

Article

Post-Occupancy Evaluation of Sports Parks during the COVID-19 Pandemic: Taking Sports Parks in Beijing as Examples

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Abstract: China fully built a wealthy society but faced a serious COVID-19 epidemic together with the rest of the world. The emergence of the epidemic highlights the importance of sports parks for physical activity. By reviewing national fitness policies and identifying several types of sports parks, this paper investigates urban dwellers' usage and preferences in sports parks by means of a questionnaire, with behavioural observation and interviews as complementary research methods. Taking the Beijing Olympic Forest Park, Sun Park, and Huilongguan Park as examples, this study reveals that participants present a high overall satisfaction with the sports parks. The factor analysis indicates that Sports Facilities and Maintenance & Management are the first and second most significant factors influencing residents' willingness to use sports parks. This research can guide the planning and construction of sports park in the future.

Keywords: post-occupancy evaluation; semantic differential method; sports parks



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1. Introduction

1.1. National Fitness Policies in China

Promoting the construction of a healthy China is the foundation for truly building a wealthy society and realizing socialist modernization. It is also a national strategy to improve the health of the Chinese nation and achieve coordinated development of people's health and the social economy. China also presents a vision for how it can participate actively in global health management and fulfill its international commitments in the 2030 Agenda for Sustainable Development [1]. With the influence of the Olympic spirit and advocacy for the national fitness movement, people have become more concerned about physical activity. The pursuit of personal physical and mental health and well-being has become a popular new value in relation to sports. Therefore, promoting the concept of a healthy lifestyle has brought about increased participation in fitness and exercise and has inspired many sports enthusiasts [2,3]. With the launch and implementation of a series of national fitness policies (see Table 1), the number of people who regularly participate in sports and exercise, the area of sports venues per capita, and the total scale of the national sports industry have all increased significantly (see Figure 1). With policy encouragement and continued capital investment, mass sports centres, sports parks, and other sports-related facilities were constructed for physical activity as well as for urban leisure lifestyles, which are of strategic importance for the quality of life in our increasingly urbanized society [4].

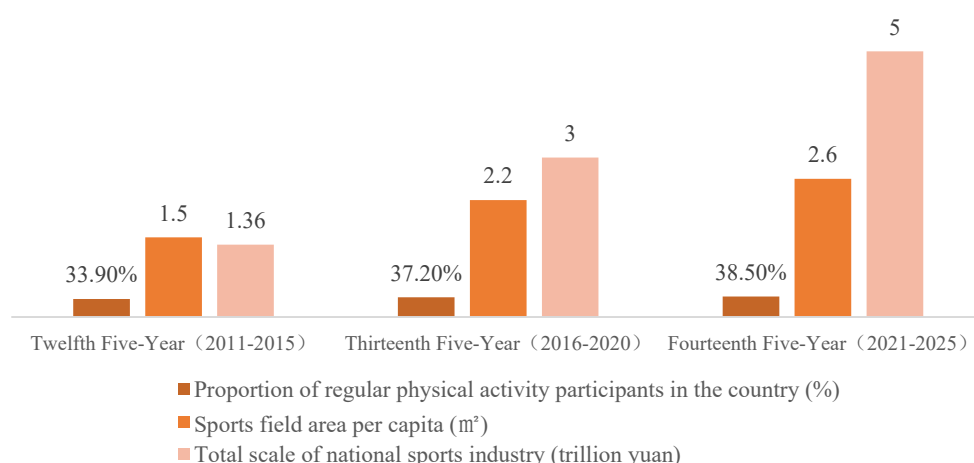


Figure 1. Summary of the development of national fitness and trends in China.

Table 1. Summary of key National Fitness policies in China.

Report	Issue Department	Issue Number	Release Date
The National Fitness Program (2021–2025) [5]	China’s State Council	[2021] No.11	3 August 2021
The implementation plan for the national fitness facilities to supplement the shortcomings during the 14th Five-Year Plan period [6]	National Development and Reform Commission	[2021] No. 555	20 April 2021
Opinions on Strengthening the Construction of National Fitness Venues and Facilities to Develop Mass Sports [7]	China’s State Council	[2020] No. 36	10 October 2020
Opinions on promoting national fitness and sports consumption and promoting the high-quality development of the sports industry [8]	China’s State Council	[2019] No.43	17 September 2019
Health China Action Task (2019–2030) [9]	Health China Action Promotion Committee	N/A	9 July 2019
Outline of the “Healthy China 2030” Plan [10]	China’s State Council	N/A	25 October 2016
The National Fitness Program (2016–2020) [11]	China’s State Council	[2016] No. 37	15 June 2016
The National Fitness Program (2011–2015) [12]	China’s State Council	[2011] No. 5	15 February 2011
National Fitness Regulations [13]	China’s State Council	National Order No. 560	13 August 2009
Outline of the National Fitness Program [14]	China’s State Council	[1995] No. 14	20 June 1995

