
Outdoor Environments as Children’s Play Spaces: Playground Affordances

Nor Fadzila Aziz and Ismail Said

Contents

1	Playgrounds versus “Play” Grounds?	2
2	Children’s Play in Outdoor Environment	3
3	Play as a Transactional Process Between Environment and Children	4
4	What are Affordances?	8
4.1	Level of Affordances Indicates the Qualities of Environment and Children’s Relationships with Environment	9
4.2	Level of Actualized Affordances Indicates the Extent of Child-Environment Fit ...	11
5	Factors that Influence Level of Actualized Affordances	12
5.1	Characteristics of Physical Environments	12
5.2	Human Nature Needs	13
5.3	Human-Interaction Needs	14
5.4	Other Individual and Social Factors	15
6	Types of Children’s “Play” Grounds	16
7	Conclusion	19
	References	20

Abstract

Play in outdoor environment is crucial for children’s healthy development and learning because it creates meaningful, enduring environmental connections and increases children’s performances. However, the extent of children’s engagement in outdoor play and the way they can learn through play is strongly influenced by the physical and social contacts with the outdoor environments. However, the design of children’s outdoor environment commonly did not

N.F. Aziz (✉)

School of Housing, Building and Planning, Universiti Sains Malaysia, USM, Penang, Malaysia
e-mail: nfadzila@usm.my; fadzilanor@gmail.com

I. Said

Faculty of Built Environment, Universiti Teknologi Malaysia, UTM, Johor, Malaysia
e-mail: b-ismail@utm.my

address the children's needs and preferences, which results to low engagement with the environment. It is due to the lack of understanding on child-environment transaction relationship through play. Therefore, this chapter aims to provide a discussion on the transactional relationship of children's play through the concept of affordances. It discusses how children perceive the properties of the environments in terms of its functionality and playability and how they view the outdoor environment as their "*play*" grounds. The concept of affordances in children's play not only informs about the properties and attributes qualities of environments but also indicates the children's abilities to coping with and adapt to the environmental affordances. The child-environment transaction through play also indicates the level of actualized affordances in the environments and the degree of person-environment fit (P-E fit). In sum, the understanding of child-environment transaction is crucial in the creation of better environment for children's "*play*" ground that can optimize their play experiences. The concept of affordances is not only relevant to environmental psychologists but also to geographers, planners, and designers. The relational properties of affordances and the developmental dimension of environments (Heft 1988) can provide the geographers, planners, and designers with insight into how to manage and manipulate the physical environment in supporting different human activities and experiences (Ward Thompson 2013).

Keywords

Affordances • Transactional relations • Play grounds • Actualization • Outdoor play • Child friendliness • P-E fit

1 Playgrounds versus "*Play*" Grounds?

Playgrounds are the designed spaces that usually include equipment for specific uses and users. It is the places where people, especially children, will go to do enjoyable things. However, playgrounds are normally designed and governed by adults and, therefore, dominated by adult influence. According to Ferré et al. (2006), playgrounds normally are designed with high restriction to the number of users and primarily consist of children aged 3–10 years old. The designs of spaces and equipment normally are not appropriate for other potential users such as younger children, and adolescents make the spaces less utilized by these age groups. Another issue is the reflectance of users' basic needs on the design of playgrounds (Ferré et al. 2006).

In contrast with "*play*" grounds or play spaces, it can be anywhere and almost everywhere that children found by themselves as a playing platform, a space, or corner that fulfills their playfulness and curiosity, and without the control of adults. They are the places where children perceive that they can afford their play

activities. It is not limited to specific activities; indeed the children have freedom to create their own activities depending on how they view the potentials of the play grounds and its affordances. In other words, playgrounds are places for children and play grounds are children's places (Rasmussen 2004). Table 1 summarizes the key distinction between playgrounds and "*play*" grounds.

2 Children's Play in Outdoor Environment

Play is a quintessential childhood activity which is both a need and right of children and is central to their well-being. Play should be fun, passionate, spontaneous, self-initiated, and purposeless (Piaget 2007) because the activity itself is more crucial than the outcome. This means the experiences that children gain through play, such as doing, exploring, discovering, failing, and succeeding, are more meaningful. Children's association with a range of playful activities can contribute to their physical, social, cognitive, and emotional development (Pellegrini 2009) and enhance their problem-solving abilities and creative thought (Kellert 2005). Therefore, play is a valuable and enjoyable activity which is also a process through which children learn without being taught (Piaget 2007).

Play is the primary mechanism through which children become familiar with their environment. Play allows children to stretch themselves cognitively, physically, and socially. Children rely on their imaginations while playing, and they learn to use their thoughts to guide their behaviors. Historically, the majority of play took place outdoors, where children created imaginary worlds of their own. Playing in outdoor environments that offer various affordances can stimulate their senses and generate their cognitive skills. The outdoor environment offers unique opportunities for children to engage in active and creative play as well as a ground where they can interact with friends.

Therefore, play has been central to the study of children's outdoor environments. In recent years, there has been a growing discourse regarding play in outdoor environments as both a need and a right of children. It is due to dramatic change in children's lives where children have lost the freedom to actively and independently play in their neighborhoods and cities. Children today have also lost opportunities to have contact with nature in their daily lives. The erosion of opportunities for children's outdoor free play and interaction with the natural environment is due to rapid urbanization in many developed and developing countries. Many cities have become negative places to live, especially for children, due to the increasing amount of street traffic, badly planned urban environments, pollution, and other hazards that have contributed to a diminished access to the outdoor environment. These phenomena have also contributed to the increase in concerns on children's safety and health. This has led to adults' misconceptions about the risks and values of play for children, especially for those who live in cities.

Children's growth and development in outdoor environments are influenced by children's interaction patterns in environmental friendliness. Specifically, children learn about the outdoor environment through three modes: cognitive, affective, and

Table 1 The key distinction between playgrounds and “play” grounds

	Playgrounds	“Play” grounds
Definition	The spaces are specifically designed by adults for children to play (places for children)	The spaces are not specifically designed for children to play, but children found the spaces as places that can afford their play activities (children’s places)
Features and uses	Equipped with equipment for specific uses and users	Various natural and man-made features available in the spaces offered various play and uses for children and others
Opportunities for play	Children’s play is restricted because the spaces are normally designed and governed by adults	Children have freedom to create their own play activities without the control of adults

evaluative (Kellert 2002). Cognitive development begins with the recognition of play spaces, followed by the discovery of the spaces’ features and affordances (Kyttä 2002). Affection signifies the positive feelings for and emotional attachment to a place (Kellert 2002), and awareness and sensitivity to the physical and environmental factors are requisites for affection. Cognitive and physical contact with the elements in the outdoor environment generates children’s sensitivity to the functions of those elements. Frequent exposure to the outdoor environment thus allows children to become sensitive to the properties of features. Consequently, frequent and repetitive physical experiences trigger a positive feeling toward the environment. The evaluative development refers to the way in which children perceive the features of the environment as valuable materials, which they utilize as and shape into play tools. During repeated interactions with particular materials, children become familiar with, appreciate, and are aware of the absence or presence of those materials in nature.

