

# Research on Urban Micro-green Space Design Strategies Under the Perspective of Place Attachment Theory- pocket Parks in Guangzhou Old Town as an Example

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## Abstract:

As an important constituent of high-density urban spatial system, urban micro-greenspace plays a significant role in alleviating the scarcity of green space resources and enhancing the quality of human environment. The study adopts the field survey method and structured analysis method to systematically analyze the intrinsic association between the two, based on the place attachment theory and urban micro-green space as the carrier of the research object. Through empirical research on three typical cases, namely Kangwang Pocket Park, Guangjiu Railway Memorial Park and Qiuxing and Pocket Park in Guangzhou, the study evaluates the spatial efficacy of the parks from the dimensions of emotional attachment and functional dependence. The design strategy of urban micro green space under the perspective of place attachment theory is summarized: by respecting the natural characteristics of the site; by exploring the regional cultural connotation; and by enhancing spatial communication and interaction. The above strategies provide theoretical and practical guidance for the design of urban micro-green space and help to create attractive, cultural and interactive urban micro-green space.

## Keywords:

Urban Microgreens, Place Attachment, Design Strategies, Urban Renewal

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## 1. Introduction

With the advancement of globalization and the renewal and redevelopment of urban and rural areas, people's living environments are gradually turning into a "factory" style of mass construction, and the original distinctive features such as regionality and ethnicity are gradually blurred, so that the emotional connection between people and places is facing a lot of problems. How to regulate the contradiction between people's deep feelings for once familiar and intimate places, and the fact that the boundaries are no longer clearly defined and memories of the past are fading away after the renewal of places has become an important issue that needs to be solved urgently [1].

In recent years, the theory of place attachment has gradually emerged in the field of urban public space, providing new ideas to solve the problem of insufficient attraction of urban public space [2]. Human memory is always closely connected with places, and the familiarity and emotional dependence of an individual on a place can enhance his or her sense of identity and belonging to that place [3]. Meanwhile, place attachment is positively correlated with people's psychological recovery, and natural environments with a higher degree of attachment are more recoverable than urban environments [4]. For example, Li Baoyong et al. (2022) analyzed through empirical research and confirmed that the method of upgrading and transforming the landscape of old urban parks based on the theory of place attachment has feasibility and application value, which can better preserve the historical memory of the city and strengthen the people's emotional attachment to the urban environment [5]. Zhu Zhengying (2021) took 18 pocket parks in Xicheng District of Beijing as the object and used structural equation modeling to analyze the relationship between environmental preference, place attachment and pocket park vitality, and the study showed that both place dependence and place identity have an impact on pocket park vitality, and place dependence can affect pocket park vitality through the mediating role of place identity [6]. And both environmental preference and place attachment are individual's emotional expression of the environment, so individual's environmental preference is one of the conditions for the establishment of place attachment [7].

In summarize, the study combines the theory of place attachment with urban micro-greenspace, and takes Guangzhou practice case as the object of study to explore how to enhance the vitality of urban micro-greenspace by improving people's attachment and preference for places, and in this way, to continue and protect the unique local cultural characteristics, and to create urban micro-greenspace environments with restorative physical and mental benefits for people.

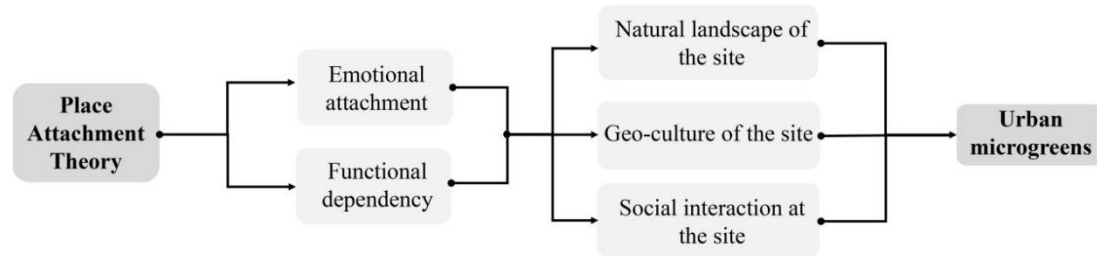
## **2. Exploring the Integration of Place Attachment Theory and Urban Micro-green Space**