1.2. Sports Parks—A New Place for National Fitness

From leisure urban parks and national fitness centres to gymnasiums, a variety of places for physical activity have been provided to urban dwellers in China. Sports parks not only bring vitality to existing urban parks, but also provide a new testing ground for inter-disciplinary integration and interactive applications of technology, and they upgrade and transform the sports industry. Sports parks are parks that are themed around physical fitness. They are built on green land with vegetation, provide facilities for competitive sports and physical exercise, and are open to the public for free or at a low cost, to meet the needs of residents for rest, excursions, and exercise [15]. Promoting the construction of sports parks is of great significance in meeting the people’s growing demand for sports and fitness and in improving the quality of people’s lives. The National Development and Reform Commission asserts that around 1000 more sports parks will be constructed by 2025 [16]. As an important space for conducting physical activity, the spatial planning of

sports parks has become a prominent issue in the transformation of China into a strong sporting nation [17]. The people's increasing demand for healthy lives, national fitness as a national goal, diversified integration, and upgrading of the sports industry, etc., all provide important support for the design and construction of sports parks in China.

Even though the official report on sports park design and planning guidelines remains unpublished, researchers and designers have started to consider the classification of sports parks in their own ways and attempt to summarise the rules and past experiences in sports park planning. As a means of practicing the concept of a healthy China, construction of the sports park is one of the key measures to relieve the pressure of urban land construction [18]. Existing urban public spaces and communal social spaces are all ideal places for adding sports elements. In general, sports parks can be classified into three types: (1) Legacy Sports Park (LSP): This is a place where at least one major sports event occurred before, and which was transformed into a park with a legacy for urban dwellers' tourism as well as for their daily physical activity. Unlike other categories of sports parks, one or more professional-level stadiums exist here and are in use for hosting sporting competitions [19,20]. (2) Urban Leisure Sports Park (ULSP): In response to the National Fitness Program, existing urban leisure parks have been upgraded with extra sports facilities for urban dwellers' physical activity. In addition to holding sports competitions regularly, these parks are mainly open to citizens for daily physical and leisure activities [15,21]. (3) Community Sports Park (CSP): This is a new type of community park with exercise through sports as the main function, using landscaping combined with various outdoor sports fields (including basketball courts, badminton courts, table tennis courts, etc.) on separate land [22–24].

The sports park in China was identified and developed through a process of transformation from high-speed growth to high-quality development. The number of sports parks in China has been increasing in the last decade. The State Council of China issued the National Fitness Plan (2021–2025) to explain that China will continue to construct new sports parks, expand more than 2000 existing sports parks, and add fitness venues and facilities in urban parks to promote physical activity and improve public health [5]. Meanwhile, how to design layouts and improve service quality at sports parks to promote people's involvement in the national fitness program is a new challenge for the development of sports parks.

Research on spatial environments as well as evaluations of sports parks were previously conducted by international academics. Theoretical research and practical exploration of sports parks in Japan [25], the United States [26,27], and other countries [28–30] have explored different sports park management and operation models.

Evaluation systems such as the Physical Activity Resource Assessment (PARA) [22], the Recreation Facility Evaluation Tool (RFET) [31], the Environmental Assessment of Public Recreation Spaces Tool (EAPRS) [32], and the Bedimo-Rung Assessment Tools (BRAT) [33] have been applied to focus on park environmental characteristics along with non-physical factors, including park facilities, leisure time available, aesthetics, sense of security, and proximity to the park, etc. [34] Many scholars in China have studied the classification, characteristics, and management modes of sports parks in the form of case study analysis [17,24,35–37]. They have conducted practical work on sports parks based on sports industry policy planning to explore sports park design strategies [23,24,38–40].

More research on sports parks in China should be conducted in advance of publishing the national policies, guidelines, and programs, especially at the beginning of the period of their high-quality development. The quality of sports parks here refers to the significance of their contributions in improving the urban living environment and increasing residents' expectations for better lives [24]. The COVID-19 pandemic has made people more concerned about their health. People chose a "slow life" model and were limited to public places to avoid being infected. Consequently, it has been necessary but challenging for researchers to do field studies during the pandemic. How people perform physical activity, what their subjective preferences are for existing sports parks, and what the determining factors are in people's willingness to select and use sports parks remain unclear. The objectives of the

study are: (1) to record physical activity behaviour patterns; (2) to examine users' subjective perceptions of existing sports parks based on the Semantic Differential method; (3) to explore the factors that influence users' willingness to use sports parks. The findings of this study will provide a spatial optimization strategy for sports parks planning, construction, and management.

2. Materials and Methods

2.1. Study Area

The Beijing Olympic Forest Park, Sun Park, and Huilongguan Park were selected as case studies (see Figure 2) to conduct a quantitative survey on behavioural demand and functional space of sports parks in China.



Figure 2. Site plan of the Beijing Olympic Forest Park (**left**), Sun Park (**middle**), and Huilongguan Park (**right**).

The Beijing Olympic Forest Park is the legacy of the 2008 Beijing Olympic Games as well as the 2022 Beijing Winter Olympic Games. As a large, manufactured nature park situated at the north end of the Olympic Green in Beijing, the park consists of the south, central, and north parts, with many walking paths, competition venues, and leisure facilities for urban dwellers. It has a strong brand effect that attracts tourists from all over the world. Meanwhile, it is also a place for public fitness and leisure use.

