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# CONSTRUCTION OF A CHILDREN-FRIENDLY LANDSCAPE ENVIRONMENT WITH FUNCTIONS OF PSYCHOLOGICAL TREATMENT AND PHYSICAL REHABILITATION

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## Abstract

*The landscape environment is critical to the development of children. The importance of children-friendly landscape environment has been highlighted in relevant literature. This paper explores deep into the construction of a children-friendly landscape environment. The construction strategy was discussed from multiple perspectives, such as landscape policy, landscape planning, landscape design, and landscape technology and facilities. Besides, key indices of landscape environment were analyzed under each perspective. It is concluded that, in addition to basic aesthetic and ecological functions, a good landscape environment should have functions like psychological treatment and physical rehabilitation, i.e. be friendly to children with psychological and physical problems.*

**Key words:** Psychological Cure, Physical Rehabilitation, Kid-friendly, Landscape, Environment.

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## INTRODUCTION

According to statistical data of the World Bank (WB), children occupied 26.05% of the world population in 2016, presenting a dropping trend year by year. According to the data of National Bureau of Statistics (NBS), till 2016, the population of children in China was 230 million, taking up about 16.64% of the total population. The healthy growth of children is the important guarantee for social development, but various problems will be encountered in children's growing process. In China, owing to the limitation of educational resources and parents' over expectation, children are faced with heavy study pressure (Lu, 2008). Stipulation on Actually Guaranteeing Primary and Secondary School Students' Campus Sports Activities for One Hour Everyday printed and distributed by the Ministry of Education has ensured the time of outdoor

activities to some extent. But Chinese children and juveniles in quiet activities for 2 hours and a longer time account for a high proportion, which has brought about many negative effects on teenagers' healthy growth. The social anxiety disorder of childhood (SADC) is a common emotional disorder of children (Halldorsson & Creswell, 2017), and will seriously influence children's physical and psychological health. Studies show that children with SADC present comparatively significant differences from normal children in perception, emotion, family life, peer interaction, school life, living environment, self-knowledge, experience of depression, and anxiety experience. In addition, the disability related to autism has already become the most common mental disturbance among Chinese children (Lu, 2018). Besides, the continuous increase of morbidity and younger-age trend of childhood obesity are also restricting children's healthy growth (Zhang & Yang, 2015).

The whole society should pay attention to children's psychological and physical problems, since

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children are the future of the country and nation. The whole society should provide a good environment for the healthy growth and development of children. The environment includes social environment, ecological environment, family environment, educational environment, and landscape environment, and plentiful researches show that the urban landscape environment plays an important role for children's healthy development (Grose, 2011). The landscape environment can be set as the auxiliary intervention system for autistic children, and make up the defects of intervention therapy for autism implemented indoors (Guo, Dong, & Zhang, 2013). Though obesity is influenced by many factors like heredity and diet, lack of exercises is also an important inducement. The natural landscape environment has a certain function on reducing the morbidity of childhood obesity, and the time of outdoor play presents a negative correlation with the body mass index (Kimbrow, Brooks-Gunn, & Lanahan, 2011). The formation of SADC will be influenced by many factors (Xia, 2014), and it is an important therapeutic method to proactively integrate into social environment. The landscape environment undoubtedly provides a natural high-quality site. A significant statistical relation exists between the usage of urban open green space and self-reported pressure experience, regardless of the respondent's age, gender and socioeconomic status. The higher the frequency for a person to visit urban green land is, the lower the reporting frequency of diseases related to pressure will be (Grahn, Stigsdotter, 2003).

Law of the People's Republic of China on the Protection of Minors stipulates that children are entitled to four fundamental rights, including survival right, protection right, development right, and participation right, which are also advocated by Convention on the Rights of the Child (UNICEF, 1992). The kid-friendly city is an idea of urban construction proposed by United Nations International Children's Emergency Fund (UNICEF): The government shall give children priority in public affairs, and bring children into the decision making system (UNICEF, 1996). The kid-friendly city is generalized around the world, and more than 400 cities have gained the title of kid-friendly city at present. But it is a pity that China has no city which can be called kid-friendly city, which is incommensurate with its status as a country with the most children in the world. Of course, the reasons cover multiple aspects. Firstly, China is the largest developing country in the world. Though it has become the world's second-largest economy, the national income per capita is still low, and it is hard to

