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PLAYABLE URBAN FORM – A FRAMEWORK OF BUILDING PLAY-FRIENDLY NEIGHBORHOODS FOR CHILDREN

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Abstract

Building a child-friendly city is supporting the sustainable development goal of cities. This concept was firstly proposed in 1996. By 2021, more than 870 cities worldwide have obtained the certification from United Nations Children's Fund. The Chinese government also paid great attention to the child issue. With the efforts of researchers and governments, practices and theories are becoming comprehensive. This paper discusses the child-friendly city at the neighbourhood level. Building a playable neighbourhood contributes to making a child-friendly environment. Children's play space could be divided into two categories: the formal play places, for example, small gardens and playgrounds designed especially for kids, and the other is informal play place, which is not designed for children but gathered with children spontaneously. The network of the playable urban form includes both two categories. The framework of building play-friendly neighbourhoods can be achieved through accessibility, safety, and affordance, which are concluded by literature review, and then this system was got tested for analysis in one neighbourhood of Nanjing, China.

Keyword: play, neighbourhood, child-friendly, evaluation

Introduction

Theory about children's play activities can be traced back to the 19th. Firstly, the theory was popular that play is the result of surplus energy. Energy finds its release in the aimless exuberant activities of play. Later, relaxation theory, pre-exercise theory, and recapitulation theory fulfilled the research area, and people realised the importance of children's play, which is related to the health of the body and the cognition developments (Herrington and Brussoni, 2015). In the white paper from the LEGO foundation (Whitebread and LEGO Fonden, 2017), researchers suggest five types of play for children's development: physical play, object play, symbolic play, pretend play, and rule-based game.

How to enable those different types of children's play? In other words, how to protect the rights of children's play? On 20 November 1959, the United Nations General Assembly had adopted the *Declaration of the Rights of the Child* and stated: *The child shall have full opportunity for play and recreation, which should be directed to the same purposes as education; society and the public authorities shall endeavour to promote the enjoyment of this right.* Later, On 5 June 1996, the Second United Nations Conference on Human Settlements (Habitat II) proposed the concept of Child-friendly cities, strengthening children's role in urban planning and affairs. From the nine rights goals of the child-friendly cities initiative on its official homepage (*Guiding Principles*), those goals could be achieved from the aspects of policies, services, and space. On the space level,

the two main goals are to enable children: *Live in a safe, protected and clean environment, have access to green spaces and have space for play and entertainment.* This means that cities are required to provide children with a safe and continuous network of spaces and a safe social environment in which they can have easy access to natural spaces, as well as to meet the needs of children of all ages for their activities, its essential goal is to establish the game space network. This paper will put the discussion on what the playable network is and how to evaluate it.

Background

In the process of large-scale urban construction, the lack of necessary attention to children's play space has led to the rapid disappearance of those places in the city. According to Mitsuru Senda, in Japan, the territory children play daily declined by 95% between 1955 and 1975 in metropolitan areas and 90% in outlying urban areas. Later this fell by a further 80–90% in the 2000s (Senda, 2015). Urban children without physical games are forced to stay at home, facing tremendous physical and psychological challenges. Therefore, it is necessary to construct a stable urban play space network for children. The question is: what kinds of play places in cities do children need?

Formal play places

Children need separate places for playing is a modern notion emerged after the nineteenth century. Before that time, kids could play anywhere and everywhere. With urban sprawl and industrialisation, people became concerned about the ill effects and risks of letting children playing on the street. The Middle-class believed that a fenced and supervised play place is safer for children's play activity, contributing to the generation of modern playgrounds.

Early game theory believed that games were a way of consuming excess energy, and this theory was also reflected in the early period of playground development. In the late 19th, the Sandbox from Germany was introduced to the US and integrated with outdoor gymnasias, built equipment, and organised sports (Frost, 2012), helping children in crowded working-class settlements with nowhere to play and releasing their surplus energy. Through the mass-reproducible plastic and metal products, the number of playgrounds from 41 in 1906 increased to 872 by 1928 (Howell, 2008). Urban planners also considered them to be an essential part of a genuinely modern community. For example, Perry proposed the neighbourhood unit and elaborated the recreation park in the unit's centre in the 1920s. Many subsequent policies focused on pre-arranging children's playgrounds. In 1933 the International Congress for Modern Architecture adopted the Athens Charter and called for constructing children's playground in residential areas. However, from the perspective of some researchers (Aaron and Winawer, 1965), this early period of playground development usually led to one-dimension play: physical activities, and rarely encourage creative play, ignoring the development of children's cognitive, emotional and social development.

