The Sustainable Development of Urban Cultural Heritage Gardens Based on Tourists' Perception: A Case Study of Tokyo's Cultural Heritage Gardens

Ge Chen [1] , Jiaying Shi [2] , Yiping Xia [1] and Katsunori Furuya [2,*]

[1] Institute of Landscape Architecture, College of Agriculture and Biotechnology, Zhejiang University, Hangzhou 310058, China; dovexxc@163.com (G.C.); ypxia@zju.edu.cn (Y.X.)

[2] Department of Environmental Science and Landscape Architecture, Graduate School of Horticulture, Chiba University, Chiba 271-8510, Japan; jsntsjy@gmail.com

* Correspondence: k.furuya@faculty.chiba-u.jp

check for updates

Abstract: For the cultural heritage gardens in the urban environment, modern high-rise buildings inevitably change their original landscape and form a new landscape experience with visual impact. Whether cultural heritage gardens and modern cities can coexist harmoniously is one of the critical issues to achieve their sustainable development. This research aimed to find an indicator of landscape morphology, which can predict the visitor's cognition for such cultural landscape forms. This study surveyed tourists' preferences in six selected cultural heritage gardens in Tokyo. We used hemispheric panoramas to calculate the view factors of certain elements of the landscape at the observation points. The results showed that Sky View Factor was a positive predictor of tourists' preference, and this predictability did not change significantly with the attributes of tourists. We also found that tourists' attitudes towards the high-rise buildings outside the gardens have become more tolerant and diverse. These findings could be applied to predict visitors' perception preference of cultural heritage landscape in the context of urban renewal, contributing to the sustainable development of cultural heritage landscape and urbanization.

Keywords: cultural heritage garden; tourists' preference; sustainable development; Tokyo; view factor

1. Introduction

Cultural heritage landscape that remains in the urban environment represents the preservation and embodiment of the historic culture and people's wisdom of the city and the country [1]. It is also an attractive point for urban tourism development and an essential resource for urban economic growth [2]. However, urbanization after the Industrial Revolution has caused a rapid increase in the urban population. At the same time, a large number of modern high-rise buildings have emerged, and the social and cultural atmosphere has changed. As a result, the city's structure and landscape have undergone tremendous changes. Worldwide, the cultural heritage landscape in many cities is facing a significant threat of destruction and even gradually disappearing due to urbanization [3–6]. Therefore, nowadays, how to achieve the sustainable development of the urban heritage landscape has become a worldwide focus of attention. The Sustainable Development Goals (SDGs) adopted by the member states of the United Nations (UN) in 2015 clearly state that it is necessary to strengthen the protection and maintenance of the sustainable development of world cultural heritage and natural heritage [7].

Despite the sharp image of asphalt and skyscrapers, Tokyo still preserves nine metropolitan cultural heritage gardens today. They are not only green public open spaces but also the historical

mark of the entire city [8]. These gardens were built from the Edo period to the Taisho era (from the 17th century to the beginning of 20th century). As precious and fragile resources, they are registered as cultural assets of Tokyo and Japan by the Japanese government [9]. Under the provisions of Japan's National Cultural Property Protection Law [10], the internal landscapes of these heritage gardens are well preserved. Still, the surrounding areas of the gardens are not included in the areas covered by the protection law. Thus, some of these gardens are surrounded by modern high-rise buildings now. The original designers of the garden would never be expected that tall modern buildings outside the gardens have now replaced their bright design idea as "shakkei" (borrowed scenery). The landscape space seen by tourists visiting the gardens now is very different from the original appearance of the gardens.

While urban renewal changes the spatial form of cultural heritage landscapes, it also continually alters the people's perception of it [11,12], and affects the research on the protection and management of heritage landscapes [13]. For visitors to the Tokyo metropolitan cultural heritage garden, modern high-rise structures that break into their horizons may bring about visual conflict, but at the same time, may also bring about a new viewing experience. The cultural landscape is the result of the constant interaction between human civilization and the natural environment, which is a dynamically changing process [14]. Previous research has tended to criticize the negative impact of urbanization on heritage landscapes. However, with the development of the times, people's aesthetic preferences for cultural heritage have become more and more diverse. Therefore, studies on the perception of tourists should pay more attention to the sustainable development of cultural heritage landscapes [15,16].

This current study aims to find a visibility indicator of landscape morphology which can predict the perception of tourists in the cultural heritage gardens in the urban context. We took the Tokyo Metropolitan Cultural Heritage Gardens as the research objects. On-site questionnaires were carried out to investigate the tourists' perception preferences, and the view factors of different landscape elements at the observation points were calculated. Spearman correlation coefficients and stepwise linear regression analysis were used to examine the relationship between tourists' preference and view factors. Specifically, this study focuses on the following questions:

1. What are the attitudes and preferences of tourists nowadays towards the influence of high-rise buildings outside traditional Japanese gardens in the urban context?
2. Can the view factors (including sky, garden, and building view factors) be considered as a reliable predictor of tourists' preferences?
3. Do attitudes and preferences of this phenomenon change due to demographic attributes of visitors?

To our best knowledge, the study is one of the first investigations to focus on the predictability of landscape morphological indicators for the cultural heritage landscape. Additionally, based on the results of the investigation, we attempt to discuss whether the urbanization and the protection of heritage in the city must conflict and whether they can achieve positive common development [2,17]. It will also provide some reference for the study of the sustainable development of historical heritage landscape in the city from the perspective of historical landscape perception and evaluation.

2. Literature Review

2.1. Heritage Landscape in the Context of Modern Cities

The visual relationship between cultural heritage and its surroundings has been an active topic of sustainable research for many years. In the context of urbanization, the most visible influence of modern high-rise buildings on the traditional landscape is that it has broken into the background of the heritage garden and become a new form of view [18]. The visual impact of the outside high-rise modern buildings on the cultural heritage garden has already attracted the attention of many scholars. Most of the previous studies held a negative attitude. Antrop pointed out in 1997 that the destructive

modern impact after World War II changed the structure and function of the traditional landscape [19]. Some original scenes have even been completely erased, while the newly formed modern landscapes lack individuality [20]. Oh proposed in 1998 that urban expansion brings the existing landscape in the city with the accumulated visual pressure [21]. Swensen and Jerpåsen suggested in 2008 that the heritage landscape and its surrounding environment should be taken as a whole and protected by better legal planning [22]. UNESCO also proposed in 2017 that urban development threatened the visual integrity of the historical heritage landscape [23].