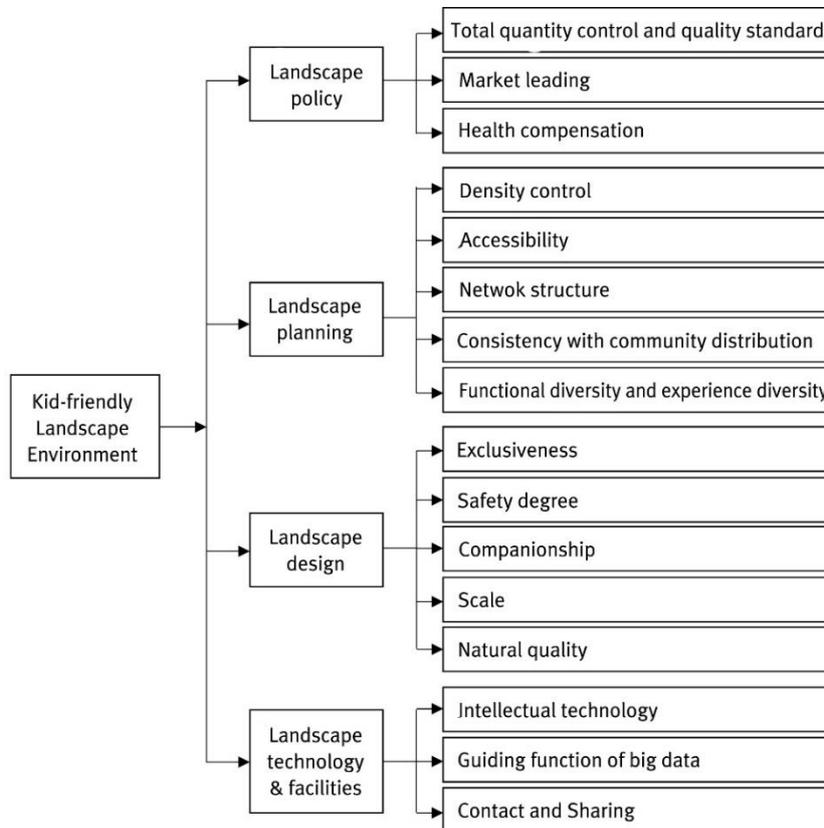
consider all aspects in urban construction. Secondly, it comes to the issue of consciousness, and the government and society haven't fully realized the importance of kid-friendly city for children's development. The good news is that the construction of kid-friendly city has already attracted attention from the government. At present, Shenzhen City clearly put forward that it would construct a kid-friendly city in "Outline of the Thirteenth Five-Year Plan for National Economic and Social Development", and Changsha City also set forth the construction goal of kid-friendly city in "Strategic Planning for Perspective Development of Changsha City by 2050" in 2015 (Shen & Liu, 2017). But on the whole, there are still few cities that have put forward the construction goal, and the kid-friendly city still has a long way to go in China.

The kid-friendly city is a complicated system. The core is to form a perfect kid-friendly urban space, to benefit all children in cities during daily life, and to allow them to play and study conveniently and safely whenever and wherever possible. The urban open space, i.e. landscape environment, is an important part of kid-friendly city construction, and the key index of children's welfare is a healthy habitat (Wilks, 2010). At present in China, however, there are few researches about kid-friendly city or landscape, and the fundamental reason is that the construction of kid-friendly landscape environment does not attract enough attention.

## METHOD

Based on the environment of children's growth and development in China, by setting demand analysis - multi-dimensional perspective - key index as the basic research method, this study aims to promote children's health and development through building a systematized kid-friendly landscape environment. As for the composite demand, the requirement for the construction of kid-friendly landscape environment is comprehended through bibliographic retrieval. Besides, under the construction orientation of psychological cure and physical rehabilitation, a discussion is made from the perspectives of landscape policy, landscape planning, landscape design, and landscape technology and facilities. Besides, key indexes under each perspective are analysed (Figure 1).

Figure 1. Diagrammatic sketch of research method



## RESULTS AND DISCUSSION

### Landscape policy

**Total quantity control and quality standard:** The construction of kid-friendly landscape environment needs concerted effort of the whole society. Different from the spontaneous progressive feature of urbanization in Western developed countries, urbanization in China often presents the characteristic of advancement dominated by government (Sun, 2015). In most cases, the government will control indexes like urban land use, function, intensity and density through land use planning and urban master planning, and guarantee the implementation by way of legislation. Therefore, the construction of kid-friendly landscape environment cannot be realized without the leading role of the government. At present, urban landscape environment planning is often treated as a special project of urban planning in China. Similarly, the construction of kid-friendly landscape environment should also be listed in urban master planning. Besides, the government should conduct overall control for land use, functions, intensity and density of kid-friendly landscape environment, and

formulate corresponding guide rules and construction standards, so as to provide guarantee for the implementation via legislation.

