

兼顾儿童与家长观点的都市公园儿童游乐场设计

Children's Playground Design of Urban Park with Consideration of Children and Parents

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摘要: 儿童游乐场是儿童成长过程中重要的游戏空间, 本文从儿童的观点探究儿童对户外游戏空间的需求。攀爬、斜面等空间属性满足了功能游戏的空间需求, 非固定的空间形状则较容易激发儿童的想象力, 使其创造出建构游戏或戏剧游戏等玩法。针对家长的研究结果显示, 可及性及方便性是选择儿童游戏场的最主要因素, 家长对设施的多样性不满意, 但却尚未意识到儿童在游乐场中应获得更多游戏效益, 这是未来应加以正视的问题。

关键词: 儿童游戏行为; 创造力; 家长观点

Abstract: Children's playground is an important game space during the growth process of children. The thesis explores the needs of children for outdoor game space based on their perspective. Space attributes, such as climbing and beveling, can meet the space requirements of functional games. Non-fixed space design is easier to inspire imagination of children and create various ways for play like constructive games or drama games. However, research of parents showed that accessibility and convenience are the most important considerations for choosing children's playground. Parents are also dissatisfied with the lack of diversity of playground facilities, but they do not realize that children should get more benefits from games in playgrounds. This is a problem which should be addressed in the future.

Key words: Children's play behavior; Creativity; Parents' perspectives

引言

现代科技日新月异, 技术越发达, 网络的应用范围就越广泛, 人们依赖网络的时间也越来越长, 连儿童的生活都充斥着手机、电脑、平板等电子产品, 这不仅对儿童的身心造成影响, 还可能会引起“自然缺失症”。美国作家提出的“自然缺失症”(nature-deficit disorder)^[1], 并非医学诊断, 而是指因远离自然而产生的各种症状, 如过胖、感觉迟钝、注意力不集中及躁郁倾向等生理和心理疾病。还表现在人们不尊重大自然, 不愿了解动植物、饮食来源以及家乡地理等方面。

现在的儿童被传播媒体吸引, 很少在户外直接感受大自然, 而户外游乐场是除了家中庭院外

为儿童提供最多身体活动的场域^{[2][3]}。游乐场其实不仅是儿童游戏的场所，它被赋予了更多的功能，在儿童成长过程中有很大作用。户外游乐场能满足较多需要大幅动作的游戏，如跑、攀爬、跳等大肌肉活动。除此之外，游戏场也可以培养儿童发展责任感，问题解决能力，合作、空间能力和其他多种技巧^{[4][5]}。

然而近年各地出现的许多户外游乐场都是由相似的塑胶游戏设备组成，例如，将色彩缤纷的平台、滑梯架设于橡胶铺面上^[6]，这种相似的游戏设施不仅无法满足儿童对复杂性的发展需求^[7]，还会让儿童觉得无聊^[6]。

近年来澳洲都市设计及景观建筑引领了改善城市设计规划的风潮，以户外游乐场作为改造对象，李怡贞将其经典案例划分为如下四大类型^[8]：

(1) 自然生态游乐场：以自然为基底，尽量选用天然材料来创造一个游戏的空间，依照场地去建构活动的场域。

(2) 文化地景游乐场：没有大量的游戏设施，而是将游戏部分融入景观，通过文化地景来呈现。

(3) 冒险运动场：孩童喜欢有速度感的活动，可使儿童发挥想象力和游戏创造力。

(4) 城市创意游乐场：包含孔洞结构等，能让儿童有更多不同的游戏体验。

1 父母的考虑

父母对儿童户外游乐场产生了重要影响，决定了儿童是否能进到户外游乐场，若是父母喜欢环境和设施，他们的小孩能达到每日运动建议量^[9]；反之，倘若户外游乐场不受家长喜爱，则到访频率较低，停留时间较短^[10]。研究团队采用半结构式访谈，汇集家长对户外游乐场的观点，然后将访谈结果与前人文献做统整，编制正式问卷进行调查。