### ***2.1. Concepts and connotations***

Place attachment theory is a core concept in the field of environmental psychology and human-place relations, and its core connotation points to the multidimensional dynamic linkage mechanism between people and specific places. The theory emphasizes that the generation of place attachment relies on two interacting dimensions: emotional attachment (the sense of belonging, identity and security that people feel towards a place) and functional dependence (the ability of a place to actually satisfy the needs of its users).

The core connotation of place attachment theory can be summarized into three points: (1) emotion deepens with interaction, the emotional connection between people and places is not static, but is gradually strengthened with the lengthening of the time of use and the increase in the frequency of interaction. (2) Places have dual attributes, each place not only contains physical features such as the architectural layout of the physical space and the natural environment, but also carries social and cultural meanings such as historical memories and collective activities. (3) Co-creation between people and places, users are not passive recipients of the place, but continuously give new meanings to the place through their daily behaviors to form a two-way shaping of the relationship.

Therefore, place attachment theory provides a theoretical framework for spatial assessment and optimization by analyzing the emotional, cognitive, and practical bonds between people and places, and its application can effectively strengthen the emotional connection dimension of places, thus enhancing the attractiveness of spatial places [8]. (Figure 1)



**Figure 1.** Place Attachment Theory and the Mechanism of Microgreens Associations.

## 2.2. Components of place attachment theory

### 2.2.1. Natural landscape of the site

As a symbol of place, natural landscape is associated with individual identity or cultural memory, and a certain mountain or forest in one's hometown may carry personal memories of one's growth. For example, the kapok in Guangzhou, the wutong wood in Nanjing, and the pine trees in Huangshan, etc., make people feel the emotion of "belonging to this place".

Personal emotional attachment and cognitive belonging can provide individuals with a natural affinity for the venue and even bring about healing. At the same time, the restorative potential of a place-attached environment may depend in part on the extent to which it reflects an individual's values and identity, with individual identity playing a key role in perceived environmental restorativeness [9]. In addition, natural landscapes enhance people's attachment to places by providing resources or fulfilling functional needs, and unique natural landscapes may become the core attraction of places, reinforcing their irreplaceability. (Table 1)

**Table 1.** The central role of natural landscapes.

| Dimension             | The role of the natural landscape                                                     | Typical example                         |
|-----------------------|---------------------------------------------------------------------------------------|-----------------------------------------|
| Emotional attachment  | Evoke a sense of beauty, serenity or healing and become a symbol of identity or place | Ficus (South China), Sycamore (Nanjing) |
| Functional dependency | Serve as a link for social interaction, provide resources and event space             | Parks, Beaches, Forest trails           |

### 2.2.2. Geographical culture of the place

Regional culture is one of the core elements of the emotional connection between people and places, and it gives places a unique spiritual core through historical inheritance and symbols [10]. Regional culture is often symbolized by unique architectural styles, such as the wok-ear houses, Manchurian windows, and the riding floors in Guangzhou, the gardens in Suzhou, and the landmarks of the Forbidden City and the Potala Palace, all of which are intuitive carriers that evoke regional identity. (Table 2)

**Table 2.** *The central role of regional culture.*

| Dimension             | Role of geo-culture                                                                                     | Typical example                                                                                           |
|-----------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Emotional attachment  | Connecting the past with the present, creating emotional continuity and consolidating group affiliation | Modern redesign of traditional architecture, Suzhou gardens represent the aesthetics of Jiangnan literati |
| Functional dependency | Deepening the sense of belonging through participation in cultural activities                           | Crowd-place interactions in the Dai Water Festival                                                        |

### **2.2.3. Social interaction at the site**

Social interaction is a network of interactions between people in a place that deepens people's attachment to the place through shared experiences and emotional connections. Places provide a platform for the formation and development of social networks, and public spaces such as plazas, markets and parks constitute daily "theaters of life" as residents gather spontaneously; informal interactions with neighbors, vendors or passersby gradually accumulate into a sense of familiarity and security in the place.