The cultural heritage gardens in Tokyo is full of visual and cultural conflicts influenced by the modern urban environment and are typical cultural heritage landscape remain in the city. Japanese scholars Shinji et al. proposed in 1989 the negative impact of modern buildings on the landscape of Tokyo Metropolitan Cultural Heritage Gardens [24]. They claimed that modern high-rise buildings destroyed cultural landscape and caused visual invasion. Many subsequent studies have also argued that those modern high-rise buildings have harmed the gardens [25–28]. More recently, other opinions have appeared which believe that although modern buildings affect the landscape of traditional gardens, the contrast between modern and classic may not necessarily be negative, and may even stimulate people's imagination [29]. Such opinions, however, have not been confirmed through any research.

To date, however, there has been little empirical evidence of whether the attitude preference of tourists is related to any landscape morphological indicators of such conflict landscape. The study by Shinji et al. only measured the heights of the visible buildings outside the gardens, and the distances between them and the observation points in five Tokyo Metropolitan Cultural Heritage Gardens [24]. They then determined the elevation angle of the line of sight to the building, judged its impact on tourists' perceptions. The judgments were based on theories without conducting visitors' surveys, and the correlation between spatial features and visitor preferences were not analyzed. Senoglu et al. studied the impact of the high-rise buildings outside the Hama-rikyu Gardens in 2018 and collected visitors' attitudes and preferences through questionnaires [29]. They verified the prospect–refuge theory in Hama-rikyu Gardens but failed to find a correlation between geometric proportions of the buildings and tourists' preferences. Therefore, inspired by the previous research, this study surveyed the various choices of tourists and tried to find out the landscape morphological indicators that are related and predictive to the preferences of tourists in the cultural heritage gardens.

2.2. Landscape Morphological Indicators

View factor is also called form factor or shape factor. The most commonly used one in urban morphology is Sky View Factor (SVF), which is defined as the percentage of the visible area of sky at a particular location, with a value from 0 to 1, indicating a completely closed space to a fully open space [30,31]. SVF is often used to study the geometric characteristics of urban canyons, urban temperature distribution, and urban thermal comfort [32]. The methods for calculating SVF include the photographic process, GPS signal-based method, simulation method, among others [33]. Among them, the photographic process is the classic, where a hemisphere diagram azimuthal projected from panoramas taken by spherical cameras are used to calculate the SVF [34,35]. This method is more suitable to measure the view factor of various landscape elements at discrete observation points for the garden landscapes. As a visual physical indicator, the concept of SVF is similar to some landscape visibility indicators such as the "Visible Green Index," which was proposed by Japanese scholar Aoki in 1987, based on visual psychology [36]. It has become one of the regular greening evaluation indexes recognized by the Japanese government since 2004 [37].

In 1981, Takei and Oohara suggested that the proportion of sky occupied by buildings had a clear correlation with the visual pressure of high-rise buildings on people [38]. As an index of landscape space, sky proportion is often used as an index of landscape visual quality evaluation [39]. Jiang et al. proposed a relationship between tree cover density and landscape preferences in 2015 [40]. Based on the previous research, Gong et al. further estimated the SVF, tree view factor (TVF), and building

view factor (BVF) in high-density urban environments to extract street features in 2018 [34]. Therefore, inspired by the previous research, this study attempted to introduce view factor into the spatial morphology description of cultural heritage garden landscapes in cities, and at the same time, quantify the SVF, BVF, and garden view factor (GVF), defined as the percentage of the visible area of garden landscape at the observation points, of the observation points.

3. Materials and Methods

3.1. Selection of Observation Points

The Tokyo Metropolitan Cultural Heritage Gardens are an important cultural heritage from the Meiji and Edo periods of Japan (17th to 20th century). There are nine gardens in Tokyo (Figure 1, Table 1), where the modern urban environment conflicts with classical natural landscapes. Among them, Kyu-Iwasaki-tei Garden, Kyu-Furukawa Garden, and Tonogayato Garden are private gardens with western-style historical buildings as the main view. They are not the type of traditional Japanese-style gardens that we focused on in this study and thus were excluded. Observation points were selected in Hama-rikyu Garden, Kyu-Shiba-rikyu Garden, Koishikawa Korakuen Garden, Rikugien Garden, Kiyosumi Garden, and Mukojima-Hyakkaen Garden.
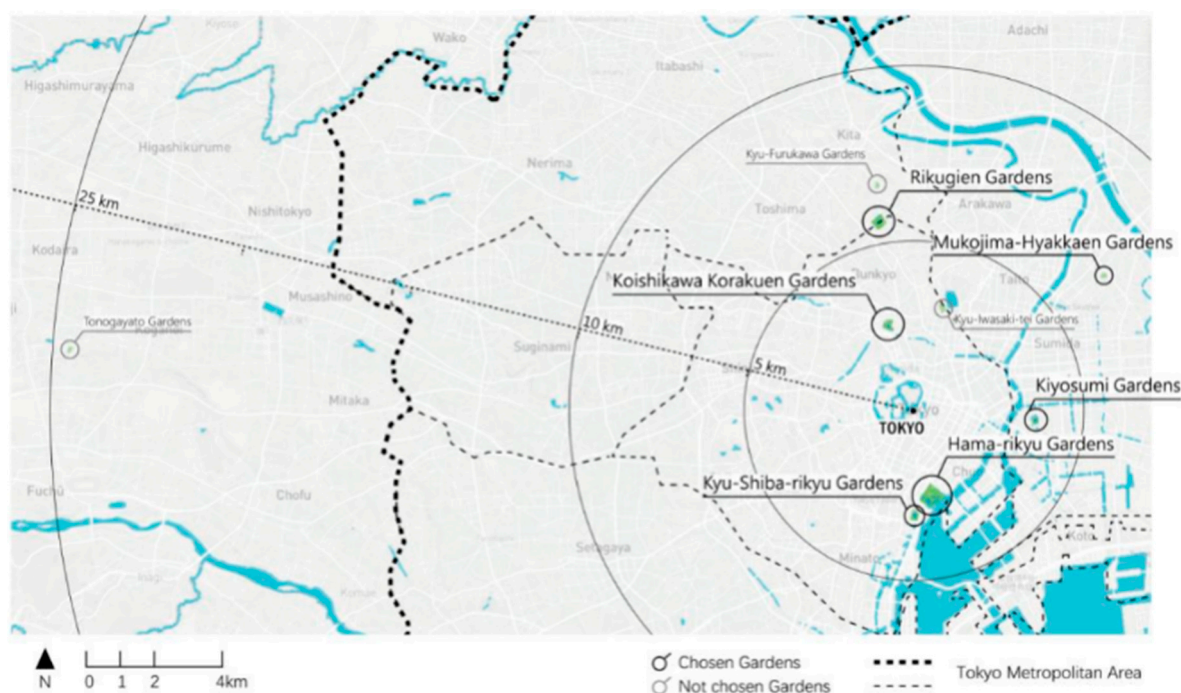

Figure 1. Location of Tokyo Metropolitan Cultural Heritage Garden (drawn based on Google map and mapbox open source map).