Sun Park is a ULSP built in 1984. Over 85% of it is green space, with a total area of 288.7 ha, which includes 68.2 ha of water surface area. The layout of the park has changed over time. In 2008, Sun Park was part of the Beijing 2008 Olympic Games and was the venue for the beach volleyball competition. After the competition, a beach volleyball theme park was built to serve as a model of post-game utilization. Now, a well-designed landscape and pedestrian walkway is proposed as part of the National Fitness program, which would be open to the public and mainly used for regular recreation and sports exercise by locals.

Huilongguan Park is a CSP with sports facilities, green spaces, and recreational footpaths built in the last two years. With over 50 ha of green space, the total area of Huilongguan Park is 80 ha, which includes a variety of sports facilities: four outdoor tennis courts, four full basketball courts, 30 badminton courts, 3000 m² of roller-skating space, 10 table tennis tables, as well as leisure pathways. In response to the call of the national fitness program to meet the requirements of people's physical activities, an innovative commercial management and operation model was proposed to support leisure and exercise spaces for the surrounding residents.

2.2. Data Collection

The main data collection tool is a questionnaire. Behavioural observations and interviews were used as complementary research methods, mainly during the pilot study to understand how urban dwellers used the sports park as part of our search for key places to disseminate the questionnaires. The questionnaire was divided into three aspects: basic information on respondents (including gender, age, education level, income status, occupation, etc.), sports park usage (including the distance between residence and sports park, time, mode and frequency of visit, purpose of visit, how to get information about sports park, etc.), and a scale with evaluation factors (including evaluation of overall park perception, sports facilities, and park facilities).

All questionnaires were distributed and collected on-site. When the respondents filled out the questionnaires anonymously, we explained the parts of the questionnaires that were not clear to the respondents to ensure that they understood and filled out the questionnaires accurately. In response to the epidemic prevention and control requirements, all researchers wore masks throughout the process, kept a safe distance of more than one meter from the interviewees, and completed data collection in the form of speaking out the questions and filling in the questions on the respondents' behalf. A pilot study was done to find ways to improve the design of the questionnaire in advance of its formal distribution. The researchers studied three representative sports parks of diverse types, the Beijing Olympic Forest Park, Sun Park, and Huilongguan Park, covering five time periods on weekdays as well as weekends between August and September 2021. The time slots were 6 a.m.–9 a.m., 9 a.m.–12 a.m., 12 a.m.–3 p.m., 3 p.m.–6 p.m., and 6 p.m.–9 p.m. The location of the questionnaire distribution covered, as much as possible, all physical activity areas, including the square spaces, specific exhibition areas, fitness footpaths, children's playgrounds, sports facilities, stadium areas, etc. Respondents were selected carefully to involve all age groups to ensure the representativeness of the sample.

2.3. Analysis Tools

Valid responses to the questionnaires were analysed according to the following steps (see Figure 3). Firstly, the basic information on respondents and sports park usage in the first two parts of the questionnaires were analysed statistically to gain insight into urban dwellers' daily usage of the sports parks. Secondly, the mean scores of the evaluation factors in the overall perception of sports parks, sports facilities, and park facilities were calculated. A Semantic Differential score method (SD) evaluation line chart for assessment of sports park facilities was drawn to indicate participants' subjective preferences for the sports parks. The SD method is a research method created by American psychologist Charles E. Osgood and his colleagues, which uses semantic differentiation scales to study the meaning of things [41]. By focusing on subjective evaluation, with the advantage of easy administration and relatively fast Question & Answer sessions, this method is especially suitable for measuring emotional and behavioural aspects of attitude [42] and has been applied to research in the fields of architecture and environment [43–45]. The method quantitatively measures human perception through linguistic scale analysis, clearly reflecting the research objectives. We assigned a semantic scale to sports park-related factors by using adjectives and their antonyms that describe the users' preferences for sports park usage. The scale measures respondents' psychological feelings by counting and analysing the differences between the two adjectives chosen by the respondent, thus transforming the respondents' perceptual evaluation of space into a value that can be analysed quantitatively [46,47].

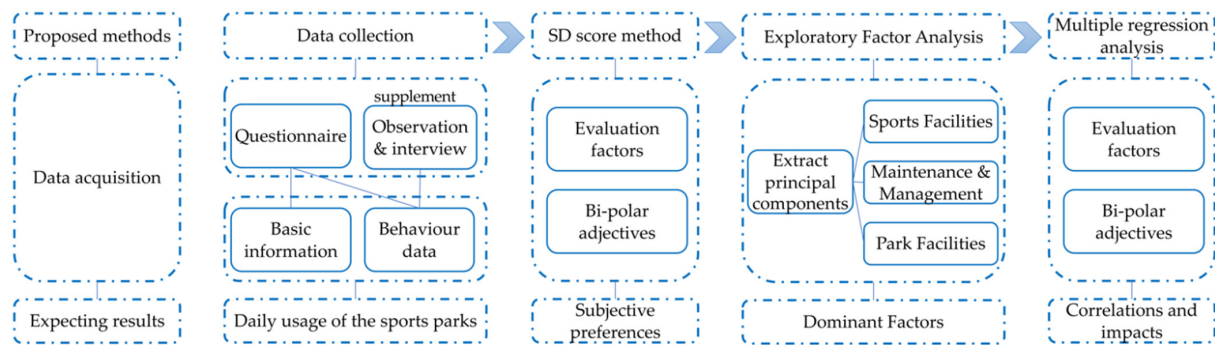


Figure 3. Research design.