Second, frequent interactions at a place contribute to a shared sense of identity and belonging, e.g., residents of a neighborhood may feel connected to each other because of their joint participation in community activities, and these memories deepen an individual's emotional attachment to the place. Thus social interactions give a place a specific meaning, allowing individuals to develop a deeper emotional attachment to that place. (Table 3)

**Table 3.** *The central role of social interaction.*

| Dimension             | Social interaction role                                                                                             | Typical example                        |
|-----------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Emotional attachment  | Forming emotional connections through shared experiences and transforming physical spaces into "warm" living places | Morning exercise, Communication, Chess |
| Functional dependency | Provide space for communication and interaction                                                                     | Open space, Plaza, Boulevard           |

## **2.3. Place attachment theory in urban micro-greenspace**

### **2.3.1. The role of urban micro-greenspace**

Urban micro-greenspace usually refers to green open space with a small area, flexible layout and complex functions, and its core features include "small micro-scale", "high accessibility" and "multi-functional complexity". They act as "urban oases" in high-density cities, saving people's time costs in traveling to green parks and increasing their willingness to travel.

In addition, micro-greenspace is mostly located in building gaps, corners or street-side boundaries, with obvious "threshold" characteristics, and is often used as a catalyst for urban regeneration, activating abandoned, dormant or inefficient spaces in the city, and triggering wider regeneration and renewal with a point to point approach [11].

### **2.3.2. The Value of Place Attachment Theory in Microgreenspace Design**

- (1) Enhancement of residents' emotional identity

The theory of place attachment emphasizes the emotional connection between people and places, and gives full consideration to the historical and cultural elements and regional characteristics of the site, and integrates them into the design of the micro-green space, so as to evoke the memory and sense of identity of the residents with their local cultures, and to make the residents emotionally dependent on the micro-green space, and to enhance their sense of belonging to the place.

### (2) Enhancement of space utilization efficiency

Through the theory of place attachment, designers are able to gain a deeper understanding of residents' needs and usage habits for different types of spaces. In the design of micro green space, according to the activity characteristics and behavioral patterns of residents, the functional areas can be reasonably divided, such as the installation of leisure seats, fitness equipment, children's play area, etc., to meet the residents' needs for social interaction, leisure, entertainment and other aspects, to improve the spatial utilization rate of the micro green space, so that it can better serve the residents in their daily lives.

### (3) Promote community cohesion

As part of a community's public space, the theory of place attachment can help design micro-greens to promote residents' communication. For example, an open layout with awnings, benches and other facilities can be used to provide a comfortable environment for residents to communicate and enhance community cohesion and centripetal force.

## 3. Relevant Case Studies in Guangzhou

### 3.1. Case Selection

The study selected Kangwang Pocket Park, Guangjiu Railway Memorial Park and Qiuxinghe Pocket Park as cases. All three cases are located in Yuexiu and Liwan districts, the old cities of Guangzhou with deep cultural heritage and certain social influence.

Kangwang Pocket Park was selected as the "Most Beautiful Pocket Park in Guangzhou 2023", which records the history of Kangwang Road and the story of patriotic general Kang Baosi. Qiu Xinghe Pocket Park was selected as the "Most Beautiful Pocket Park in Guangzhou 2024", which promotes spiritual culture with the theme of bravery and courage. In addition, the Guangzhou-Kowloon Railway Memorial Park, with its unique historical commemorative significance, was selected as the "Most Creative Pocket Park" in Guangzhou in 2023. (Figure 2 and Table 4)

Therefore, these three cases reflect the important value of urban micro-greenspace from different perspectives, such as cultural heritage, historical remembrance and spiritual promotion, respectively, and provide rich samples and case support for the study.