Previous studies have shown that children perceive distinctive differences in different outdoor environments that offer different affordances for their activities (see Table 2). It is their relationship with the physical and social environments that structures their perception and shaping of the potential environmental affordances (Kyttä 2002).

3 Play as a Transactional Process Between Environment and Children

Children’s play in an environment is viewed as a transactional process between them and the environment because the relationship is dynamic in an interactive system, where the components cannot be taken out of context (Kyttä 2003; Werner and Altman 1998). Figure 1 illustrates the transactional process of children’s play from the perspective of ecological perceptual psychology. The theories of affordances and the person-environment fit (P-E fit) operationalized the

Table 2 The affordances of children's outdoor environment

Types of environment	Authors	Major findings
Neighborhood	Kyttä (2002) and Veitch et al. (2006)	Home yards and immediate surroundings in the neighborhood become the important resources of affordances for children's active play, by offering them the opportunity for independent activities, compared to other places in the neighborhood
	van Anandel (1990), Min and Lee (2006), Veitch et al. (2008), and Castonguay and Jutras (2009, 2010)	Neighborhood outdoor spaces, such as local parks and designed playgrounds, are the psychological valued setting for children due to their psychological affection and distinction experience
School ground	Powell (2007), Ozdemir and Yilmaz (2008), and Dymont et al. (2009)	Good landscape features associated with various natural elements in the school grounds promote physical activity and offer options for active, imaginative, and creative play that appeals more broadly to children of varying interests and abilities, as well as affording social interaction and cognitive development
Playground	Hart and Sheehan (1986), Heusser et al. (1986), and Herrington (1998)	Playgrounds with complexity and variety of elements provide an opportunity for manipulation, exploration, and experimentation, which provides the opportunity to learn and develop cognitive awareness, social skills, and motor skills. Contemporary playgrounds commonly lack these elements and are perceived as neither fun nor challenging
Street	van Anandel (1990) and Holt et al. (2008)	Streets with increasing traffic were the main areas of danger for children, but children value the streets for the wide range of activities, creativity, and sense of fantasy they offer in children's play
Public places	Lennard and Lennard (1992)	Good public spaces could promote children's affection, interest, and participation in cities and towns. However, the environment of many cities and towns frequently represents a form of sensory deprivation for children

(continued)

Table 2 (continued)

Types of environment	Authors	Major findings
Natural environment/ setting	Fjørtoft and Sageie (2000)	A diverse natural landscape with miscellaneous composition and structures has the qualities to meet children’s need for a varied and stimulating play environment and improved motor skills and environmental disposition

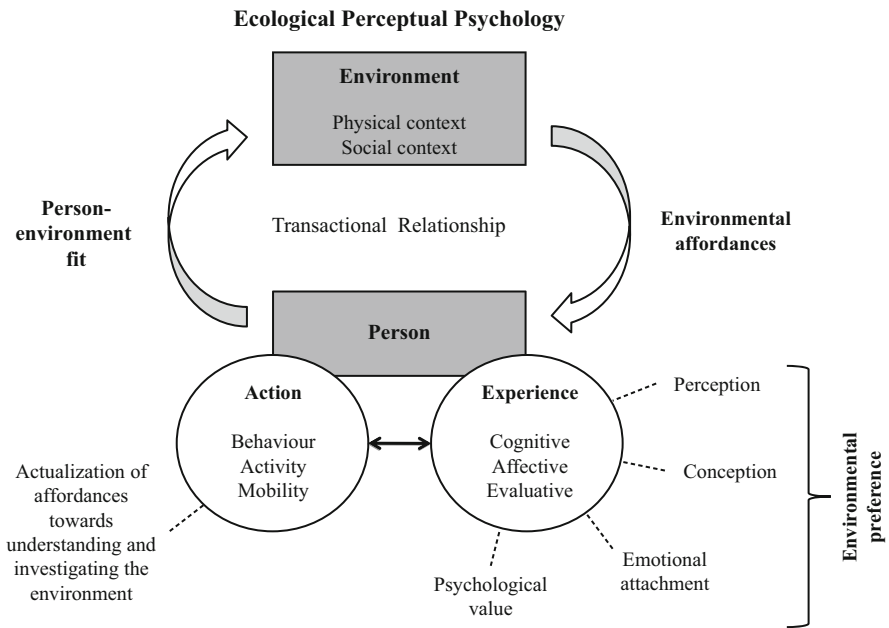


Fig. 1 The transactional of person-environment relationship from ecological perceptual psychology perspective

transactional process. The former focuses on people’s environmental preferences through ecological cognition on the environmental affordances, while the latter is viewed as a means of identifying the immediate nature of people’s environmental preferences by adjusting their behaviors to fit with the environment in fulfilling their needs.

Transactional studies stress that both person and environment play an active role in an interactive relationship, while the context includes physical and social phenomena, which are referred to as the material and sociocultural reality (Kytta 2003). As persons are perceptive in their environments, so they are capable of influencing

and changing those environments. Likewise, the physical and social contexts of the environments also influence people's behavior and being (Kyttä 2003). Therefore, in transactional research, people and environments are interrelated components that mutually define each other. Thus, they cannot be explained separately as they represent the whole interactive system underlying a phenomenon that occurs in a certain place and time.

James J. Gibson's ecological perceptual psychology is an example of a transactional framework. In ecological perceptual psychology, the environment is an ecological and dynamic system which is described in psychologically meaningful ways, and the person is considered a responsive organism who purposefully engages with his or her surroundings. The environment is a multidimensional structure associated with values within an ecological structure that permits a person to perceive and act upon the possible actions available in the environment. In this respect, the functioning person is conceptualized as being in a specific environmental context, a component that is inseparable from their environment. This is because the perceptual psychology of a person is based on the ecological information gained from the environment through their relationship with it. This relationship forms an ecological reality and then an entity (Kyttä 2003).