The evaluation factors of the scale were generated based on the literature from two databases, the Web of Science (WoS) and the China National Knowledge Infrastructure (CNKI). Consequently, 26 evaluation factors were first selected as the indicators to evaluate the sports parks. According to Lenno, the sources of bi-polar adjectives about the affective dimension of evaluation factors are both the literature and the participants [48]. Then, by summarizing the views of scholars as well as the results of the pilot tests, the affective dimension of three major categories, namely the overall perception of sports parks, sports facilities, and park facilities, 14 pairs of adjectives were finally designated to report through a five-point rating Likert scale: unpleasant–pleasant, inconvenient–convenient, monotonous–diverse, dangerous–safe, dirty–clean, uncomfortable–comfortable, crowded–spacious, insufficient–sufficient, gloomy–bright, undemanding–demanding, bad–good, disordered–ordered, inapparent–apparent, difficult–easy. Semantic differential scores were transformed to fit a scale ranging from -2 to $+2$, which are easier to interpret with a neutral point at zero (0). The system is divided into three major categories, including the overall perception of sports parks, sports facilities, and park facilities, containing a total of 17 evaluation factors (see Table 2).

Table 2. Semantic evaluation factors.

Category	No.	Evaluation Factors	Adjectives Pair
overall perception of sports park	1	Fitness and leisure atmosphere	Unpleasant—Pleasant
	2	Convenience and accessibility	Inconvenient—Convenient
	3	Types of activities	Monotonous—Diverse
	4	Sense of security	Dangerous—Safe
	5	Cleanliness	Dirty—Clean
sports facilities	6	Types of sports facilities	Monotonous—Diverse
	7	Comfort of sports facilities	Uncomfortable—Comfortable
	8	Space between sports facilities	Crowded—Spacious
	9	Number of sports facilities	Insufficient—Sufficient
	10	Brightness	Gloomy—Bright
park facilities	11	Commercial facilities	Undemanding—Demanding
	12	Children’s facilities	Unpleasant—Pleasant
	13	Landscape design and greening	Bad—Good
	14	Maintenance and Management	Disordered—Ordered
	15	Safety signs	Unapparent—Apparent
	16	Public restroom arrangement	Different—Easy
	17	Lounge seating arrangement	Insufficient—Sufficient

Thirdly, the Exploratory Factor Analysis (EFA) method was employed using IBM SPSS Statistics 26 to reduce the dimensionality of the main factors affecting the willingness of people to use sports parks. The EFA was conducted to define the underlying constructs and identify possible factors using the Principal Component method with promax rotation.

Finally, a multiple linear regression method was employed to analyse the impact of the factors on the willingness to use sports parks. Multiple linear regression analysis is a process to find the linear relationship between two or more independent variables and a dependent variable [49]. The method determines the direction of the relationship between the independent variable with the dependent variable, whether each independent variable can predict the value of the dependent variable.

3. Results

3.1. The Usage of the Sports Parks

In total, 270 responses to the questionnaire were collected with a 100% return rate and 241 valid questionnaires. Among them, 99 were collected from the Beijing Olympic Forest Park (valid number: 91; validity rate: 91.92%), 90 from Sun Park (valid number: 77; validity rate: 85.56%), and 81 from Huilongguan Park (valid number: 73; validity rate: 90.12%). The ratio of male to female participants is 1.1:1. Young people aged between 18 and 35 years and older people aged 56 years and above were the main respondents, accounting for about 71% of all respondents (see Table 3).

Table 3. Basic information and the number of respondents in three parks.

Category	Classification	Olympic Park	Sun Park	Huilongguan Park
Gender	Male/Female	41/50	47/30	39/34
Age	18 years old and below/18–35/36–55/56 years old and above	7/40/21/23	5/36/13/23	9/32/15/17
Educational level	Junior high school and below/high school/college/undergraduate/graduate and above	6/14/15/36/20	4/7/15/41/10	8/11/13/33/8
Working Status	Retired/Working	25/66	24/53	16/57

The distance from residence of the participants to the sports park and the number of participants in different age groups at different time periods are shown in Figure 4. As one of the most famous tourist attractions in Beijing, the LSP had a magnetic power over urban dwellers be like tourists; the same was true for visiting and engaging in physical activity at the Beijing Olympic Forest Park. Nearly half of the respondents lived more than 5 km away from the Beijing Olympic Forest Park (see Figure 4). Meanwhile, over 30% of people who were in the middle-aged group, 36 to 55 years old, lived around the park less than 2 km away, and chose to run, walk, and engage in other leisure activities between 18:00 and 21:00 at night (see Figure 4).