**Table 4.** Summary of cases.

| Serial number | Sample plot name      | Area (of a floor, piece of land etc) | Surroundings                                | Accessibility |
|---------------|-----------------------|--------------------------------------|---------------------------------------------|---------------|
| A1            | Hong Wang Pocket Park | 630m <sup>2</sup>                    | Commercial complexes, residential buildings | Convenient    |
| A2            | Canton and            | 8200m <sup>2</sup>                   | Commercial                                  | Convenient    |

|    |                                     |                    |                                                           |            |
|----|-------------------------------------|--------------------|-----------------------------------------------------------|------------|
|    | Kowloon<br>Railway<br>Memorial Park |                    | complexes, residential<br>buildings                       |            |
| A3 | Akihiko and<br>Pocket Park          | 2052m <sup>2</sup> | Schools, esidential<br>buildings, commercial<br>complexes | Convenient |



Figure 2. Location map of sample area.

3.2. Case Studies

3.2.1. A1 King Kang Pocket Park

(1) Case presentation

Located at the junction of Kangwang Middle Road and Longjin Road in Liwan District, Guangzhou City, Guangdong Province, Kangwang Pocket Park has a beautiful spatial environment with strong regional characteristics. (Figure 3)



Figure 3. Status of Site A1.

(2) Analysis of emotional attachment dimensions

The Kangwang Pocket Park incorporates traditional Lingnan architectural elements, such as green bricks and bar gates, to create a strong regional cultural atmosphere, evoking a sense of identity with local history and traditions in the surrounding neighborhood, and generating a deep emotional attachment to the park. The design of the park's antique landscape pavilions and the bamboo-shaped landscape wall combine aesthetic and social functions, and have become places for residents to interact, walk, chat, and reminisce about the community's past, strengthening the community's emotional ties. In addition, the park's green landscape and recreational facilities provide a comfortable environment for residents to relax and deepen their emotional attachment.

At the same time, Kangwang Pocket Park carries rich historical memories and cultural significance. The history of Kangwang Road and the story of the patriotic general Kang Baoshi are recorded on the park's profile boards, and these cultural symbols have become an important vehicle for residents to recognize their belonging. By understanding the history and culture of the park, residents are able to consolidate their local identity and feel part of this culturally rich land. The park's landscape

design and cultural displays reinforce the residents’ sense of cognitive belonging and give them a strong sense of belonging to the park. (Table 5)

**Table 5.** *Elemental analysis of emotional attachment dimensions.*

| Element extraction                                                                  | Name (of a thing)                                                           | Functional responsibility                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Trip bar door                                                               | Clarifies the boundary between green space and street space and highlights the main entrance to the green space                                                                                                                                                                                   |
|    | Manchurian window                                                           | Through colorful colors and patterns, it injects rich visual elements into the space and softens the boundaries of the space, enhancing its intimacy.                                                                                                                                             |
|    | A boiler or cauldron house                                                  | Its unique curvature of the mountain wall and architectural form enriches the landscape level and spatial changes of the park. At the same time, it also plays the role of dividing the space and echoes with other landscape elements.                                                           |
|   | South of the five ranges of Chinese traditional Chinese flowers and windows | An element that enriches the space and brings about rich visual changes                                                                                                                                                                                                                           |
|  | Bamboo writing slips in ancient times (joined together form whole scrolls)  | It brings cultural atmosphere and artistic sense to the park, becomes a landscape highlight and enriches the visual level. Secondly, the words and patterns on the bamboo slips convey historical Information to promote interactive communication among residents and enhance community cohesion |
|  | Kiosk                                                                       | Pavilions are traditional resting structures that provide shade from the sun, rain and rest for residents and visitors, while serving as open public spaces that promote gathering, communication and interaction                                                                                 |
|  | Lingnan green brick                                                         | Determine the dominant color tone of the space, enhance the Lingnan characteristics, and other elements of the harmony of the echo, unified spatial atmosphere                                                                                                                                    |
|  | Lingnan plants                                                              | The rich variety of Lingnan plants not only adds to the regional characteristics, but also eases the mood and provides a comfortable and pleasant environment                                                                                                                                     |

### (3) Functional Dependency Dimension Analysis

The space provides open space for the neighboring residents and pedestrians on the road, meeting the needs of people's daily leisure and relaxation. The park is equipped with leisure seats and shade facilities, providing a comfortable environment for residents to stay and a place to relax in their busy lives. (Table 6)