**Market leading:** The main function of the government for kid-friendly landscape environment is total quantity and quality control, while the construction of kid-friendly landscape environment should be implemented through the market. The government should strengthen training and propaganda to make the idea of kid-friendly landscape environment enjoy popular support. The kid-friendly landscape should be changed into a market demand, so as to promote the society to conduct construction spontaneously.

**Health compensation:** The policy of ecological compensation refers to the compensation in capital, technology and material objects and policy preference for residents who lose development opportunities due to environmental protection in the region (Yuan & Zhou, 2015). The construction of kid-friendly landscape environment belongs to public welfare work, and is dominated by government investment. Generally speaking, Chinese green spaces in parks,

squares and schools belong to government-invested projects, and the construction of kid-friendly landscape environment can be implemented easily. However, in terms of lands for communities and commerce, developers will take charge of the construction. Out of profit pursuit, developers can hardly construct kid-friendly landscape environment actively and voluntarily. At this time, the government should formulate a compensation policy for children's health. In other words, when developers carry out construction of kid-friendly landscape environment and reach a certain standard, the government should give the developers proper compensation, so as to encourage social force and private capital to be invested in the construction of kid-friendly landscape environment.

### **Landscape planning**

Landscape planning means the overall layout or arrangement made for the landscape environment. As for the planning of kid-friendly landscape environment, it means to decide the total quantity and quality: density control, accessibility, network structure, consistency with community distribution, and functional diversity and experience diversity.

**Density control:** Density is a frequently-used control index in urban planning, such as population density, road density, and building density. The distribution density of children's activity places directly reflects the construction quality of kid-friendly landscape environment. Children spend most of their non-school time in the special range of 500 meters to their residences, which requires the density of landscape environment sites to meet the need for children's activity range (Chambers, Pearson, Kawachi et al., 2017). Generally speaking, when the density of kid-friendly landscape sites is higher, the environment will be more kid-friendly. In actual operation, density control for kid-friendly landscape sites can be combined with the construction of urban green space system. In other words, the function of children's activities can be added in the green spaces of various levels and categories.

**Accessibility:** Children should be able to enter the nearby activity site safely. Guiding Opinions on Promoting the Sound Development of Urban Garden Greening issued by Ministry of Housing and Urban-Rural Development of the People's Republic of China requires various regions to accelerate the construction of park green space and improve the coverage rate of park service radius continually according to the requirements that urban residents can "see green every 300 meters and see park every 500 meters" when going out. This measure has laid a good

foundation for the planning of kid-friendly landscape environment, brought the service radius of kid-friendly landscape environment into urban construction, and provided high-quality landscape services for children by way of full coverage.

**Network structure:** As one of the supporting spaces for urban ecological environment construction and human settlement optimization in China, the urban greenway has already become an important scientific guidance and decision basis for many cities to realize green development. The main objective of greenway network construction is to integrate urban parks, scenic spots, relics, water areas, educational sites and cultural places into a whole, and to improve the network model and accessibility of urban green space. The construction of urban greenway has provided good conditions for the building of kid-friendly landscape environment, but further study is still needed in terms of how to organize multi-scale greenway to form a kid-friendly network space.

**Consistency with community distribution:** In China, most city housing lands are distributed in the city according to the requirements of urban master planning by following a certain rule. Therefore, kid-friendly landscape environments are not uniformly distributed in the city, and they must be consistent with community distribution. In this way, the using convenience and frequency of children can be increased, and thus the service efficiency of kid-friendly landscape environment will be enhanced.

**Functional diversity and experience diversity:** The types of kid-friendly landscape environment include natural type, sports type, recuperation type, rehabilitation type, culture type, and mixed type. In landscape planning, optimized layout should be realized according to functional types. We can increase children's participative enthusiasm and enrich their experience diversity through reasonable configuration.

### **Landscape design**

Space is the core of landscape environment design. As for the design of kid-friendly landscape environment, it is mainly reflected in the aspects of exclusiveness, safety, companionship, scale and natural quality.