The transactional relations between person and environment form the person's perception about the environment, which has a power to influence their behavior, activity, and mobility. In addition, perception is oriented toward finding environmental affordances. When perception and action interact, action reveals new affordances, and this perception of the new affordances in turn generates new actions (Kyttä 2003). Therefore, perception is fundamental in ecological perceptual psychology because it is inseparable from the corresponding intentional activity.

According to Kaplan (1987), the perceptual information a person receives from an environment and that influences his or her actions in transactional relations are the basis for that person's environmental preferences. In this case, perception is viewed as a type of fundamental cognition in ecological perceptual psychology that directs a person's affective and evaluative functions and so determines his or her actions. Normally, people tend to prefer or be attracted to environments that offer them opportunities for action, that is, environments that afford their activities (Kaplan 1987). For example, Kyttä (2003) found that the formation of environmental preferences by children is linked to the functional activity performed by children in the environment. In other words, the actualization of affordances in an environment can contribute to children's environmental preferences. Her finding continued the consistency of findings from studies on children's environmental preferences since the 1970s (Chawla 2002), which can be explained by the concept of affordances (Kyttä 2003). Moreover, the characteristics of a physical environment also are identified through environmental preference studies (Kyttä 2003) where people's actions are motivated by their preferences as a desire to understand and investigate the environment (Kaplan 1987; Kaplan et al. 1989).

The transactional approach is crucial in studies of children's environments since children's views and preferences toward the environment differ from those of adults as they have different needs, aspirations, and behaviors. The understanding of the

integration of children's actions and experiences with their environmental preferences consequently provides information in the planning and design of child-friendly environments (Kyttä 2003).

4 What are Affordances?

Affordances are a theory introduced by Gibson in 1966, which he referred to as the properties of the environment that can offer and influence the person who engages with it. The properties can be beneficial or unbeneficial to the person depending on how the person perceives its functions. Therefore, both the environment and people complement each other in the concept of affordances, which suggests the transactional relationship of both components. The concept matches with the framework of ecological perceptual psychology (Gibson 1979; Kyttä 2002), which suggests that people shape the environment and are shaped by their environment. With children, the shaping of the environment depends on the environmental affordances as perceived by the children (Kyttä 2002).

Affordances refer to the functionally significant properties of the environment, which are perceived through the actions and the perception of individual affordances (Gibson 1979; Kyttä 2004; Heft 2010). Affordances can be any objects, surfaces, substances, or places. The theory also stresses that action and perception are two inseparable components in the process of perceiving the environmental affordances. Gibson (1979, 127) said, "We must perceive to be able to move around, and we must move around to be able to perceive" the information available in the environment as it is the key element for the individual's action and perception (Ward Thompson 2013). Hence, affordances include properties from both the environment and the perceiver (Kyttä 2002) in the interactive relationship; the former is known as perception and the latter is known as action (Kyttä 2003).

According to Heft (2010), the properties of the environment are both objectively real and psychologically significant. Therefore, the perception of affordances that occurs through functional activity in the environment can provide a psychologically relevant concept for analyzing the evolving child-environment relationship (Kyttä 2003). In studies of children's environments, researchers have normally used the theory of affordances to explore how the children perceived and used their environment in terms of its functional properties, especially in the outdoors. As adults, we perceive the elements in the environment from the point of view of aesthetic values, but children value the elements, either the natural or designed features, from the point of view of "affordances" and "playability" values (Heft 1988). For example, from a study conducted at primary schools in Malaysia, a group of children perceived that a bottle can replace the function of a ball when the real ball is not available for their soccer game. They performed their pseudo-soccer game at a mini hall beside the canteen or building's corridor, with the tables at the mini hall or edges of the corridor as the goal posts (see Fig. 2). However, the environmental affordances may differ from one child to another as they perceive



Fig. 2 (a,b) The children utilized the mini hall and corridors as play spaces for pseudo-soccer, and (c) they used recycled bottles to replace the real ball

the functional properties of the environment through their own experiences with the environment. Therefore, affordances are also unique for each individual and each specific group of people (Kyttä 2003).

4.1 Level of Affordances Indicates the Qualities of Environment and Children’s Relationships with Environment

In relation to children’s engagement with their environment, Kyttä (2003) made a distinction between two levels of affordances: potential and actualized. Potential affordances refer to an infinite number of possible affordances of an environment or object (Kyttä 2003), which exist without having to be perceived. The extent of potential affordances is defined by the individual’s qualities, such as physical skills and bodily proportions, as well as social needs and personal intentions (Kyttä 2003). Therefore, potential affordances are different for each individual, group of people, and situation (Kyttä 2003; Storli and Hagen 2010). However, once the potential affordances are encountered through the individual’s independent mobility, action, and perception in the environment, they are known as “actualized affordances” (Heft 1988; Kyttä 2002, 2003, 2004). Therefore, “potential

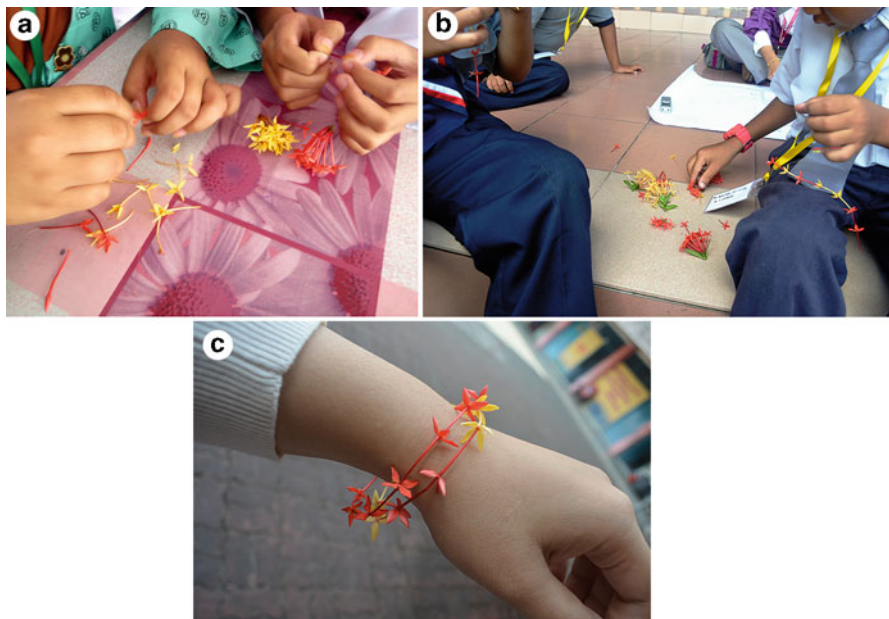


Fig. 3 (a) The girls demonstrated the jewelry-making process. (b) A boy competed with his friend to create longer jewelry. (c) A final piece of self-made jewelry

affordances become qualities of the environment, and the actualized affordances become individual relationships with the environment” (Kyttä 2003, 49). In other words, the qualities of the environment (potential affordances) are notable only when the person engages with the environment, which means the actualization of affordances has occurred (Heft 1989). Potential affordances of different “*play*” grounds may vary. For example, children playing in the stream and orchard will perceive different affordances. At the stream, the children perceive boulders at the river as climbable features that afford scaling, sitting, looking out from, and hiding, while the orchard may afford the children to pick and eat the fruits.

