

A Study on Children's Behavior after School in Winter—A Case Study of Beijing Architecture Affiliated Primary School

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Abstract: In the post-epidemic era, urban living space is increasingly required to be endowed with multiple functions and meanings, and the city itself should also be regarded as the existence of life characteristics. Stepping into the development mode of both stock upgrading and incremental structural adjustment, accelerating the optimization and transformation of urban internal space supply, building a multi-center and distributed urban cluster structure, optimizing the layout of green networks among clusters, improving community life circle, building a complete community and other social governance units will greatly promote the improvement of urban space governance capacity. The occurrence of children's group independent behavior is often inextricably linked with the active construction of community public space. Studying children's independent play behaviour and choice preference in school space will reflect their true demands and perception of space from the side and even reflect the child-centred spatial neighbourhood relationship and crowd interaction mode to a certain extent under the current urban development model.

Keywords: Selection of environmental location; Independent play behaviour; Scene association

1. Introduction

The quality of the public environment and the distribution of public service facilities within the "15-minute living circle" will impact residents' actual quality of life. As the basic unit of the community, the quality of the community's public environment and the distribution of public services will greatly impact the actual quality of life. At the same time, it will become an important and lingering part of the growing memories of the next generation of children. According to teacher Zhang Li [1], "the construction logic of space should be derived from child psychology or early childhood education theory, and the strength of the theory naturally limits its persuasive power." With "natural deficiency" becoming a sensitive word in the current children's group, paying attention to children's physical and mental health has become an important topic in the post-epidemic context. Aside from the limited social distance under the restricted space movement caused by public safety incidents, it is likely to subtly impact children's psychology and behaviour. It also leads to the original active role of space used to some extent, resulting in uncertain changes in different use situations, including the selection of activity locations, the variety of independent behaviour, the organisation of exciting street parades, natural spaces, and electronic screens. Similarly, the child-centred community activity space will significantly impact the spatial pattern of neighbourhood interactions and the effective construction of community governance.

2. Research Path

2.1 Pre-Thinking — Everything is Pre-established

If the Beijing Architecture affiliated primary school is taken as the origin and 300 m is taken as the service radius, the activity venue within the community area will include Wenxing East Street Square and Laolaile Cultural Square. Therefore, it was selected as the main research site and divided according to the "15-minute living circle" standard. As a basic educational service facility, the Beijing Architectural

Primary School will inevitably become an important part of the regional living circle. However, a study of the independent play behaviours and location choices of children in affiliated primary schools after school will inevitably become an important component of reflecting the group activities of primary school students in the region.

2.2 Research Method Generation - "Observing Actions and Behaviours"

This paper mainly uses the fixed-point observation method, questionnaire method, in-depth interview method and behaviour recording method to record the preference and behaviour characteristics of children's activity location selection. Includes actions and types of children's activities, independent play behaviours and spatial correlations. At the same time, through children's independent drawings and in-depth interviews, the children's images and feelings about spaces and places can be understood, as well as their activities and behavioural states during the epidemic, and then derive children's attitudes towards natural spaces and the use of electronic screens. The survey was mainly conducted in a sunny environment. Fixed-point videos and questionnaires were distributed in the following time periods. A total of 25 people in Wenxing East Street Square were willing to participate in valid questionnaires, and 15 in Laolaile Cultural Square.

2.3 Research Scenarios-Spatial Organization and Physical Form

The Laolaile Cultural Square and the Wenxing East Street Square are located in opposite directions from the school. As a result, if the two locations are connected in series with the school location. There is a pink distance of approximately 500 meters, and it passes by stationery stores and convenience stores popular with children. In contrast, the blue distance is approximately 600 metres, and it passes by fresh food, restaurants, dry cleaners, pharmacies, department stores, and the canteen at the entrance of Chaoyang'an Community. And this route is likely to trigger a series of interesting activities for children, such as finding playmates, visiting, exploring paths, and betting on who will arrive first. At the same time, the two squares present their spatial characteristics. Laolaile Cultural Square was built earlier than Wenxing East Street Square. It presents a wild and pyrotechnic space atmosphere, popular among surrounding communities and a favourite among the older crowd. The latter is subordinate to the office-affiliated square of the Chinalco Financial Building, which presents a geometric and sequential spatial atmosphere.