研究结果显示户外游乐场的要素由五个方面组成，分别为安全性、挑战性、可及性、自然性与附加设施。运用族群分析将家长分为三种类型：安全舒适型、可及便利型与挑战创新型。

1.1 类型一：安全舒适型家长

此类家长占 28.4%。他们较注重户外游乐场的安全舒适性，对其他要素皆不太重视，以安全至上。虽然在重要程度认知的评分上，安全性选项得分较高，也有许多研究着重在家长担忧与安全上，但令人意外的是安全舒适型的家长却没有预期的多。

1.2 类型二：可及便利型家长

此类家长占 44.7%。他们注重户外游乐场的可及性，最不注重安全舒适性。这类型的家长数量最多，也就是说，现在有许多家长偏好选择离家最近、最易抵达的户外游乐场。

1.3 类型三：挑战创新型家长

此类家长占 24.7%，他们最注重挑战性，最不注重可及性。此类家长会为了选择有挑战性的游戏设施，而选择可及性较低的户外游乐场。

通过访谈了解到，家长们觉得儿童游乐场能满足身体的活动需求并接触大自然，但同时场域也要安全，并且应该有厕所等服务设施。家长们普遍认为安全是重要的，环境也应舒适，由此可知，创新性和挑战性固然重要，但安全性还是最受重视的（图 1）。

2 儿童的观点

已有许多研究表明：游戏的内容越丰富多元，就越能激发儿童的想象力和对自我与环境的好奇心，有助于儿童脑部的发展，促进儿童生理、心理和社交能力的发展^{[11][12][13][14][15]}。可以让小朋友用贴图片的方式，来表达想法，和他们做一些沟通。

研究发现，儿童偏好攀爬、跳跃等能使基本肢体动作串联，并产生连续性的活动。游戏行为最常发生在有滑梯、攀爬绳、网与攀爬架、杆的环境中。同时，沙坑能使儿童发挥想象力，产生多样的玩法，如，挖沙来变换不同形状。

流畅性场地能保证活动的流畅性，设施与环境间具有联结性，因此儿童在此场域能想出一连串相关的活动，而传统的游乐场设施与环境都是独立的，没有联结性，儿童结束在某一环境的活动后，无法马上联结到其他环境，导致游戏失去连续性。

有些场地不限制玩法，或环境较空旷，没有明确规定场地用途，这反而会激发儿童的创新想法，由此展开活动。固定的环境限制儿童对游戏进行创新，如，玩滑梯就是滑下去、摇摇马就是坐在上面，只具有常见的游戏功能。

混合了各类特色的游乐场能为儿童提供自由发挥、不受限制的空间（遮蔽空间），且如果环境的外型与某物相似，能引发他们对游戏的联想，使其更能自由创造（沙坑）。而传统的游乐场，由于是环境没经过设计，如，随意独立摆放设施或是一整座玩具，空间限制了儿童想象的游戏行为。

综上可知，沙坑对儿童来说，是不可或缺的环境，而遮蔽空间与孔洞的设置，除了让儿童不受到空间的限制外，还提供可藏匿与隐蔽的空间，使儿童可以自由创造规则与玩法来进行游戏(图2)。



图 1 家长对户外游戏场的类型

Figure 1 Types of Parents for Outdoor Playgrounds



图 2 具有吸引力的游戏空间条件

Figure 2 Conditions for Attractive Game Space



图 3 达到身体活动量的活动

Figure 3 Activities Reaching Amount of Physical Activity



图 4 设计和研究的内容
Figure 4 The Content of Design and Research

3 儿童的需要

身体活动泛指任何运用骨骼肌且能导致任何能量消耗的身体动作^[16]。世界卫生组织将工作、家务、通勤与休闲时的活动都归类在身体活动内，例如站立、提物、走路、跑步、做家务、进行球类活动或其他运动，都算是身体活动的一种。儿童与青少年常见的身体活动多属休闲类身体活动，如在游乐场玩耍、进行追逐性游戏、球类活动与运动等^[17]。

