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Urban Parks—A Catalyst for Activities! The Effect of the Perceived Characteristics of the Urban Park Environment on Children's Physical Activity Levels

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Abstract: The potential of urban parks to enhance social welfare and deliver health benefits has been recognized. However, it is still unclear which landscape characteristics in urban green spaces best improve the physical activity levels of users. Little is known about the relationship between the microenvironment of urban green spaces and the physical activity of children, particularly in the context of high levels of childhood obesity. Using the self-report method, we extracted the perceived environmental characteristics of the landscape and combined this with behavior observation to obtain the level of children's physical activity in green spaces and to explore the influence of the characteristics of green spaces on these activities. Our results show that the highest levels of activity were found in the semiopen spaces of urban parks, which mainly consist of dense vegetation and a diverse range of recreation facilities. Play facilities were most closely related to the level of intensity of children's activities, and perceived safety was the primary social perception factor affecting their activities. In addition, perceptions of the social environment were found to play a significant intermediary role in the impact of green space on children's physical activity. The study results are intended to promote green space planning and design updates, improve the public health level of children, and provide a basis for the construction of child-friendly cities.

Keywords: urban park; perceived environment; children; physical activity; social environment; health and wellbeing

Citation: Bao, Y.; Gao, M.; Luo, D.; Zhou, X. Urban Parks—A Catalyst for Activities! The Effect of the Perceived Characteristics of the Urban Park Environment on Children's Physical Activity Levels. *Forests* **2023**, *14*, 423. https://doi.org/10.3390/f14020423

Academic Editor: Paloma Cariñanos

Received: 21 January 2023
Revised: 15 February 2023
Accepted: 16 February 2023
Published: 18 February 2023

1. Introduction

Child obesity is one of the most serious public health challenges of the 21st century [1]. The rate of overweight and obesity in children is continuously increasing [2], leading to a greater risk of chronic diseases [3]. The promotion of physical exercise in children is an influential factor in solving this problem. Furthermore, sports activities have many benefits for children's mental health [4] and cognitive development [5,6] and improve their cardiopulmonary health and sports skills [7]. One of the most effective strategies to promote children's PA is to improve the physical environment, such as urban parks, to actively encourage children to use these green spaces [8]. Urban parks with accessible recreational facilities are critical environmental resources for children participating in PA [9]. It is therefore important to explore the factors that encourage children to engage in physical activity, which not only improves their current health status but may also produce significant health benefits in the future [10].

With the attention paid to children's interests and rights to space, there has been increasing research concerning child-friendly environments [11], covering topics such

as the child friendliness of the urban environment and children's rights, interests, and health. The shaping of urban green spaces should fully consider the needs of children and young people [12] while respecting their rights. The Playful City proposal emphasized the provision of high-quality activity space for children and the development of urban spaces to support children's participation in play and games [13].

For children, the natural environment provided by urban green space is not only an objective physical environment but also encourages activities. Experiencing nature is an indispensable part of a child's growth process [14]. In addition, many studies emphasize that natural environments dominated by green space play a comprehensive and positive role in promoting the physical and mental health of children, leading to better mental health, positive environmental values, an excellent cognitive ability, a strong desire to learn, fewer physical diseases, and faster recovery [15,16]. The external environmental characteristics of urban green spaces have led many researchers to conclude that the availability and accessibility of green spaces are important factors affecting the behavior of children [17,18], and directly regulate the health benefits for children in terms of encouraging higher levels of physical activity. However, there is insufficient research that considers both the physical activity level of children and the microlandscape characteristics of green spaces.