There are various levels of actualized affordances: perceived, utilized, and shaped (Kyttä 2002, 2003). Perceived affordances are what an individual recognizes when observing the environment, and they determine the usability and functionality of the environmental features. Utilized affordances are the opportunities that exist and can be occupied through direct physical interaction with the environment. However, shaped affordances involve the manipulation of environmental features, which change the environment’s properties – either functions or forms. For example, the children at a primary school in Malaysia perceived that the *Ixora* sp. flowers can be manipulated to make jewelry (see Fig. 3). They gained shaped affordances when they manipulated the structure of the flowers by pulling out the flower’s pistil and inserting the stamen of one flower into the pistil of another flower to make the jewelry. During the process of making the jewelry, they

engaged with perceived affordances, such as recognizing the *Ixora* sp. plants, either the red flowers (*Ixora* "siamensis") or yellow flowers (*Ixora* "dwarf orange"), and utilized affordances, such as plucking the flowers.

In relation to the concept of children's play in outdoor environments, children's engagement in perceived affordances involves performatory and exploratory activities, while shaped affordances involve productivity activities. Using the example given previously on the process of making jewelry from *Ixora* sp. flowers, exploratory activity involves recognizing and searching the *Ixora* sp. flowers; performatory activity involves plucking the flowers; and productivity activity involves pulling out the flower's pistil and inserting the stamen of one flower into the pistil of another flower. The activity gives them an opportunity to communicate with peers and perform it in a sense of competition. They sometimes performed the activity in a group and competed with each other to produce the longest jewelry or in the shortest time. There are many ways of making the jewelry; they can make it with all red flowers, all yellow flowers, or a mixture of red and yellow flowers and can make it either long or short. Through the process of making the jewelry, they improved their concentration and skills. The way children change the properties of the environmental features enables them to perform their activities as desired by them.

4.2 Level of Actualized Affordances Indicates the Extent of Child-Environment Fit

Person-environment fit (P-E fit) or congruence is defined as the match between person and environment within a particular situation or setting (Edwards et al. 1998). Conflict or stress does not arise from the person or environment separately, but in accordance with the fit of both components (Edwards et al. 1998). In other words, the fit between the characteristics of a person and the characteristics of their environments can influence a person's behavior, motivation, and mental health. For example, children and adolescents are not likely to be very motivated in environments that do not fit their psychological needs (Ozdemir and Yilmaz 2008), which results in dissatisfaction. In the opposite case, a person's well-being can be enhanced by improving the fit between person and environment. Therefore, P-E fit has been considered as the basis for a person's well-being from the environmental psychology perspective.

P-E fit theory was originally developed by French and Kahn in 1962 and later was refined by other researchers, such as Caplan, Harrison, Edwards, and Cooper (Edwards et al. 1998). The theory was extensively used especially in studies of psychology and personality in organizational settings but seldom used in environmental psychology studies. However, among the earlier attempts to incorporate the theory of P-E fit into children's environments was Kytta (2003), who operationalized the theory through the concept of affordances. She suggested the actualization of affordances requires fit; the higher the number of actualized affordances, the better is the child-environment fit and the environmental child friendliness. Therefore, the actualization of affordances also involves a process of

adjustment between children and their environment in creating a better child-environment fit. In addition, children's participation in environmental planning is also viewed as an attempt to enhance the child-environment fit and children's well-being (Kyttä 2003). Hence, P-E fit is an essential criterion for environmental child friendliness of children's "play" ground environment. The relationship between the number of actualized affordances and the child-environment fit in describing the degree of environmental child friendliness will be explained further in the following section: Types of Children's "Play" Grounds.

5 Factors that Influence Level of Actualized Affordances

The use of environments by children and adolescents can be explored through environmental preference research because environmental preference is the motivational basis for a person's actions (Kaplan 1987; Kaplan et al. 1989; Hartig and Staats 2005) and the actualization of affordances. The studies on environmental preference are mainly concerned with the motives for spending time in preferred places (e.g., Malinowski and Thurbert 1996; Matsuoka and Kaplan 2008; van AnDEL 1990) and the effects on people's well-being (e.g., Hartig and Staats 2005; Korpela et al. 2002).

Study by van AnDEL (1990) has suggested that place preference is related to the function and use of place, that is, its affordances. A preferred place is likely to be used, and conversely, it is unlikely to be used if it is less preferred. Hence, the factors that influence environmental preferences are the factors that also influence the actualization of environmental affordances. Variation in environmental preferences may be due to the characteristics of the physical environment, varying human needs, the possibilities of meeting the needs in an environment, and other individual or social factors. Therefore, the level of actualized affordances at different "play" ground environment may differ according to its physical characteristics and how they attract children's preferences and fulfill children's needs.

5.1 Characteristics of Physical Environments

Stephen and Rachel Kaplan, along with Roger Ulrich, are among the pioneers in environmental preference studies (Kyttä 2003). Kaplan and Kaplan (1989) listed the coherence of information and the legibility, complexity, and mysteriousness of the environment as being the factors that influence the variation in environmental preferences. These are the characteristics of the physical environment, and the way a person can perceive the environment depends on their capacity for obtaining and processing the available information (Kyttä 2003).