Informal play places

Besides formal playgrounds, children still need informal play places to take social activities and cognitive development. Kaj Noschis considered that if children can only appear in isolated specific spaces when adults encounter children on other occasions as exceptions, adults will think that children's presence is a kind of interference and hindrance (Noschis, 2006). Kevin Lynch and A Lukashok emphasised children's use of informal spaces (Lukashok and Lynch, 1956), Berg and Medrich also observed that children tend to seek out informal play spaces that they can freely explore, known as "the Fourth environments." (Berg and Medrich, 1980).

The exploration of informal play spaces for children could be traced back to Carl's idea of junk playground, a bottom-up, child-built informal play space. Those leftover spaces showed their value through children's hands. A similar concept was adopted by the Dutch architect Aldo van Eyck. He designed over 700 playgrounds throughout the city. Each plan was unique and recognisable, geometric and abstract, boosting potential children's creative play (Withagen and Caljouw, 2017). According to Aldo van Eyck, the whole city should be turned into a play space, and playgrounds would be ordinary places of everyday civic life (Ligtelijn and Strauven, 2008). Compared to formal playgrounds, affordance and creativity were emphasised in those in-between places (Jongeneel, Withagen and Zaal, 2015). Play could be a design tool (Lefavre, 2007), and architecture could work with children to make lived cities rather than planned cities.

The network of play places

What is the playable urban form for children? According to children's behaviour and activities, Moore proposed a threefold scope model: habitual range, frequented range, and occasional range (Moore, 1986). This study also complies with the regulations on recreation places established by governments of various countries, set according to the service radius and size. For example, the London government issued the new London Plan in 2017. London defines four types of playable spaces, Doorstep, Local, Neighbourhood playable space, Youth space, and set various benchmarks for accessibilities and sizes in its play strategy.

However, most guidance is controlled at the general level and do not consider formal and informal play places, as mentioned earlier. In these regulations, streets are overlooked as an opportunity to host a large number of informal play spaces, for example, the commercial open-air play spaces connected to the street and a series of fun spaces on children's commutes, car-free walking spaces and open spaces filled with natural elements, valid space beside the entrance of public buildings. There is still much potential for fun play. Many practices for children's rights are started from the streets. One example is the walking school bus program, born in the UK and famous worldwide. Since Shenzhen, China, is working hard to build the child-friendly city, the walking bus program was also run for a trial in 2018 and received good feedback.

Methodology

Through the documents of SELF-ASSESSMENT TOOL FOR COMMUNITY SERVICE PROVIDERS AND CHILD ADVOCATES¹ as well as China's Specification for Child-friendly Community Building² and research of TU Dortmund (Wei-qion, 2008), the main points of building a playable urban form could be concluded as accessibility, safety, and affordance, corresponding to the playable urban network, they have different interpretations.

High accessibility means a high usage rate. From the vision statement provided by Dortmund, the suitable distance for school-age children should be 300-400m; for children over 12 years old, the distance can be extended to 1km. It is also mentioned in China's Specification for Child-friendly Community Building that within a 5-minute living circle, there should be at least one outdoor playground suitable for children under 12 years old, and within a 15-minute living circle, there should be at least one outdoor playground suitable for children 12 years old and above. Therefore, for formal play places, the number and distance of playgrounds are observable indicators to measure accessibility. From the perspective of safety, it is mentioned in China's Specification for Child-friendly Community Building that a continuous path with independent walking rights should be set up to connect the main community activity space and public facilities. Speed limit signs, reasonable layout of lighting facilities should be considered along those streets. Affordance means what people can do in the environment, which American psychologist James Jerome Gibson put forward in 1977. Children perceive the affordance of the environment and produce a series of behaviours. For playable urban form networks, affordance is related to diversity and the quality of the play environment. Taking the Yandong Garden community in Beijing as an example, the most significant environmental elements perceived to increase affordance are architecture and small gardens and water landscape (Che, 2015).

In this research, the selected sample for evaluation is located in Xinjiekou Street, Nanjing, China, 1.3km long from east to west, 1.8km long from north to south, covering an area of 2.12 km², with high residential density. Buildings of residential areas are built from the 1980s to 2008. From the evaluation of accessibility, safety, and affordance, a picture of how playable the neighbourhood is will be illustrated.