The theoretical framework of the ecological model includes the environmental determinants of sports activities. It proposes that sports activities are influenced at multiple levels, such as personal factors, the social environment, and the physical environment, and policy-level factors [19]. However, current research mainly focuses on social and environmental factors [20]. For example, the perception of the environment [21] has been proven to affect physical activity levels. Perceptions include the proximity, quality [22], and type of facilities [23], as well as the proportion of natural landscape [24,25], and the provision of fun activities [26]. The pressure caused by the lack of perceived safety may increase the static load [27], negatively affecting children's and adolescents' physical activity [28]. An adverse environmental security assessment will decrease participation and willingness to engage in physical activity [29]. Outdoor game space is easier to achieve the shaping of small-scale children's health environments characteristics such as a sense of attachment, sense of safety and satisfactio [30]. Children's perception of the environment will directly affect their level of physical activity. However, their perception of the social environment may also affect their level of activity. Therefore, exploring the impact and benefits of a multi-level environment is necessary [31]. This will help us to fully understand the impact of urban green space environments on children's physical activity level. Space elements have a more significant influence on outdoor activities [32,33]. Children pay more attention to the playability of an environment and its fun features, for example, flowing water [34] or spatial shape [35], than adults. The possibility of outdoor activities in green spaces is particularly effective in enhancing children's sense of enjoyment [36] and mental health [37] and is therefore essential for children's well-being [38,39]. However, the design of outdoor recreation spaces for children is still focused on their utility rather than the benefits of urban green spaces for children's health [40], cognition, and emotions, and the factors that influence these. Therefore, there is a need to further explore the beneficial impact of the characteristics of urban green spaces on various dimensions of children's development.

It is easier to shape the perception attributes of green space than those of social environments [41]. Activities, communication, participation, and enjoyment of nature in outdoor spaces are all related to the formation of place attachment [42]. In turn, attachment to places also affects the activities of children [43] because a place where they can form attachments and freely express their feelings will become their favorite place for activities [44]. However, a lack of security will negatively affect the physical activity level of children and adolescents [45,46], and adverse environmental security will decrease their willingness to participate in activities [47]. In the existing research, there is a lack of systematic analysis of the impact of green space landscape and social environment factors on physical activity. Without exploring the joint influence of landscape environments and social environments on children's physical activity levels, it is difficult to provide guidance for the landscape

planning and design of urban parks and useful adjustments that could be made to existing urban green spaces.

This study aims to build an urban park environment that supports children's engagement in activities and to explore how urban green space environments can promote the physical activity levels of children. The study provides new ideas for urban public green space construction, planning, and design, with regard to the health benefits for children. Through quantitative analysis of the urban green space environment characteristics that affect the physical activity levels of children, we contribute to a deeper and more intuitive understanding of the service benefits of urban green space for children and how an effective balance between green space characteristics and the physical and mental health needs of children can be achieved. We also consider how the potential of urban public green spaces can be further enhanced. Specifically, our goal was to quantify the impact of landscape environment perception and social environment characteristics on the physical activity levels of children. Our study provides theoretical guidance for the future design of urban parks and construction of child-friendly cities.

In this work, we ask the following research questions:

Research question 1 (RQ1): Are there significant differences between different green space characteristics and children's physical activity levels?

Research question 2 (RQ2): If the answer to research question 1 is positive, is there a relationship between the landscape characteristics of the space for games in urban parks and physical activities? Which elements are more conducive to this goal?

Research question 3 (RQ3): If the answer to research question 2 is positive, is the social environment affects the path of children's sports activities?

2. Methods

2.1. Scope of the Study

The Culture of Water Ecology Park is a typical urban park in the central urban area of Changchun, China, located in the northeast of China, as shown in Figure 1. The park has considerable space for activities and a good geographical location, being surrounded by residential areas. The Culture of Water Ecology Park Water covers an area of 302,000 square meters and in 2019 won an honorary award from the American Society of Landscape Architects (ASLA) in the comprehensive design category. The park is rich in natural vegetation and has many service facilities, and the rich landscape design attracts urban residents and children.

Figure 1. Map of the research site.

In an area in which a large number of children play, 12 play venues were selected, with six different space characteristics, including enclosed space, open space, semiopen space, undergrowth space, waterfront space, and waterfront plank road. As shown in Figure 1 (these pictures were taken in 2022), these spaces are composed of many landscape elements, a rich variety of plant species, and various urban furniture facilities, providing a good play environment for children.

2.2. Data Collection

The premise, consent form, agreement, and data collection for this study were approved by the Medical Ethical Review Board of Harbin Institute of Technology (No. HIT-2022018). Under our ethical approval process, each item of this study, including all the notes of the Declaration of Helsinki and all research variables, were approved. Before data were collected, parents and children were informed about the program and the informed consent of each child's guardian was obtained.

In accordance with the theory of children's cognitive development proposed by Jean Piaget, a child psychologist [46], and with reference to previous research methods [23], the children surveyed were grouped into three age groups: 6–8, 9–11, and 12–15. At the age of 6, children can carry out activities independently and begin attending primary school. In terms of recruitment, questionnaires were distributed through random sampling in different areas of the urban park. Children aged 6–8 years completed the questionnaire with the help of their guardians because of their limited cognitive ability. Trained observers recorded the behavior characteristics of the activities of the children. A total of 400 questionnaires were issued. After eliminating incomplete questionnaires, 372 valid questionnaires remained, which was an effective rate of 93%.