In a coherent environment, the movement and use are predictable because its orderly and organized space is explicable (Kaplan et al. 1998). Size, texture, form, and tone of colors can organize patterns into comprehensive units of forms and enhance the environmental coherence. For example, the outdoor environment such

as a play field is perceived as “*play*” grounds by children because of its coherent environment that supports their team games. On the other hand, Kaplan et al. (1998) referred to the distinctiveness of an environment as legibility. A legible environment is normally created by a composition of elements, such as vegetation, paths, and walls (Kaplan et al. 1998), which form a focal point that can attract a person's attention (Ulrich 1983). For children's play grounds, the focal point can be a play equipment (e.g., removable blocks and climbing structure) that triggers children's movements and actions in the outdoor environment. However, an environment with varied and rich environmental features is considered complex because it encourages exploration (Kaplan et al. 1998). The level of environmental complexity is determined by the number of independent features perceived in a scene, and normally, an environment with moderate levels of complexity is the most preferable (Ulrich 1983). An environment with complexity is full of surprises and can create a sense of mystery (Zhang and Jin Li 2012). Finally, the sense of mystery in an environment can trigger a person's exploratory behavior and interest as they keep going (Kaplan and Kaplan 1989), which enhances their satisfaction. Zhang and Jin Li (2012) classified these characteristics of physical environments as the environmental attractiveness that influences children's behavior in neighborhood environments.

5.2 Human Nature Needs

According to Matsuoka and Kaplan (2008), human nature needs are directly linked with the physical features of the environmental setting, which include aesthetic preference, contact with nature, recreation, and play.

The aesthetic preference includes a range of topics related to the basis of preferences toward the characteristics of the environment including scenic beauty, degree of cleanliness, and pleasant sounds and smells (Matsuoka and Kaplan 2008) and also a negative view of nature, such as scary, disgusting, uncomfortable, or even unsafe. The aesthetic characteristics of the environment play an important role in the formation of environmental preferences. They can spark an immediate emotional reaction in a person, indicating whether the environment should be approached or avoided. Ulrich (1983) referred to it as the immediate nature of environmental preferences. According to Malinowski and Thurbert (1996), aesthetic preferences differ among children of different ages. Older children and adolescents tend to appreciate the environmental aesthetic values more than younger children do. However, children's aesthetic preferences on the natural environment are based more on its appearance but not necessarily for its usability if the functions and benefits of the environment are unknown. Study by Bixler and Floyd (1997) found that children's preferences for a natural environment decrease with negative sensitivity and negative emotions, such as fear of animals, plants, weather, and sounds or of getting lost. In other words, an aesthetic preference is not enough to make children use a certain environment unless they are familiar with the environment.

Humans also desire to have contact with nature in a variety of ways, such as viewing nature or directly engaging with and experiencing nature (Kellert 2005). People, especially adults, commonly express a greater preference for the natural environment due to its restorative effect on their health and well-being (Korpela et al. 2002; Hartig and Staats 2005; Ulrich et al. 1991). Restoration through personal engagement with natural features and the environment is a form of emotional and mental self-regulation through a cognitive process (Korpela et al. 2002). For children, contact with nature is crucial for their healthy development, intellectually, emotionally, socially, spiritually, and physically. A considerable amount of literature has reported the benefits of connecting children with nature. Children's engagement with nature can develop their capacities for analytical problem solving and their critical and creative thinking skills (Kellert 2005) while increasing their concentration, confidence, and personal skills, such as social skills and self-efficiency, language and collaborative skills (Moore and Wong 1997), and a sense of wonder and imagination. These positive impacts particularly happen when children play in a natural environment. This is because children experience and judge nature not by its aesthetics, but rather as a stimulator and experiential component of their activities (Sebba 1991).

Therefore, children prefer an environment that offers opportunities for recreation and play. The idea is closely related to Gibson's theory of affordances (1979). Environments that attract children normally offer greater affordances for their active play (Castonguay and Jutras 2010; Kytta 2003; van Andel 1990). Children also prefer environments that challenge their abilities and capacities while they are playing (Kytta 2003). Hart and Sheehan (1986) found that the traditional playground, associated with various elements that offered more functional play activities, was most frequently utilized by children as compared to the contemporary playground. An environment that lacks complexity, variety, and opportunities for children to manipulate and explore will result in a lower preference and utilization by children. Children's needs for recreation and play actually are related to their needs for restoration. Functional activity may be restorative for children in rather the same way a natural environment provides a retreat for adults (Korpela et al. 2002). Even children appreciate the natural environment in terms of how it can afford their functional activity (Sebba 1991) and serve as a retreat for them. Their ability to perform play activities which result in feelings of satisfaction, enjoyment, and fascination suggests that their action itself is a reward and a form of restoration for them (Kytta 2003).

5.3 Human-Interaction Needs

The presence of other people to play with becomes the significant factor for whether children (van Andel 1990; Veitch et al. 2006; Castonguay and Jutras 2010) and adolescents (Lückmann et al. 2011; Louv 2006) like and utilize an environment. This is related to the opportunity to meet (Veitch et al. 2006; Castonguay and Jutras 2009; van Andel 1990) and socialize with others, especially peers. The presence of

other people indicates the importance of social interaction for the utilization of an environment and a person's place preferences. In a study by Veitch et al. (2006), most of the children drew and took photographs of places in their neighborhood that indicated their common meeting places with peers. However, the presence of other children can also have negative effects on their place preferences (van Andel 1990). For example, children may avoid places where they are bullied by other children and where their play is disrupted.

Regardless of the significance of social interaction as a basis in human life and environmental preferences, the need for privacy in children's environments should also be recognized (Lowry 1993). As well as social spaces where they can interact with peers, children also need quiet spaces and private places that serve as refuges for a child or group of children to withdraw from social interaction when desired. Quiet spaces offer comfort and serve as a place for children to self-regulate and refresh themselves (Lowry 1993), while private places support quiet exploration with close friends and are not noticed by adults (Lowry 1993). However, these design features are not always present in children's environments. The provision of a variety of spaces that can afford personal and social interaction (i.e., public, semi-private, and private spaces) is important to reflect a different level of human-interaction needs.

5.4 Other Individual and Social Factors

Substantial evidence also points to the influence of individual and social factors, such as personal experience, social norms, and cultural values, in shaping a person's environmental preferences (Malinowski and Thurbert 1996), including those of children.

Demographic factors, such as age and gender, are among the common factors that influence children's place preferences. Older children and males are more independent regarding outdoor play, while young children's access to outdoor environments typically is limited to their own home's yard, a neighbor's yard, or the street directly outside their home (Prezza 2007; Castonguay and Jutras 2009, 2010), which indicates low independent mobility. Gender differences are not associated with different children's spatial abilities, experiences, and enjoyment but rather with the widespread social stereotype that allows males greater freedom to explore the environment. Therefore, girls were found to be more active in the home yard, while boys tended to be active in sporting settings and private vacant areas which are located away from their home (Min and Lee 2006).