Table 1. Basic information of Tokyo Metropolitan Cultural Heritage Garden.

Name of Gardens	Area (m²)	Construction Century	Property
Hama-rikyu Garden	250,215.72	17th century	Stroll type Daimyo garden of Edo period
Kyu-Shiba-rikyu Garden	43,175.36	17th century	Stroll type Daimyo garden of Meiji period
Koishikawa Korakuen Garden	70,847.17	17th century	Stroll type Daimyo garden of Edo period
Rikugien Garden	87,809.41	17–18th century	Stroll type Daimyo garden of Edo period
Kiyosumi Garden	43,656.95	19th century	Stroll type Daimyo garden of Meiji period
Mukojima-Hyakkaen Garden	10,885.88	19th century	Private garden of Edo period
Kyu-Iwasaki-tei Garden	18,235.47	19th century	western-style historical buildings with Private garden
Kyu-Furukawa Garden	30,780.86	20th century	western-style historical buildings with Private garden
Tonogayato Garden	21,123.59	20th century	western-style historical buildings with Private garden

The "heat maps" based on big data were selected to decide the research points to ensure that the selected points were in line with the subjective preferences of most garden visitors. The points with "visible outside high-rise buildings" were selected from the hotspots as the research points, which also ensured that the influence of outside buildings here on the viewing of garden visitors was widespread, rather than random or rare.

The specific observation points were selected from the heat maps generated from the photos with geographic coordinate information [41]. After writing the relevant code through IDEA, we used the Flickr API for keyword tag search (Japanese and English names of the six target gardens), sourced 6513 photos (2004–2018), and set the geographic coordinate data in EXCEL. Then, the data were imported into QGIS to generate the heat maps. The selection of observation points was based on the following principles: (1) The skyline seen in the observation points should be coherent; (2) Landscape elements in the observation points should be varied; (3) If there are several observation points in one garden, the perspective of the buildings outside the gardens seen in the observation points should be different; and (4) The site of the observation point should be safe and undisturbed. Finally, nine observation points were selected (Figure 2).
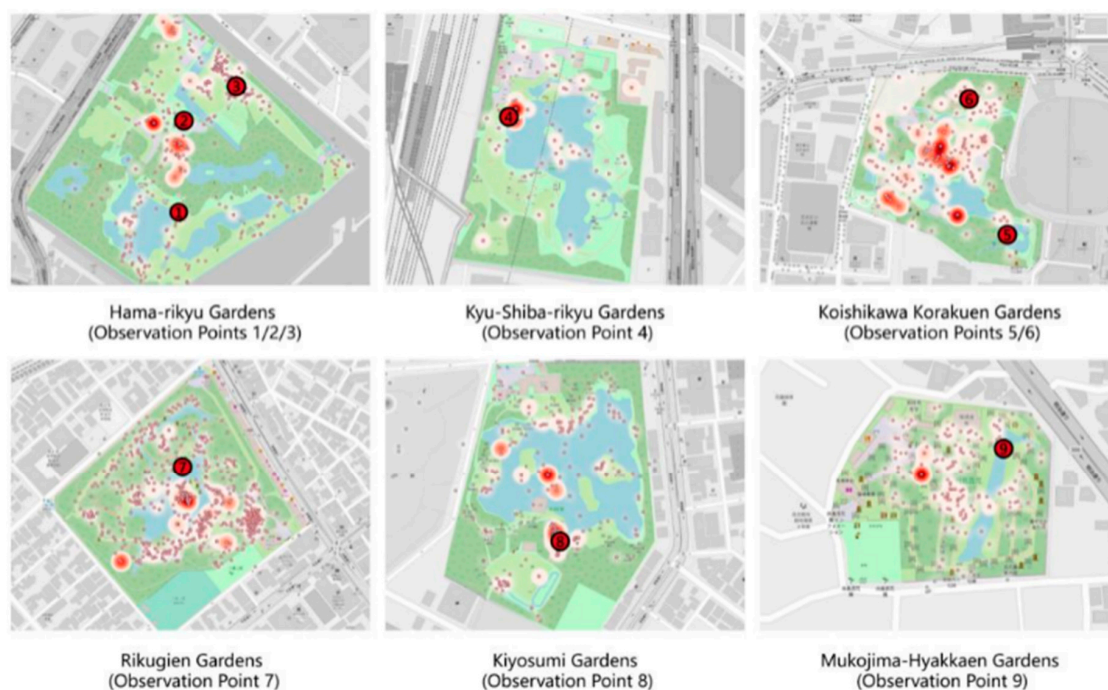

Figure 2. Observation points selected by heat maps.

3.2. The Questionnaire Survey

Trilingual questionnaires in Chinese, Japanese, and English were printed for tourists to judge the proposition of "whether modern buildings outside gardens have a positive impact on the overall landscape of the garden." The attitude of the respondents was measured on a 6-point Likert scale, with 1–6 points representing: totally disagree, disagree, somewhat disagree, somewhat agree, agree, fully agree.

The questionnaire-based survey was conducted from 25–28 March 2019, with similar weather conditions; that is, clear sky with little clouds. In the target gardens, visitors were randomly invited to have a full-angle observation of the landscape and fill out questionnaires at the selected observation points. Respondents were required to fill out questionnaires separately to ensure independent opinions. A total of 388 tourists (175 females; 231 East Asian (including Japanese) and 157 non-East Asian) participated in the survey, with an average of 43.1 respondents for each observation site (minimum 26 and maximum 47). Respondents ranged in age from 16 to 82, with an average age of 39.8.