2.3. Physical Activity Data Collection

This study was conducted in sunny weather with appropriate temperature conditions in August 2022. Because August to early September is the summer vacation period for children, we chose to conduct practical observations on Saturdays and Sundays every week for a total of 12 days. The most popular periods for children's physical activities were selected according to the presurvey results: 9:00–10:00, 14:00–15:00, and 18:00–19:00. In order to facilitate data collection and analysis, in accordance with The Children's Leisure Activities Study Survey Chinese Version (CLASS-C) [47], physical activity items mainly included ball games, daily games, and other activity types and corresponding metabolic equivalent values. The observers recorded the type of physical activity undertaken by the children who completed the questionnaire within 10 min in each activity space. Because of the different types of physical activity undertaken, there was a significant difference in metabolic equivalent values. Therefore, in the subsequent analysis, the metabolic equivalent value of children's physical activity was normalized, and its range was 1 to 5.

2.4. Questionnaire Design

The questionnaire mainly consisted of two parts. The first part was the subjective evaluation of the park landscape characteristics, including playability and interest. Playability was measured considering the number of activity spaces and play facilities in which children could play. Interest was measured considering the available natural landscape space and interesting things that could be seen. These indicators were evaluated using a five-point scale ranging from "very rare (1)" to "very much (5)".

The second part investigated the children's perception of the social environment of green space activities. The indicators of attachment [48] and perceived safety [49] commonly used in previous studies were adopted. In accordance with our research purpose, we divided attachment and perceived safety into two dimensions and eight items, respectively. As shown in Table 1, these items were evaluated using a five-point scale ranging from "strongly disagree (1)" to "strongly agree (5)".

Table 1. Evaluation of children's perception of social environment in urban parks.

Dimensions	Keyword	Item
Perceived attachment	Place dependence	I will definitely come here when I do something I want to play in this park. If I have time, I will often come here to play.
	Place identity	I feel very relaxed when I stay here and can do anything I want. I will miss it when I cannot come here for a long time.
Perceived safety	Environmental safety	I am very familiar with the surrounding environment when playing in the park. I trust people around me when I play in the park.
	Activity safety	I was worried about slipping and tripping when I was playing in the park. I can feel relaxed and happy when I play in the park.

2.5. Data Analysis

SPSS statistical analysis software was used to analyze the survey data from the questionnaire. First, ANOVA was used to test the significant differences between various types of spaces and physical activities in urban parks.

Secondly, Pearson correlation was used to test the relationship between the intensity of children's physical activity and landscape environment perception factors, and between intensity of physical activity and social and environmental perception factors. The *t*-test was performed at $p < 0.01$ and $p < 0.05$ to test for significant differences. In addition, linear regression and stepwise regression analyses were carried out to explore the relationship and degree of influence between multiple factors and children's physical activity, as well as the internal mechanism of the impact on children's physical activity.

Finally, the mediating effect was used to test how the children's perception of the social environment in which they participated in physical activities was affected by landscape environment characteristics, and to clarify the relationship between landscape environment, social environment, and the physical activity levels of children.

3. Results

3.1. Reliability and Validity

We analyzed the validity and reliability of the questionnaire regarding children's play spaces, landscape environment perception, and social environment perception in urban parks. The Cronbach α coefficient was 0.710, and the value of the data reliability coefficient was higher than 0.6, which indicates that the data reliability was acceptable. The KMO and Bartlett test were used to verify validity, and the KMO value was 0.756, between 0.7 and 0.8, indicating a good level of validity.

3.2. Descriptive Statistics and Analysis

In the children surveyed, there was no significant difference in the number of boys and girls, which accounted for 49.96% and 50.54% of the total, respectively. In addition, the numbers of children aged 9–11 and 12–15 were similar, whereas the number of children aged 6–8 was relatively small, accounting for one-fifth of all participants.

Analysis of variance was used to study the effect of the children's age on physical activity. As shown in Table 2, the intensity of physical activity was significant at 0.01 ($F = 7.732$, $p = 0.001$) and varied according to the age of the child, and the intensity of physical activity also increased with age.