身体活动与健康息息相关，身体缺乏活动更被视为疾病的决定因素^[18]。过去研究证实身体活动对儿童的生理、心理及各项发展皆有益处，儿童期的身体活动也与许多短期及长期的健康结果有关^{[19][20]}。世界卫生组织建议 5~17 岁儿童与青少年每日应达到 60 分钟以上的中度至剧烈等级身体活动^[17]，然而现今许多统计结果皆显示，儿童与青少年的身体活动量明显不足^[21]。

学校是儿童与青少年最常接触的场地，课间的身体活动对儿童具有重要影响^[22]。学校具有多种场域类型，可以为儿童与青少年提供进行不同种类身体活动的机会，例如，校园中的“硬铺面区”能为儿童提供进行动态与静态活动的场所，“游乐场区”则是儿童最偏好的活动场域^[23]。

本研究通过让儿童佩戴内置 GPS 系统的智慧心率手表来测量儿童的心跳率，计算身体活动强度与活动时间，并以内置 GPS 系统确定儿童的活动位置，了解儿童的场地偏好，由此探讨儿童的身体活动行为，并分析校园中的场地类型及校园配置对儿童身体活动的影响。

研究结果显示，儿童最偏好的场地类型前三项依次为游乐场区、球场和硬铺面区。选择“游乐场区”多是因为游戏设施本身对儿童具有吸引力，该场域也能够供其进行规则游戏或追逐游戏；选择“球场”是因为该场域能够供其进行球类活动，但也有部分男生表示仅会在场边观看；“硬铺面区”是儿童从事身体活动的重要场域，该场域不会限制儿童的活动类型，儿童可以在这里从事多样的活动，例如进行追逐游戏、规则游戏或多种球类活动。本研究认为，不同场域所能提供的身体活动需要不同的时间。

总体来说小学低年级最常使用的场域为游乐场、穿堂及草地区，小学高年级最常使用的场域则为球场及硬铺面区。研究发现，分区的校园配置虽然便于儿童前往，但却容易使儿童的活动范围受到限制。研究还发现，活动时间较短会限制儿童的活动范围，使儿童仅在教室附近的场域活动，且仅会在单一场域进行活动；活动时间较长时则能扩大儿童的移动范围，在非单一场域进行活动。另外，本研究通过活动轨迹图发现，儿童不愿在气温较高时前往缺少遮荫的场域，由此可见，影响儿童身体活动的气候因素包括天气状态与气温。

不同年级儿童的 MVPA（中度至剧烈身体活动）具有显著差异（图 3），二年级儿童的 MVPA 明显多于五年级。身体活动强度把导致心跳率大于 130 bpm 以上的活动定义为 MVPA，本结果显示，儿童平均仅用课余时间的 11.75% 进行 MVPA，儿童可能会因天气太热、雨后场地湿滑、课程安排或体力等种种因素，减少平均每日的 MVPA。研究表明，走廊、硬铺面区、游乐场区、球场、操场及草地区都可以让儿童进行并达到 MVPA 的活动，活动多为球类活动、追逐游戏与使用游乐器材，这说明儿童会尽可能地在距离较近的地方找到最适合从事身体活动的场域，并进行 MVPA。

4 结语

游戏的内容越丰富多元,就越能激发儿童的想象力和对自我与环境的好奇心,有助于儿童脑部的发育,更可以促进儿童生理、心理和社交能力的提升^{[11][12][13][14][15]}。因此,游戏可以说是儿童健康成长与发展的核心,也是儿童发展智力和学习能力的重要途径,更是儿童除睡眠外,儿童花费时间最多的活动^{[25][26]}