3.3. View Factor

While conducting the questionnaire survey, panoramic images were taken at the observation point by a GoPro Fusion spherical camera (Figure 3a). The camera was fixed at the height of 170 cm to ensure that the shooting height was consistent with the viewing angle of the human eye. The image obtained was fed into RayMan software [42,43]. An R package was used to project the panoramic image from a cylindrical projection to an azimuth projection (Figure 4), and then used to generate a hemisphere diagram (Figure 3b) [44]. Figure 3c shows the fisheye diagram segmented according to landscape elements, with extraction of sky (in blue), garden landscape (in green), and buildings (in yellow), based on which the view factor of each landscape elements were calculated.
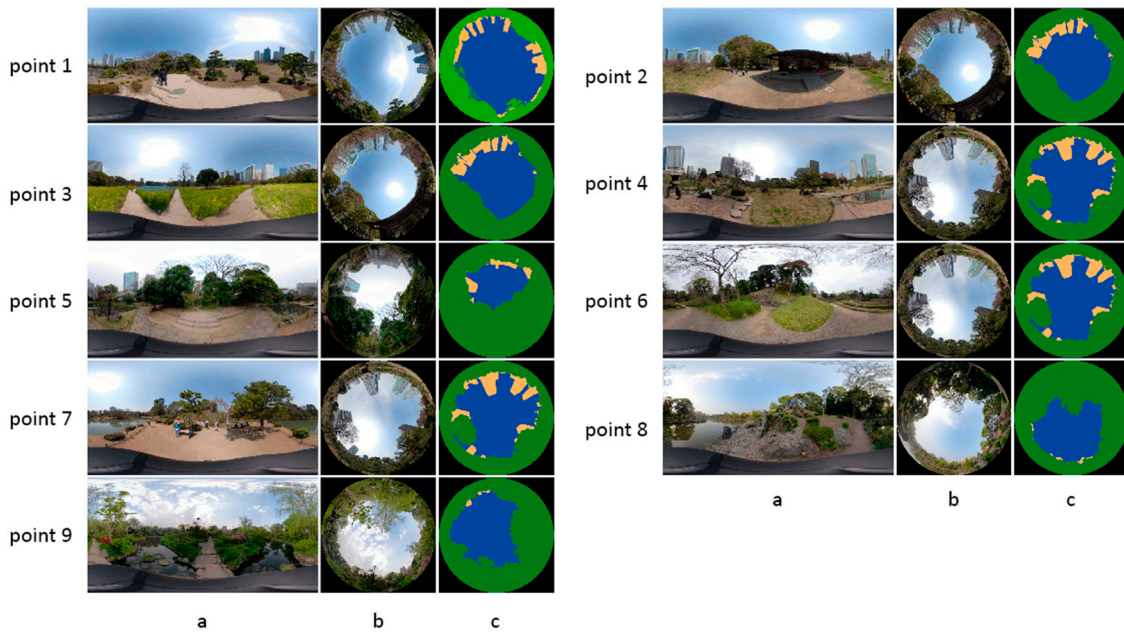

Figure 3. Panoramas (**a**) cylindrical projected panoramas, (**b**) fish-eye hemisphere, and (**c**) segmented fish-eye hemisphere.
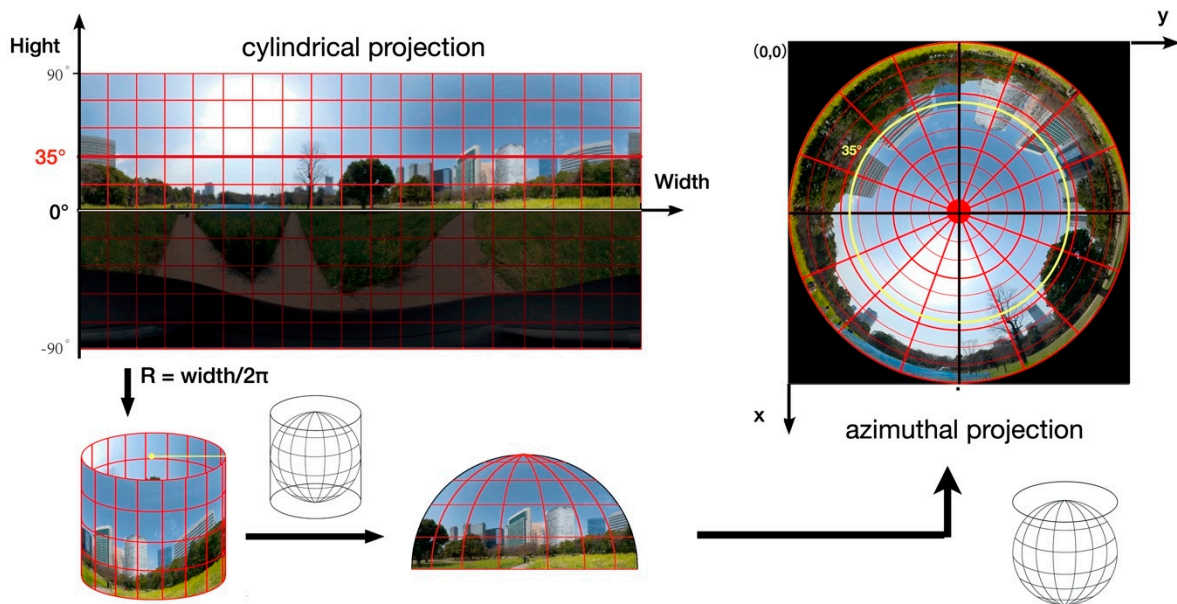

Figure 4. Geometric model from fish-eye hemisphere with panoramic view from cylindrical projection to azimuth projection (redrawn from study of [33]).

3.4. Analysis Method

The dependent variables of this study were visitors' preference score of the influence of modern high-rise buildings that are outside, on the overall landscape of the historic garden. The independent variables of SVF, GVF, and BVF were computed from the hemisphere diagram. The statistical analysis software JASP (0.9.2.0 release) was used for data analysis.

4. Results

4.1. Reliability Analysis and Descriptive Statistics

Unstandardized Cronbach's α was calculated for the collected preference scores to ensure that the data can be used for further analysis (Cronbach's α of all data higher than 0.788) (Table 2). The descriptive statistical results of the respondents' preference score for each observation point and the results from the calculation of the view factors are also shown in Table 2.

Table 2. Reliability coefficients, number of questionnaires, mean scores, and view factors of each observation point preference scores.

	1	2	3	4	5	6	7	8	9	Mean
Cronbach's α	0.894	0.851	0.871	0.888	0.896	0.918	0.850	0.788	0.829	/
Valid	47	46	45	46	45	45	46	41	26	/
Mean	3.894	3.783	3.600	3.435	3.178	3.356	4.130	3.122	3.808	/
Std. Deviation	1.088	1.052	1.304	1.500	1.628	1.334	1.392	1.166	1.357	/
SVF	0.562	0.403	0.494	0.443	0.197	0.160	0.375	0.344	0.362	0.371
GVF	0.357	0.531	0.408	0.455	0.771	0.823	0.620	0.650	0.633	0.583
BVF	0.081	0.066	0.098	0.102	0.032	0.017	0.005	0.006	0.005	0.046