Children's preferences for particular settings are also influenced by their different experiences in and resulting psychological affection for those settings (van Andel 1990; Min and Lee 2006). Children's familiarity and proximity with a place become important factors for outdoor play and place preferences (Castonguay and Jutras 2009) as children are likely to repeat their visit to a place which gave them good experiences and psychological affection. Furthermore, children's use of an outdoor environment is also influenced by their attitude to active play; either they

are an “indoor kid” or an “outdoor kid.” Indoor kids seldom play outdoors; they prefer sedentary activities like video or computer games, drawing, and watching television at home (Veitch et al. 2006).

Social restrictions, such as parental safety concerns, become the main factors that restrict children’s autonomous mobility to play independently in outdoor environments (Veitch et al. 2006; Prezza 2007). Parental safety concerns are mainly related to a fear of strangers, the dangers of crime and traffic (Min and Lee 2006; Veitch et al. 2006, 2008; Castonguay and Jutras 2009, 2010), and exposure to negative cultures. This social factor appears to limit children’s ability to play away from home without adult supervision. Hence, it reduces the range of children’s environments as their place preferences. The limited opportunity to wander independently has limited their chances of finding a suitable place for self-regulation and of creating emotional bonds to the environment. Children’s independent mobility is one of the factors that influence the actualization of affordances in children’s environments. Children’s independent mobility shrinks significantly with the increasing degree of urbanization (Kytä 2004).

6 Types of Children’s “Play” Grounds

The number of actualized affordances actually is not an assurance for children’s favorite places and vice versa. The actualization of affordances and children’s preferences are two essential components in the child-environment transactional process. Therefore, it is important to understand the relationship between these two components in recognizing the types of children’s environments or “play” grounds that can afford their play activities.

Figure 4 shows a model describing the hypothetical types of children’s environments that emerge from the variation of children’s place preferences and the number of actualized affordances. There are four types of children’s environments: (i) friendly environment, (ii) adapted environment, (iii) restrained environment, and (iv) neglected environment. The varying environmental situations of the model are interpreted on the basis of the degree of P-E fit between the potential affordances of the environment and children’s place preferences. The degree of P-E fit then determines the number of actualized affordances in the environments. The higher the degree of P-E fit between the environmental affordances and children’s preferences, the greater the actualization of affordances. As illustrated in the model of children’s environments (see Fig. 4), the friendly and adapted environments are most likely to be the environments that can support children’s play. This is due to the greater number of actualized affordances that occur in those environments compared to the limited number of actualized affordances in the restrained and neglected environments.

A friendly environment is the environment most preferred by the children. Such an environment not only offers an extensive number of potential affordances, but

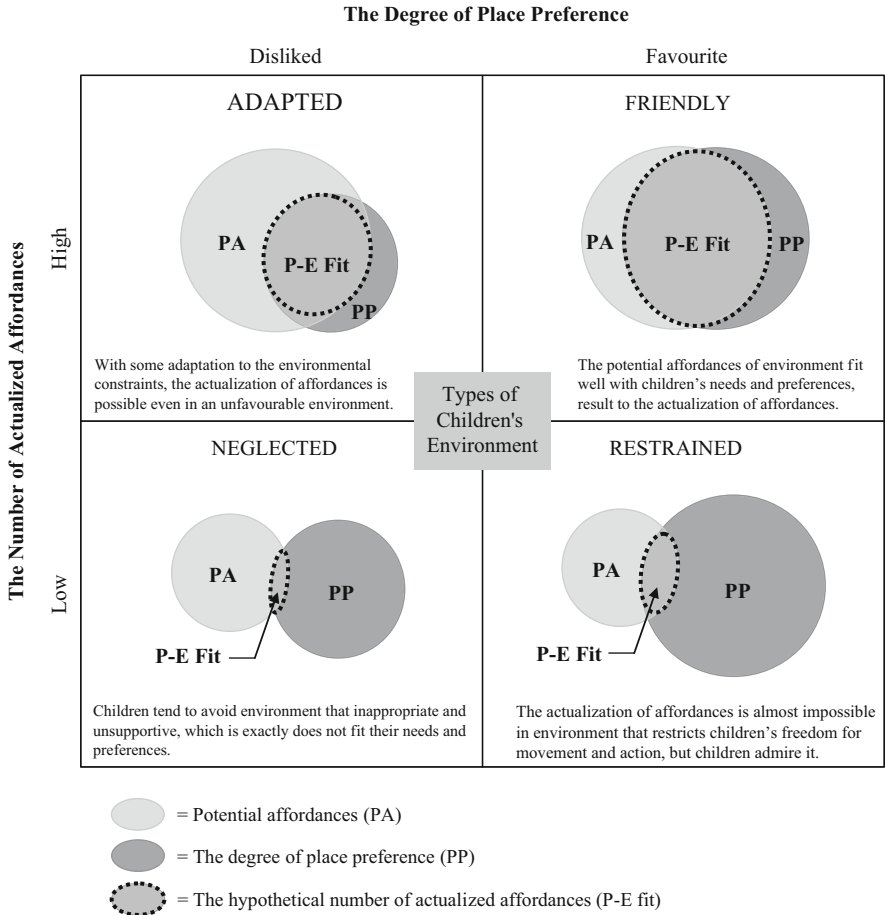


Fig. 4 A model describing the hypothetical types of children’s environment from the variation of children’s place preferences and the number of actualized affordances

also the potential affordances fit well with the children’s needs and preferences. The higher degree of P-E fit results in a greater number of actualized affordances. Children have more freedom and a sense of control to perform their preferred activities in this environment as it offers fewer constraints. A friendly environment normally is not only attractive, safe, and comfortable but also offers higher number of affordances and degree of accessibility for children’s play. The characteristics of the friendly environment provide the highest possibilities for children’s independent mobility toward the actualization of affordances. The properties and attributes of the environments not only trigger the children’s preferences but also afford their play activities.

Regarding the adapted environment, the children disliked the environment but still perform their activities there. The environment offers quite an extensive number of potential affordances, but due to some environmental attributes that do not fit the children's preferences, such as inadequate facilities, uncomfortable and unsafe, thus results in a lower preference among the children. Such an environment is inappropriate and inadequate, but it might be the only available environment that can afford children's play. The children perceive the potential affordances and make some adaptations to the environmental constraints to enable them to perform their play activities. Therefore, the actualization of affordances is possible even in environments that children do not like. The examples of adapted environments are streets, staircase, and vacant land. For adults, we might perceive the environments as inappropriate for children's play; however, for children, the environments might become among the places that can afford their play. In this context, the children modify the places' functions and their own behaviors to make it suitable for new purposes and make it fit with their needs. Therefore, the environments become as part of their "*play*" grounds with several affordances.