**Table 6.** Functional Dependency Dimension Element Analysis.

| Element extraction                                                                | Name (of a thing) | Functional responsibility                 |
|-----------------------------------------------------------------------------------|-------------------|-------------------------------------------|
|  | Stone chair       | Provision of open space                   |
|  | Kiosk             | Provision of open space and communication |

### 3.2.2. A2 Guangzhou-Kowloon Railway Memorial Park

#### (1) Case presentation

The Guangzhou-Kowloon Railway Memorial Park is located next to Dashatou Erma Road, Yuexiu District, Guangzhou City, and is the former site of Dashatou Railway Station, the starting point of the Chinese section of the Guangzhou-Kowloon Railway. The Guangzhou-Kowloon Railway, built in the late Qing Dynasty, was the first railroad in China connecting the mainland with Hong Kong, and the whole line was opened to traffic in 1911.

With the opening of the new Guangzhou Railway Station in 1974, the passenger transportation business of Dashatou Railway Station was gradually shifted and eventually withdrawn from the historical stage. To commemorate this history, the Memorial Park was opened in October 2016, covering an area of about 8,200 square meters. The garden placed one of China's last batch of mass-produced steam locomotives "construction-type" steam locomotive head, but also displayed when the Guangzhou-Kowloon carriages of the "dining car food price list", "business income and expenditure list", "concise schedule", etc., next to the "father of China's railroads, the statue of Zhan Tianyou". (Figure 4)



**Figure 4.** Status of Site A2.

#### (2) Analysis of emotional attachment dimensions

The Guangzhou-Kowloon Railway Memorial Park is located at the old Guangzhou-Kowloon Railway Station next to the Second Road of Dashatou in Yuexiu District, which is the starting point of the railroad connection between Mainland China and Hong Kong and carries a century of history. The steam locomotive head and green carriages displayed in the Park, as well as the stone-carved “Full Map of the Route of the Guangzhou-Kowloon Railway”, vividly demonstrate the past of railroad transportation. These objects recall the important role of the Guangzhou-Kowloon Railway in connecting Guangdong and Hong Kong and promoting regional development, and evoke an emotional resonance with history.

In the Memorial Park, there is a statue of Zhan Tianyou, who, as an advisor to the construction of the Guangzhou-Kowloon Railway, symbolizes the pioneering spirit of China’s railroad construction. The contribution of Zhan Tianyou and the Guangzhou-Kowloon Railway, as an icon of railroad development in modern China, are both culturally symbolic, inspiring national pride and love for local culture. At the same time, the Memorial Park showcases the history and culture of the Guangzhou-Kowloon Railway through physical objects and stone-carved texts, so that the public can understand its development and impact on Guangzhou and the Guangdong-Hong Kong region. This learning and cognitive process helps to reinforce residents’ understanding of and sense of belonging to the local culture.

As an important historical symbol of Guangzhou, the Guangzhou-Kowloon Railway Memorial Park allows residents to visualize their historical connection with the city. The glory of the Guangzhou-Kowloon Railway and Guangzhou’s position as a transportation hub and economic center in the Memorial Park enhances residents’ identity as Guangzhouites and their sense of belonging to the local community. (Table 7)

*Table 7. Elemental analysis of emotional attachment dimensions.*

| Element extraction                                                                  | Name (of a thing)      | Functional responsibility                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Railroad track         | The railroad tracks serve as landscape markers in the Memorial Garden, guiding the eye and helping visitors understand the theme and layout. At the same time, the railroad track divides functional areas, such as display area and rest area, which enhances the spatial hierarchy and order, and the straight line extension characteristic adds spatial beauty to the Memorial Garden. |
|  | Zhan Tianyou Sculpture | Evoking memories of the course of railroad construction in modern China and enhancing the cultural connotation and artistic value of the Memorial Park                                                                                                                                                                                                                                     |
|  | Safety Warning Signs   | Enriching site landscape elements and creating a historical and cultural atmosphere                                                                                                                                                                                                                                                                                                        |