2.3.1 Research Location - Wenxing East Street Square

As an affiliated square of the Chinalco Financial Building, Wenxing East Street Square is located at the intersection of Xizhimenwai South Road and Wenxing East Street, which is adjacent to the New Power Financial Technology Center in the north, the Financial Technology Center in the east and the playground of Beijing Jianzhu University (not allowed to enter during the epidemic), Beijing Institute of Education (Wenxing Street Branch) in the south. The whole is narrow and distributed at different heights of the ladder platform, with an area of about 3870 m². A large staircase separates the front and back spaces, while the north-south and east-west traffic flow lines are retained. Refer to Figure 1 and Figure 2.

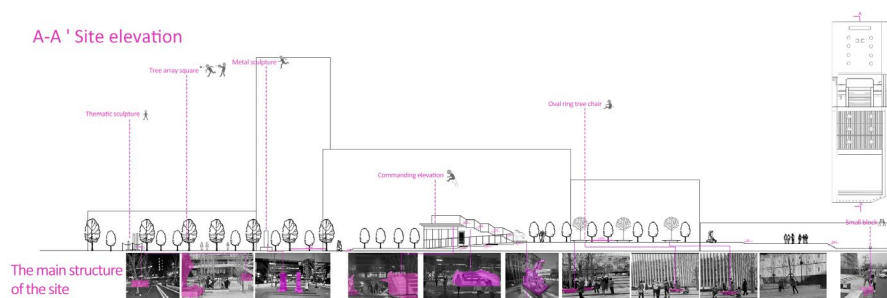


Figure 1: Elevation view of Wenxing East Street Square A-A'

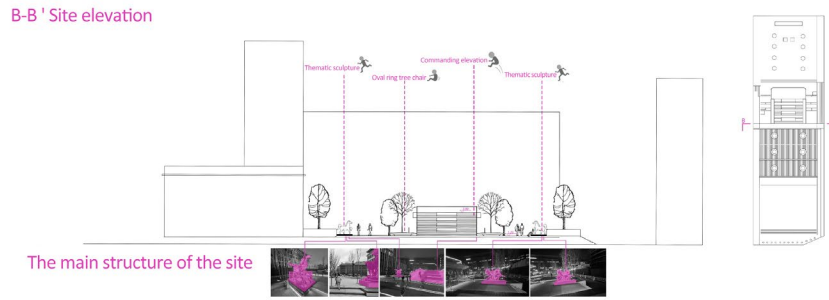


Figure 2: B-B' Elevation of Wenxing East Street Square

2.3.2 Research Location—Laolaile Cultural Square

Laolaile Cultural Square is located next to Wenxing South Street and is distributed in a planar shape, which is adjacent to Haojiawan to the north, Chaoyang'an community, publishing house and convenience store to the east, and Sanlihe Road to the west, with an area of approximately 2576m². It is mainly divided into open space, activity space, natural space and transportation space, and there are many activity facilities for the surrounding residents. Because children and the elderly love it, it forms a spatial behaviour phenomenon of integration or contradiction between groups.

2.4 Influencing Factors of Location Selection Preference

Besides the perception of the destination and the expected choice, the location selection preference is also influenced by the morphological characteristics of the street space, the sequence and surrounding service facilities, and the feasibility of street gaming. Musfiroh (2003) [2] proposed that freedom and safety are important factors in stimulating children's creativity in play activities. Freedom refers to children's opportunities to choose street activities, while safety refers to factors that may harm them, including the street's size and layout, ease of access, quality of equipment and materials, greenway space, and game space and traffic calmness. See Table 1.

Table 1: Influencing factors of environmental selection of survey sites

Research location		Wenxing East Street Square	Laolaile Square
Spatial influencing factors of passing streets (during school hours)	Distance from school	230m	390m
	Passing street space traffic parking	10 vehicles/min. 15 non-motorized vehicles/min	4 motor vehicles/min. 5 non-motor vehicles/ min
	Passing street traffic road parking	22 motor vehicles 15 non-motorized vehicles	59 motor vehicles 45 non-motorized vehicles
	Pathway service facilities	Restaurant 1, Public Security Bureau, College of Education	Restaurant 1, Public Security Bureau, middle school, restaurant 2. Convenience stores, stationery stores, restaurants 3
	Pathway railing fence length	Railing 165m Wall 122m	Railing 165m Wall 122m
	Pathway natural plant number	35 Pieces Xiaoqiao trees One Daqiao trees	20 Pieces Xiaoqiao trees 2 Daqiao trees
The space influence factors of the site itself	Green space ratio	15%	32%
	Ratio of activity facilities or structures	3%	5%
	The ratio of space occupied by other crowd activities	8%	30%

The destination characteristics of the two have been explained above, and the most critical safety

factors in the street space experience to different destinations have not been guaranteed due to the large parking space on both sides of the street and the high circulation after school.