Table 2. ANOVA results.

	Age (Mean ± SD)			F	*p*
	6–8 Years Old (*n* = 88)	9–11 Years Old (*n* = 145)	12–15 Years Old (*n* = 139)		
Physical activity level	3.02 ± 0.73	3.27 ± 0.78	3.41 ± 0.66	7.732	0.001 **

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

The independent sample *t*-test was used to study the difference in physical activity levels by gender. As shown in Table 3, there was a 0.01 significance of gender for physical activity intensity ($t = 2.654$, $p = 0.008$). It can be seen from the specific comparison differences that the average activity intensity of boys (3.36) was significantly higher than that of girls (3.16).

Table 3. *t*-test analysis results.

	Gender (Mean ± SD)		*t*	*p*
	Boys (*n* = 184)	**Girls (*n* = 188)**		
Physical activity level	3.36 ± 0.72	3.16 ± 0.74	2.654	0.008 **

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

3.3. Difference between Spatial Characteristics and Physical Activity Intensity

In order to answer research question 1 (RQ1), ANOVA was used to study the difference in the intensity of children's physical activity in different types of spaces in urban parks. As shown in Table 4, the different types of space showed significant differences in children's physical fitness level ($p < 0.05$). Specifically, the intensity of physical activity demonstrated in different environments was shown to follow the order semiopen space > undergrowth space > open space > enclosed space > waterfront plank road > waterfront space. The physical activity level of the children in semiopen spaces was the highest, whereas that in waterfront spaces was the lowest.

Table 4. Variance results of different types of spaces and children's physical activity levels.

	Different Types of Spaces (Mean ± Standard Deviation)						F	*p*
	Waterfront Space (*n* = 66)	**Waterfront Plank Road (*n* = 59)**	**Semiopen Space (*n* = 60)**	**Open Space (*n* = 63)**	**Enclosed Space (*n* = 63)**	**Undergrowth Space (*n* = 61)**		
Physical activity level	3.05 ± 0.65	3.11 ± 0.69	3.62 ± 0.75	3.30 ± 0.65	3.17 ± 0.83	3.35 ± 0.73	5.100	0.000 **

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

3.4. Relationship between Landscape Characteristics and Physical Activity

We used correlation analysis to study the correlation between physical activity intensity and play facilities, play venues, interesting things, and interesting landscape, and used the Pearson correlation coefficient to express the strength of the correlation. As shown in Table 5, interesting landscape was the factor most closely related to children's level of physical activity. The correlation coefficient was 0.494, which was significant at 0.01. Play facilities came in second place. Additionally, the social environment of the venue also had a significant positive relationship with the intensity of the children's physical activity, and even more powerful was the perceived safety of the social environment. This is a preliminary answer to research question 2.

Table 5. Pearson correlation between environmental perception characteristics and physical activity level of children.

	Physical Activity Level	**Ranking**
Play facilities	0.494 **	2
Play space	0.450 **	5
Interesting things	0.347 **	6
Interesting landscape	0.497 **	1
Perceived attachment	0.465 **	4
Perceived safety	0.481 **	3

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

3.5. Construction of Children's Physical Activity Model

3.5.1. Construction of Regression Model for Children's Physical Activity

In order to further answer research question 2 (RQ2), a multilevel multiple linear regression model was constructed for the dependent variable intensity of children's physical activity. All the environmental features were included in the regression model. Using the multicollinearity test of independent variables, the variance expansion factor VIF was found to be less than 2, indicating that there was no multicollinearity between independent variables.

First, as shown in Table 6, we used the results of the Pearson correlation analysis of independent variables and dependent variables described in the previous section, the covariates with relevant landscape characteristics, and the personal attributes of the children to build Model I. Second, we added social environment characteristics to build Model II, which includes the landscape and social environment.

Table 6. Results of multi-layer regression equation model.

Variable Types	Variable	Model I		Model II	
		Standardized Coefficients	*p*	Standardized Coefficients	*p*
		Beta		Beta	
Covariates	Constant	-	0.000 **	-	0.145
	Gender	−0.083	0.041 *	−0.083	0.019 *
	Age	0.116	0.005 **	0.101	0.005 **
Landscape perception characteristics	Play facilities	0.284	0.000 **	0.208	0.000 **
	Play space	0.213	0.000 **	0.146	0.001 **
	Interesting things	0.085	0.077	0.078	0.069
	Interesting landscape	0.226	0.000 **	0.162	0.000 **
Social perception characteristics	Perceived attachment	-	-	0.258	0.000 **
	Perceived safety	-	-	0.263	0.000 **

Dependent variable: physical activity of children; * $p < 0.05$ ** $p < 0.01$.