The results show that the average of respondents' preference scores of all observation points of the impact of outside high-rise buildings on the overall landscape is 3.59. The most preferred site was spot-7, while the lowest preference was for spot-8, with preference scores of 4.13 and 3.12, respectively. Of the 388 respondents, 210 (54.12%) agreed with the proposition that the high-rise buildings outside the garden had a positive impact on the overall landscape. Among them, 108 respondents (27.84%) had a strongly positive attitude (5 Points and above). On the other hand, 178 respondents (45.88%) believed that the buildings outside the garden had a negative impact on the overall landscape, of which 89 respondents (22.94%) had a strongly negative attitude (2 points and below) (Figure 5).
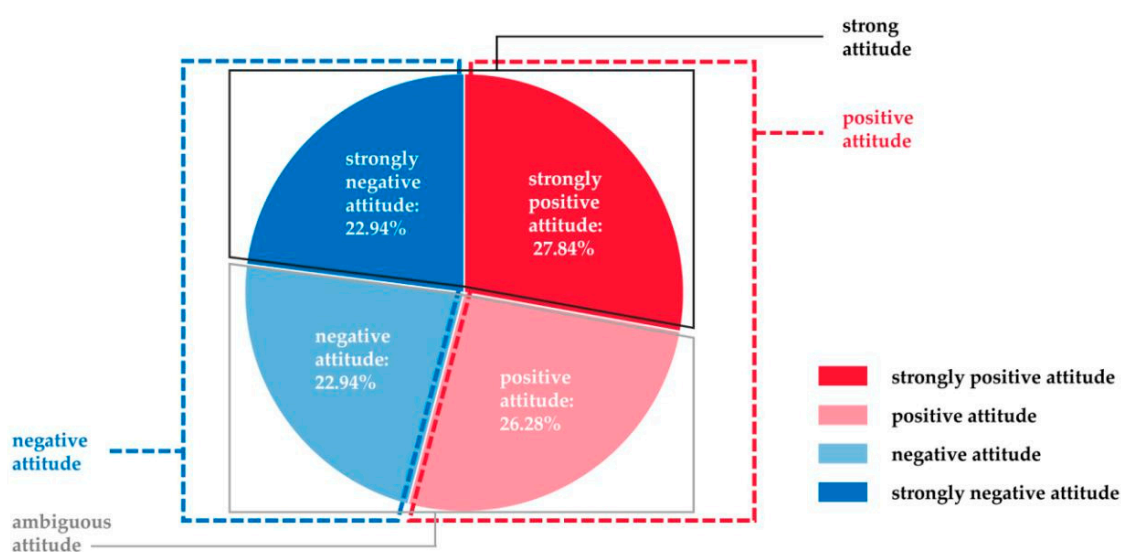

Figure 5. The results of the respondents' preference.

4.2. Correlation between View Factor and Tourist Preference

The Pearson correlation coefficient was employed to test the correlation between respondents' preferences and view factors. Table 3 indicates that the SVF and GVF are significantly correlated with respondents' preferences. SVF is positively correlated with respondents' preferences, while GVF is negatively correlated.

Table 3. Pearson correlation between view factors and respondents' preferences.

		SVF	GVF	BVF
Respondents' preference	Pearson's r	0.131 **	−0.112 *	0.019
	p-value	0.010	0.028	0.707

$* p < 0.05, ** p < 0.01.$

Then, stepwise multiple linear regression was employed to analyze the predictability of highly correlated view factors for tourist preferences. The results show that SVF has strongly positive predictability on the respondents' preferences (Table 4). The adjusted R^2 of the regression model is 0.015, and ANOVA analysis of stepwise multiple regression is significant ($p = 0.010$).

Table 4. Predictors of view factors in stepwise multiple linear regression.

	Regression Model						
Model	Unstandardized Coefficients		Standardized	t	Sig.	Correlations	
	B	Std. Error	B			Partial	Part
SVF	1.411	0.544	0.131	2.594	0.010 **	0.131	0.131
$R = 0.131; R^2 = 0.017;$ Adjusted $R^2 = 0.015;$ F(385) = 6.731; $p = 0.010$							

$** p < 0.01.$

4.3. The Influence of Tourist Attributes on Preferences

Analysis of variance was used to test whether the attributes of respondents affected their preferences. The respondents' preferences were the dependent variables, while their nationality (East Asian countries/other foreign countries), gender (male/female), and age (10 years as a group) were the independent variables. The results show that generation affected tourist preferences ($p < 0.05$, $\eta^2 = 0.055$) (Table 5).

Table 5. Analysis of variance of respondents' nationality and gender on cognitive attributes.

Dependent Variable	Fixed Factor	Sum of Squares	df	Mean Square	F	*p*	η^2
Respondents' Preferences	Nationality	279.30	287	279.27	3.794	0.052	0.013
	Gender	202.00	287	202.04	2.735	0.099	0.009
	Age	29.53	281	4.219	2.349	0.024 *	0.055
Respondents' Preferences (age as a potential influencing factor)	Nationality	289.75	285	289.75	3.962	0.047 *	0.013
	Gender	255.48	285	255.48	3.493	0.063	0.012
	Nationality * Gender	76.83	285	76.83	1.051	0.306	0.004

$* p < 0.05.$

A multivariate analysis of variance was then employed with the nationality (East Asian countries/other foreign countries) and gender (male/female) of the respondents as independent variables, and age as a potential influencing factor. It was found that under this condition, nationality had an effect on the dependent variable ($p < 0.05$, $\eta^2 = 0.013$). However, the effect size of both age and nationality is less than 0.06, judged to be a small effect according to Cohen's d effect size [45], indicating that tourists' preference for modern buildings outside the gardens will not be significantly affected by their attributes.

5. Discussion

5.1. Tourists' Attitude Towards Architecture Outside the Garden

Among the 388 questionnaires, 210 (54.12%) held a positive attitude; that is, the buildings outside the garden had a positive impact on the landscape of the garden. A total of 178 (45.88%) of the questionnaires held a negative attitude. This shows that the respondents' attitude towards the influence of modern high-rise buildings outside the cultural heritage garden is not necessarily negative. Even respondents who think that the high-rise buildings outside the garden have a positive impact on the garden landscape are slightly more than those who disagree. The attitude of nearly half of the respondents is not strong (three to four points account for 49.22% of the total questionnaire), which is a more neutral attitude.

In terms of each garden, the gardens with higher scores of respondents' preference are: Rikugien Garden, Hama-rikyu Garden, Mukojima-Hyakkaen Garden and Kyu-Shiba-rikyu Garden (mean of preference scores >3.4). It can be found that the SVFs of these gardens are all higher (SVF > 0.36). Among them, Rikugien Garden and Hama-rikyu Garden have the largest garden area and wider garden landscape, so the SVF is also higher. Hama-rikyu Garden and Kyu-Shiba-Rikyu Garden are located in the same coastal area with a broad view of the city, so the SVF of Kyu-Shiba-Rikyu Garden is also high.