**Exclusiveness:** Children's viewpoints play an important role not only in planning and design but also in the persistent landscape management process (Jansson, Sundevall, & Wales, 2016). At the current stage, most landscape environments are spaces of mixed type. Since all groups can use the environment, children's using opportunity is reduced. Children are quite different from adults in psychological characteristics and thinking mode (Elshater, 2017), so

the kid-friendly landscape environment should be relatively independent and carry a clear mark showing the exclusiveness for children.

**Safety degree:** Children are often curious, so an excessively safe environment is unattractive for children. But meanwhile, children are restless and lack self-protection ability, so the kid-friendly landscape environment must be safe. Hence, there is a need to find a balance point between adventure and safety: safety includes environmental protection, non-toxic, cleanness, height limit, water depth limit, flexible material and stability; adventure means to satisfy children's desire for exploration and allow children to move or freely set up activity facilities, and besides, covert sites are also popular with children.

**Companionship:** Companionship is an indispensable element in children's growing process and an important link to establish an intimate family relationship. The current construction of kid-friendly landscape environment often ignores the needs of parents as the activity object, which has invisibly reduced the chance for children to acquire companionship. Meanwhile, the kid-friendly landscape environment is also parent-friendly landscape environment, and can strengthen the kin relation through joint participation in activities.

**Scale:** "Watching the city at the height of one meter" is an important principle in the design of kid-friendly city, and means to conduct urban construction from the angle of children. The kid-friendly landscape environment should not only meet children's psychological characteristics, but also satisfy children's physiological characteristics. Childhood is a stage when the height changes the fastest. Therefore, the kid-friendly landscape environment should not only meet the requirements for exclusiveness, but also reach the requirements for mixing in the internal part. In other words, different facilities should be set up according to the heights of children at different ages.

**Natural quality:** Children's healthy development needs a kid-friendly ecological system (Ramezani & Said, 2013), and neighboring natural space can reduce social, emotional and behavioral disorders of children at 4-6 years old (Richardson, Pearce, Shortt et al., 2017). Trees have provided materials, space and common uses and contents, and real games cannot become prosperous without them (Laaksoharju & Rappe, 2017). Children contacting the nature frequently have richer personalities, keener feelings and more creativity than children who seldom contact the nature. The diversity of landscape elements like vegetation and landform is considered as the quality dimension of natural landscape (Fjørtoft & Sageie, 2000). Therefore, the kid-friendly landscape

environment should shape a landscape by making the best of elements like plants, landform and water body, so as to provide a relaxing and natural recreation site for children.

### **Landscape technology and facilities**

**Intellectual technology:** Intellectual technology is the important direction of urban development in the future (Ibrahim, El-Zaart, & Adams, 2018), and intellectual technology also plays an important role in the construction of kid-friendly landscape environment. Based on face-recognition cameras and wearable devices, children's safety in activities can be ensured. In addition, intellectual technology can also help children expand the social interaction space, and information technology will help children find more partners in landscape environment.

**The guiding function of big data:** An inquiry and three-dimensional simulation system of kid-friendly landscape environment can be established, to allow children to freely choose the site they like. In addition, big data analysis can be conducted for basic information like children's place of residence, age and gender, choice of site, and evaluation results after use, in order to better satisfy children's needs by optimizing and improving the landscape environment.

**Contact and sharing:** Children's social cognition is developed in the interaction process among human, things and objects in the surrounding environment (Chi & Xin, 2004). Mutual association between children should be respected in the construction of kid-friendly landscape. Children need to learn skills of social life and exchange covering planning, cooperation, sharing, taking turns, waiting, tolerance, and care through group communication and cooperative games, and experience the "social" role.

### **CONCLUSIONS**

Childhood is an important stage of growth, so the whole society should provide necessary survival, development, protection and participation opportunities and conditions for children, and furthest satisfy children's development needs. Under the influence of factors like social economy and consciousness, children's development and protection of rights are still faced with numerous problems and challenges. Children's physical and psychological health is the foundation for children's development, and it is inevitable to conduct landscape environment construction under the orientation of psychological cure and physical rehabilitation. Based on the composite demand for the construction of kid-friendly landscape

environment, a discussion is made from the aspects of landscape policy, landscape planning, landscape design, and landscape technology and facilities, so as to provide a basis for the construction of kid-friendly landscape environment.

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