At the same time, the highly continuous fences, fence vertical interfaces, and spatial sequences close to the same proportions in the purple route further reduce children's recognition and accessibility of the street space. Consequently, even if children are still interested in exploring, they are discouraged by their parents' advice because the traffic density is so high. In "Living conditions: the influence on young children's health" [3], it is also noted that traffic congestion will reduce children's independence, especially in play areas, schools, and leisure areas.

The blue route has specific territorial characteristics because it belongs to the traffic space in the community. But what's interesting is that the main reason why other children frequent this route is related to the close interaction with children in the community. There are also little secrets to them buried in the corners of the community. At the same time, many groups of children have moved in from other places in the community. They will always express their nostalgia for the play space with more possibilities in their original residence in some way.

Generally, the different characteristics of the two sites have different advantages and disadvantages for children. However, the results show that under the relatively even rhythm of the street space, Laolaile Cultural Square has limited children's "degree of freedom" because the elderly group is too active, which has become the main reason why the relatively wide Wenxing East Street Square "obtained the C position".

3. Using Numbers to Clarify the Law - Analysis of Children's Behaviour Patterns

3.1 The Actual Impact of the Site on the Service Scope

According to the valid questionnaires that were collected, children within the distance range of 300-500 meters will utilize the venue more frequently, and the number of people who use the venue more than 20 times per month accounts for a considerable proportion, while the frequency of use of the venue in other distance areas does not fluctuate. Refer to Figure 3 and Figure 4.

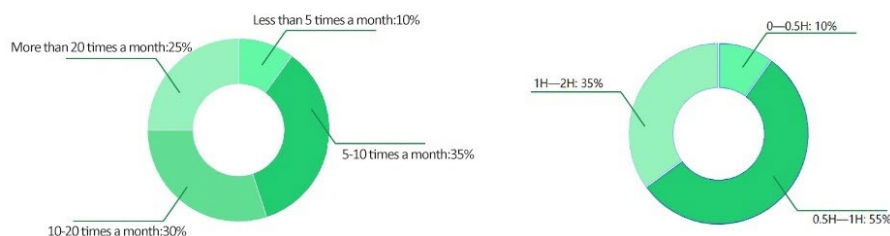


Figure 3: Children's Frequency of Use and Length of Stay at Wenxing East Street Square

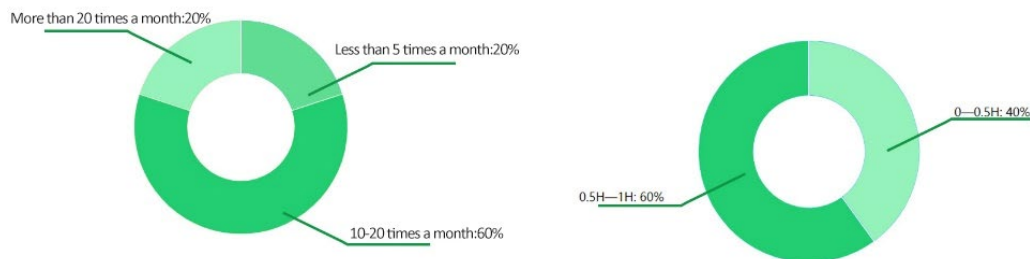


Figure 4: Children's frequency of use and length of stay at Laolaile Cultural Square

The majority of children's activities are group-based, and the establishment of group relationships within different residential address distances can have a significant influence on how frequently children use the venue. Children willing to enter the venue alone typically live within a short distance. Therefore, children who are farther away are more likely to be involved in group activities.

3.2 Children 's Behaviour Activity Type, Action and Behaviour Characteristics

Children's spatial behavioural activity trajectories are related to their preferences, emotional ups and downs, and activity centre points derived from security. They are also affected by spatial forms such as points, lines, and surface factors, either in circles around a single object or along the path of a tree. Different base groups of children largely determine the radius of their radius around the centre of the range of activities, and the greater the base, the greater the radius of children 's range of activities. At the same time, children's low-view angle, field of view, and body swing are all related to the overall perception of the spatial scale of the activity venue and the frequency of activities. Professor Kazuhiko Nakamura of Yamanashi University proposed 36 basic movements classified into "balancing movements", "moving movements", and "operating movements" to describe children's activity status most appropriately.