In the process of conducting the questionnaire, through discussions with the tourists, we obtained many different opinions from various traditional concepts. For example, two tourists from Spain believed that both the urban background and the traditional landscape of observation point 4-Kyu-Shiba-rikyu Garden were rare for them, and the traditional Japanese garden and modern architecture together were new landscape forms, rather than destroyers of the traditional landscape. Additionally, the building complex outside Hama-rikyu Garden and Kyu-Shiba-rikyu Garden is a very famous skyline view of Tokyo [46]. Many respondents said that under such a modern visual background, the uniqueness of traditional landscapes could be more prominent and form an impressive visual impact. Another typical example is observation point 9 at Mukojima-Hyakkaen Garden. The architecture outside the garden includes the Tokyo Sky Tree, which is a famous landmark of Tokyo [47]. According to statistics from a Japan Tourism Website, after the Tokyo Sky Tree was built in 2012, the shooting spot in Mukojima-Hyakkaen Garden, where the Tokyo Sky Tree can be seen, has become the most popular spot among tourists. Therefore, we believe that the impact of outside high-rise buildings on the overall landscape of the traditional garden can be discussed with a more diverse and tolerant perspective. In other words, urbanization does not necessarily have a destructive negative impact on the heritage landscape in the city. The modern cultural atmosphere created by urbanization and the historical features embodied in the heritage landscape may inspire each other under specific circumstances, creating compelling visual and cultural conflicts.

In addition, in Hama-rikyu Garden and Koishikawa Korakuen Garden, we chose two to three research points in the same garden, and different respondents' preference scores were obtained. For Hama-rikyu Garden, the buildings outside the garden of the three research points were the same, and the difference was the garden landscape. Research points 1–3 represented: plant landscape of cherry blossoms and pine of Japanese garden, Japanese traditional garden pavilion landscape, and rape flower field landscape, with respondents' preference scores decreasing in order. This illustrates the influence of the garden landscape itself on tourists' preference for buildings outside the gardens.

For Koishikawa Korakuen Garden, the biggest difference between the two observation points was that the Tokyo Dome, one of Tokyo's landmarks, can be seen at point 5 but not at point 6. However, the results showed that the respondents do not have high preferences for point 5, and the difference between the two points was not obvious. During the questionnaire survey, many respondents said that although it is one of Tokyo's landmarks, the Tokyo Dome is too close to the garden. The huge volume and round shape make people feel visually depressed. Additionally, the landscape of Koishikawa Korakuen Garden was relatively closed compared to other gardens with a low SVF.

Therefore, the buildings outside the gardens cannot be judged solely by building attributes, but also needs to be considered comprehensively in combination with building distance, building height and other factors.

The Sustainable Development Goals (SDGs) also mention the promotion of knowledge and skills development and appreciation of cultural diversity. In the urban context, the existence of heritage landscapes is more precious and meaningful, while its meaning and culture also develop with the changes of the times. The new culture and connotation formed by the heritage landscape in the urban environment have been more widely accepted, which is also supposed to be the goal that sustainable development expects to achieve. There is no doubt that excessive urbanization would cause irreversible damage to the heritage landscape. However, we hope to make the results of inevitable urbanization more positively related to the heritage landscape and to achieve the sustainable development of the heritage landscape and city.

5.2. The Predictability of View Factor on Preferences

The results of the correlation analysis showed that SVF (r = 0.131, p = 0.01) and GVF (r = −0.112, p < 0.05) were independent variables that had a strong correlation with the preferences of the respondents. Meanwhile, SVF and tourist preferences were positively related; and GVF was negatively correlated. However, BVF did not show any strong correlation, which also validated the research of Senoglu et al., that the visible building index does not explain tourist preferences [29].

The results of the stepwise multiple linear regression of two substantial correlated factors showed that SVF was a strong positive predictor of respondents' preferences (F = 6.731; p = 0.010). The ANOVA analysis of stepwise multiple regression was significant (p = 0.010), indicating that the regression model had remarkable statistical significance. However, the adjusted R2 interpretation of the regression model was 0.015, which stated that the model did not fit the dependent variable well. We believe that this was partly due to too few observation points and the small sample size of the independent variables, which also made it impossible to determine the optimal value interval of SVF. It also reflected the deficiencies in the design of this study to some degree. In future research, more observation points should be set up to expand the sample size of each view factor. Although the value of R^2 is not an absolute measure of the goodness of fit, the purpose of this study is not to determine the threshold of the linear relationship. Therefore, our findings indicated that the SVF of the cultural heritage garden is a valid positive predictor of the tourists' preference for modern high-rise buildings outside the garden on the overall landscape.

In addition to discovering the predictability of SVF, there were also some other findings from data analysis. Since the research object of this study was the cultural heritage gardens, we focused on the two conflicting objects of "buildings outside the garden" and "garden landscape". Therefore, we did not simply use the concept TVF, but introduced the concept of GVF, which includes both the TVF and garden landscape view factor. In the correlation analysis, SVF and GVF showed inverse correlations with respondents' preference, which was easy to understand. With the parameter calculation method used in this study, the value of BVF was so small that the increase of SVF would inevitably lead to a decrease of GVF. However, it also reflected the disadvantage of the setting of SVF and GVF; that is, the correlation between these two parameters was too strong. Therefore, we added the tree view factor of each observation point and found that it was also strongly negatively correlated with the preferences of the respondents (r = −0.121; p = 0.017), but did not show predictability for the dependent variable.

It is counterintuitive that there was a negative correlation between the vegetation view factor and the respondents' preferences. Studies by Asgarzadeh et al. show that green trees have a certain degree of relief for people's sense of oppression. Still, at the same time, the type and quality of green plants have a meaningful impact on people's psychological perception [48]. The start date of our study was at the end of March. From the panoramic photos taken in our research, we can see that many tall deciduous trees in the garden had not yet grown new leaves, which had an inevitable influence on the shielding effect of the buildings. Therefore, we believe that in future study of cultural heritage

gardens, seasons are an influencing factor that needs to be considered. The time of our experiment was the "cherry blossom season", which is also one of the most representative seasons of Japan. In other words, we also believe that this experiment should be seasonal, and an annual experiment in each season should be conducted. On the other hand, the results of this experiment also indicate that it may not be enough to describe the landscape of cultural heritage gardens with simple visual proportion. On this basis, future studies should pay more attention to the embodiment of landscape culture in the description.

In addition, it is found that age and nationality (East Asian or not) had a certain degree of influence on the predictability of SVF, which is consistent with the research results of Senoglu et al. [29]. We believe that people of different ages will have different opinions on the renewal and sustainable development of cultural heritage gardens. Additionally, garden visitors who were more familiar with East Asian culture and East Asian traditional garden culture than Western tourists, tended to have different attitudes towards the impact of buildings outside the gardens. Although this impact was very small, it also indicated that the sustainable development of cultural heritage gardens requires multiple considerations.

