscape design in a local research [49]. This result can be associated with the long landscaping tradition in the city originating from the royal gardens in 100 BC [43] (p. 24); [50], further explaining the high rating of vegetation conditions. Environmental amenities and supporting facilities were rated low. For the former, this result is expected because of the serious environmental pollution of the city and the heavy use of UGSs [35,42]. The unsatisfactory assessment result about supporting facilities reflects the universal inclination toward quantity over quality in the management and provision of UGSs in China because the greening ratio and the area per capita of the public UGSs of a city, rather than the quality of its UGSs, concern the political decisions of the city government.

Regarding the types of UGSs, the assessment results (Table 4) well reflect the variations in quality of UGSs in Guangzhou associated with the hierarchical nature of the provision. Under the two-level management approach, more resources are allocated to city-level parks and then to district-level ones [43]. Furthermore, the assessment results may explain the unusual pattern of visits to UGSs in the city that urban parks are highly preferred and nearby small gardens are largely neglected [35].

In summary, users can differentiate the variations in quality of UGSs across both its dimensions and its types and may accordingly make reasonable assessments of UGSs. The findings lend support to citizen assessments, echoing previous studies. For example, citizen assessments can furnish accurate information on the status of community parks [4]. Observers can readily distinguish among urban scenes, and diverse groups make highly consistent assessments of the scenic quality of total urban landscapes [24]. Furthermore, the findings may echo local daily experiences of landscapes or neighborhoods as a valid information source [25,26] or "ordinary (*versus* professional) modes of knowledge" [6] (p. 561), supporting citizen assessments.

Does the assessment result of individual UGSs agree with the overall assessment? The approximately positive individual assessments (Table 4) well matched the somewhat satisfactory overall assessment (Figure 2). The agreement between the results from the different (indirect *versus* direct) assessment methods indicates both the good reliability and validity of citizen assessments, thus verifying them as effective performance measures [6]. Furthermore, despite the insufficient official data for full comparisons, the assessment results confirm the fact of limited UGSs in the city (Table 1). Particularly in terms of the two widely used official assessment indicators of UGSs in China, both the green ratio and the area per capita of public UGSs of the city met the corresponding national requirements. However, this finding challenges Stipak's [7] argument that citizens lack sufficient knowledge about public services to make accurate judgments.

For the third question, the weak socio-demographic effects (only explaining 1% of the variance) were found on the overall assessment (Table 5). This finding indicates that the overall assessment was only slightly influenced by personal backgrounds, echoing other studies on UGSs. For example, demographic and socio-economic variables explain only 8% of the differences in citizen satisfaction with parks [51]. No significant effects on citizen assessments of community parks have been found in terms of age, education, and income [4]. Variations in citizen assessments seldom result from the characteristics of respondents [12]. The present finding may be associated with a general perception of inadequate UGSs in the compact city [42]. Another possible reason is the generally low satisfaction with governments and the services they offer [4], however relevant questions were not included in the survey. However, the current finding differs from those of studies on other services, such as police, fire, and street services, indicating significant effects [8,11,51]. As Licari *et al.* have highlighted, citizen characteristics are only sometimes (*i.e.*, not consistently) associated with service assessments [4]. This relation is associated with the specific services examined [51]. Likewise, a latest study observed that the socio-economic effects on satisfaction are complex, depending on particular (utility) services [13]. The detachment between personal backgrounds and the overall assessment implies that citizen assessments mainly depended on the actual status of the UGSs themselves, thus indicating the validity of citizen assessments.

The positive findings about citizen assessments call for city managers to seriously consider them when formulating policies. When objective measures are unavailable, citizen assessments are a

desirable alternative because, aside from their validity as evidenced in this study, they are faster and easier to perform than objective ones. Even if citizen assessments are sometimes not correlated with objective assessments [7,10], they can convey valuable information on the extent to which citizen demands are satisfied [18] and still act as a complement to overcome the hardness of objective measures [6]. Citizen assessments play an appropriate role in performance measures of public services [6]. For example, the client's perception of the resolution time of the dispute, rather than the objective measurement (the actual recorded time), strongly influences their satisfaction with the performance of the state agency [52]. Further, Schachter [6] highlighted that contextual subjectivity also equally applies to objective or expert-generated measures.