Accordingly, it can be concluded that the peak time period for school days is between 16:00 and 16:30. The four-story platform space of Wenxing East Street Square is in a high-density gathering state and mainly linear and mobile movements. Most activities are planar and operational during the 15: 30-16: 00 period of the rest day. During the 16: 30-17: 00 period, most of the activities are concentrated on one point, and the balance activities and mobility are the main activities. Since wheeled tools are prohibited from entering the venue under security orders, many activities occurred in the adjacent traffic space.

Due to the presence of infrastructure and a concentrated area of natural space, Laolaile Cultural Square encourages more interesting behaviour, such as "overturning ", "throwing, digging", "burying traps", and even "inverting", "hanging", and "flipping" with horizontal bars and parallel bars. Even the newly built tents during the epidemic have become an excellent hiding place for hide-and-seek games, mainly operational and balance activities. Furthermore, various tools were also displayed since the venue does not restrict activities such as cycling and skateboarding. However, since the elderly also like the table tennis boards and sports facilities at this venue, the children's activity space is squeezed chiefly into the corners.

Different space types will inspire different play behaviours in children, and natural areas have more wild interests and possibilities than other areas. The complex space has clear spatial rules, limiting the game activity choice. Refer to Figure 5.

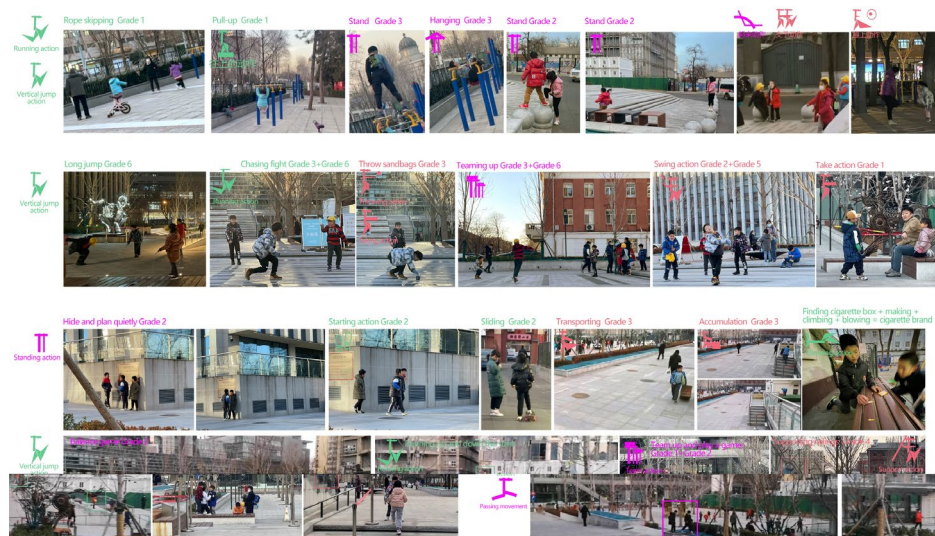


Figure 5: Children 's various play behavior

4. Autonomous Spatial Play Behavior

4.1 The Correlation between Space Type and Gameplay

Due to their natural nature, children will always go from their communities, and schools to surrounding streets, small shops, stationery stores, or activity venues with more playmates of the same age and find or be inspired to create those game experiences that are "customized, interesting, and passed down from older children to younger children." This traditional street game activity, which is rooted in

space itself and has the imprint of children, originates from human beings' inherent space experience, satisfaction and exploration desire. Moreover, this engaging game activity also encourages children to develop their senses and recognize their bodies, regulate their emotions, become acquainted with their surroundings, build a circle of friends, build a model of the street space they imagined in their minds, and even trigger a better understanding of the natural environment. Many factors can influence children's autonomous behaviour, including the size, shape, colour, soft and hard attributes of the building elements in the site space, such as the material of the ground, the degree of smoothness or flatness, the definition of the facade space, the angle of the sunlight, and other factors can become an important incentive to limit or inspire children 's autonomous behaviour. This kind of spontaneous behaviour can achieve ultimate happiness based on the smallest space and invisibly establish a close and exclusive image of childhood with the space itself. American sociologist Mildred Parten Newhall proposed a breakdown of six game types: casual play, independent play, spectator play, parallel play, and associative play, which are gradually integrated into the cooperative play process. A psychological research study has identified five basic types of human play: physical play, play with objects, symbolic play, pretend or sociodramatic play, and rule-based play [4].