6. Conclusions

This study took the cultural heritage gardens in Tokyo as the research object and investigated the tourists' perception preference of the impact of urban high-rise buildings on the historical garden landscape in the context of urbanization. The findings show that tourists' attitudes towards the high-rise buildings outside the traditional gardens were increasingly diversified, and the impact of this phenomenon was not necessarily negative. Therefore, in future policy setting for the protection and management of the cultural heritage landscape and its surrounding environment in the city, the relationship between the city and the cultural heritage landscape should be viewed from a dynamic perspective. The managers of the urban heritage landscape should try to associate the results of urbanization with the heritage landscape more positively to achieve the goal of sustainable development of cultural heritage landscape and city together.

Furthermore, this exploratory study introduced the urban morphological description parameter SVF into the evaluation of traditional garden landscapes in an urban context and attempted to quantify tourists' preferences and landscape spatial form in Tokyo Metropolitan Cultural Heritage Gardens. The results of this study showed that Sky View Factor and tourists' preferences were significantly positively correlated, while Garden View Factor was significantly negatively related. Meanwhile, SVF had predictability for tourists' preferences, which means that, to a certain extent, and within a specific range, the wider the landscape of the observation point, the more tourists would tend to think that the outside modern high-rise buildings have a less negative impact on the traditional landscape. However, the building view factor did not show any correlation with the dependent variable. Additionally, the age and nationality of tourists caused differences in tourist preferences, but the impact was minimal.

Our research explores the coexistence and win–win challenges between the protection and management of cultural heritage landscapes and urban development in cities from a novel perspective. From the standpoint of people's continually changing and updated views and artistic perspectives over time, the sustainable development of heritage gardens in the city is discussed. The novelty of this paper is in its extension of the research and evaluation of the perception of urban cultural heritage landscapes to the field of urban morphology and proposition of a new method of quantifying landscape morphology, using spherical cameras to calculate the SVF, GVF, and BVF. This study also takes the lead in analyzing and discussing the correlation between the view factors of the landscape elements and the tourists' perception preference, which provides a new idea for the research of urban heritage landscape protection and sustainable development in the context of urbanization.

References

1. Boniface, P.; Fowler, P. *Heritage and Tourism in the Global Village*; Routledge: Abingdon, UK, 2002; ISBN 978-1-134-90843-1.
2. Nuryanti, W. Heritage and postmodern tourism. *Ann. Tour. Res.* **1996**, *23*, 249–260. [CrossRef]
3. Udeaja, C.; Trillo, C.; Awuah, K.G.B.; Makore, B.C.N.; Patel, D.A.; Mansuri, L.E.; Jha, K.N. Urban Heritage Conservation and Rapid Urbanization: Insights from Surat, India. *Sustainability* **2020**, *12*, 2172. [CrossRef]
4. Hosagrahar, J.; Soule, J.; Girard, L.F.; Potts, A. Cultural Heritage, the Un Sustainable Development Goals, and the New Urban Agenda. *BDC Boll. Cent. Calza Bini* **2016**, *16*, 37–54. [CrossRef]
5. Jigyasu, R. The Intangible Dimension of Urban Heritage. In *Reconnecting the City*; John Wiley & Sons, Ltd.: Hoboken, NJ, USA, 2014; pp. 129–159, ISBN 978-1-118-38394-0.
6. Harvey, D.C. Heritage Pasts and Heritage Presents: Temporality, meaning and the scope of heritage studies. *Int. J. Herit. Stud.* **2001**, *7*, 319–338. [CrossRef]
7. *Culture: Urban Future. Global Report on Culture for Sustainable Urban Development*; UNESCO: Paris, France, 2016; ISBN 978-92-3-100170-3.
8. Burgess, J.; Harrison, C.M.; Limb, M. People, Parks and the Urban Green: A Study of Popular Meanings and Values for Open Spaces in the City. *Urban Stud.* **1988**, *25*, 455–473. [CrossRef]
9. Havens, T.R.H. *Parkscapes: Green Spaces in Modern Japan*; University of Hawai'i Press: Honolulu, HI, USA, 2011; ISBN 978-0-8248-3477-7.
10. Cultural Properties | Agency for Cultural Affairs. Available online: https://www.bunka.go.jp/english/policy/cultural_properties/ (accessed on 30 June 2020).
11. Hough, M. *Out of Place: Restoring Identity to the Regional Landscape*; Yale University Press: London, UK, 1990; ISBN 978-0-300-05223-7.
12. Chiesura, A. The role of urban parks for the sustainable city. *Landsc. Urban Plan.* **2004**, *68*, 129–138. [CrossRef]
13. Jones, M.; Daugstad, K. Usages of the "cultural landscape" concept in Norwegian and Nordic landscape administration. *Landsc. Res.* **1997**, *22*, 267–281. [CrossRef]
14. Antrop, M. Why landscapes of the past are important for the future. *Landsc. Urban Plan.* **2005**, *70*, 21–34. [CrossRef]
15. Wu, J. Urban ecology and sustainability: The state-of-the-science and future directions. *Landsc. Urban Plan.* **2014**, *125*, 209–221. [CrossRef]
16. Von Wirth, T.; Grêt-Regamey, A.; Moser, C.; Stauffacher, M. Exploring the influence of perceived urban change on residents' place attachment. *J. Environ. Psychol.* **2016**, *46*, 67–82; [CrossRef]
17. Winter, T. *Post-Conflict Heritage, Postcolonial Tourism: Tourism, Politics and Development at Angkor*; Routledge: Abingdon, UK, 2007; ISBN 978-1-134-08494-4.
18. Jerpåsen, G.B.; Larsen, K.C. Visual impact of wind farms on cultural heritage: A Norwegian case study. *Environ. Impact Assess. Rev.* **2011**, *31*, 206–215. [CrossRef]
19. Antrop, M. The concept of traditional landscapes as a base for landscape evaluation and planning. The example of Flanders Region. *Landsc. Urban Plan.* **1997**, *38*, 105–117. [CrossRef]
20. European Environment Agency Task Force. United Nations Economic Commission for Europe. In *Europe's Environment: The Dobris Assessment*; Stanners, D.A., Bourdeau, P., Eds.; European Communities: Copenhagen, Denmark, 1997; ISBN 978-92-826-5409-5.
21. Oh, K. Visual threshold carrying capacity (VTCC) in urban landscape management: A case study of Seoul, Korea. *Landsc. Urban Plan.* **1998**, *39*, 283–294. [CrossRef]

22. Swensen, G.; Jerpåsen, G.B. Cultural heritage in suburban landscape planning: A case study in Southern Norway. *Landsc. Urban Plan.* **2008**, *87*, 289–300. [CrossRef]

23. Labadi, S. UNESCO, world heritage, and sustainable development: International discourses and local impacts. In *Collision or Collaboration*; Springer: Cham, Switzerland, 2017; pp. 45–60, ISBN 978-3-319-44515-1.