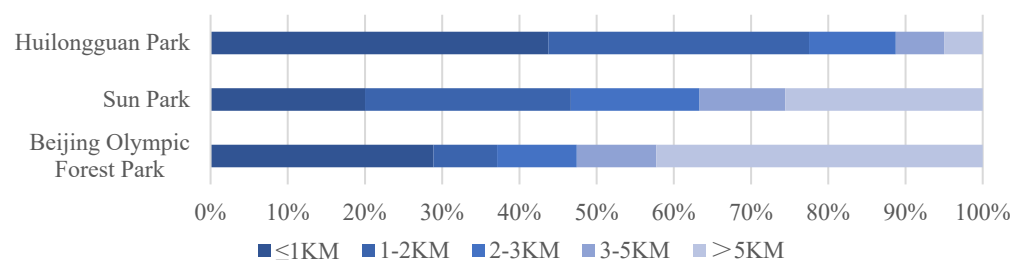


Figure 4. The distance from the users' residences to the sports park.

According to the statistics, the age composition of participants is significantly different between morning and afternoon times at Sun Park. In the morning, between 6:00 and 9:00,

retired people over 55 years old make up 70% of the total number of participants. In the afternoon, between 15:00 and 18:00, the number of young people aged 18–35 years old reached a peak, accounting for over 60% of the total number of participants (see Figure 4).

As a CSP serving the local community, nearly 90% of the participants lived within three km of the Huilongguan Park. The park has become the main place for doing morning exercise for the elderly nearby (up to 70% of the participants) between 6:00 and 9:00 in the morning (see Figure 5). Yet, during the lunch break and after work hours, over 90% of the participants are customers who pay for the physical education training and the rental of Sports Venues.

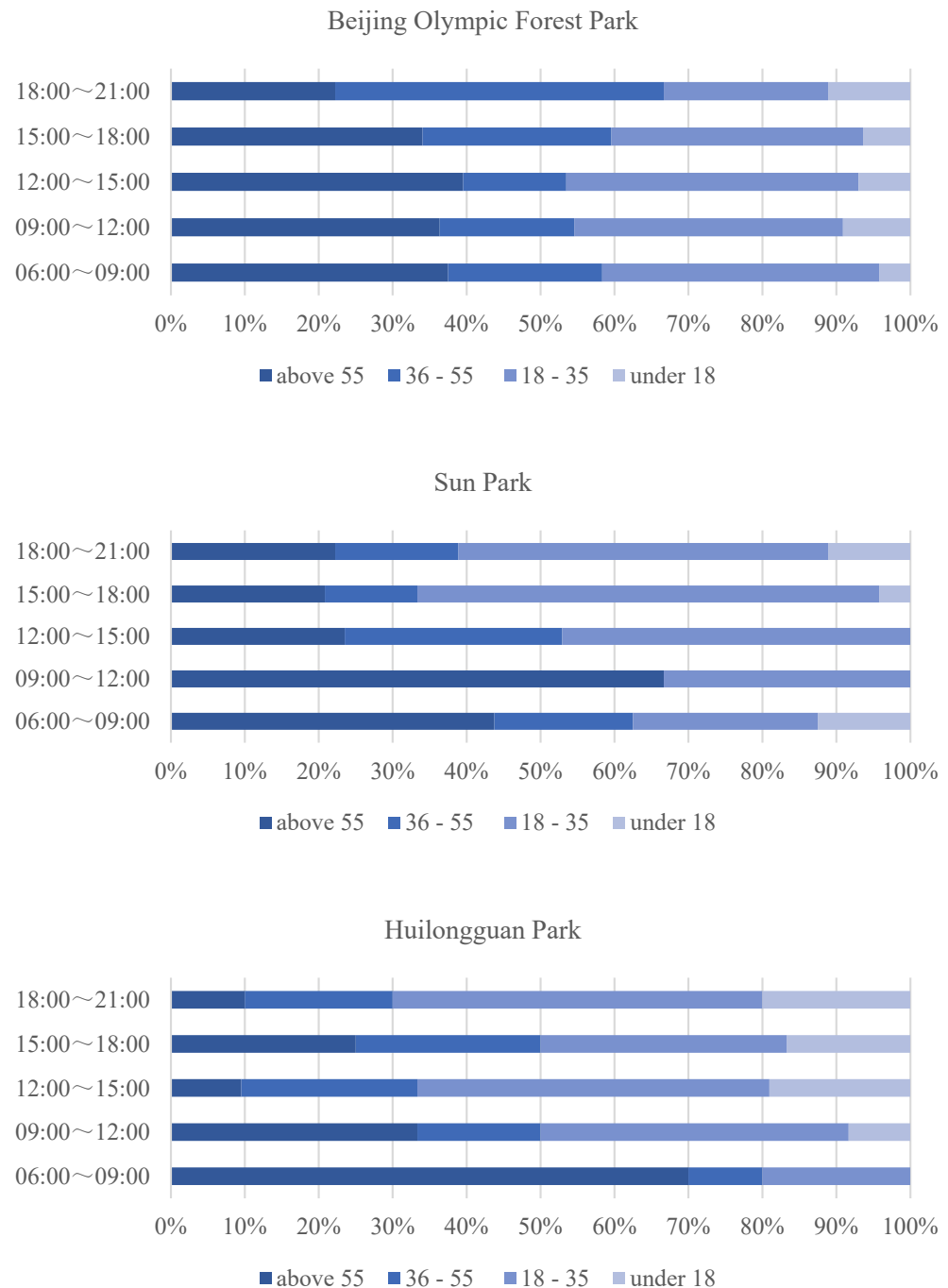


Figure 5. Changes in population age ratio in different periods of a day.