In the model, beta is the standard coefficient, indicating the impact effect value. A positive value indicates that the correlation between the variables and the children's physical activity level is a positive relationship. The model results show that among the relevant environmental independent variables, the landscape environmental elements that had a significant positive impact on children's physical activity levels were facilities, space, and landscape. All social environmental factors had a positive impact on physical activity. The degree of influence was perceived as safety > attachment > playable facilities > interesting landscape > playable space.

As shown in Table 7, after the two variables of perceived attachment and perceived safety were added to the model, the value of the regression equation significance test was found to be less than 0.01, and the regression model was well fitted, with statistical significance. The adjusted R^2 was 0.543. With the addition of the independent variable of social environment, the model's adjusted R^2 increased from 0.402 to 0.543 (the adjusted R^2 difference was statistically significant, significance value < 0.01); that is, the model's influence on the intensity of children's physical activity considering the dependent variable or predictive ability was strengthened. The degree of influence of the two dimensions was perceived safety (B = 0.263, significance value < 0.01) > perceived attachment (B = 0.258, significance value < 0.01).

Table 7. Fitting result of multiple regression model.

Model	R^2	Adjusted R^2	F Change	Significant F Change
I	0.412	0.402	F (4367) = 58.886	0.000
II	0.553	0.543	F (8363) = 56.169	0.000

3.5.2. Mediating Effect of Social Environment on Children's Physical Activity

After the regression model was used to obtain the impact effect of the landscape environment, the social environment of the green spaces in which children were playing was tested for the intermediary effect, further exploring the impact of the landscape environment characteristics on children's level of physical activity, and dividing the complex impact between the landscape environment, social environment, and children's level of physical activity. Model 4, a simple mediation model in SPSS, was adopted. Based on the variable results obtained in Model II, the mediating effects of attachment and safety were tested, and the proportion of mediating effects was determined. The results are shown in Table 8. These show that the perceived safety and attachment of the social environment had significant intermediary effects between the play facilities and the intensity of physical activity, accounting for 14.974% and 11.449%, respectively. Furthermore, perceived safety plays a significant intermediary role between play sites, interesting landscape, and physical activity intensity. The proportion of effects was relatively high, at 22.480% and 17.438%, respectively.

Table 8. Mediation effect test results.

Term	c Total Effect	a	b	a × b Intermediary Effect Value	a × b (Boot SE)	a × b (z Value)	a × b (*p* Value)	a × b (95% BootCI)	c′ Direct Effect	Inspection Conclusion	Effect Proportion
Play facilities = >sense of safety = >physical activity	0.227 **	0.131 **	0.259 **	0.034	0.015	2.208	0.027	0.015~0.077	0.167 **	partial mediation	14.974%
Play facilities = >sense of attachment = >physical activity	0.227 **	0.094 *	0.277 **	0.026	0.016	1.648	0.099	0.005~0.066	0.167 **	partial mediation	11.449%
Play space = >sense of safety = >physical activity	0.167 **	0.145 **	0.259 **	0.038	0.018	2.033	0.042	0.011~0.084	0.113 **	partial mediation	22.480%
Play space = >sense of attachment = >physical activity	0.167 **	0.061	0.277 **	0.017	0.016	1.036	0.300	−0.010~0.054	0.113 **	no significant mediating effect	0%
Interesting things = >sense of safety = >physical activity	0.063	−0.081	0.259 **	−0.021	0.016	−1.296	0.195	−0.061~0.005	0.058	no significant mediating effect	0%
Interesting things = >sense of attachment = >physical activity	0.063	0.096 *	0.277 **	0.027	0.015	1.777	0.076	0.006~0.065	0.058	full mediation	100%
Interesting landscape = >sense of safety = >physical activity	0.223 **	0.150 **	0.259 **	0.039	0.016	2.443	0.015	0.015~0.078	0.164 **	partial mediation	17.438%
Interesting landscape = >sense of attachment = >physical activity	0.223 **	0.073	0.277 **	0.020	0.016	1.296	0.195	−0.006~0.056	0.164 **	no significant mediating effect	0%