24. Shinji, I.; Shimizu, T.; Takemata, T. The Present Situation of Landscape Destructions on the Cultural Property Gardens in Tokyo. *J. Jpn. Inst. Landsc. Archit.* **1988**, *52*, 43–48. [CrossRef]

25. Arifin, N.H.S.; Masuda, T. Visitors' Judgements on the Scenery of Ritsurin Garden. *J. Jpn. Inst. Landsc. Archit.* **1997**, *61*, 259–262. [CrossRef]

26. Koizumi, M.; Ishikawa, M. A Study of Landscape Structure in Dai-sensui and Yokobori Area of Hamarikyu Garden. *J. Jpn. Inst. Landsc. Archit.* **2007**, *70*, 497–500. [CrossRef]

27. Shinobe, H. A study on the scenery protection around the garden in the city. *J. City Plan. Inst. Jpn.* **2012**, *47*, 625–630. [CrossRef]

28. Lin, L.; Homma, R.; Iki, K. Visual Impact Analysis and Control Method of Building Height for Landscape Preservation of the Traditional Gardens: A Case Study on the Suizenji Jōjuen in Kumamoto City. In *Proceedings of the Smart Growth and Sustainable Development: Selected Papers from the 9th International Association for China Planning Conference, Chongqing, China, 19–21 June 2015*; Pan, Q., Li, W., Eds.; GeoJournal Library; Springer International Publishing: Cham, Switzerland, 2017; pp. 115–125, ISBN 978-3-319-48296-5.

29. Senoglu, B.; Oktay, H.E.; Kinoshita, I. An empirical research study on prospect–refuge theory and the effect of high-rise buildings in a Japanese garden setting. *City Territ. Archit.* **2018**, *5*, 3. [CrossRef]

30. Oke, T.R. *Boundary Layer Climates*; Psychology Press: Hove, UK, 1987; ISBN 978-0-415-04319-9.

31. Oke, T.R. Canyon geometry and the nocturnal urban heat island: Comparison of scale model and field observations. *J. Climatol.* **1981**, *1*, 237–254. [CrossRef]

32. Svensson, M.K. Sky view factor analysis – implications for urban air temperature differences. *Meteorol. Appl.* **2004**, *11*, 201–211. [CrossRef]

33. Li, X.; Ratti, C.; Seiferling, I. Quantifying the shade provision of street trees in urban landscape: A case study in Boston, USA, using Google Street View. *Landsc. Urban Plan.* **2018**, *169*, 81–91. [CrossRef]

34. Gong, F.-Y.; Zeng, Z.-C.; Zhang, F.; Li, X.; Ng, E.; Norford, L.K. Mapping sky, tree, and building view factors of street canyons in a high-density urban environment. *Build. Environ.* **2018**, *134*, 155–167. [CrossRef]

35. Hämmerle, M.; Gál, T.; Unger, J.; Matzarakis, A. Comparison of models calculating the sky view factor used for urban climate investigations. *Theor. Appl. Climatol.* **2011**, *105*, 521–527. [CrossRef]

36. Aoki, Y. Relationship between percieved greenery and width of visual fields. *J. Jpn. Inst. Landsc. Archit.* **1987**, *51*, 1–10. [CrossRef]

37. Xiao, X.; Wei, Y.; Li, M. The Method of Measurement and Applications of Visible Green Index in Japan. *Urban Plan. Int.* **2018**, *33*, 98–103. [CrossRef]

38. Takei, M.; Ohara, M. A Study on Measurement of the Sense of Oppression by A Building: Part-4 Estimation of A Permissible Value of the Sense of Oppression and Conclusion of this Study. *Trans. Archit. Inst. Jpn.* **1981**, *310*, 98–106. [CrossRef]

39. Bulut, Z.; Yilmaz, H. Determination of landscape beauties through visual quality assessment method: A case study for Kemaliye (Erzincan/Turkey). *Environ. Monit. Assess.* **2008**, *141*, 121–129. [CrossRef]

40. Jiang, B.; Larsen, L.; Deal, B.; Sullivan, W.C. A dose–response curve describing the relationship between tree cover density and landscape preference. *Landsc. Urban Plan.* **2015**, *139*, 16–25. [CrossRef]

41. Sun, Y.; Fan, H.; Helbich, M.; Zipf, A. Analyzing Human Activities through Volunteered Geographic Information: Using Flickr to Analyze Spatial and Temporal Pattern of Tourist Accommodation. In *Progress in Location-Based Services*; Lecture Notes in Geoinformation and Cartography; Krisp, J.M., Ed.; Springer: Berlin/Heidelberg, Germany, 2013; pp. 57–69, ISBN 978-3-642-34203-5.

42. Matzarakis, A.; Rutz, F.; Mayer, H. Modelling radiation fluxes in simple and complex environments—application of the RayMan model. *Int. J. Biometeorol.* **2007**, *51*, 323–334. [CrossRef]

43. Matzarakis, A.; Rutz, F.; Mayer, H. Modelling radiation fluxes in simple and complex environments: Basics of the RayMan model. *Int. J. Biometeorol.* **2010**, *54*, 131–139. [CrossRef] [PubMed]

44. Honjo, T.; Lin, T.-P.; Seo, Y. Sky view factor measurement by using a spherical camera. *J. Agric. Meteorol.* **2019**, *75*, 59–66. [CrossRef]

45. Cohen, J. The Effect Size Index: D. In *Statistical Power Analysis for the Behavioral Sciences*; Lawrence Erlbaum Associates: Mahwah, NJ, USA, 1988; pp. 20–26, ISBN 0-8058-0283-5.

46. Hamarikyu Gardens | Chūō Ku | Japan | AFAR. Available online: https://www.afar.com/places/bang-li-gong-en-si-ting-yuan-hamarikyu-gardens-tokyo (accessed on 30 June 2020).

47. 向島百花園|公園へ行こう! Available online: https://www.tokyo-park.or.jp/park/format/index032.html (accessed on 30 June 2020).

48. Asgarzadeh, M.; Koga, T.; Yoshizawa, N.; Munakata, J.; Hirate, K. Investigating Green Urbanism; Building Oppressiveness. *J. Asian Archit. Build. Eng.* **2010**, *9*, 555–562. [CrossRef]