3.2. SD Evaluation Results

Following the statistical analysis of the sports park questionnaire responses, the table of evaluation indicators based on the SD scale method for sports parks is presented in Table 4. The SD evaluation curve was plotted on the vertical axis of the average scores of each factor of the 241 valid questionnaire responses (see Figure 6). It is an intuitive way to assess subject's impressions of the usage of sports parks. The results obtained have no negative values and all the factors received favorable comments. The mean scores for most factors were greater than one for the three sports parks. This indicates that the factors of overall perception, sports facilities, and park facilities of the three sports parks investigated are quite high from an overall perspective. Relatively speaking, the mean values of the commercial facilities and children's facilities were only 0.62 and 0.88 at LSP, indicating that more commercial and children's facilities were required in the park. The mean value of the commercial facilities was only 0.91 at ULSP, indicating that participants seek to be served with more commercial facilities in the park. Finally, the standard deviations for 17 pairs of adjectives had statistically insignificant difference, which were approximately 0.2. This result indicates that although some differences exist among individuals' perceptions of the sports park, their choices of adjectives as a whole present the same opinion on indicators.

Table 4. Statistical results of the evaluation indexes of the three sports parks.

	Questionnaire Content		LSP	ULSP	CSP	Mean Score
	Evaluation Indicators	Adjectives Pairs				
overall perception of sports park	Fitness and leisure atmosphere	Unpleasant—Pleasant	1.48	1.48	1.96	1.64
	Convenience and accessibility	Inconvenient—Convenient	1.58	1.61	1.47	1.55
	Types of activities	Monotonous—Diverse	1.22	1.30	1.81	1.44
	Sense of security	Dangerous—Safe	1.41	1.49	1.89	1.60
	Cleanliness	Dirty—Clean	1.44	1.17	1.19	1.27
Evaluation of sports facilities	Types of sports facilities	Single—Diverse	1.09	1.30	1.58	1.32
	Comfort of sports facilities	Uncomfortable—Comfortable	1.27	1.19	1.27	1.25
	Space between sports facilities	Crowded—Spacious	1.35	1.39	1.66	1.47
	Number of sports facilities	Insufficient—Sufficient	1.34	1.09	1.53	1.32
	Brightness	Gloomy—Bright	1.40	1.38	1.78	1.52
Evaluation of park facilities	Commercial facilities	Undemanding—Demanding	0.62	0.91	1.53	1.02
	Children's facilities	Unpleasant—Pleasant	0.88	1.21	1.56	1.22
	Landscape design and greening	Bad—Good	1.64	1.61	1.10	1.45
	Maintenance & Management	Disordered—Ordered	1.56	1.34	1.44	1.45
	Safety signs	Inapparent—Apparent	1.45	1.14	1.75	1.45
	Public restroom arrangement	Different—Easy	1.20	1.18	1.62	1.33
	Lounge seating arrangement	Insufficient—Sufficient	1.05	1.09	1.70	1.28