The present findings have special implications for Chinese cities where objective performance measurement systems of public services are to be established, such as where few physical data of UGSs are available. Although citizen assessments have increased, they are new and dubious to most Chinese officials [37]. The positive findings in this study help promote and even institutionalize citizen assessments [51] in Chinese cities as a standard management practice.

However, the quality or performance of most public services is extremely complex to measure and assess [53,54]. Therefore, citizen assessments should not be seen as valid in every case [6]. This also applies to services infrequently or indirectly used by citizens, such as police services and emergency medical assistance [4,7]. Conversely, UGSs, *inter alia*, are usually associated with the daily lives of citizens and thus make valid assessments easy for them. Im and Lee [17] found that citizen satisfaction varies with the type of service. Accordingly, the validity of citizen assessments may rely on specific assessed services themselves or more specifically on the degree of citizen familiarity with the services [4,18]. More attention needs to be paid to the particular types of services when applying citizen assessments.

5. Conclusions

Through assessments of UGSs in Guangzhou, China, this research examined the validity of citizen assessments as a policy tool of urban public services. Given the debate on objective measures and data limitations, the present study concentrated on three key debates on citizen assessments or three critical aspects of the issue rather than following previous studies to directly compare citizen assessments with objective measures. Users can recognize the variations in quality of UGSs across dimensions and types, the assessment results of individual UGSs matched the overall assessment of all UGSs in the city as a whole, and the overall assessment was only slightly influenced by socio-demographic factors. The findings consistently demonstrate that user assessments are superior indicators of the quality of UGSs.

The weak effects of personal backgrounds markedly differ from findings concerning other services. Aside from the effect of a general perception of insufficient UGSs in the dense city, UGSs are free public services and their use induces almost no expenses. This is remarkably different from those (utility) services required to choose and pay in the market, such as water, electricity, and gas [13]. Namely, UGSs may be more accessible than these services. Moreover, in contrast with other (free) services particularly seldom used, e.g., police, fire, and street services, UGSs are associated with citizens' daily lives and familiar to them, users in particular. Such familiarity may help produce reasonable assessments, independent of personal backgrounds.

The present findings offer empirical evidence to support citizen assessments as a policy tool, positively responding to the debate regarding such assessments. In practice, these findings help promote serious consideration and implementation of citizen assessments, particularly in cities, such as Chinese ones, that lack objective performance measurement systems of public services or where citizen assessments are questioned. However, attention needs to be given to the specific types of services when performing citizen assessments. Compared with other services (e.g., police services), UGSs are familiar to citizens and thus make reasonable assessments easier for them. This point deserves caution in interpreting and generalizing the current findings.

The current study was conducted in a large municipality in China with limited UGSs. To further examine citizen assessments, similar research can be made in other (medium-size or small) cities with adequate and quality UGSs in China and abroad. Given that recent studies find a relationship between both, future efforts can also compare citizen assessments with objective measures or official data if available. Methodologically, as a complex concept, citizen assessments or satisfaction should ideally be measured through a synthetic measure with composite indicators and analyzed by more sophisticated methods as presented by Ferrari and Manzi [3].

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Author Contributions

Xi-Zhang Shan and Xijun Yu conceived and designed the research; Xi-Zhang Shan carried out the questionnaire survey and the data analysis. Xijun Yu and Xi-Zhang Shan interpreted the results and wrote the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

Appendix

Table A1. Assessment dimensions and indicators of UGSs.

Assessment Dimension	Assessment Indicator
Vegetation conditions	Vegetation quality
	Vegetation cover ratio
	Tree shade
	Tree height
	Vegetation health
	Vegetation visual diversity

Table A1. *Cont.*

Assessment Dimension	Assessment Indicator
Supporting facilities	Information board location
	Message on information board
	Information board number
	Information board quality
	Table/bench number
	Table/bench quality
	Table/bench comfort
	Table/bench location
	Shelter number
	Shelter quality
	Shelter comfort
	Shelter location
	Dustbin number
	Dustbin design
	Dustbin location
	Toilet number
	Toilet cleanness
	Toilet comfort
Environmental amenities	Quietness
	Air quality
	Water quality
Landscape aesthetics	Building number
	Scenic beauty
	Landscape design
Management and maintenance	Vegetation tending
	Facility maintenance
	Cleanliness
	Safety

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