|                                                                                     |                           |                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Steam locomotive          | Steam locomotive head as a large-scale exhibits, strong visual impact, to become an important landscape node of the Memorial Park, provide photo sightseeing places, enhance the ornamental and attractive                                                                                |
|    | Wooden platforms          | Adding a sense of history and beauty to enhance the viewing experience. The platform also serves as a resting and viewing place for visitors, providing a place to sit and enjoy and take photos of the area                                                                              |
|    | Photo Gallery             | Cultural presentation, education, emotional awakening                                                                                                                                                                                                                                     |
|    | Entrance building         | Unique entrance design enhances the identity of the memorial garden and makes it a prominent landmark                                                                                                                                                                                     |
|   | Green carriages           | Green carriages with its distinctive color and unique shape, for the Memorial Park to add a railroad cultural atmosphere, become a visual focus and an important landscape node. And tourists can enter the carriages to rest and enjoy the landscape, improving the comfort of the tour. |
|  | Traffic Interval Monument | Enriching site landscape elements and creating a historical and cultural atmosphere                                                                                                                                                                                                       |
|  | Lingnan plants            | The rich variety of Lingnan plants not only adds to the regional characteristics, but also eases the mood and provides a comfortable and pleasant environment                                                                                                                             |

### (3) Functional Dependency Dimension Analysis

As an open piece of urban public space, the Guangzhou-Kowloon Railway Memorial Park provides an ideal place for residents and tourists in the vicinity to take a leisurely walk and relax. People can enjoy the vintage railroad landscape and feel the historical atmosphere here, and at the same time, they can also do some light physical exercise, such as walking and jogging, which satisfies the demand for recreational space.

In addition, the vintage railroad elements in the Memorial Park attracted many tourists to visit and take photos, providing a platform for people to socialize and interact. It provides a platform for people to share their interest in history, exchange their understanding of railroad culture, and enhance communication and cooperation. (Table 8)

**Table 8.** *Functional Dependency Dimension Element Analysis.*

| Element extraction                                                                | Name (of a thing)        | Functional responsibility                   |
|-----------------------------------------------------------------------------------|--------------------------|---------------------------------------------|
|  | A chair for leaning back | Provision of open space                     |
|  | Seating                  | Provision of open space                     |
|  | Dining car facilities    | Provide places to eat, rest and communicate |

**3.2.3. A3 Qiu Xing and Pocket Parks**

**(1) Case presentation**

Qiu Xinghe Pocket Park, formerly known as Qiu Xinghe Square, is located on Lianquan Road, Shahe Street, Yuexiu District, and has now become a theme park for the righteous and courageous in Yuexiu District. The park was honored as the "Most Beautiful Pocket Park" and "Most Nature-friendly Pocket Park" in Guangzhou in 2024.

With the core theme of bravery, the park memorializes the feats of Qiu Xinghe and other heroes of bravery through artistic sculptures and other forms of expression, and conveys positive social energy. The construction of the park not only enhances the beauty of the environment, but also provides a place of leisure and communication for the residents in the neighborhood, and at the same time plays a function of education and publicity. (Figure 5)



**Figure 5.** *Status of Site A3.*

**(2) Analysis of emotional attachment dimensions**

With the theme of justice and bravery, the Qiu Xinghe Pocket Park vividly displays the glorious deeds of Qiu Xinghe and other heroes of justice and bravery through the sculptures, landscape sketches and other elements in the park. These elements can not only arouse the residents' admiration for the heroes, but also inspire people to pursue the values of justice and bravery deep in their hearts, which in turn generates emotional resonance and deep emotional attachment.