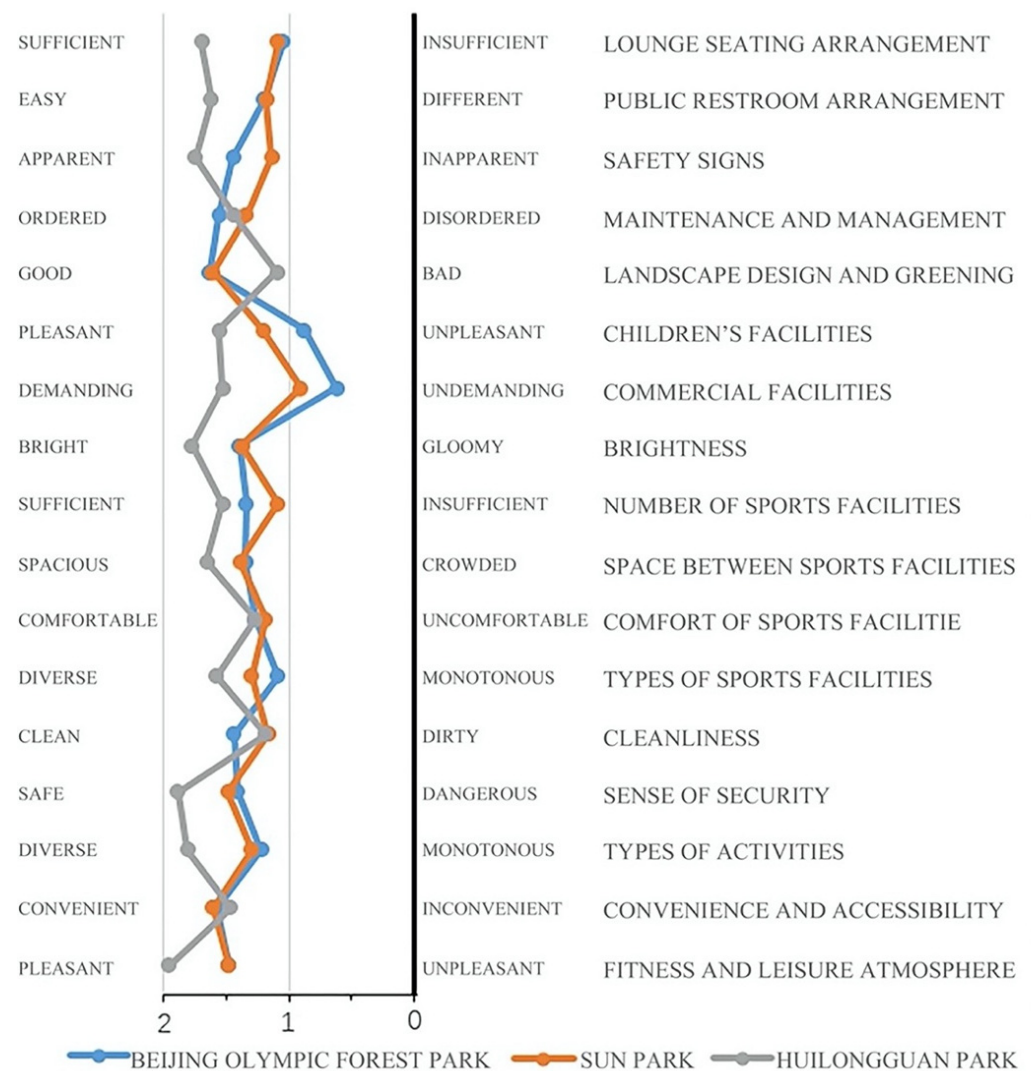


Figure 6. SD evaluation curves of three sports park spaces.

3.3. Factor Analysis

To determine the relationship between willingness to use sports parks and SD evaluation factors, an EFA was employed using the Principal Components method, and the reproduced rotational correlation matrix represented 53.156% of the original correlation matrix, which indicates good construct validity of the scale ($KMO = 0.776$, $p < 0.000$). The reliability was tested via Cronbach's coefficient. The α coefficient for all the questionnaire data is 0.803, which is greater than 0.8, indicating acceptable internal consistency [50,51]. Therefore, the questionnaire is useable and reliable. It indicates that the data are suitable for factor analysis, which can be employed to reduce the number of variables and explain the same amount of variance with fewer variables. Three extracted principal components are presented in Table 5, with the value of only those items above 0.5 being presented. Factor 1 was renamed Sports Facilities (X1), with five items with a factor loading from 0.676 to 0.814. Factor 2 was renamed Maintenance & Management (X2), with four items with a factor loading from 0.566 to 0.708. Factor 3 was renamed Park Facilities (X3), with three items with a factor loading from 0.510 to 0.701.

Table 5. The rotated component matrix.

SD Factor	Factor 1	Factor 2	Factor 3
Comfort of sports facilities	0.814		
Number of sports facilities	0.769		
Space between sports facilities	0.712		
Types of sports facilities	0.683		
Brightness	0.676		
Lounge seating arrangement		0.708	
Public restroom arrangement		0.686	
Safety signs		0.642	
Maintenance & Management		0.566	
Children’s facilities			0.701
Commercial facilities			0.666
Landscape design and greening			−0.510

3.4. Multiple Regression Analysis

The correlations between the three factors obtained, namely Sports Facilities X1, Maintenance & Management X2, and Park Facilities X3, and the willingness of urban dwellers to use sports park, were analysed (Table 6).

Table 6. Results of multiple regression variables.

Dependent Variable	Independent Variables	Unstandardized Coefficient		Standardization Factor	t	sig
		B	Standard Deviation			
Willingness to use	(Constant)	4.507	0.026	—	174.510	0.000
	Sports Facilities	0.194	0.026	0.431	7.515	0.000
	Maintenance & Management	0.162	0.024	0.359	6.809	0.000

The degree of willingness of urban dwellers to use sports parks is positively correlated with the degree of two of the three independent variables—Sports Facilities and Maintenance & Management ($p < 0.05$). The Park Facilities factor did not have a significant effect on the respondents’ intentions to use the sports parks. A multivariate linear regression between the degrees of willingness to use the parks and two principal component factors was established, as shown in Equation (1):

$$Y = 0.194 X1 + 0.162 X2 + 4.507 \quad (1)$$

where X1 and X2 are the key factors affecting the willingness of residents to use sports parks, Sports Facilities, and Maintenance & Management. The weights of the impact of each independent variable on the dependent variable were determined by comparing their coefficients in the multivariate linear regression equation [52]. In Equation (1), Sports Facilities, and Maintenance & Management have coefficients of 0.194 and 0.162, respectively. Therefore, urban dwellers’ selection of sports parks was dependent on Sports Facilities first, followed by their Maintenance & Management.