我们希望通过游戏的过程激发出儿童对游戏的想象力与创造力。侯锦雄和陈昭志^[27]曾提到,设计者精心规划的场所并不一定是儿童最喜欢使用的地方,反而是一些不经意打造的场所更能聚集众多的儿童。如此,不仅丧失了原本的设计意义,更无法满足儿童的需求。因此,理解儿童本身对于游戏的需求,进而去设计出符合他们所需的游乐场是更需重视的问题。

通过解决户外游乐场有无厕所、环境脏乱与设施维护不完善等问题,以及寻求游乐挑战性与安全性的平衡,为设计规划者提供实质的参考意见。在设计层面,通过创造共融游戏设施,供不同年龄层的人使用,提高设计的吸引力。了解儿童对场域的偏好以及身体活动量的需求是非常重要的,适当的游戏设施配置及场域规划能增加儿童的身体活动,并将过去对家长儿童的研究,回馈给设计师,再取得与政府的平衡。设计师激发孩子的创造潜能,并使儿童参与设计,这样设计师和政府达到平衡的同时,也能满足家长与儿童的需求。

Introduction

With the rapid development of modern science and technology, the application scope of the Internet will become wider and wider as the technology is becoming more and more developed and people will spend more and more time on the internet. Electronic products such as mobile phones, computers and tablets even fill children's life. This phenomenon will not only affect children's physical and mental health, but may also cause nature-deficit disorder. The "Nature - Deficient Disorder"^[1] (Louv, 2009) mentioned by American writers does not refer to medical diagnosis, but various phenomenon caused by being away from nature, such as overweight, insensitive, inattentive, manic-depressive tendency and possible physical and psychological diseases. At the same time, it will also make people disrespect nature and be unwilling to know about animals, plants, food sources and hometown geography.

Today's children are attracted to the media and rarely experience nature directly outdoor, while outdoor playgrounds are the fields that provide most physical activities for children besides the home courtyard^{[2][3]}.

In fact, the playground is not for playing, it is endowed with more functions and plays an important role in children's growth. Outdoor games can satisfy more games with large movements, such as running, climbing and jumping. In addition, it can also help children to develop the sense of responsibility, problem solving ability, cooperation, space ability and other skills^{[4][5]}.

However, in recent years many outdoor playgrounds are made up of similar plastic games equipment, such as colorful platforms and slides erected on rubber pavements^[6], which are not only unable to meet the complexity of children's development needs^[7], but also can make children feel bored^[6].

In recent years, Australian urban design and landscape architecture have led the trend of improved urban design and planning. Li Yizhen divided these classic cases of outdoor playgrounds transformation into the following four types^[8].

- (1) Natural ecological game yard: Based on nature, it chooses natural materials as much as possible to create a game space and construct an activity field according to the field situation.
- (2) Cultural landscape game field: There is not a large number of game equipment, but the game part is incorporated into the landscape and presented through cultural landscape.
- (3) Adventure Sports Ground: Children like activities with a sense of speed, which will help them exert their imagination and creativity.

(4) Urban Creative Game Yard: Including hole structure and so on, it can enable children to have more different game experiences.

1 Parents' Consideration

Parents play a very important role in children playing in outdoor playgrounds, deciding whether children can enter outdoor playgrounds. If parents like the environment and equipment, their children will be able to reach the recommended daily exercise amount^[9]; On the contrary, if the outdoor games are not preferred by parents, the children's visit frequency is lower and stay time is shorter^[10]. The research team used semi-structured interviews to collect parents' views on outdoor games, then integrated the interview results with the previous literature and formulated a formal questionnaire for investigation

The results show that five factors make up the outdoor games, namely, safety, challenge, accessibility, naturalness and additional facilities. By using cluster analysis, parents are divided into three types: safe and comfortable, accessible and convenient, and challenging and innovative.

1.1 Type One: Parents of Safe and Comfortable Type

This type of parents accounted for 28.4%. The safety and comfort of outdoor game places are more important to them. They don't attach much importance to other factors and take safety first. There may be many studies focusing on parents' concerns and safety. Although the score of safety item is higher among the grade of importance, it is surprising that the number of parents who are concerned with safety and comfort is not as many as expected.