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

3.6. The Influence of Social Environment on Children's Physical Activity

To further explore the impact of social environment on children's physical activity, we took the four elements of social environment as independent variables, and children's level of physical activity intensity as a dependent variable for stepwise regression analysis, as shown in Table 9. In the model, the R-squared value was 0.428, which means that place dependence, place identity, environmental safety, and activity safety accounted for 42.8% of the changes in the intensity of children's physical activity. The degree of influence on children's activities followed the order activity safety (B = 0.240, $p < 0.05$) > place

identity (B = 0.232, $p < 0.05$) > place attachment (B = 0.222, $p < 0.05$) > environmental safety (B = 0.173, $p < 0.05$). The model passed the F test (F = 68.518, $p = 0.000 < 0.05$), indicating that it was effective. The model formula is as follows: physical activity intensity of children = 0.420 + 0.222 × place dependence + 0.232 × place identification + 0.173 × environmental safety + 0.240 * activity safety.

Table 9. Stepwise regression analysis results.

	Denormalization Coefficients		Standardization Coefficients	*t*	*p*	VIF	R^2	Adjusted R^2	F
	B	Standard Error	Beta						
Constant	0.420	0.180	-	2.334	0.020 *	-			
Place dependence	0.222	0.035	0.257	6.366	0.000 **	1.042			
Place identity	0.232	0.035	0.273	6.633	0.000 **	1.086	0.428	0.421	F (4367) = 68.518, $p = 0.000$
Environmental safety	0.173	0.033	0.214	5.314	0.000 **	1.036			
Activity safety	0.240	0.029	0.335	8.204	0.000 **	1.071			

Dependent variable: physical activity of children; D–W value: 1.367; * $p < 0.05$ ** $p < 0.01$.

4. Discussion

4.1. Influence of Space Type on Physical Activity

In order to explore the spatial environment factors that affect the physical activity levels of children, this study verified the relationship between the different types of spaces in urban parks and the activity levels of children [22] and concluded that among the various types of spaces in urban parks, semiopen space had the highest level of physical activity, followed by undergrowth space. Semiopen spaces often provide room for children's activities in the form of squares and have many entertainment facilities [50]. Such spatial characteristics mainly manifest in environments with more diverse types of play facilities and vegetation [51]. The play opportunities, vegetation, and beautiful scenery provided by semiopen spaces encourage children to be more active [52].

On the other hand, although previous studies have shown that the presence of water has benefits for health and well-being and is also positively related to physical activity [53], our results show a lower level of physical activity near water. The main reason for this result may be related to the safety of activities in waterfront spaces [54]. Therefore, to encourage high-intensity activities in urban parks, it is particularly vital to ensure that there is a reasonable level of perceived safety together with appropriate service facilities. Greater attention should be paid to the perceived safety and accessibility of facilities for children, the selection of natural and artificial elements and materials, the color design of the site, and the impact of seasonal changes [55,56].

These results could provide a basis for implementing and evaluating environmental interventions to encourage higher levels of physical activity. In addition, the study further confirmed that natural landscapes could meet the needs of children for a stimulating and changing play environment. Children can improve the quality of their activities by playing in natural recreation facilities [57].

4.2. Perceiving the Benefits of Environment on Physical Activity

This study emphasizes that in urban green space, the impact of the perceived environment on children's activities is very significant. In green spaces, the landscape environment has a positive and significant relationship with the physical activity levels of children. From the multiple regression model, it was concluded that the landscape elements that significantly impacted the degree of physical activity were the facilities that provided playability, followed by interesting natural scenery, even though, compared with naturally designed spaces, the Kit Fence Carpet style provides fewer opportunities for play [58]. It is undeniable that the natural environment and facilities provided by green spaces [59] have a positive effect on children's activities [60]. For example, slides, swings, rock climbing equipment, and age-appropriate adventure facilities are all elements that encourage

children to perform physical activities [61]. These are also very important landscape elements. In addition, children enjoy activities in a place where they can have contact with their playmates and make use of the facilities [62]. Therefore, the attraction of the green space environment and the enjoyment of activities in that environment promote children's physical activity and form a "positive feedback" relationship.