Second, the park, as a public space, provides a place where residents can gather and communicate. The fact that people share their views and feelings about acts of bravery here enhances the emotional connection between community residents, further deepens their emotional attachment to the park, and thus strengthens their sense of identity in the community. (Table 9)

**Table 9.** *Elemental analysis of emotional attachment dimensions.*

| Element extraction                                                                 | Name (of a thing)          | Functional responsibility                                                                                                                                     |
|------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | Qiu Xinghe Sculpture       | Highlighting the theme of Qiuxing and Pocket Park's bravery, providing a place for the public to commemorate and honor the heroes of bravery                  |
|   | Lingnan traditional houses | It enriches the landscape level and spatial variation of the park, and at the same time it also plays a role in dividing space                                |
|  | Lingnan plants             | The rich variety of Lingnan plants not only adds to the regional characteristics, but also eases the mood and provides a comfortable and pleasant environment |

(3) Functional Dependency Dimension Analysis

The Qiu Xing and Pocket Parks provide a wealth of recreational facilities, such as fitness equipment, recreational seating and children's play areas, to meet the daily needs of residents for leisure, exercise and recreation. These functional facilities enable residents to relax and enjoy their leisure time in the parks, thus enhancing their functional reliance on the parks.

As public spaces in the community, parks promote communication and interaction among residents. People participate in a variety of activities in parks, such as fitness, chatting and parent-child games, which enhances the relationship between neighbors and strengthens the cohesion and centripetal force of the community, making parks an indispensable part of community life. (Table 10)

**Table 10.** *Functional Dependency Dimension Element Analysis.*

| Element extraction                                                                  | Name (of a thing) | Functional responsibility                                                                  |
|-------------------------------------------------------------------------------------|-------------------|--------------------------------------------------------------------------------------------|
|  | Seating           | Provision of open space                                                                    |
|  | Gym equipment     | Provision of leisure activities to relieve stress and enrich the leisure life of residents |

|                                                                                   |                       |                                     |
|-----------------------------------------------------------------------------------|-----------------------|-------------------------------------|
|  | Pathway               | Offers walking, Running and more    |
|  | Children's facilities | Entertainment features for children |

3.3. *Summary of cases*

Through the extraction and in-depth analysis of the elements of Kangwang Pocket Park, Guangzhou-Kowloon Railway Memorial Park and Qiuxinghe Pocket Park, the following three points can be summarized:

- (1) Urban micro-green space design should focus on the integration of cultural elements, and show the unique charm of local culture through architecture, landscape and art works, so that residents can emotionally resonate with the place.
- (2) The design of urban micro-green space should focus on the integration of cultural display and educational functions, and pass on regional culture through diversified ways, such as setting up cultural display areas and organizing cultural activities, etc., so as to strengthen the cognitive belonging of residents to the place.
- (3) The age and living habits of residents should be fully considered, and functional facilities such as leisure, fitness and entertainment should be reasonably configured to meet the needs of different groups and improve the utilization rate of the place and the satisfaction of residents.

4. **Urban Micro-Green Space Design Strategies under the Perspective of Place Attachment Theory**

4.1. *Respect for the natural characteristics of the site*

4.1.1. *Prioritize the use of native plants*

Local plants have been adapted for a long time and have a high degree of compatibility with the local ecological environment and strong environmental adaptability, which can ensure their healthy growth while reducing maintenance costs. It not only provides a comfortable environment for people, but also becomes an important window for the natural display of regional culture, enhances the residents' sense of identity and belonging to local nature and culture, and makes the green space an important space for the display of urban culture and natural characteristics.

4.1.2. *Reasonable utilization of existing sites*

In urban micro-green space design, fully considering the natural conditions of the original site, and maximizing the retention and use of natural elements within the site, such as the original topography, water bodies, trees, etc., is an important expression of respect for the natural characteristics of the site.

In the Guangzhou-Kowloon Railway Memorial Park, the original railroad remains of the site and the surrounding natural environment are reasonably utilized and combined with modern landscape design. This design not only preserves the historical traces of the site, but also creates a public space with a strong sense of place and historical atmosphere for tourists, so that when people visit the Memorial Park, they can better feel the intermingling of history and nature, enhance their emotional attachment to the site, and make the green space become an important carrier to show the unique style of the city and the ecological environment.

## ***4.2. Deepening regional cultural connotations***

### ***4.2.1. Integration of regional architectural elements***

Regional culture is one of the core elements to establish emotional connection between people and places, and it gives places a unique spiritual core through historical inheritance and symbols. Exploring the connotation of regional culture can make urban micro green space become a window to show local culture.