4. Discussion

The differences in core service functions and facility configurations among the three types of sports parks resulted in different usage patterns and preferences of the respondents. Visited by surrounding residents as a regular exercise place for physical activity, LSP was generally selected to be visited by tourists with a strong intention of visiting venues. It provides not only a place where users can be physically active but is an important photogenic location that is part of the tourist experience for some, as well as a symbol of self-confidence for China. The latter may be one of the reasons why people treat it as one of the most famous tourist attractions [53]. Meanwhile, participants have a contrary view in terms of commercial facilities. Obviously, allocating proper commercial facilities such as retail, souvenir stores, and vending machines in the sports park could increase income from the manager's perspective. Meanwhile, one of the participants indicates that necessary commercial facilities would increase the joyful experience of visiting LSP. However, participants who live close to LSP and do regular exercises there indicate that too many commercial facilities will impact their experience of using sports and park facilities. Compared with LSP, ULSP is a more inclusive and popular place for urban dwellers for leisure and physical activity. Urban dwellers tend to invite friends and families together to ULSP for a better quality of life. Not only can ULSP provide sports facilities for physical activity but can serve as a place for leisure and socialising. In ULSP, people of different ages choose to visit ULSP at separate times. ULSP provides a variety of sports and park facilities for a more diverse range of users. Even though CSP also provides services to different age groups, it is more like a place for business operation where fees are charged for physical education training for adolescents, and a social and sports place for the middle-aged. In response to the National Fitness Program and national goal to improve the urban quality of life, CSP is also built with green spaces and entry is free of charge to the elderly.

The study finds that the selected sports parks have a suitable number of staff, and satisfactory level of maintenance and management. Although many visitor gathering points are scattered throughout the parks, there is no obvious crowding situation. The COVID-19 pandemic severely impacts the social economic development and limits population mobility in China, which has resulted in slightly different findings in this work compared with research conducted before the pandemic [54,55]. Compared with the findings in previous work, participants expressed their pleasure and satisfaction with the sports parks when they have fewer people. This satisfaction is reflected in the evaluation of the characteristics of the sports parks. In terms of individual preferences, the overall SD average score is above one for all the characteristics of sports parks except for children's and commercial facilities of LSP and commercial facilities of ULSP. With a fine overall atmosphere, urban dwellers prefer to choose sports parks as their leisure and sports places on weekends and holidays, especially during the pandemic. The whole family can benefit from the sports-related and leisure atmosphere and their time and economic costs are relatively low. Regularly visiting sports parks for physical activity is gradually becoming a lifestyle for families to provide them with physical and mental health benefits [2].

Even though three distinct types of sports parks were selected as case studies, the results of the multiple regression indicate that the key factors influencing the willingness of residents to use sports parks were Sports Facilities and Maintenance & Management. As the dominant factor affecting respondents' willingness to use sports parks, the provided Sports Facilities could support people who are in different age groups to engage in physical activity and thus have a significant positive effect on community attachment [23,56]. Furthermore, the Sports Facilities of the sports park must also meet certain requirements and specified standards to meet participants' sports-related needs. The respondents assert that comfortable, bright, and spacious sports courts, and the quality of the sports facilities were the determining factors in whether they will come to a sports park.

The Maintenance & Management of the sports parks is not related to their architectural design and spatial planning but is related to the long-term maintenance for a high-quality sports and leisure environment. The quality of the sports environment is not only de-

terminated by the physical facilities such as casual seating, restrooms, etc., but also key characteristics of the overall spatial environmental quality such as cleanness, convenience, safety, and so on. It is the responsibility of the sports park managers to ensure that there is no long-term damage to equipment [57]. The Maintenance & Management could improve the user experience and impression of the parks, which will attract more urban dwellers to do regular physical fitness activities in the parks.

5. Conclusions

People's demand for physical activity is booming, and the construction of sports parks is the most effective and direct way to meet these needs. This research takes three sports parks in Beijing as examples and uses the Semantic Differential score method as well as statistical analysis to understand how urban dwellers use sports parks and their subjective perceptions of sports parks. Furthermore, this research identifies the two significant factors—sports facilities, and Maintenance & Management—that impact participants' willingness to use sports parks. The sports park is one of the important places for citizens to do leisure activities as well as physical exercise. During the planning and construction of the sports park, these are the two factors that require consideration in order to support the high-quality development of the sports parks and better serve urban dwellers. The sports facilities, key elements of the sports parks, play a dominant role in the willingness of the participants selecting to use sports parks for physical activity. This paper stresses strengthened communication between architects and sports park decision-makers. How to allocate sports facilities within the overall layout of the sports parks, how to quantify the number and types of sports facilities to better serve urban dwellers, and even how to satisfy participants who immerse themselves in the atmosphere of leisure and physical activity in sports parks, can all be tailored and reshaped by architects' technique.

Furthermore, an interdisciplinary collaboration between managers and decision-makers was required for the sports park. A value co-creation for the stakeholders of the sports park, including designers, managers, urban dwellers, and decision-makers, can shed light on the spatial organization and design quality of the sports park, which also helps the sports park better serve the urban dwellers. Meanwhile, the biophilic design of the sports park should be considered in advance of its design and construction. Especially, as proposed by the government, the proportion of green land in newly built sports parks should not be less than 65% of the land area of the park [16] to achieve sustainability as framed through the UN Sustainable Development Goals. Empirical research is unique during the pandemic. With the end of the pandemic, a comparison of sports park usage during and after the pandemic can be studied in the future.

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