1.2 Type Two: Parents of Accessible and Convenient Type

This type of parents accounted for 44.7%. They do not pay attention to the safety and comfort of outdoor playgrounds, but to the accessibility of outdoor playgrounds. This type of parents is also the largest group, that is, many parents now prefer to choose the outdoor playgrounds that are closest to home and most accessible.

1.3 Type Three: Parents of Challenging and Innovative Type

This type of parents accounted for 24.7%, and they pay the most attention to challenge and the least attention to accessibility. This type of parents will choose outdoor playgrounds of lower accessibility in order to choose challenging game equipment.

According to interviews, parents feel that children's playgrounds can meet the needs of physical exercise and expose children to nature, but at the same time, the playgrounds should be far away from danger and should have service facilities such as toilets. Parents generally believe that safety is important and the environment should be comfortable. Therefore, although everyone attaches great importance to the innovation and challenge of the game field, safety is still in the first place (figure 1).

2 Children's Point of Views

Many studies have shown that the more varied the content of the game is, the more active children's imagination will be. At the same time, it can inspire children's curiosity about themselves and the environment, which can also help their brain development in the process of growing up, and can also promote the development of children's physical, psychological and social abilities^{[11] [12] [13] [14] [15]}.

Children can express their ideas by posting pictures and we can communicate with them.

The study found that children prefer to climb, jump and do some basic body movements that children can connect in series, such as these continuous activities. For example, children play slides, climbing ropes, nets and climbing frames, poles, and all these game environments will all produce the above-mentioned game behaviors. At the same time, when children play with sand pits or dig sand to change different shapes and play various games, they all exert their imagination.

A smooth playground can provide a place for children to do activities smoothly, which means that there is connectivity between facilities and the environment. Therefore, children can think of a series of related activities in this kind of game environment, while the traditional game field is independent of the environment and has no connectivity, so that children cannot connect to other environments immediately after playing in one game environment, resulting in no continuity of the game.

When the playground does not restrict children's various games or the environment is relatively wide, it will stimulate children's innovative ideas and launch activities here because the playground does not specify the purpose. The fixed playing environment limits children's creative playing behavior, such as sliding and rocking horses on the slide, which only causes them to play common functional games. When children are in a playground environment mixed with various types of characteristics, children can play freely, not be restricted by space (shadowed space), and the appearance of the environment is similar to something, which can arouse their association with games and make children more free to create (sand pits). However, the traditional game field may be an environment that has not been designed and the facilities or a complete set of game equipment are placed independently at will, so the game space limits the children's imagination of the game behavior, so the children cannot generate rich imagination.

From the above, it can be seen that sand pits are an indispensable playing environment for children. However, setting up more shielding spaces and holes not only allows children not to be limited by space, but also provides hidden space and allows them to freely create rules and play games (figure 2).

3 Children's Needs

Physical activity refers to any activity that uses skeletal muscle and can lead to any energy consumption^[16]. WHO(World Health Organization) also categorized movements during work, house work, commuting and leisure as physical activities. Activities, such as standing, lifting objects, walking, running, doing housework, playing ball games or other sports, etc., which are considered to be one kind of physical activities. The common physical activities of children and teenagers are mostly leisure physical activities, such as playing in the playground, chasing games, playing ball games and sports^[17]. Physical activity is closely related to health, and lack of physical activity is also considered to be the main determinant of poor health^[18]. Previous studies have confirmed that physical activity is beneficial to children's physical, psychological and various development. Physical activity in childhood also affects many short-term and long-term health outcomes^{[19][20]}. The World Health Organization recommends that children and teenagers aged 5~17 should do moderate to vigorous physical activity for more than 60 minutes per day^[17]. However, many statistics show that children and teenagers obviously do not do enough physical activities^[21].