In the design of urban micro-greens, architectural elements of regional characteristics are fully integrated, such as trip bar doors, Manchurian windows and wok-ear houses in the Lingnan region. These elements not only have unique visual effects, but also carry local historical and cultural memories. By skillfully applying these elements in the architectural and landscape design of the park, such as the entrance gatehouse, landscape vignettes, leisure pavilions, etc., a spatial atmosphere with regional characteristics can be created, so that the residents can feel the charm of the local culture in their daily leisure and strengthen the sense of identity and belonging to the local culture. For example, through the use of traditional Lingnan architectural elements, the Kangwang Pocket Park has successfully created a strong regional cultural atmosphere and aroused the residents' sense of identity with local history and tradition.

### ***4.2.2. Strengthening the display of history and culture***

Micro-green spaces are utilized as carriers for cultural displays, and people, events and cultural traditions related to local history are displayed through the installation of sculptures, cultural walls and display halls. For example, the Qiu Xinghe Pocket Park, with the theme of bravery, remembers the feats of Qiu Xinghe and other heroes of bravery through artistic sculptures and other forms of expression, and conveys positive social energy.

This kind of design can not only arouse residents' admiration for heroes and inspire the pursuit of the values of justice and bravery, but also enable them to emotionally resonate with the place and enhance their cultural attachment to the community and the city. At the same time, the historical and cultural display can also introduce the local history, folk customs, etc. by setting up introduction boards and cultural panels, so that residents can have a more in-depth understanding of the local culture and further strengthen the cognitive belonging.

## ***4.3. Enhancement of space communication and interaction***

### ***4.3.1. Construction of multifunctional communication spaces***

Through rational planning and construction of multi-functional communication spaces, such as open plazas, boulevard walks, leisure pavilions, etc., the diverse social

needs of residents can be met. These spaces can not only accommodate the activities of people of different ages, but also promote interaction and communication between neighbors.

#### ***4.3.2. Introduction of interactive landscape elements***

Interactive landscape elements not only enhance the interest and participation of the space, but also promote interaction and communication among residents. By skillfully incorporating elements such as interactive fountains, sculptures, and installation art, residents are incentivized to actively participate in the use and experience of the space, which in turn becomes an active place for exchanging ideas and sharing feelings.

The above elements not only beautify the environment, but also inject vitality into urban life, making public space more lively and interesting, and becoming an integral part of community culture.

#### ***4.3.3. Organization of community cultural events***

As important public spaces for the community, urban micro-greenspaces should make full use of their site conditions to organize various cultural activities on a regular basis in order to enhance community cohesion and vitality. These activities can cover a wide range of forms such as community festival celebrations, cultural exhibitions and art performances, providing a platform for residents to interact and exchange ideas, and promoting exchanges and cooperation among neighbors. Secondly, the activities can provide a window for displaying and appreciating local culture and art, which not only enriches the spiritual and cultural life of residents and helps to pass on and promote local culture, but also brings more vitality and creativity to the community.

## **5. Conclusions**

The study systematically investigates the optimization strategies of urban micro-green space design from the perspective of place attachment theory, and empirically analyzes Kangwang Pocket Park, Guangzhou-Kowloon Railway Memorial Park, and Qiuxing and Pocket Park in Guangzhou as case studies. It is found that through design strategies such as respecting the natural characteristics of the site, exploring regional cultural connotations, and enhancing spatial communication and interaction, the emotional attachment and functional reliance of residents on urban micro-greenspaces can be significantly strengthened, thus improving the efficiency of micro-greenspace use and community cohesion. These strategies not only help to preserve and pass on local cultural characteristics, but also provide residents with green spaces with physical and mental recovery functions, which promotes the harmonious and sustainable development of the community. In the future, urban micro-green space design should further deepen the application of place attachment theory and focus on the organic combination of culture and function in order to enhance the quality of urban public space and the quality of life of residents.

## **Conflicts of Interest**

The authors declare that there is no conflict of interest regarding the publication of this article.

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