In the intermediary variable model of urban park landscape environment affecting children's physical activities, the social environment of landscape characteristics affecting children's physical activities can explain the impact path. Of these, the impact of perceived safety is a critical factor for encouraging physical activity in children [63]. It plays a powerful intermediary role in promoting activities in the outdoor environment, among the effects of social environment perception characteristics on children's physical activity levels and perceived safety of activity. Children pay more attention to the sense-of-place identity created by green space. This feeling can be expressed as, "I will be more relaxed and happy when I am here, and I will miss this place when I am not here." These results can help urban managers and policymakers to protect the rights and spatial interests of children in cities by following guidelines for the construction of child-friendly cities [64], creating an excellent social environment and promoting the development of children in cities.

4.3. Planning Green Space to Enhance Physical Activity

The landscape features in urban parks and the social environment they create can attract and promote children's engagement in physical activities. In addition, parents believe that the naturalness of such activity spaces promotes the physical and mental development of their children [65,66]. In green spaces, the relationship between the richness of the natural scenery and the activity level of the children is the strongest, showing that the composition and characteristics of landscape elements affect children's perception of the natural environment [67,68]. It reflects the natural style and seems to shape the way to link green space with health [69] through the presence of plants, flowers, and tree cover [70]. This perception of a preference for the natural environment attracts children to participate in activities. There is a considerable difference between adults and children in terms of their understanding of the availability of environmental functions. Children are keen to interact with the environment. For example, adults believe trees can provide shade, privacy, or isolation from noise. However, for children, trees are quiet and hidden places for playing, carving, climbing, and playing hide and seek. Therefore, green space has a tremendously positive effect on the cognitive attitude of children towards nature and improves their activity levels [57,71].

In addition, to meet the wants of children in terms of their age and gender, more consideration should be given to the number of activity spaces and the population of children in the area when sites are designed. Different types and scales of play activity for all age levels that can be easily maintained should be provided [55]. The construction of urban green space should be re-examined from the perspective of protecting children's rights, and space and resources should be redistributed in the process of urban green space renewal.

4.4. Limitations and Prospects

Our research was limited by critical factors and its cross-sectional nature, which may affect its universality, in particular for cities with different economic environments. In addition, our research results may have selective daily liquidity bias or confusion of personal characteristics because of personal preferences that simultaneously lead individuals to visit certain places and drive their behavior in these places. Furthermore, when conducting questionnaire surveys with children, it was evident that some of them had little experience with the natural environment, which may have affected their response when combined with the fact that children's perceptual function is not of a spatial nature [57,67].

Future research will require additional resources to address these limitations. The causality can be confirmed through long-term follow-up research, further expanding the research locations, and more refinement of the green space characteristics.

5. Conclusions

Our research established the impact of urban parks on the physical activity of children. Of the various types of space, semiopen space was the most functional space for children due to its dense vegetation and diverse range of recreation facilities. Play facilities had the most significant impact on activities. The landscape and social environment had a positive impact on physical activity. Furthermore, use of the multiple regression model revealed that the effect of green space on children's physical activity was 54%, emphasizing the positive role of urban green space with a natural setting in promoting children's participation in physical activity. In addition, the social environment played a significant role among the environmental characteristics affecting children's physical activity, with safety shown to be more significant than attachment.

The critical factors needed to improve children's activity levels are more focused on creating an attractive natural landscape and playable facilities. From the perspective of developing a green space environment that promotes children's physical activity levels, this study provides new evidence for constructing an urban park environment to support children's engagement in activities. For urban planners, these findings point to a new way of thinking about the design of urban green spaces, not with regard to quantity, but in terms of naturalness, fun, and the characteristics of children's activities in the urban environment. In addition, there is an urgent need for more research, especially regarding landscape design in green spaces.

Author Contributions: Conceptualization, Y.B. and M.G.; methodology, M.G.; software, M.G.; validation, M.G.; formal analysis, M.G.; investigation, Y.B. and M.G.; resources, Y.B. and M.G.; data curation, Y.B. and M.G.; writing—original draft preparation, M.G.; writing—review and editing, Y.B, M.G. and D.L.; visualization, X.Z.; supervision, Y.B, D.L. and X.Z.; funding acquisition, Y.B. and M.G. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Research Topics of China Youth Research Association (grant number: 2022B27), Jilin Province Science and Technology Development Plan Project (grant number 20210203013SF), and key research topics of higher education teaching reform in Jilin Province (grant number: 2020).

Institutional Review Board Statement: The study was approved by the Ethical Review Board of Harbin Institute of Technology (HIT-2022018).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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