Whitebread D et al. [5] also pointed out that body games are related to motor development, block games can improve spatial processing or mental rotation, pretend games can involve language development, especially narrative skills, and so on. According to the actual observation site and in-depth interviews, the above types of autonomous games are obtained, such as oral and classic traditional games. At the same time, there are also some new games that are improvised in combination with the current popular elements. In addition, it will appropriately select and partition the space for the game activities that want to take place. For example, the following games, "Mouse Stealing Oil", "Dark Slice", and "Desert Island Raft Survival" all need to limit the "safe area to play the role", "Public Dangerous Struggle Area", and use iconic structures or trees as interactions or references, which in turn triggers rich game setting associations such as "monsters" and "supply stations" and so on. Similarly, the emergence of the "cigarette card" game is closely related to the elderly groups smoking in the venue and discarding cigarette packs, creating a blending or contradiction between them.

4.2 The Space Rulers and Children 's Behavior (Natural Space)

The adaptation of game behaviour has a great correlation with the space itself and the immediate spatial state for the game behaviour of different numbers of groups. Kids will be each "universal" game "in the ground" play incisively and vividly, especially the natural life area is always the children 's free play paradise. Even the barriers that serve as space media will become elements they can play. Therefore, the "strong rules" in the space will not become a "threat" in their eyes. On the contrary, they will constantly reorganize various disordered spatial elements to improve their game experience. For example, in the "Go to Prison" game, some children regard the railing element as an important barrier to prevent prisoners from escaping. Others are regarded as interesting obstacles during tree climbing competitions, and even the gaps between the railings can become important reference lines for children to throw stones [6].

4.3 Children 's Perception of Space

Children 's positioning of the world depends on body information and sensory impressions. According to the relevant questionnaire survey, children generally have a consistent bottom-line requirement for a sense of security in space. Refer to Figure 6.

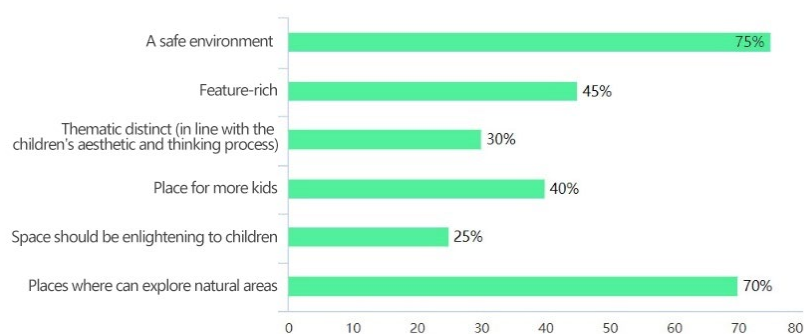


Figure 6: Children 's choice statistics of spatial elements

Figure 7 was obtained by asking several children to draw their favourite impressions of the venue. It can be seen that most children are deeply impressed by the stepped square, tree pond, and concrete sculpture landscape elements in the centre, and have given them various imaginations at the cognitive level. At the same time, it can be seen that the different perceptions of the site centre in its world space. For example, in this picture, No. 7 and No. 9 imagine the central staircase space to be a castle, so they will play the "Design Your Home" game mentioned earlier. In this picture, it appears that Nos. 2 and 6 portray extremely anthropomorphic scenes, and they will impart to daily space types the colours of the scenes exclusively imagined by children. No. 5 represents a scenario based on event-based play, while the remaining incomplete graphic representation reflects the areas they frequently play in or pay attention to daily. The cognition of place space is diverged chiefly from the centre point of the ladder and then may form a cognitive image defined by important landmark points or boundaries, as shown in Figure 8.