Schools are the most frequently visited areas for children and teenagers, and physical activity during school hours has an important impact on children^[22]. Schools have multiple field types that can provide children and teenagers with opportunities to engage in different kinds of physical activities, such as " hard pavement areas" in schools that can provide children with dynamic and static activities, and children's favorite field of activity is "game field"^[23].

This study measured the heart rate of children by letting them wear smart heart rate watch with GPS system to calculate the intensity and time of physical activity, and used GPS system to locate the active position of children. Through this research method, we can know children's field preference, discuss children's physical activity behavior, and analyze whether the field type and campus configuration in the campus will affect children's physical activity.

The results show that the top three most preferred field types for children are the game field, the ball park and the hard pavement area. The reason why the " playground area" is in the first place is mainly that the game equipment in the playground is attractive to children, and children can also play regular games or chase games here. The reason for choosing the " ball parks" is mainly that children can play

ball games there. However, some boys said they would only watch the game on the sidelines. The "hard pavement area" is an important field for children to engage in physical activities, because it does not restrict the types of children's activities. Children can engage in various activities here, such as chasing games, regular games or various ball games. This study suggests that different fields can provide children with physical activities at different times. Generally speaking, playgrounds, halls and grass areas are frequently used by children in the lower grades, while the most frequently used fields in the higher grades are stadiums and hard pavement areas. The study found that although the school adopts a separated campus configuration that is easy for children to go to, it easily limits the scope of children's activities. This study also found that the range of children's activities is limited by the time of their activities, which makes children can only move in the field only near the classroom. When the activity time is longer, the range of children's movement can be expanded to other fields. In addition, this study also found that children are reluctant to go to the field without shade when the temperature is high. Therefore, weather condition and temperature are the climatic factors that affect children's physical activities. There is a significant difference in MVPA(Moderate to Vigorous Physical Activity) among children of different grades (figure 3), and the MVPA of children of second grade is significantly higher than that of fifth grade. Physical activity intensity that makes the heartbeat rate more than 130 BMP is classified as MVPA. The results show that children spend only 11.75 % of their rest time at school in MVPA on average. Children may reduce the average daily MVPA due to various factors such as hot weather, wet ground after rain, curriculum arrangement or physical strength. Research shows that corridors, hard pavement areas, game fields, ball parks, playgrounds and grass areas can all allow children to carry out and achieve MVPA. Most of these activities are ball games, chasing games and using amusement equipment, which means that children will find the most suitable field for physical activities as close as possible and reach MVPA.

4 Conclusion

The more varied the content of the game is, the more active the children's imagination will be. At the same time, it can inspire children's curiosity about themselves and the environment, which can also help their brain development in the process of growing up, and can also promote the development of children's physical, psychological and social abilities^{[11][12][13][14][15]}. Therefore, playing games can be regarded as the core of children's healthy growth and development, an important way for children to develop their intelligence and learning ability, and activities that children spend the most time besides sleeping^{[25][26]}.

Games can stimulate children's imagination and creativity in the process of playing games. Hou Jinxiong and Chen Zhaozhi^[27] have mentioned that the place carefully designed by designers is not necessarily the place that children like most, instead, some casual places can gather many children to play. In this way, not only has the meaning of the original design been lost, but also the needs of children cannot be met. Therefore, it is more important to understand children's needs for games and then to design the games that meet their needs.

By solving the problems of whether there are toilets, dirty environment and inadequate facilities maintenance in the outdoor games, as well as seeking a balance between the challenge and safety of the game equipment, substantive reference opinions should be provided for designers. At the design level, people of all ages can use the game equipment to enhance the attractiveness of the design. It is very important to understand children's preference for fields and the demand for physical activity. Proper game equipment configuration and field planning can increase children's physical activity. We should also give back the past research on parents and children to the designers and balance it with the government. Designers stimulate children's creative potential and let them to participate in the design, so that designers and governments can reach a balance while meeting the needs of parents and children.

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