In contrast, in the restrained environment, children normally demonstrate greater preferences for the environment, but the actualization of potential affordances is limited due to some restrictions. Its environmental characteristics attract the children's preferences and trigger the children's interests in play. However, they do not have freedom to access the environment, which limits their movement and action. The condition results in a lower number of actualized affordances. The example of a restrained environment is school field. Children may perceive the school field as a place that can afford their physical activities with peers while at school, but they could not perform their play activities because the school regulations prohibit them from playing on the field without a teacher's supervision, especially during recess. This situation normally results to the feeling of dissatisfaction among children but they still desire to play at this type of environments.

The neglected environment is the environment least liked by the children. It is the environment that the children tend to avoid due to its unattractive environmental characteristics and limited number of potential affordances. This might be due to the inadequate attention given to the environment, such as lower maintenance, and thus, it had been neglected. The environment most probably does not fit with the children's needs and does not offer any attractions for the children's play. The environment was not only inappropriate for but also unsupportive of the children's activities.

This model can be applied to children's outdoor environments in identifying the level of child friendliness of an environment. When applying this model, the places that represent each type of environment may differ depending on how children perceive its potential affordances and the environmental characteristics that influence their preferences. This enables researchers and designers to plan the improvement strategies for children's environments as the variation of children's environments in this model is related to the degree of its environmental characteristics that influences the actualization of affordances and children's place preferences.

7 Conclusion

The quality of life and of the environment can never be improved without an understanding of the person-environment relationship. In the context of children's environments, there is a need to understand children's perceptions about their "play" ground environment. An understanding of children's perceptions will lead to an understanding of their emotions, needs, preferences, and interactions. It is an essential part of the process of creating a child-friendly "play" ground environment that will offer more meaningful play experiences for children through an encouraging engagement and interaction with the environment. Therefore, the concept of affordances helps the researchers, geographers, planners, and designers to understand the child-environment transaction through their behavioral and perceptual responses when they are playing. It is crucial because the key factor that influences the actualization of affordances and children's preferences for outdoor environments as their "play" grounds is the transactional process between children and their environment itself. These happen only when children directly engage with their environment and actualize its affordances through their functional activities. If not, the affordances of outdoor environment cannot be actualized because children do not have access to the environment and cannot perceive the affordances even in an attractive and safe environment.

Also, studying children's play and the child-environment transactional process through the concept of affordances also indicates the properties and attributes of the environment that influence children's behavior and interactions. The properties and attributes also influence children's place preferences and the actualization of environmental affordances. Children's place preferences and the actualization of the environment are linked to their needs for recreation and play, environmental aesthetics, contact with nature, and social interaction. In addition, the individual, physical, and social factors also influence the degree of children's interaction with their environment. For planners and designers, these information will provide insight into how to manage and manipulate the physical environment in supporting different children's activities and experiences. It is based on the understanding of child-environment transactions that then leads to the subsequent development of research into landscape and environmental preferences in order to improve the environment for children.

For geographers, the understanding of different types of children's "play" ground environment will provide insight about places in which children's play happens, considering some places are not purposively designed for children to play. This can help us to deconstruct adults' perception about play and "play" grounds for children since children utilize the environment differently from adults. This is due to children's propensity for playing in the environment rather than working or taking leisure. Geographers could do more to study not only children and their "play" ground environment but also to ask the children on how they perceive the environmental affordances, in terms of its potentials and constraints for play. It will provide insights about geography of play and hence about the nature of play itself from the perspective of children.

The way children view the environment is always different from adults. The children also learn best through play especially in an environment that fits their needs. The problems occur when adults do not understand these and try to design the places for children without considering the children's needs and preferences. Hence, children's participation in the process of planning and designing their environment is crucial to the creation of ideal "play" grounds for play. Certainly, they are good sources of information about the design and planning of the environments they occupy because they are aware of the spatial features of their environments and are able to make choices accordingly.

References

- Bixler, R. D., & Floyd, M. F. (1997). Nature is scary, disgusting, and uncomfortable. *Environment and Behavior*, 29(4), 443–468. SAGE.
- Castonguay, G., & Jutras, S. (2009). Children's appreciation of outdoor places in a poor neighborhood. *Journal of Environmental Psychology*, 29(1), 101–109. Elsevier.
- Castonguay, G., & Jutras, S. (2010). Children's use of the outdoor environment in a low-income Montreal neighborhood. *Children Youth and Environment*, 20(1), 200–230. University of Colorado.
- Chawla, L. (2002). *Growing up in an urbanising world*. London: Earthscan Publications.
- Dyment, J., Bell, A., & Lucas, A. (2009). The relationship between school ground design and intensity of physical activity. *Childrens Geographies*, 7(3), 261–276. Routledge.
- Edwards, J. R., Caplan, R. D., & Harrison, R. V. (1998). Person-environment fit theory: Conceptual foundations, empirical evidence, and directions for future research. In C. L. Cooper (Ed.), *Theories of organizational stress* (pp. 28–67). Oxford: Oxford University Press.
- Ferré, M. B., Guitart, A. O., & Ferret, M. P. (2006). Children and playgrounds in Mediterranean cities. *Childrens Geographies*, 4(2), 173–183. Routledge.
- Fjørtoft, I., & Sageie, J. (2000). The natural environment as a playground for children: Landscape description and analyses of a natural playscape. *Landscape and Urban Planning*, 48(1), 83–97. Elsevier.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Hillsdale: Lawrence Erlbaum Associates.
- Hart, C. H., & Sheehan, R. (1986). Preschoolers' play behavior in outdoor environments: Effects of traditional and contemporary playgrounds. *American Educational Research Journal*, 23(4), 668–678.
- Hartig, T., & Staats, H. (2005). Linking preference for environments with their restorative quality. In B. Tress, G. Tress, G. Fry, & P. Opdam (Eds.), *From landscape research to landscape planning: Aspects of integration, education and application* (pp. 279–292). Dordrecht: Springer.
- Heft, H. (1988). Affordances of children's environments: A functional approach to environmental description. *Childrens Environments Quarterly*, 5(3), 29–37. University of Colorado.
- Heft, H. (1989). Affordances and the body: an intentional analysis of Gibson's ecological approach to visual perception. *Journal for the Theory of Social Behaviour*, 19(1), 1–30. Wiley.
- Heft, H. (2010). Affordance and the perception of landscape: An environmental perception and aesthetics. In C. Ward Thompson, P. Aspinall, & S. Bell (Eds.), *Innovative approaches to researching landscape and health: Open space: People space 2* (pp. 9–32). Abingdon: Routledge.
- Herrington, S. (1998). Landscape interventions: New directions for the design of children's outdoor play environments. *Landscape and Urban Planning*, 42(2), 191–205. Elsevier.