Results and Discussions

After the field investigation, twelve places could be found where children gathered playing, within how many children playing in one hour around 5 pm are recorded. (Figure.1). During these places, five are informal play areas; seven places are equipped with standard fitness equipment (pointed out in blue in Table.1). Through

¹ <https://s25924.pcdn.co/wp-content/uploads/2017/11/Self-Assessment-Tool-for-Community-Service-Providers-and-Child-Advocates-1.pdf>

² http://www.cfc-c.org/upload_img/file/201912/1576045532222140.pdf

the questionnaire with local people, the accessibility score and the affordance score can be accessed. For accessibility score, the maximum score is 5, which means convenient to reach, and the minimum is 1 point. The source of the rating for the affordance is whether the children think that various activities can be carried out here. (Table.1).



Figure 1. Play places and the number of children playing

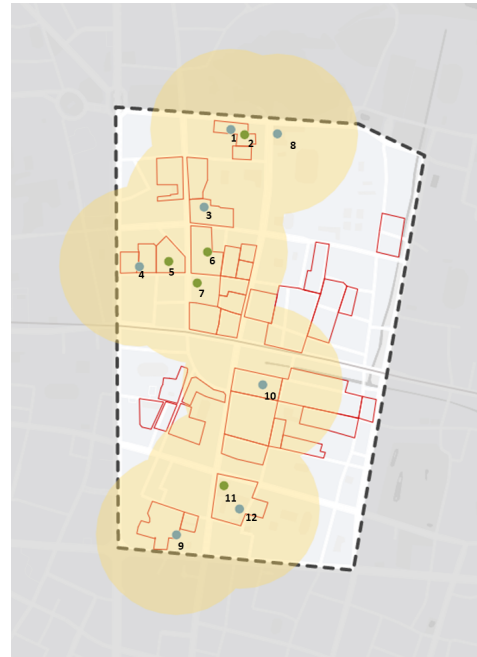


Figure 2. Accessibility of play in the area

Table 1. Conditions of each play place

POINT	AREA	EQUIPMENTS	AGE GROUPS	USE CONDITION	NUMBER OF CHILDREN PER HOUR	ACCESSIBILITY SCORE	AFFORDANCE SCORE
1	100	Standard fitness equipment	>3	Middle used	4	3	3
2	60	Pavilion	No limits	Well used	6	3	4
3	20	Standard fitness equipment	>3	Middle used	7	3	3
4	20	Standard fitness equipment	>3	Less used	2	3	3
5	30	Slope, pavilion, standard fitness equipment	>3	Middle used	4	3	5

6	150	Pavilion	No limits	Well used	10	4	4
7	1500	seats	No limits	Middle used	13	5	2
8	30	Standard fitness equipment	>3	Well used	12	5	3
9	30	Standard fitness equipment	>3	Less used	0	1	3
10	150	Standard fitness equipment, Pavilion	>3	Well used	16	5	5
11	2000	seats	No limits	Less used	2	5	2
12	30	Standard fitness equipment	>3	Less used	3	3	3

According to the research of Dortmund, a range of 300-400m is required for the accessibility of school-age children. From Figure.2, the playgrounds in the studying area can cover more than 80%, but the utilisation rate of many places is still shallow. The main reason is that the affordance is not very good, most of which only have equipment. According to observations, the utilisation rate has a great relationship with affordance. For example, point 2, point 6, and point 10 are better for affordance. In addition to equipment, there are some other types of space for free use. The street's analysis found that the street connected with more play space, the lower level the street has. That could be explained that narrow street has a safer traffic condition and connect more play places. For example, the street connecting point 3,5,6,7 is just an ordinary two-lane road, and there are many businesses around the street, which afford an excellent social surveillance effect. The width of the street leading to point 11 and 12 is relatively large, leading to fewer children in the play places.

Conclusions

The network of the playable urban form includes the space of both formal and informal play places. Formal play places, known as playgrounds, have got many research results, while informal play places are always ignored, and this space can be found in the interstice of the city. It should also be noted that street play has elapsed recently as the original space for children. A playable neighbourhood form should be a tree structure, with the family as the base point, street space as the backbone, and organic permeation of various activity

spaces and natural spaces. The street space is an essential linear space connecting the family and the activity space in this structural system.

Accessibility, safety and affordance are three aspects for designers and researchers to evaluate if the form of the neighbourhood is playable for children. From the case in Nanjing, we found that the play places are often located within a small community. The accessibility is suitable for children and can cover most areas. However, they are not well designed for formal play, only standard sports equipment, the affordance level is not satisfied. For a playable urban form, streets are significant, where a more life focused place means safer for residents and connected more play places.

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