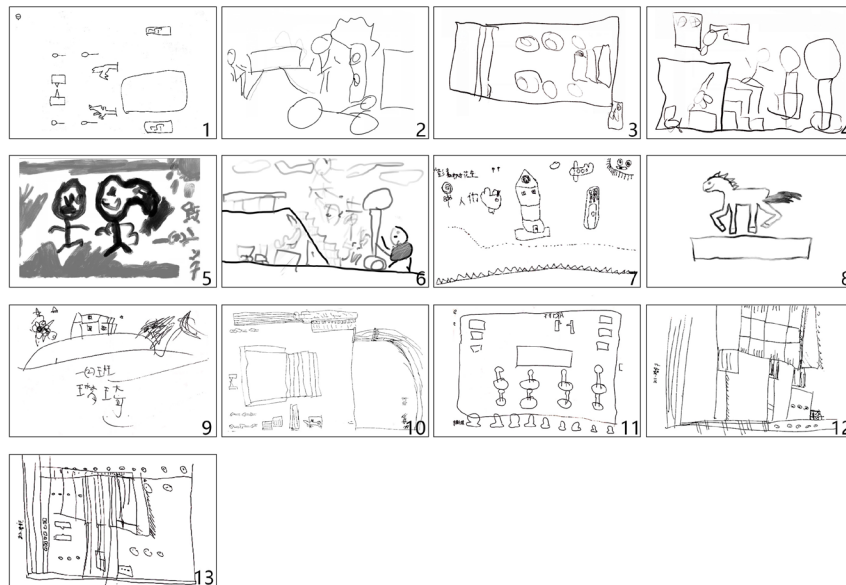


Figure 7: Spatial perception painting of sunken square in Wenxing East Street

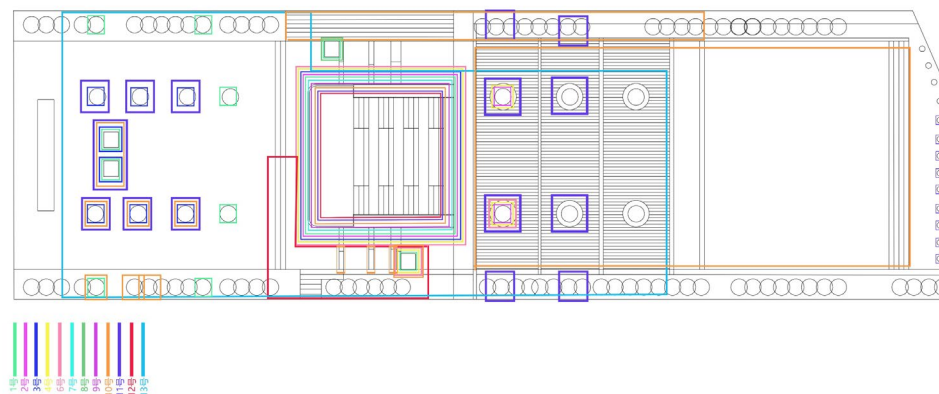


Figure 8: Perception times of spatial landscape elements

5. The Variability of Children 's Behavior in the Post-epidemic Era

5.1 Nature and Electronic Screens

Videos, games, and lectures based on electronic screens have become part of children's lives in the 21st century. Excessive addiction to video games is likely to limit the development of children 's other skills and even connect with adverse effects such as obesity. The COVID-19 epidemic has greatly limited

children's travel distance and outdoor time. At the same time, naturally active children can no longer play with their friends, and large-scale online classes have reduced their exposure to electronic screens more frequently. Thin electronic screens can easily include interesting activities and experiences on the way to school or the possibility of relating to more children and space environments. However, according to the questionnaire, it has stimulated children's blueprint imagination for outdoor space to a certain extent, which benefits from effective epidemic prevention and control and the active role of parents.

5.2 The Role of Chinese Parents

In Chinese culture, parents use a "strong intervention" method to regulate children incapable of making distinctions. It is essential to recognise, however, that the role of the parent in filtering out distractions can play an essential role in allowing children to integrate and participate in outdoor natural spaces, as well as in maintaining children's normal life order during times of public health emergencies.

6. Conclusion

Childhood memories are unique and profound memories deep in everyone's heart, and the spatial environment accompanying every "older child" to grow up carries each generation's extremely important spatial emotions. This kind of subtle connection between the individual and the space that exists in the surrounding activity spaces, streets, or even a small green space is the initial stage for each individual to understand themselves and establish contact with the world, which even became the original flavour with a sense of warmth in the childhood video tapes. However, studying the state of children's autonomous play behaviour during the new epidemic period can "peek" into some fragments of the current real-life space to a certain extent. Then, the true connotation and practical significance of space shaping itself, as well as the fireworks in life, can be obtained from the most frequent behavioural activities of daily children.

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