- Heusser, C. P., Adelson, M., & Ross, D. (1986). How children use their elementary school playgrounds. *Childrens Environments*, 3(3), 3–11. University of Colorado.
- Holt, N. L., Spence, J. C., Sehn, Z. L., & Cutumisu, N. (2008). Neighborhood and developmental differences in children's perceptions of opportunities for play and physical activity. *Health and Place*, 14(1), 2–14. Elsevier.
- Kaplan, S. (1987). Aesthetic, affect, and cognition. Environmental preference from an evolutionary perspective. *Environment and Behavior*, 19(1), 3–32. SAGE.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. London: Cambridge University Press.
- Kaplan, R., Kaplan, S., & Brown, T. (1989). Environmental preference. A comparison of four domains of predictors. *Environment and Behavior*, 21(5), 509–530. SAGE.
- Kaplan, R., Kaplan, S., & Ryan, R. L. (1998). *With people in mind: Design and management of everyday nature*. Washington, DC: Island Press.
- Kellert, S. R. (2002). Experiencing nature: Affective, cognitive, and evaluative development in children. In P. H. Kahn & S. R. Kellert (Eds.), *Children and nature: Psychological, sociocultural, and evolutionary investigations* (pp. 117–151). Cambridge, MA: MIT Press.
- Kellert, S. R. (2005). Nature and childhood development. In S. R. Kellert (Ed.), *Building for life: Designing and understanding the human-nature connection* (pp. 63–89). Washington, DC: Island Press.
- Korpela, K., Kyttä, M., & Hartig, T. (2002). Restorative experience, self-regulation and children's place preferences. *Journal of Environmental Psychology*, 22(2), 387–398. Elsevier.
- Kytä, M. (2002). Affordances of children's environments in the context of cities, small towns, suburbs and rural villages in Finland and Belarus. *Journal of Environmental Psychology*, 22(1), 109–123. Elsevier.
- Kytä, M. (2003). *Affordances and independent mobility in the assessment of environmental child friendliness*. Doctoral of Philosophy dissertation. Finland: Helsinki University of Technology.
- Kytä, M. (2004). The extent of children's independent mobility and the number of actualized affordances as criteria for child-friendly environments. *Journal of Environmental Psychology*, 24(2), 179–198. Elsevier.
- Lennard, H. L., & Lennard, S. H. C. (1992). Children in public places: Some lessons from European cities. *Environments*, 9(2), 56–75. University of Colorado.
- Louv, R. (2006). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill: Aloquin Books.
- Lowry, P. (1993). Privacy in the preschool environment: Gender differences in reaction to crowding. *Health Care*, 10(2), 130–139. University of Colorado.
- Lückmann, K., Lagemann, V., & Menzel, S. (2011). Landscape assessment and evaluation of young people: Comparing nature-orientated habitat and engineered habitat preferences. *Environment and Behavior*, 45(1), 86–112. SAGE.
- Malinowski, J. C., & Thurbert, C. A. (1996). Environmental developmental shifts in the place preferences of boys aged 8–16 years. *Journal of Environmental Psychology*, 16(1), 45–54. Elsevier.
- Matsuoka, R. H., & Kaplan, R. (2008). People needs in the urban landscape: Analysis of landscape and urban planning contributions. *Landscape and Urban Planning*, 84(1), 7–19. Elsevier.
- Min, B., & Lee, J. (2006). Children's neighborhood place as a psychological and behavioral domain. *Journal of Environmental Psychology*, 26(1), 51–71. Elsevier.
- Moore, R., & Wong, H. (1997). *Natural learning: The life history of an environmental schoolyard*. Berkeley: MIG Communications.
- Ozdemir, A., & Yilmaz, O. (2008). Assessment of outdoor school environments and physical activity in Ankara's primary schools. *Journal of Environmental Psychology*, 28(3), 287–300. Elsevier.
- Pellegrini, A. D. (2009). Research and policy on children's play. *Child Development Perspectives*, 3(2), 131–136. Wiley.
- Piaget, J. (2007). *The child's conception of the world: A 20th century classic of child psychology* (2nd ed.). Lanham: Rowman and Littlefield.

- Powell, M. (2007). The hidden curriculum of recess. *Children Youth and Environments*, 17(4), 86–106. University of Colorado.
- Prezza, M. (2007). Children's independent mobility: A review of recent Italian literature. *Children Youth and Environments*, 17(4), 293–318. University of Colorado.
- Rasmussen, K. (2004). Places for children – children's places. *Childhood*, 11(2), 155–173. SAGE.
- Sebba, R. (1991). The landscape of childhood: The reflection of childhoods's environment in adult memories and in children's attitudes. *Environment and Behavior*, 23(4), 395–422. SAGE.
- Storli, R., & Hagen, T. L. (2010). Affordances in outdoor environments and children's physically active play in pre-school. *European Early Childhood Education Research Journal*, 18(4), 445–456. Routledge.
- Ulrich, R. S. (1983). Aesthetic and affective response to natural environment. In I. Altman & J. F. Wohlwill (Eds.), *Behavior and the natural environment* (pp. 85–125). New York: Plenum.
- Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Nelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, 11(3), 201–230. Elsevier.
- van Andel, J. (1990). Places children like, dislike, and fear. *Childrens Environments Quarterly*, 7(4), 24–31. University of Colorado.
- Veitch, J., Bagley, S., Ball, K., & Salmon, J. (2006). Where do children usually play? A qualitative study of parents' perceptions of influences on children's active free-play. *Health and Place*, 12(4), 383–393. Elsevier.
- Veitch, J., Salmon, J., & Ball, K. (2008). Children's active free play in local neighborhoods: A behavioral mapping study. *Health Education Research*, 23(5), 870–879.
- Ward Thompson, C. (2013). Activity, exercise and the planning and design of outdoor spaces. *Journal of Environmental Psychology*, 34, 79–96. Elsevier.
- Werner, C. M., & Altman, I. (1998). A dialectical/transactional framework of social relations: Children in secondary territories. *International Studies on Childhood and Adolescence*, 5, 123–154.
- Zhang, H., & Jin Li, M. (2012). Environmental characteristics for children's activities in the neighbourhood. *Procedia Social and Behavioral Sciences*, 38, 23–30. Elsevier.